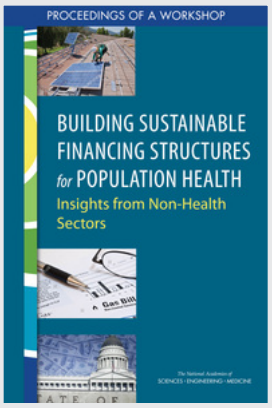

Building Sustainable Financing Structures for Population Health: Insights from Non-Health Sectors: Proceedings of a Workshop

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Building Sustainable Financing Structures for Population Health: Insights from Non-Health Sectors

PROCEEDINGS OF A WORKSHOP

Theresa Wizemann, *Rapporteur*

Roundtable on Population Health Improvement

Board on Population Health and Public Health Practice

Health and Medicine Division

The National Academies of
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ACRONYMS AND ABBREVIATIONS

ACO	accountable care organization
CARB	California Air Resources Board
COWS	Center on Wisconsin Strategy
GDP	gross domestic product
HUD	U.S. Department of Housing and Urban Development
IEA	International Energy Agency
NHT	National Housing Trust
PAYS®	Pay As You Save®

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Introduction[3]

The topic of the resources that are needed to improve health and address the factors that shape health has been a focus for the National Academies of Sciences, Engineering, and Medicine's Roundtable on Population Health Improvement since its launch. This topic was first addressed in a 2014 workshop that discussed such financial mechanisms as pay-for-success financing and hospital and health system community benefit funding (IOM, 2015). To continue its exploration of the topic of resources, but with a focus on non-health-care models, the roundtable hosted a workshop on October 19, 2016, to explore sustainable financing structures that reflect a recognition of the health and non-health factors that shape the well-being of U.S. communities. The goals of the workshop were to learn from the long-term, sustainable financing strategies used in other sectors, to explore how those approaches could be applied to population health, and to consider structures that work across sectors (e.g., examples where capital flows across sectors).

The uneven distribution of health in the United States has been the result of multiple forces—from a wide variety of sectors—that shape the life experiences of individuals, explained workshop planning committee chair Pamela Russo, a senior program officer at the Robert Wood Johnson Foundation. Although health care is a critical factor in health, it is also true that various social, economic, and physical exposures influence who gets sick and who stays healthy as well as whose lives end prematurely versus whose lives are long and active. Furthermore, there are systematic inequities that affect the health of individuals. However, one will not find alleviating poverty, changing school climates to increase the success of children who have been exposed to multiple adverse events or traumas in their lives, or increasing social cohesion listed as line items on a health budget. Establishing long-term, dependable, and adequate funding streams for creating safe, healthy, and equitable conditions in communities has not been a priority for most policy makers, Russo said. Appropriations from federal and state agencies or grants from foundations can catalyze change, but they rarely provide funding for the long term or at scale,

[3] The planning committee's role was limited to planning the workshop, and the Proceedings of a Workshop has been prepared by the workshop rapporteur as a factual summary of what occurred at the workshop. Statements, recommendations, and opinions expressed are those of individual presenters and participants, and are not necessarily endorsed or verified by the National Academies of Sciences, Engineering, and Medicine, and they should not be construed as reflecting any group consensus.

which reduces their ability to have a major impact on population health. Thus the focus of this workshop, Russo said, is to look to other sectors to learn how they have achieved long-term, sustainable funding flows for their agendas.

WORKSHOP OBJECTIVES

As one of its major activities, the Roundtable on Population Health Improvement sponsors workshops for its members, stakeholders, and the public to discuss issues of importance for improving our nation's health, said George Isham, a senior advisor at HealthPartners, a senior fellow at the HealthPartners Institute for Education and Research, and the co-chair of the Roundtable on Population Health Improvement. The roundtable's vision is of a strong, healthful, and productive society that cultivates human capital and equal opportunity. This vision rests on the recognition that outcomes such as improved life expectancy, quality of life, and health for all are shaped by interdependent social, economic, environmental, genetic, behavioral, and health care factors and that achieving these outcomes will require robust national and community-based policies and dependable resources. The roundtable has identified six areas in which actions can be taken toward achieving this vision: building dependable relationships; developing effective policies; metrics and measurement; effective communication; research to understand relationships and potential interventions; and resources. The concept of dependable resources lies at the core of this workshop, Isham said.

The agenda for this workshop was developed by an independent planning committee, chaired by Russo, which included Carter Blakey, Alex Blandford, Denise Fairchild, Gary Gunderson, Jim Knickman, Bobby Milstein, and Christopher Parker. The statement of task given to the planning committee is provided in Box 1-1. In the context of multi-sector collaboration, with a focus on dependable (not one-time) resources, and with the aim of improving health, wealth, well-being, and health equity, the workshop agenda was developed by the planning committee with the following objectives:

- To improve the fiscal fluency of decision makers and the public to move toward common purpose at community scale and explore frameworks for funding reinvestment and reallocation.
- To identify existing opportunities and constraints on realigning funding in ways that are conducive to co-benefits (for all sectors involved).
- To discuss the strategies, including the conditions, needed to realign resources, i.e., what it takes to move funding from one arena to another.
- To explore what decision makers, communities, and other stakeholders need in order to speak about realignment with confidence, including the possible opportunities to move funds from one part of the system to another. In accordance with the policies of the National Academies of Sciences, Engineering, and Medicine, the workshop did not attempt to establish any conclusions or recommendations about needs and future directions, but instead focused solely on issues identified by the speakers, discussants, and workshop participants. The planning committee's role was limited to planning the workshop.
-

BOX 1-1
Statement of Task

An ad hoc committee will plan and convene a 1-day public workshop that will explore the need for, availability of, and potential of modified financing structures that reflect a recognition of health and non-health factors (educational, economic, social, and environmental) that shape the well-being of U.S. communities. The workshop may include presentations on and discussion of: the historical patterns of resource investment or allocation in both the public and private sector; the evidence to date from pilots, prototypes, and research across the country; and the conditions (e.g., collaboration, leadership, metrics) needed to ensure the success of modified financing structures designed to advance population health and health equity. A summary of the presentations and discussion at the workshop will be prepared by a designated rapporteur in accordance with institutional guidelines.

ORGANIZATION OF THE WORKSHOP

This Proceedings of a Workshop summarizes the presentations and discussions that took place at the workshop, Building Sustainable Finance Structures for Population Health. In the first session of the workshop, participants considered a historical analysis of four case studies demonstrating how cross-sector policy and financing were applied to address major social determinants of health inequity (Chapter 2). The next two sessions reviewed current case examples from two non-health sectors, justice and energy. Justice reinvestment (Chapter 3) uses innovative and preventive methods to reduce detention and incarceration and reinvests the resulting savings in further prevention at the federal, state, and local levels, in both adult and juvenile justice. Clean-energy financing (Chapter 4) interrupts the cycle that drives people out of affordable housing as their energy costs increase, providing multiple savings and co-benefits at the federal, state, and local levels. In describing all of the case examples, speakers discussed strategies to align and accelerate funding streams, the modification of current funding structures, and opportunities and constraints encountered in creating a sustainable, reliable flow of funds. Following the plenary discussions of the case studies, participants broke into three small groups to further consider different types of funding mechanisms and their potential application to population health improvement. Attendees then reconvened in plenary session, and group facilitators reported on their groups' discussions (Chapter 5). In the final session, roundtable members reflected on the presentations and identified key takeaway messages (Chapter 6).

Audience Participation Activity

The planning committee intended that this workshop be highly interactive, Russo said. As preparation for the forthcoming discussions, an audience participation activity was conducted by Christopher Parker, an associate project director at the Georgia Health Policy Center and a co-principal investigator of Bridging for Health, an initiative sponsored by the Robert Wood Johnson Foundation. Bridging for Health, Parker said, seeks to both identify and to catalyze local multi-sectoral collaborations that are using innovative financing mechanisms that could support population health and health equity.

As an opening exercise, prior to the first session Parker encouraged participants to affirm the individuals at their table by saying something positive, such as admiring another person's jewelry or tie. He encouraged participants to continue to "give each other voice" and ensure that all present had the opportunity to contribute throughout the workshop.

Next, using Poll Everywhere (PollEv.com) to engage both in-person and webcast attendees, Parker asked three questions and shared the responses in real time. The first poll question prompted participants to enter a word or phrase that best described the state of financing for population health. The theme across the responses, Parker said, was that the state of financing for population health is fragmented, dysfunctional, and generally not what it needs to be but that there is significant potential for change. The response words and phrases included "fragmented," "dysfunctional," "rare," "lacking," "constrained," "stingy," "uncoordinated," "nonexistent," "missing," "inadequate," "woefully inadequate," "not aligned with expectations," "tricky," "lopsided," "in the shadow of the health care financing," "grant dependent," "limited," "seeking direction," "lacking data," "not connected enough to innovation," "new horizon," "emergent," "poised to unlock great value," "potential," "exciting opportunities for change," and "full of possibility and potential."

Parker also asked participants to say what they thought could spark the greatest improvements in financing population health at scale and to describe the extent to which they feel they have enough fiscal fluency to be a champion for population health at scale (Figures 1-1 and 1-2). Parker then charged participants to listen to the presentations and discussions in a way that increased their own understanding and broadened their own scope and to be actively engaged in the workshop conversations that will help to broaden the scope of others.

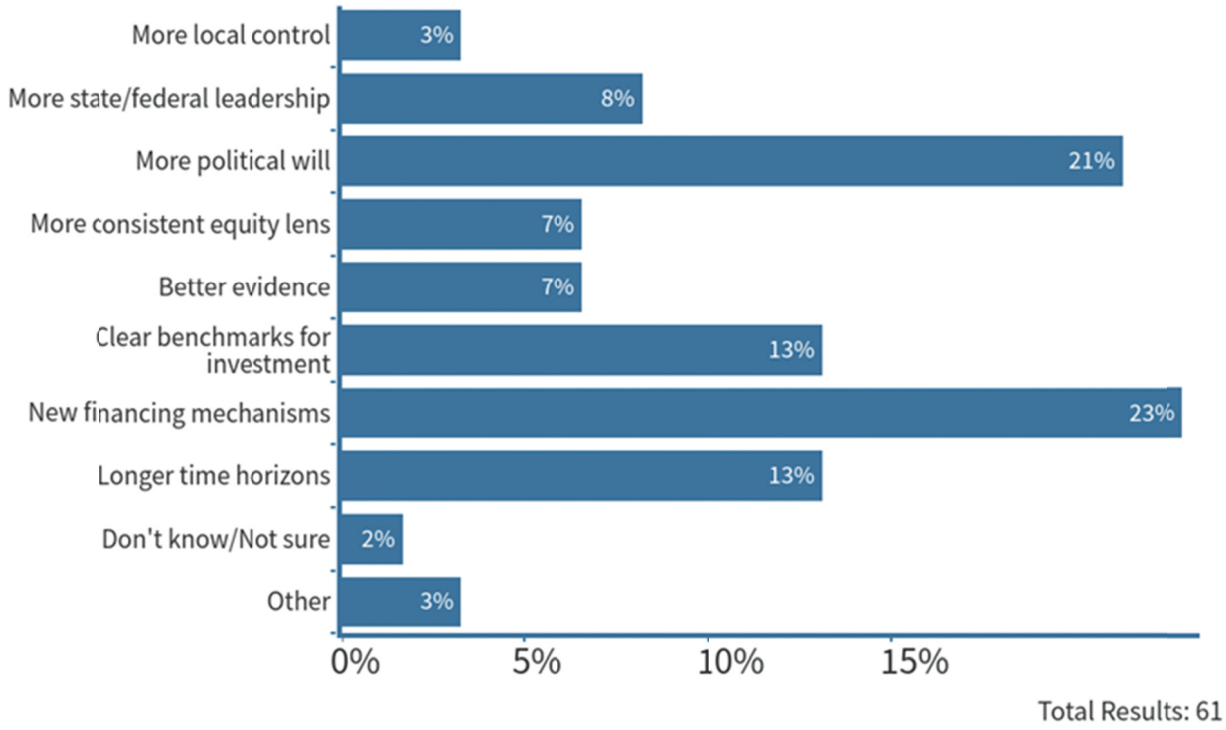

FIGURE 1-1 Audience poll question: What could spark the greatest improvements in financing population health at scale? Select the top two.
SOURCE: Parker presentation, October 19, 2016 (generated by audience input on PollEverywhere, with poll questions developed by Bobby Milstein and Chris Parker).

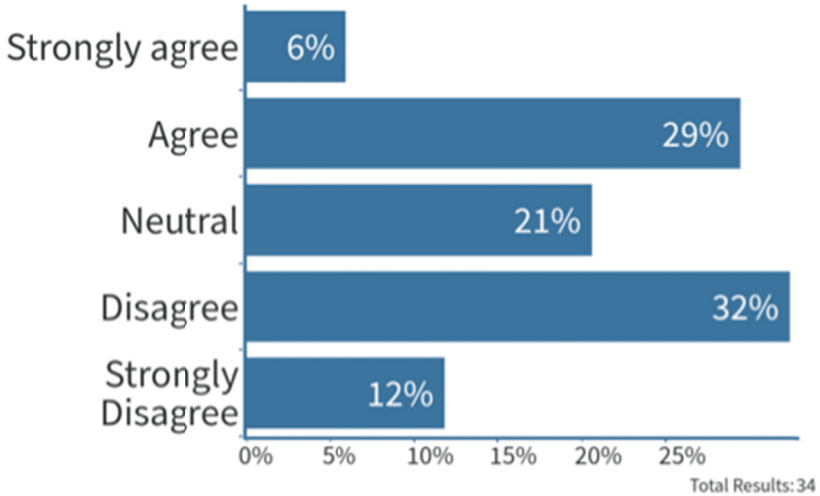

FIGURE 1-2 Audience poll question: I have enough fiscal fluency to be a champion for financing population health at scale.
SOURCE: Parker presentation, October 19, 2016 (generated by audience input on PollEverywhere with poll questions developed by Bobby Milstein and Chris Parker)

2

Sustainable Financing Structures for Population Health: Historical Patterns and Insights for the Future

In preparation for the workshop, the roundtable commissioned a historical analysis of the strategies and conditions that are needed to realign resources and move funding from one arena to another.4 The resulting paper discusses examples of cross-sector policy and financing from four non-health domains that affect public health: the environment, the neighborhood, the home, and economics. An overview of the examples was provided by the authors, Raphael Bostic, a professor and the Judith and John Bedrosian Chair in Governance and the Public Enterprise as well as the chair of the Department of Governance, Management, and Policy Process at the Sol Price School of Public Policy at the University of Southern California; and Anthony Orlando, a doctoral candidate at the Sol Price School.

[4] The complete commissioned paper is provided in Appendix C.

BOX 2-1
Highlights and Main Points Made by Individual Speakers and Participants*

- Context matters. In considering historical examples, it is important to remember the policy context at that time. For new initiatives, it is necessary to work within current political, environmental, and social contexts. (Orlando)
- Political will matters. Co-benefits can often be more important than the initial stated goal in convincing people to back a program or policy, and that includes equity—there are many examples of financing interventions that improve equity and also achieve other benefits that are initial stated goals. (Bostic, Orlando)
- Health is often a side benefit of policy programs in other sectors. Partnering with others who are interested in solving non-health problems offers a better chance of getting funding requests approved by Congress, city councils, etc. (Orlando)
- The elements of success for the reallocation of resources in the various examples included: acknowledgement of the problem, some level of agreement about what should be done to address the problem, the legal authority to create necessary structures, an evidence base to support the argument for the benefits to be gained, a partnership between scientists and communicators, and a willingness to compromise. (Bostic, Orlando)
- Implementing interventions to improve the environment for health can have unintended consequences that exacerbate inequity; considering such effects holistically and in partnership with community members is crucial. (Flores)
- Funding allocation is a political process, and it is important to ask whose voice and priorities are being heard and considered in decisions about the aggregate expenditures on policies. (Bostic)
- A common challenge is that spending in one sector often results in savings in another, but it is generally not possible for the government agency that allocated the funding to capture the benefit of its investment. (Bostic)

* This list is the rapporteur's summary of the main points made by individual speakers and participants (noted in parentheses) and does not reflect any consensus among workshop participants or any endorsement by the National Academies of Sciences, Engineering, and Medicine.

Session moderator Debbie Chang, the senior vice president of policy and prevention at Nemours Children's Health System, said that these are examples of existing structures that have the potential to be effective for population health and that new financing structures are not necessarily the solution. (Highlights are presented in Box 2-1.)

Many of the challenges that people face in the area of economic development and in realizing their individual potential are health-related issues, Bostic said. For example, health can be an invisible barrier to success in school performance or to job attachment. The commissioned paper was designed to consider examples of successful, sustainable financing structures from other domains that could have the potential for being used, at scale, in population health. Bostic offered two questions for participants to keep in mind as they listened to the examples presented by Orlando: What was the institutional arrangement that prevailed that allowed success to happen, and how did these institutions come together? Second, what were the sources of the financing? In all four examples, he said, resources have been reallocated from elsewhere.

Orlando added that each of the examples discussed in the paper has a different financing structure as well as different pros and cons and lessons to learn.

THE ENVIRONMENT

In the 1970s there were about 200 days per year when the particulate matter in the air in Los Angeles exceeded healthy levels, including dozens of days each year when particulates were at emergency levels, Orlando said. There were certain hours during the day when students were not allowed outside for recess because of the high levels of particulates in the air. Fortunately, this is no longer the case.

Orlando highlighted two key events, one at the state level and one at the federal level, that catalyzed the change. At the state level, then-Governor Ronald Reagan created the California Air Resources Board (CARB) in 1967 to address the problem. For the first few years, however, the board had little impact. Orlando attributed this to the board's lack of legal authority to regulate air quality and to a lack of political backing. Political will matters, Orlando said, but the question is, The political will of whom? Policy makers at one level of government might be very much in favor of an initiative, while policy makers at another level are completely unaware of it, or unwilling to back it. Several years after the establishment of CARB, in 1970, President Richard Nixon signed the Clean Air Act, which gave CARB the legal authority to regulate particulates in the air. The act also put in place other regulations—for example, requiring cars to have catalytic converters and requiring the conversion of coal power plants to "cleaner" natural gas.

In considering this example, Orlando said, it is important to remember the policy context. The policy context in the 1970s was very different from the context today. This was a very top-down, government-regulated solution that would be less favored today, but it has been dramatically successful. Pollution levels in the air in Los Angeles over the subsequent decades have dropped significantly. Orlando added that there are many stories of public policy successes that have either been forgotten or that have not been passed down to the next generation, and he was personally quite surprised to learn that stories of brown air and not being able to see the building across the street were not exaggerated.

NEIGHBORHOODS

The context in which people live affects health, Orlando said. There are numerous social determinants of health within one's neighborhood (e.g., concentrated poverty, crime, walkable neighborhoods, the ability to exercise, access to healthy food). In 1994 the U.S. Department of Housing and Urban Development (HUD) launched Moving to Opportunity, an experimental initiative that gave some residents of public housing in select major cities the opportunity to move to new neighborhoods to escape whatever ills they faced in their current neighborhoods.

Participating residents were assigned by lottery to one of three groups: a group that received housing choice vouchers and were required to use them to move to a low-poverty neighborhood; a group that received housing choice vouchers to use wherever they chose, with no restrictions; and a control group that stayed in public housing and did not receive any vouchers. Orlando noted that a complex issue in the context of housing choice vouchers is that

people often choose to stay in the same high-poverty neighborhoods. He suggested that such people have social capital and connections that they do not want to lose (e.g., babysitters, family and friends who can connect them to employers, etc.). Some might even be afraid to move into the low-poverty neighborhoods. Some research suggests that when low-income families move into a low-poverty neighborhood they may feel more stress because now they feel have to live up to neighborhood expectations, or they may be ostracized in community, Orlando said.

The Moving to Opportunity researchers sought to understand how people would behave if they were given the choice of where to live. Orlando provided two key takeaways from the Moving to Opportunity experiment. Both groups who received vouchers experienced improved health, especially mental health. However, the health aspect was actually a side benefit, he said. Moving to Opportunity was created to help people economically, and early studies of the program suggested that Moving to Opportunity was a failure because the heads of the households, the adults who had made the choice to move, were not experiencing significantly better economic outcomes (in terms of unemployment, wages, etc.). A decade later, however, researchers found that the children of the families that had moved were doing significantly better financially as adults. This is consistent with existing sociological research on neighborhoods, Orlando said, which suggests that it is difficult for adults to make the jump to a better occupation and better income, but neighborhood conditions have a tremendous impact on children's cognitive development, their mental health, their ability to develop impulse control, and their development of the focus and emotional intelligence that is required to succeed in the workplace. These outcomes are not apparent until the children enter the workplace many years later. When advocating for addressing the social determinants of health, Orlando said, it is important to make sure that policy makers, voters, and others are aware that there are health implications of economic interventions and that outcomes should not be considered only in economic terms.

From a financing perspective, Moving to Opportunity was a private–public partnership, with private foundations supplementing the government funding for the vouchers and private consultants hired to ensure that the research would be objective. After the experiment was completed, the private foundations remained in many of the communities and continued to assist the residents.

In response to a question about the funding for the vouchers for Moving to Opportunity, Bostic said that the vouchers had existed for about 20 years before Moving to Opportunity started. What changed with Moving to Opportunity was the locations where the vouchers could be used. Essentially, it was the same amount of resources used in a different way, toward housing in different neighborhoods. There was also a multiplier effect in that, once beneficiaries achieved self-sufficiency in their new home and did not need the voucher anymore, those dollars could be deployed to other people. The original demonstration project was slated for 5 years, but it has been continued far longer, in large part because of the support of philanthropic institutions.

HOUSING HAZARDS

Although people might not immediately think about housing as being related to health, Orlando said, they do understand that everything they breathe at home and everything they drink that comes through their pipes matters to their health. One of the more successful housing interventions was the Healthy Homes Initiative, launched in 1999 by HUD. The initiative awarded federal grants to state and local governments to create their own programs to reduce

household hazards—in particular, to reduce children's exposure to lead in homes. This example is more suited to the current political environment, Orlando suggested, as there is support in Congress (i.e., political will) for this type of grant programs, as opposed to the more top-down regulatory approach. Again, he stressed that it is necessary to work within the current political context. These grants have been very successful in reducing lead exposure and making homes healthier. Orlando suggested that an element of success was that the grants from HUD gave states and cities ownership of the process as well as the freedom to create programs that were best suited to the context of their cities. Conversely, one potential drawback is that the federal government does not have much control over the resulting programs, which may affect the likelihood that legislators provide sufficient funding.

EDUCATION AND ECONOMICS

In many ways a person's childhood economic and educational circumstances determine the career path that the person follows and his or her earning potential. There have been multiple efforts at education reform in the last 20 years, Orlando said, and the evidence for their success has been very mixed. One standout example is the Harlem Children's Zone.

The Harlem Children's Zone is a "No excuses" charter school. All students are held to a high level of expectations, and no excuses for poor progress that are based on the student's background are accepted. The research shows, Orlando said, that this type of charter school does succeed in closing the achievement gap in terms of student tests scores, especially in mathematics and reading.

What makes the Harlem Children's Zone unique is that it combines the charter school with community programs. The Harlem Children's Zone has expanded over the years and now covers a 97-block area in Harlem in New York City. Any child who lives in those 97 blocks, regardless of whether he or she attends the school, can participate in the community programs. The programs include after-school tutoring, extracurricular activities (e.g., karate, dance classes), and college prep classes. There are also programs for parents, such as parenting classes, income tax help, or anything else that might help the families help their children.

Harlem Children's Zone has shown significant success in closing the achievement gap in test scores. The results over the long term have been less clear, however. Similar to the case with Moving to Opportunity, researchers have tried to assess how students' earnings are affected years later, after they graduate, and the evidence has been mixed. Whether this is a sustainable solution is up for debate, Orlando said.

From a financing perspective, Harlem Children's Zone is a typical charter school in the sense that it has city funding. It is also a public–private partnership, and like many high-achieving charter schools, it receives significant funds from private foundations, including the Gates Foundation and other education reformers. Harlem Children's Zone now has assets of hundreds of millions of dollars, Orlando said, which makes its schools far better funded on a per school or per pupil basis than public schools or even most charter schools. The question is whether this is a scalable financing arrangement (i.e., whether that much money can be put into every school in the country), and Orlando suggested that it probably is not.

Each of these examples is different, Orlando concluded, from top-down regulation to partnerships between different levels of government, to public–private partnerships. Each has

been successful in its own way. Not all of the approaches may be scalable, he cautioned, and not all may fit into today's policy context, but they all offer examples to draw upon when advocating for funding to address the social determinants of health.

Discussion

A robust discussion followed the presentations. Participants considered common elements across the cases, the need to address equity issues and take a holistic approach to problem solving, housing and health, bringing initiatives to scale, policy making, and overcoming disincentives and challenges.

Common Elements Across Cases

Bostic and Orlando expanded on the key conditions for success that enabled the reallocation of resources in these non-health-sector examples. Bostic highlighted several elements that must reach a threshold level if broad collective action is to be catalyzed. First, there must be an acknowledgement that there is a problem. Each of the cases discussed revolved around an issue that had been widely recognized and broadly understood, he said. There must also be some sense of an agreement about what should be done about the problem (i.e., a particular approach or strategy). There needs to be the legal authority to create a structure that establishes the incentives. For example, it was only after the Clear Air Act provided legal authority that CARB was able to really effect change. Finally, Bostic said, it is important to have an evidence base that can help set forth the benefits to be gained from reallocating resources.

Orlando added that another element of success is collaboration between science and communications. Many scientists face challenges in communicating their ideas to legislators and the public. As an example, he said that the first person who ran CARB was a scientist, which helped to establish firmly for policy makers and voters that this was an actual scientific problem and that there was a scientific way to solve it. The second person who ran CARB was a communications expert and former campaign manager who knew how to make change happen within the political system. Orlando also noted the need to also define the set of second-best solutions and not just the ideological "big idea." Politics is a matter of compromise, and securing the political will requires people who are willing to compromise and work toward achievable solutions.

Applying an Equity Lens

Chang pointed out that the roundtable applies an equity lens to all of the population health topics it considers, and she asked what the examples suggest is needed to adequately address equity issues. The four cases selected all have an equity lens, Bostic replied. Moving to Opportunity and Harlem Children's Zone are both about putting people on a trajectory to become self-sufficient and not require public assistance. He said that, while policies may focus on equity, it is important to make the case that there will be a general, broad-based benefit when seeking support. Orlando agreed that it can be difficult to garner support for an intervention that is solely designed to address an equity concern. The upside of the examples discussed is that there are co-benefits, which often are more important than the initial stated goal in convincing people to back the program. Moving to Opportunity started as a demonstration project (not a policy) for this reason, Bostic continued. The intent was to show what the set of benefits could be if the program

were brought to scale. The Clean Air Act also has a very significant equity element to it, Bostic said. The worst-quality air was in the neighborhoods that had the least resources, in places where residents were not able to buy their way out of the problem.

Terry Owen of the Cuyahoga County Health Department in Greater Cleveland noted that while the national background rate of lead poisoning is very low, hyperlocal data suggests that there are very pronounced disparities based on place in many urban areas. He asked whether there is an understanding that such gaps still exist for this and other issues (e.g., teen pregnancy), and raised a concern about national-level data preventing policy makers from understanding the need to close these gaps. Bostic said that the way federal grant monies are used is often left to the discretion of local parties. He said there is about $100 million per year available for lead abatement in the home and that communities can get three $5 million grants on an annual basis. However, many communities are not engaged. Part of the communications function is to make sure that these issues are understood to be significant and to make sure that all the players are sharing a goal that is worth pursuing.

Taking a Holistic View of Problem Solving

George Flores of The California Endowment suggested that from an equity perspective, solving one problem in one aspect or in one place could result in a new problem popping up in another. For example, in addressing the air quality conditions in the immediate Los Angeles area, the trucking industry and industrialization moved further up toward the mountains, and now places in the Inland Empire Riverside–San Bernardino area have tremendous air pollution issues. With regard to people's ability to move to opportunities or change communities to improve themselves, there have also been tremendous issues around gentrification and neighborhood change.

It is important, Flores said, to take a holistic look and realize that when making environmental changes, school changes, or economic changes, the capacity of the people in those communities must also be increased. They need to have or develop the agency, the voice, the leadership, and the capacity to govern their lives and become self-sufficient at a higher level because they are now living and working and trying to succeed in a new environment. Absent that investment in people, he said, the model will be less successful. It is also important to recognize that bad environments are the way they are because of bad policies, racism, discrimination, and decisions that were made by power structures that are probably still in place. Until those change, the same afflictions will resurface in a matter of a generation or two. The policies and the power structure need to change as well, Flores added.

Orlando agreed and said that, for example, charter schools are often very controversial in these neighborhoods, in part because residents feel that outside foundations are coming in and telling them how to run their schools and not asking for the input of the local communities. He stressed that it is important to take into account what people's actual desires are in the communities.

Housing and Health

Bob Kaplan from Stanford University asked whether housing relocation (i.e., Moving to Opportunity) was the best economic investment opportunity from the perspective of trying to improve health outcomes. He cited studies that suggest that the health effect is small. Bostic

reiterated that Moving to Opportunity was not designed as a health intervention. However, investments in non-health domains can have ancillary health benefits. He reminded participants to look beyond the health domain for allies in other domains and for investment of non-health resources that can contribute to improving population health. Orlando agreed and added that often the best health interventions are those that are not targeted toward health. Partnering with others who are interested in solving other non-health problems offers a better chance of getting funding requests approved by Congress or by a city council.

Orlando reminded participants of the importance of context. Today, in cities like Los Angeles housing is so expensive and there is such a shortage of housing units that people who receive vouchers might look for 90 days and still not be able to find a housing unit in a new neighborhood. In other words, in many cities today relocation vouchers may no longer be the best use of money. Bostic and Chang noted the current debate on how much focus should be on place versus the individual.

Michael Bodaken of the National Housing Trust (NHT) mentioned the longitudinal generational research on Moving to Opportunity that shows long-term effects. He noted that NHT is buying properties in high-opportunity neighborhoods and introducing vouchers into those properties. Bostic briefly described how housing vouchers work, including the percentage of a recipient's salary to be contributed to housing cost and the government portion that is added, up to a calculated fair market rent. He added that there is a proposal out for comment to change how the fair market rent is calculated (based on smaller zip code areas, rather than an entire metropolitan area) that grew out of the experiences of Moving to Opportunity.

Bringing Initiatives to Scale

Isham was interested in what the examples implied about the scale of resources that might be necessary to increase life expectancy in the entire U.S. population by a significant amount. Orlando acknowledged that none of the interventions discussed would dramatically increase population health on a national scale. Most were targeted to certain cities or places, and he suggested that voters and policy makers do not have national interventions to address population health on their minds, in part because budget resources are limited for both political and economic reasons. Some of the examples are more scalable than others, but they serve as examples of different types of financing arrangements.

Bostic noted that three of the four examples have been scaled. The Clean Air Act is a national law; as noted, the efforts to revise the national housing voucher calculation grew out of Moving to Opportunity; and every community in the country has access to resources to address lead paint issues. He cautioned about the need to make the distinction between going to scale and solving the problem. Each of these programs will only touch a finite number of people because resources are not unlimited. But to the extent that the programs reach across the entire country and make progress in as many places as possible, improvements among the poorest performers will increase the average.

Bostic also noted that the Obama administration tried to scale the Harlem Children's Zone, and Department of Education initiatives were explicitly patterned after this model. The challenge they found was that the local context mattered significantly and the way that the program was structured did not translate into the same benefits in other places. The challenge

was not the scalability, but rather the complexity of the program's implementation—a factor that had not been fully appreciated when the program was put into place.

Expenditures and Policy Making

Tom Kottke of HealthPartners in Minneapolis pointed out that Finland spends one percent more than the United States on health and welfare, but the country's gross domestic product (GDP) is half that of the United States. It ranks about fourth internationally in education. Is there something to be learned from the Finnish experience about education and how the country has been able to achieve this on half of the U.S. GDP?

There are many policy approaches that make sense, Bostic said. Communities and societies need to determine what makes sense for them and what they are willing to fund and at what levels. That is part of the political process. The variation in the extent to which various states are willing to fund certain activities demonstrates that the political process can lead to different results, depending on who is involved. Who has a voice and whose priorities are heard and understood are among the factors that shape decisions about the aggregate expenditures on implementing policies. It is important that the voice of population health (experts) is heard, Bostic said, so that the issues that are important for improving quality of life are understood better and move higher on the priority list for resources.

Orlando did caution that the spending cited by Kottke mostly captures health expenditures that are not social determinants (i.e., elements of the medical system). He emphasized the importance of thinking about health expenditures as everything spent on transportation, urban planning, the environment, and anything else that affects health. If this spending is included, the amount of money spent on health is actually much higher than just medical expenditures.

Disincentives and Challenges

Steve Smith of the University of Florida observed that, regardless of their specific goals (e.g., better education, economic improvement, etc.), all of the examples from the different sectors were essentially aimed at doing the same thing—increasing opportunity for individuals so that they would have better, longer lives. He also observed that there are disincentives to overlapping these efforts, particularly at the federal government level and perhaps at the state level as well. He asked how these disincentives could be overcome to align the different fields that are basically trying to achieve the same result and act as a force multiplier for accomplishing change.

At the federal level, Bostic said, one disincentive is that if one department uses resources that create benefits in other departments, the original department does not get credit for it. So, for example, the incentive to collaborate where some housing money might be used for a health clinic is significantly diminished. Such partnerships essentially become "charitable goodwill." At the local level, one of the challenges is that the beneficiaries at the local level of incentives are often different governmental entities. For example, if the City of Los Angeles builds a homeless shelter, there are benefits to the county health system because the number of emergency room visits is reduced. There is no way for the city to recapture those benefits. In contrast, San Francisco is both the city and the county, and the same people see the budget line items. They capture the actual benefits, and so they are willing to invest.

One of the biggest challenges, particularly in addressing the social determinants of health, Bostic said, is a lack of binding long-term enforcement mechanisms. In some cases, for example, individuals at the city and the county level might have an agreement that the one who reaps the savings will transfer some money back to the one who spent. However, if one of the individuals is voted out of office or reaches a term limit, a new person comes in, and commitments and contracts must be reestablished and renegotiated continuously. Bostic suggested that there is a need for a new contractual structure under which communities or parties will have to actively opt out. Then perhaps there could be agreements that are more binding. He noted that 401(k) retirement funds where people have to opt in have far lower participation than plans where people have to opt out.

3

Case Example 1: Justice Reinvestment

The first contemporary case example from a non-health sector discussed at the workshop was in the area of justice reform and justice reinvestment.[5] Elizabeth Lyon, the deputy director of state initiatives at the Counsel of State Governments Justice Center, provided an overview of the technical support provided to states that are participating in the Justice Reinvestment Initiative. Judge Steven Teske, the chief judge of the juvenile court of Clayton County, Georgia, spoke about how Clayton County, with leadership from the juvenile court, has created an infrastructure for both public and private funding to support evidence-based programs to reduce juvenile crime. He described a school–justice partnership model that is designed to reduce juvenile delinquency by promoting academic success using alternatives to suspensions and school-based arrests.

The session was moderated by Paula Lantz, the associate dean for academic affairs and a professor of public policy at the Gerald Ford School of Public Policy at the University of Michigan. (Highlights are presented in Box 3-1.)

[5] According to the Council of State Governments Justice Center, "[j]ustice reinvestment is a data-driven approach to improve public safety, reduce corrections and related criminal justice spending, and reinvest savings in strategies that can decrease crime and reduce recidivism|" https://csgjusticecenter.org/jr (accessed May 25, 2017).

BOX 3-1
Highlights and Main Points Made by Individual Speakers and Participants*

- The elements underlying the success of the justice reinvestment initiative include: state-level commitment to participation and support, data-sharing agreements, stakeholder engagement and relationships, decision-maker fluency on the issue, high-level buy-in to legislative proposals, and implementation support. (Lyon)
- The core strategies underlying the success of justice reform programs aimed at reducing juvenile crime include: identifying champions with vision, stakeholder knowledge, and subject matter expertise; using evidence-base practices to develop a systemic algorithm; taking an incremental approach; implementing quality control and oversight mechanisms; developing a sustainability plan; and developing good public relations. (Teske)
- Access to behavioral health services seems to be a key area for cross-sector collaboration; it is difficult for individuals in the criminal justice system to receive behavioral services for multiple reasons, including provider unwillingness and geographic availability. (Lyon)

* This list is the rapporteur's summary of the main points made by individual speakers and participants (noted in parentheses) and does not reflect any consensus among workshop participants or endorsement by the National Academies of Sciences, Engineering, and Medicine.

JUSTICE REINVESTMENT INITIATIVE

The Justice Reinvestment Initiative is a public–private partnership funded by the U.S. Department of Justice, the Bureau of Justice Assistance, and the Pew Charitable Trust, Lyon said. The initiative was first federally funded in 2010, and about 30 states have now participated in the program.

Rising correction costs are a significant concern for state leaders. Many states spend more on corrections than they do on education. In 2015 states were spending well over $57 billion on institutional corrections. A state facing rising correction costs or other criminal justice issues can apply to become part of the program. There is a fairly rigorous threshold that has to be met before a project is initiated, Lyon said. All three branches of government in the state must agree to participate, and there must be bipartisan support. The governor, the chief justice, the senate president, and the house speaker are required to sign letters indicating their support for participating in the project. The program is data driven and relies on information gathered from local government, state government, and other sources. Data-sharing agreements are required so that a technical assistance provider can analyze the state data independently. There are several technical assistance providers, including the Council of State Governments Justice Center, the Crime and Justice Institute, the Pew Center on the States, and others. Over the course of 1 to 3 years, a unique problem statement is then developed for the state, identifying what is driving its corrections issues and its corrections costs. The process begins with an extensive stakeholder engagement process, which involves meeting with local government, law enforcement,

behavioral health experts, treatment service providers, victim advocates, the business community, and others. The Justice Reinvestment Initiative then proposes policy solutions and changes that can be made to the corrections system to avert rising costs and produce safer outcomes for communities, and it helps implement and sustain data collection, performance metrics, transparency, and accountability. The stakeholder-engagement, analysis, and policy-development steps typically require around a year to complete, after which a legislative package is typically introduced. Lyon said that there is an excellent track record of legislation being passed in a short period of time, which she attributed to the high level of buy-in that happens before the process even starts. She added that criminal justice is an issue on which people can find common ground, and she identified fluency on the issue, relationships, policy, and buy-in as being among the many contributors to the success of this effort. After the policies are enacted, there is an implementation-support phase that lasts from 12 to 24 months.

There are many factors that drive individuals' entry into the correctional system and, later, recidivism, Lyon said. These factor include social networks, neighborhood, home situation and housing, employment, an individual's ability to respond when faced with a problem, and support systems. The challenge is to identify the approaches that can help individuals so that they do not return to the correctional system.

State Funding and Reinvestment Examples

State governments are seeking to avert rising correction costs so that they can address various other priorities in their state budgets. However, a system cannot be changed so comprehensively without making investments in that system. Creating a lasting change can take quite a few years. Implementation support, including justice reinvestment, helps to fund these programs.

Lyon shared several examples of how states have chosen to fund justice reinvestment programs and to reinvest the savings generated from successful policies. When the Justice Reinvestment Initiative was first getting started, the idea was to take the calculated savings from corrections costs and invest them back into the community, into non-correction domains. An early project in Kansas was set up this way, but it was decided that there was so much need within the correctional system that the funding should stay within that system in order to address those needs.

Pennsylvania chose not to make an upfront investment in programs, but instead created a statutory formula that requires the legislature to calculate, on an annual basis, the savings attributed to justice reinvestment policies, and the state mandates that those savings be redirected into relevant programs. Because policies take time to actually realize savings, there was not much to be reinvested in programs in the first several years. However, during one fiscal year the savings attributed to the program jumped from $12 million to $38 million, and, based on the formula, the reinvestment went from $3 million to $10 million. That money was reinvested in victim services, risk assessment tools, policing, county probation, community reentry efforts, and other state parole efficiencies.

In contrast, Lyon said, West Virginia made an upfront investment, appropriating nearly $12 million over the course of 3 years to support expanded substance abuse treatment services. West Virginia has the highest rate of death per accidental drug overdose. In getting stakeholder input from judges, it seemed that the judges were sending drug offenders to jail as an alternative

to putting them back on the streets, where the judges feared they would overdose and die. The state appropriations were used to establish a grant program for substance abuse treatment services for individuals at home in their communities. In order to be eligible for a grant, applicants were required to establish a partnership between the criminal justice service providers, the behavioral health service providers, and the community service providers and to have a place to provide the treatment. Training was provided for the grant recipients because many behavioral health treatment providers had not previously worked with individuals who also had criminogenic needs (i.e., risk factors for recidivism) to be addressed. Lyon stated that research shows that it is not enough to treat just the substance abuse or just the thoughts that lead an individual to commit a crime; both need to be treated at the same time, as co-occurring issues.

In some programs, reinvestment is being made in community supervision. Research has shown that individuals who are in the community tend to do better than individuals who are behind bars. The challenge is to make community supervision more effective, not just to keep the individual from being re-incarcerated, but to keep the community safe as well (both the community where that individual may reside and the communities where that individual may go to commit crimes).

Lyon closed by mentioning that the initiative is currently being independently evaluated in order to understand the impact of the policies enacted, and a report is expected in early 2017. Early findings show that there has been a significant amount of money reallocated into different services to produce different outcomes, including decreasing prison populations and decreasing crime rates (in many places and across many categories).

Improving Outcomes and Containing Costs Using Evidence-Based Programs to Reduce Juvenile Crime

An analysis by the Georgia Criminal Justice Reform Council in 2012 found that when juvenile judges commit a child to state custody, it costs $91,000 per year to house a child in secure detention and about $29,000 per year to house a child in a non-secure facility. Teske, a member of the council, said that the analysis also found that 65 percent of these individuals reoffended within 3 years of their release from either a secure or a non-secure facility. In many cases, they had in the meantime reached the age of 17, the adult age of criminal liability in Georgia, and were now incarcerated in adult facilities. This is not the most effective use of taxpayer's money, Teske said. He also pointed out that, although about 35 percent of the population in Georgia is African American, nearly 70 percent of the youth who are "out-of-home" and committed to the state are children of color.

Current research indisputably shows, Teske said, that detaining low-risk youth or allowing low-risk youth to come in to the system has a significant negative impact on young people and increases the risk of delinquency. The analysis by the Georgia Criminal Justice Reform Council found that about 40 percent of the youth in secure confinement were low-risk offenders, and about 54 percent of the youth in non-secure facilities were low risk. Teske suggested that these were young people who probably would have outgrown their youthful delinquency, and instead they were indoctrinated into criminal culture in adult life.

Based on these findings, significant reforms were made to the state juvenile justice system in 2013. First, a judge can no longer commit a juvenile to an out-of-home placement for a misdemeanor offense, unless there are three prior separate adjudicated acts, of which at least one

has to be a felony. This change alone will drive down the detained youth population in terms of bed space and also save money, Teske said. Changes to the system also included mandated use of validated risk assessment tools, including a detention assessment instrument, a pre-disposition risk assessment, a structured disposition matrix, and a juvenile needs assessment. In essence, judges cannot commit a child to the state unless that child has been assessed for risk and needs. Services for lower-risk youth will be provided in the community.

A structure for reinvestment was also created. Savings are placed with the Criminal Justice Coordinating Council, and the use of the funding is overseen by a multidisciplinary group called the Juvenile Justice Funding Committee, which establishes the policies for how that money will be reallocated to local control. Funding is offered to counties through grants for community-based services for delinquent youth. Savings must be invested in evidence-based programs and practices that reduce recidivism in a juvenile population, Teske said. Programs shown to be effective interventions in this population include Multi-Systemic Therapy, Functional Family Therapy, Thinking for a Change, Aggression Replacement Training, and Seven Challenges. Teske said that none of these programs existed in the State of Georgia before the reforms because all resources were invested in brick-and-mortar facilities. Brick-and-mortar facilities punish the symptoms, he said, but do not treat the underlying causes of disruptive behavior and delinquency.

The results of the changes have been positive. In fiscal years 2014 and 2015, out-of-home placements were reduced significantly. With the shift to community-based rehabilitation, Georgia has been able to close three juvenile detention facilities, Teske said. In Clayton County, the savings available for reinvestment in evidence-based programs for youth increased from about $200,000 in 2014 to about $400,000 in 2015 and 2016, and about $700,000 is available for reinvestment in 2017.

School–Justice Partnership Model

Teske described an algorithm to reduce recidivism in juvenile justice (see Figure 3-1). The algorithm is used when a youth commits a delinquent act at school. Misdemeanors never enter the court system, but rather are diverted to restorative justice programs. For those offenses for which a juvenile is arrested, there are “release valves” throughout the algorithm, and every opportunity is taken to move the juvenile off the delinquency pathway into a pathway that strategically addresses the underlying causes of the delinquent act he or she committed. For juveniles who are eligible for commitment, there is a “deep end” program called Second Chance.

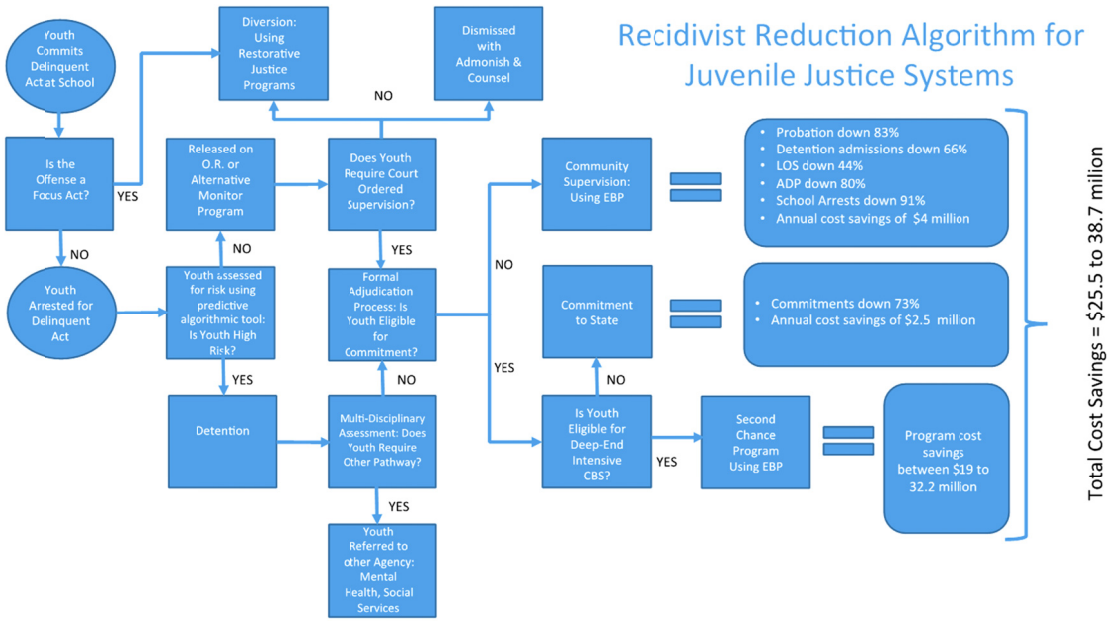

FIGURE 3-1 Recidivist reduction algorithm for juvenile justice systems.
NOTE: O. R. = own recognition; EBP = evidence-based practice; CBS = community-based services
SOURCE: Teske presentation, October 19, 2016.

Teske described expanding the algorithm to include the concept of prevention, incorporating mechanisms and tools to identify youth at risk, and to deliver targeted strategic services in a school–justice partnership model. This approach grew out of an epidemiology approach to juvenile justice. Like diseases, disruptive behaviors do not occur by chance, and they are not randomly distributed, Teske said. There are at-risk populations—and characteristics that place members of these populations at risk—that need to be studied so that solutions can be developed. The goal of the partnership with the school system was to reduce suspensions and arrests. Research shows that keeping youth in school increases graduation rates, and increased graduation rates are associated with reduced crime. Since implementation of the program in Clayton County 2003, school arrests are down 91 percent, and graduation rates have risen every year. Arrests have been replaced with restorative justice practices (e.g., peace circles, mediation, drug testing, drug assessment, boundaries, drug education). All misdemeanors are prohibited from being referred to the juvenile court, including possession of drugs. The school system, through its school resource officers, can directly refer youth to the restorative justice division at the court without having them arrested and at no cost to the school system.

System of Care

Teske said that these alternatives do not necessarily work for chronically disruptive children. In 2010 the Clayton County System of Care was established to assist disruptive youth who are in need of clinical services, rather than education-based alternatives. The System of Care, a 501(c)(3) organization with both public and private funding, has a single point of entry called the Clayton County Collaborative Child Study Team. Every week the team visits all of the schools across the county and conducts risk–needs assessments of student and their families, looking to identify the underlying causes of the chronic disruptive behavior. Teske said that the number one cause of referral to the System of Care is trauma. Eighty-seven percent of referred

students score high for trauma, most of which is associated with poverty. Students in the System of Care have shown improved attendance and improved grades in language arts, math, and science, and there has been an 86 percent decline in disciplinary referrals among this population. The first cohort is graduating from high school, and Teske said that these are students who would likely not have graduated at all. He added that the school board has now given $400,000 to the System of Care for direct services to chronically disruptive students because it reduces the school system's administrative costs.

Clayton County from 2003 to Present

Teske shared some of the outcomes of Clayton County's efforts since becoming a Juvenile Detention Alternatives Initiative site in 2003. The juvenile crime rate is down 71 percent, he said. Annual detention admissions have declined by 66 percent, and recidivism has declined. The average length of stay for juveniles who are detained has been reduced by 44 percent. The average daily detained population has been reduced by 80 percent. There has also been an 83 percent decline in the number of probationers; a 78 percent decline in total violations filed; and a 93 percent decline in violations of probation warrants. There has been a 73 percent decline in commitments to the state juvenile justice system (youth being placed out-of-home outside of Clayton County). Teske emphasized the importance of school climate and relationships in achieving these outcomes.

Core Strategies

In closing, Teske described some core strategies and lessons learned at the local level that he said also apply at the state level.

- Have a champion(s) who has the characteristics of a convener—someone with vision, legitimacy, stakeholder knowledge, and subject matter knowledge. For justice reform in Georgia at the state level it was the governor, and at the local level, Teske said it was he himself (as chief judge of the juvenile court) and the school superintendent.
- Use the research to determine what works in the subject-matter area.
- Using the best, evidence-based practices, create a systemic algorithm. Determine what practices will function best where, so that they lead to cost savings.
- Use an incremental approach. Change must be made before savings can be realized and reinvested toward the identified best practices and programs. There may be a need to "invest to reinvest," Teske said. In Georgia, the governor asked the legislature for an investment of $5 million to support evidence-based programs in the highest detention-committing counties. There needed to be programs available up front for the youth staying in the community rather than being committed to the state.
- Quality control mechanisms are needed as well as oversight of implementation. Failure to do this, Teske said, is the one thing that will kill reinvestment. Keep assessing and modifying.
- Develop a sustainability plan. For Georgia, it was the statutory creation of the Criminal Justice Reform Council.

- Good public relations are essential to fostering political will. Keep the issue in front of legislators, bureaucrats, and administrators and show them how using evidence-based practices saves money that can be strategically invested to improve outcomes.

DISCUSSION

Overcoming Challenges

Moderator Lantz asked the panelists about concerns they have dealt with in justice reform and reinvestment. For example, when closing facilities there are likely to be concerns about job loss in the community. Teske acknowledge that there was some pushback at the local level, but he said he felt he was able to reduce it by approaching the changes in a very collaborative way. He emphasized the importance of engaging stakeholders, and he said that a unified stakeholders approach was used. It is a consensus approach (i.e., not a majority vote) that allows for compromise, and it includes both voting members and advisors. Advisors are highly influential, he said, and include, for example, the Prosecuting Attorneys' Council of Georgia, the Public Defenders' Council of Georgia, and the local county commissioner's association. Any recommendations to the governor must be supported by research and data. Recommendations based in evidence and approaches that saved money were what won the Republican-led legislature over and led to culture change, he explained. He added that polling by Pew and others show that people favor rehabilitation and community-based programs over sending juveniles prison.

On the topic of overcoming concerns, Lyon agreed with Teske's core strategy of having champions. She suggested that a very deep bench of champions is needed when one's champions are elected leaders who come and go. Lyon noted that different stakeholder groups will have different issues and said that this is where having a deep bench of champions can be very helpful to allow for peer-to-peer interaction. As an example, she said, if a prosecutor is against something, a champion who is a prosecutor from a similar state could be enlisted to talk with that person, supporting the discussion with data. She acknowledged that sometimes the data are not enough or people do not believe the data. The strategy then is to keep discussing it, from different angles, across focus groups and meetings.

Lyon raised the very serious concern of those occasions when an offender is released to community supervision and then commits a heinous crime. It becomes very challenging to have conversations about data, because no matter how good the numbers are, someone has been killed in that community. Teske added that the Second Chance program is a very intensive program based on best practices. It has now graduated more than 70 youth since 2010, with a 6 percent recidivist rate (one of whom did commit murder). If those 70 youth were sent to prison, Teske said, 65 percent of them would have reoffended when they were released. It is important to understand the overall risk, and there is a greater risk if these juveniles are sent to prison (which leads to, as noted, a 65 percent recidivism rate). There are no perfect practices. It is about reducing the risk. But when that risk is realized, do not sensationalize it, he advised.

A Role for Health in Justice Reinvestment

Sanne Magnan asked how the Roundtable on Population Health Improvement, public health, and health care systems could be helpful to justice reinvestment. Lyon suggested several areas where health could work with justice to help overcome challenges. A particular obstacle in rolling out funding for increased substance abuse services has been finding treatment providers who are willing to work with people in the criminal justice system. Another challenge is providing access to services, as many of the areas where the Justice Reinvestment Initiative works are very remote. The evidence indicates that individuals do best when they are in their communities, but this is very challenging if those communities do not have services. A variety of approaches are being piloted, she said, including telemedicine. A related challenge is that many adults who leave the justice system are now taking medications to help address whatever recurring issues they might be dealing with. It would be helpful if state systems would provide a prescription that lasts more than 30 days. Lyon mentioned attempts to leverage Medicaid expansion to access these services, but said there are often not enough doctors to fill these prescriptions. When an inmate is released to supervision within a community, the first 60-day period is when that inmate is most likely to reoffend. It is during this time that closely coordinated care, services, and programs are essential, but these are some of the biggest challenges that states face.

Establishing the Evidence Base

Martha Gold, a visiting scholar at The New York Academy of Medicine, acknowledged the role of an evidence base in making a persuasive case for a program, and she pointed to the lack of funding for such research. She asked about the quality and robustness of the evidence for justice programs and about who funds the research. Lyon said that federal resources supported some of research on these programs. Legislation often mandates that funding can only be used for evidence-based programs, and it is a difficult conversation to have when a corrections director, governor, legislator, appropriator, or other stakeholder believes a particular program works, when the evidence shows otherwise. For adults, she said, there are actually few programs that have shown significant results in reducing recidivism.

Teske referred participants to the website of the Office of Juvenile Justice Delinquency Prevention (www.communitysolutions.gov). The website lists programs that are evidence based, programs that are promising, and programs that are known to not be effective. The questions are: What does it take to move a program from promising to evidence-based? and Where does the funding come from to support the research? In Georgia there have been discussions about the potential need to relax the evidence base and to deploy some promising programs for the purpose of study.

Engaging Families

Magnan asked about engaging clients and their families in such a way that they do not feel disempowered by the new system that has been put upon them. Teske observed that many of these families do not want any intervention because they do not understand. They live a lifestyle that is normal to them, and they do not realize the trauma they are exposed to. Providers need to understand the responsivity principle of programming. This means that providers need to ensure that staff have the skills needed to be patient and to positively influence that family so they are

receptive. With juvenile offenders there is also the possibility of having to deal with parents who themselves have mental health issues that are not being treated

Mary Pittman, the president and chief executive officer of the Public Health Institute, asked about preventative interventions that could dissuade others in a family from following the same path as the disruptive or chronically disruptive youth in the family. Teske highlighted multi-systemic therapy and functional family therapy as important approaches. Clinicians go into the family home, identify all the issues that members of the family are facing (including basic needs such as food, shelter, transportation), and develop a treatment plan for the entire family. Teske said that court officers are reporting that families are happier after such interventions because they are seeing tangible results right from the beginning. Teske pointed out that the clinician is not solving the family's problems, but is instead teaching the family members and empowering them to find solutions to their issues. The System of Care expands this approach to involve the community. Lyon added that there are different programs for adult offenders. She stressed the importance of talking directly to individuals who have been incarcerated, to those who are on community supervision, and to their families about what they need and what works. Lantz referred participants to a recently published cost–benefit analysis of multi-systemic therapy and the cost savings it has shown (Borduin and Dopp, 2015; see also Dopp et al., 2014).

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Case Example 2: Clean Energy Financing

Participants continued the discussion of financing in fields outside of population health by considering clean energy financing as another contemporary case example. Michael Bodaken, the president of the National Housing Trust (NHT), discussed the health benefits of affordable housing, the challenges in financing affordable properties, and creative funding streams. Holmes Hummel, a principal with Clean Energy Works and a former senior policy adviser in the U.S. Department of Energy's Office of Policy and International Affairs in the Obama administration, examined aspects of financing energy efficiency and how that affects access and participation in the clean energy economy. Joel Rogers, the Sewell–Bascom Professor of Law, Political Science, Public Affairs, and Sociology at the University of Wisconsin–Madison and the director of the Center on Wisconsin Strategy (COWS), energy efficiency and renewable energy financing. (Highlights are presented in Box 4-1.)

BOX 4-1
Highlights and Main Points Made by Individual Speakers and Participants*

- Public systems supply very basic needs, and inefficiencies within them disproportionately affect people with limited resources. Extremely low-income renters are significantly burdened by high utility bills that consume large portions of their income, and they tend to live in areas where these basic needs are less well provided. (Rogers, Bodaken)
- Anything with value can be financed. Where there is waste, money can be made by reducing that waste. (Rogers)
- Place-based strategy development can help to address equity gaps by adding value, reducing waste, and capturing and sharing the benefits of doing both. (Rogers)
- Inclusive financing structures can allow low-income populations access to cost-effective energy upgrades. Compared to loan-based or debt-based instruments, inclusive financing results in a larger addressable market, greater acceptance of the financing offer, bigger projects that produce deeper savings, and fewer defaults. (Hummel)
- Housing is an essential component of health. The health sector need to reach out to the housing sector and to utilities as potential partners; the potential health co-benefits may include mitigating asthma triggers. (Bodaken)
- Clean energy financing, among other examples of resource reallocation, presents challenges and opportunities to employment (i.e., job loss and job creation) that warrant consideration and thoughtful response. (Flores, Bodaken, Hummel)

*This list is the rapporteurs' summary of the main points made by individual speakers and participants (noted in parentheses) and does not reflect any consensus among workshop participants or endorsement by the National Academies of Science, Engineering, and Medicine.

To open the session, moderator Mary Pittman, the president and chief executive officer of the Public Health Institute, highlighted several points of overlap between clean energy and health that she drew from publications by the three panelists. A report from the International Energy Agency, for example, included a benefit–cost analysis, which is common in health care. She observed, however, that health care considers cost–benefit, while the energy report referred to benefit–cost, considering the benefits first in order to reduce bias against energy efficiency. The energy articles showed that data are lacking regarding the positive impacts of energy efficiency in the public sector, similar to the challenge of needing data to show the benefits of prevention to population health. Another similarity could be seen in short-term variables for tax rates and lifetime benefits for health efficiency, she said. There is a mismatch between the incentives and when the outcomes or benefits accrue. She also observed that there are challenges of silos in both energy and health, referring to an article on indoor and outdoor air quality and the multiple factors that must be addressed simultaneously in order to reap benefits. Finally, she noted a similarity between clean energy and health in terms of the local requirements, different local assets, and local structures that caused those in the energy sector to refine their approach from a generalized state/national approach to an approach that could be implemented at the local level.

Financing Affordable Properties

NHT is an affordable housing developer, a lender, and a housing policy advocate, Bodaken explained. NHT operates about 4,000 property units along the East Coast and in Chicago and has developed about 25,000 apartments across the United States. Bodaken acknowledged that the health benefits of housing have not historically been the focus of the work of NHT. The mission of NHT was rather to help people get into affordable housing. However, NHT began to hear anecdotally from residents that, once their housing had been rehabilitated, they were experiencing unanticipated health benefits such as a reduction in asthma or an increased comfort of living. As an example, he mentioned a property in Southeast Washington, D.C., that was taken down to its studs and rebuilt as the first green apartment complex in Washington, D.C. Recertified carpets and chemical-free cabinets were among the green features that were installed. The residents reported that they were very happy with the housing and that, for example, a child's asthma was better and he was not missing school as a result.

More recently NHT decided to focus more on energy efficiency and approached the U.S. Department of Housing and Urban Development (HUD) about using weatherization funds broadly in affordable housing. Bodaken said that NHT highlighted the potential health benefits as part of the discussion. He referred participants to workshop background materials describing the strong correlation between energy-efficient affordable housing and health outcomes, and he shared several examples.[6] A longitudinal study by the Southwest Minnesota Housing Partnership demonstrated a reduction of about 33 percent in chronic asthma over a period of 5 to 6 years after the energy-efficiency retrofit of its properties, Bodaken said. At the Mission Creek Senior Community in San Francisco, Mercy Housing has instituted health-supported services that have extended some resident's ability to stay there, delaying their need to move into assisted housing or into nursing homes by 2 or 3 years, and saving the city $30,000 per year. Clearly, there were better health outcomes for the people who were living in affordable housing, and money was saved as well, but Bodaken said that part of the conundrum in these situations is how to allocate resources to pay for these types of programs and initiatives.

Energy Efficiency for All

Bodaken described a model that he suggested population health might be able to develop an analog of. NHT determined that it cost an additional $3,000 per apartment to do an energy efficient retrofit. Although the renovations are good for the tenants, he said, there is no economic reward to the property owner for doing an energy retrofit. In considering what additional financing, outside of HUD, could be brought to bear to reduce the $3,000 burden, NHT found that private-investor-owned utilities across the United States expend $7.5 billion per year in energy retrofits of schools, hospitals, homes, and other buildings. Tenants, however, reap a scant

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[6] See the 2015 International Energy Agency report, *Capturing the Multiple Benefits of Energy Efficiency*, Chapter 4: Health and Well-Being Impacts of Energy Efficiency. http://www.iea.org/publications/freepublications/publication/Captur_the_MultiplBenef_ofEnergyEficiency.pdf (accessed December 1, 2016). See also the workshop attendee packet for NHT fact sheets on affordable housing and health. http://nationalacademies.org/hmd/~/media/Files/Activity%20Files/PublicHealth/PopulationHealthImprovementRT/16-OCT-19/Attendee%20Packet.pdf (accessed December 1, 2016).

0.3 percent of those dollars, even though they contribute to the funding through fees in their utility bills.

To address the fact that residents of affordable housing were not getting the benefit of these funds, NHT launched the Energy Efficiency for All campaign, together with the Natural Resources Defense Council and the Energy Foundation in California. The campaign, now in its third year and in 12 states (California, Georgia, Illinois, Louisiana, Maryland, Minnesota, Missouri, New York, Ohio, Pennsylvania, Rhode Island, Virginia) and the District of Columbia, has secured over $200 million for energy efficiency in affordable multi-family housing. Bodaken said that utilities were generally unaware of the need until the campaign reached out to them about starting a low-income program that works for rental housing. Most low-income individuals in the United States are renters, he said, and Energy Efficiency for All helped the utilities design and implement more effective utility energy-efficiency programs for owners of affordable housing units. He suggested that it would be very interesting for the utilities to start thinking more about the indirect benefits of energy efficiency, including the benefits to health and to addressing the social determinants of health.

Bodaken acknowledged that the process for Energy Efficiency for All has taken a lot of time and resources. He also emphasized the importance of working with good partners. With regard to health, Bodaken said that housing is where the people live and that health or illness in people's lives is going to happen in their homes. He suggested that the roundtable think about the home as being the place where it all happens and then think about whom they could work with. Upon reflection, he said, perhaps there should be health care partners added to Energy Efficiency for All. He also emphasized the value of working with leaders in the states, in a state-by-state strategy rather than a national strategy.

INCLUSIVE FINANCING FOR DISTRIBUTED CLEAN ENERGY SOLUTIONS

The clean energy revolution is well under way, Hummel said, but, he added, it is not happening nearly fast enough.

Industrial Revolution and Climate Change

Hummel highlighted the relationship between modern energy development and human development and noted that metrics for energy development are often used as indicators for human development. The Human Development Report, issued annually by some multi-lateral development banks, links increased energy consumption with economic development. The association is so robust and persistent over time that some policy makers thought it was irreversible and perhaps non-negotiable, Hummel said. However, the threats to the environment resulting from energy consumption are causing policy makers and the public to rethink the basis for this link. More than 80 percent of the energy in the global economy is fossil-fueled. This dependence is creating hazards to health that stress life-support systems around the world. In 2012 the International Energy Agency (IEA) stated that energy-related carbon dioxide emissions needed to be completely eliminated by 2075 in order to limit the global temperature rise to 2°C.[7] Further, IEA said that achieving a 2°C stabilization target would require a large-scale additional

[7] See http://www.iea.org/publications/freepublications/publication/ETP2012_free.pdf (accessed December 1, 2016).

annual investment in clean energy and energy efficiency in the built environment (power, buildings, industry, transport).

Coincident with the international assessment, a U.S. assessment of the science around climate change found clear connections between population health and the mitigation of climate change impacts.[8] Hummel summarized the key findings of the report: there are wide-ranging health impacts of climate change, certain populations are especially vulnerable, preparedness and prevention provides protection from the impacts of climate change, and taking action on climate and other types of co-related pollutants can improve health and provide other social benefits.

In the United States, the costs associated with extreme weather disasters attributed to a changing climate are not distributed equally, Hummel said. People in the southern states are on the front line of these disasters and are incurring huge losses, despite the emergency aid that is sent. These costs need to be factored into choices made about future investment, Hummel said. The U.S. federal government has also assessed the social cost of carbon, and it factors these values into the cost–benefit analysis of every regulation that would affect carbon dioxide emissions.[9] Previously, Hummel said, a major gap in public policy analysis had been the assumption that carbon dioxide pollution had zero social costs. It is estimated that the social cost over the next 10 to 15 years will be between $40 and $50 per metric ton of carbon dioxide. This type of calculation can have an important and profound effect on the regulatory impact analysis of energy policies.

Recovering Social Costs and Harnessing Public Spending

The social cost of carbon is a "shadow price," and it does not affect the economy until someone actually has to pay it. Hummel discussed what it would mean to recover some portion of that social cost for public benefit.

Carbon pricing policy in the northeastern states is more advanced than in other parts of the country, Hummel said. Over the past decade, the Northeast has generated more than $1.5 billion in public receipts that have then been available for public spending. This is the result of the Regional Greenhouse Gas Initiative cap-and-trade program. Hummel briefly explained that a cap-and-trade program sets a price on carbon that is designed to send a signal to private sector actors that pollution is not free. In that system companies must pay for the "permission to pollute" by buying allowances that are available to them through an auction. The auction fetches on the order of $3 to $4 per ton of carbon dioxide (ranging from about $1 to $5), which is only 10 percent of the social cost of carbon that the federal government has assessed. This means that, even after discounting the social cost of carbon by 90 percent, the Northeast produces billion-dollar-scale benefits which are then associated with public spending programs that can be informed by public health experts. Each state determines how the money will be spent, and energy efficiency has been the top investment priority in each of these states except for Maryland (the priority investment in Maryland was in direct financial assistance with paying utility bills).

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[8] The National Climate Assessment is available at http://nca2014.globalchange.gov/report/sectors/human-health (accessed December 1, 2016).

[9] For more information on the social cost of carbon see https://www3.epa.gov/climatechange/Downloads/EPAactivities/social-cost-carbon.pdf (accessed December 1, 2016).

Contours of the Clean Energy Divide

Public spending is not enough to overcome the barriers encountered in the clean energy revolution, Hummel said. The scale of the demand is too big for public spending alone, and the vast majority of the money will need to be sourced from the private sector. Even with private sector capital, there will be barriers to progress. Multiple factors affect the pace at which mitigation policies are adopted across the United States, including a sensitivity to price impacts. For example, in vulnerable communities (areas in which electricity costs constitute a greater share of household income), there is less enthusiasm for clean energy policies that might increase the cost of electricity. Persistent, underlying conditions of inequality (i.e., poverty) affect the distribution of these impacts. Hummel said that the NAACP has highlighted the dimensions of equity that affect the clean energy future of the United States and has called for directed investment policies that to address longstanding environmental injustice and to increase opportunity.[10] Hummel observed, however, that even where those investment policies are in place, barriers to investment persist, producing a clean energy divide.

Ninety percent of the persistent-poverty counties in the United States are served by electric cooperatives. These are utilities where the customers have an ownership stake in the utility and a shareholder vote. Co-ops cover more than three-quarters of the United States, serve more than 40 million people, and together buy $40 billion of electricity. Hummel said that the Roanoke Electric Cooperative in Down East, North Carolina, is the only utility in the United States that is led by people of color and serves majority-people-of-color communities. Common qualifying criteria for loans and leases across the United States are home ownership, credit score, and sufficient income. Based on these criteria, Hummel said, nearly all members of the Roanoke Electric Cooperative were disqualified from receiving low-interest loans for investments in energy efficiency. Hummel reiterated the point by Bodaken that more than half of people below median income are renters and, as such, face barriers to entering the clean energy economy, and he added that inclusive financing solutions are needed.

Inclusive Financing for Distributed Energy Solutions

Pay As You Save® (PAYS®)[11] is a utility financing solution that offers all customers the option to access cost-effective energy upgrades using a proven investment and cost-recovery model that benefits both the customer and the utility, Hummel explained (see Figure 4-1). The utility draws low-cost capital from its usual sources and invests in cost-effective distributed energy upgrades (e.g., better building efficiency, rooftop solar arrays). The utility pays the installer; the customers pay nothing upfront for the upgrades they choose. Costs for the solutions installed are tied to the meters they serve. Costs are recovered on the customer bill with a fixed monthly charge that is less than the estimated savings generated by the upgrade. In this way the customer is then participating in the cost recovery without being personally assigned a debt obligation (and does not suffer the financial sector scrutiny required for upfront loans or leases to join the clean energy economy).

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[10] See http://www.naacp.org/wp-content/uploads/2016/04/JustEnergyPolicies%20Compendium%20EXECUTIVE%20SUMMARY%20FINAL%20FEBRUARY%202014.pdf (accessed December 1, 2016).

[11] Pay As You Save® and PAYS® are trademarks of the Energy Efficiency Institute, Inc., of Vermont, which works with both municipal and investor-owned utilities.

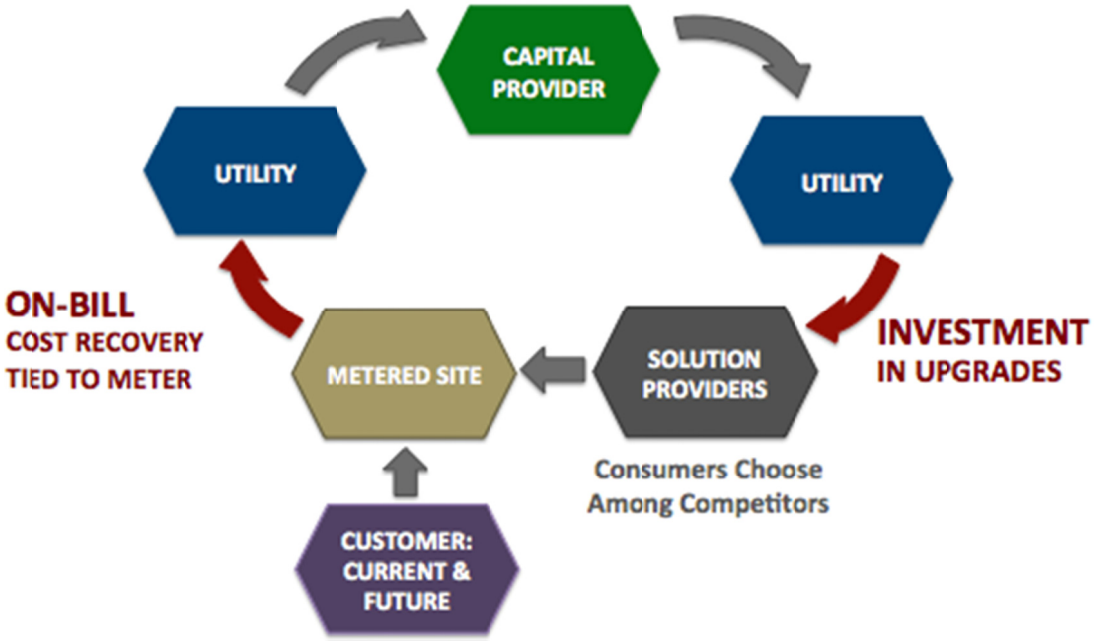

FIGURE 4-1 Pay As You Save (PAYS) utility financing solution.
SOURCE: Hummel presentation, October 19, 2016.

The PAYS solution is an inclusive approach to a clean energy future. There is no consumer loan, lien, or debt; it reaches renters and low-income market segments that are chronically locked out; it leads to higher uptake rates; and it produces deeper energy and carbon savings, Hummel said. Compared to loan-based or debt-based instruments, inclusive financing allows for a larger addressable market, greater acceptance of the financing offer, bigger projects that produce deeper savings, and fewer defaults (see Figure 4-2). Hummel said the Roanoke Electric Cooperative and several others have been able to demonstrate the success of PAYS in persistent poverty regions of the United States.

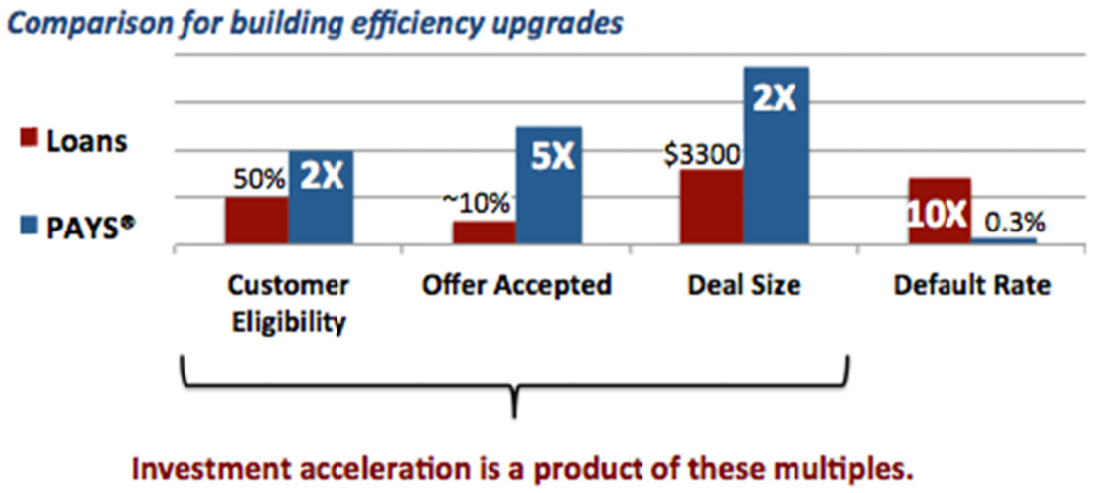

FIGURE 4-2 Pay As You Save versus loan- or debt-based financing.

SOURCE: Hummel presentation, October 19, 2016.

The results have been incredibly impressive, Hummel said, resulting in an immediate surge in investment. Hummel shared results from the Ouachita Electric Cooperative in Arkansas as an example. Comparing the first 3 months of its inclusive financing program to the best 3 months of its debt-based program showed that within less than 4 months it was able to double the number of customers; to achieve 100 percent opt-in by multi-family rental units and greater than 80 percent opt-in by single family units; and to double the scale of capital improvements. As a result, it quadrupled the investment deployment in a community that experiences persistent poverty.

THE FUTURE OF CLEAN ENERGY

Rogers shared his perspective on some of the financing challenges of advancing clean energy approaches. He suggested that by 2050—assuming a world population of nearly 10 billion—energy consumption will likely be more than double what it is today. While the vast majority of energy currently produced is fossil-fuel-based, the market share of renewable energy sources (e.g., solar, geothermal) is steadily increasing. Rogers acknowledged the optimism about efforts to address climate change concerns, such as the Paris Agreement and the recent agreement on reducing the use of refrigerants. He noted, however, that even if all of the Paris Agreement commitments are met and pledges fulfilled, the world will still fall far short of the goal to limit global warming to 2°C above what it was in pre-industrial times.

Energy Has Value

Energy has a lot of value, Rogers said, and anything with value can be financed. Spending on energy is huge, accounting for about 9 percent of the U.S. gross domestic product, or just short of $2 trillion. The United States consumes about 100 quads of energy per year,[12] and more than half (about 55 percent) of the energy consumed is wasted in various ways. Rogers suggested that the United States wastes more energy in its electric power generation sector alone than Japan uses in an entire year. And where there is waste, he continued, money can be made by reducing that waste.

Individuals spend money directly out of pocket for energy, and increasing energy efficiency can result in direct savings to individuals. Energy, housing, transportation, water, and other systems are very connected in terms of cost. Because these systems supply basic needs, inefficiencies within them disproportionately affect people with limited resources. The poor spend a greater percentage of their income on these needs and tend to live in areas where these basic needs are less well provided. Rogers mentioned several initiatives to address these inequities through financing, such as PAYS (discussed by Hummel, above), and the Property Assessed Clean Energy program for homeowners, which pays for energy efficiency upgrades and recoups the costs through a property tax assessment. Rogers also noted that renewable energy sources are becoming more competitive. The price of solar panels, for example, has dropped about 80 percent, and efficiency has increased significantly over the past 5 or 6 years.

[12] A quad is a unit of energy that is equivalent to 10^{15} (one quadrillion) British thermal units.

Fixed Costs

One of the main challenges in changing the energy landscape is the presence of fixed costs and fixed investments, which are deeply connected to social and political capital. Change takes time, Rogers observed, noting that there are still homes in the United States that are heated by coal- or wood-burning stoves, despite the broad transition to oil, natural gas, electricity, and other potentially cleaner forms of energy consumption. Investments in many old-style coal-burning power plants are fully amortized, as are investments that were made in other infrastructure for the "dirty energy system." People see opportunity in resisting change, so they can continue to get money out of older equipment. The Clean Power Plan for existing power plants is aimed at reducing carbon emissions through such measures as converting coal plants to natural gas. Rogers suggested the need for discussions about the limits of that plan, in terms of actually changing the fundamentals of the U.S. utility model.

Globally, the world must adapt to a "carbon budget" that is only about 550 gigatons more than today's usage if it is to avoid the catastrophic temperature increase to 2°C above pre-industrial levels, Rogers said. If the world went on a very strict carbon budget and ramped up all of the renewable energy efforts, particularly solar, the goal would be achievable within 30 years, he said. The problem is not the investment in clean energy, but the fact that there are 2,795 embedded carbon gigatons in booked reserves of oil and natural gas and other carbon sources. This is more than five times the amount that humanity can spend, he pointed out. The booked value of these reserves is in excess of $30 trillion. In essence, he said, saving humanity would take $30 billion away from the holders of these reserves, which is a significant political problem.

State and Local Politics

Housing, transportation, and energy policies all affect the built environment, and all have considerable effects on public health. These policies are, in general, the outcome of state and local politics, Rogers said out. Energy policy is almost entirely set at the state level. Energy policy is also intensely dominated by narrow business interests. Recently, he said, it has also been an area where competitive federalism has become increasingly nationalized, in a particularly problematic way.

Unlike justice reinvestment, in the energy arena the fossil fuel companies and utilities have significant power at the local level to push back against clean energy development. The business model is to sell more energy, not less. Rogers noted the increasing difficulty of working in partisan state government environments. He lamented the focus on privatizing public goods, even when such privatization presents challenges for a state's economy or may not even be attuned with constituent expectations. He raised concerns that this is a dangerous step back from health-based, resiliently financed, community-based solutions.

DISCUSSION

During the discussion following the panel presentations, the speakers expanded upon financing approaches for energy efficient upgrades, especially for renters and low-income residents. Participants also discussed the value of place-based strategies that produce co-benefits

in fostering equity and considered the impact on workers and communities when an industry changes or leaves an area, resulting in job losses.

Financing Energy Efficiency Upgrades

Russo observed that in the examples that had been discussed, the utilities appeared to not even think about renters at first. She asked for further discussion about the funding for retrofitting buildings and other such projects in rental units. She also wondered whether an energy utility's only reason for pursuing energy efficiency is because it is regulated and required to do so.

Bodaken clarified that nearly everyone pays a utility bill, and most utility bills in the United States include a small fee that goes toward funding energy-efficiency programs (called ratepayer funds). Those fees stay with the utility that collects them, he said. The programs are state- or utility-based and vary from facility to facility (i.e., this is not a federal requirement). There are still some utilities that do not have energy-efficiency programs. As discussed, the Energy Efficiency for All campaign is not generating new resources, but rather is reallocating existing resources to those who need them most. In this case, most people who are poor rent their homes, and extremely low-income renters are significantly burdened by high utility bills that consume large portions of their income. Reallocating existing energy-efficiency resources towards rental housing accounted for a relatively small amount of money, but it is an approach that, on an annual basis, can begin to show an impact. The strategy, Bodaken suggested, is that once a utility company sets up a program, a nonprofit developer, such as NHT, can leverage that program along with its other resources to rehabilitate rental living spaces. Sometimes utilities do this type of initiative on their own, but more often it is other groups that lead the effort.

Rogers pointed out that energy-efficiency programs are a relatively small part of a utility company's overall budget. He noted that there are private-sector energy service companies that serve both public and private clients and that make their money through energy efficiency. They establish energy performance contracts in which the energy efficiency upgrades are financed and then repaid through the accrued savings (similar to the PAYS example described by Hummel).

Hummel added that the inclusive financing programs he described do not use utility ratepayer funds as they do not provide the level of funding needed for the scale of the problem. They look to the same sources of public and private financing that are used to build substations, extend transmission and distribution lines, or pay for smart grid upgrades. Hummel said that there are convergent interests between utilities and their customers in distributed energy solutions. Financial analysis of utilities involved in inclusive financing has shown large-scale benefits to the utilities in reducing their costs for peak demand. Hummel suggested that this could be likened to addressing the cost of emergency room care in the health sector.

Place-Based Strategies That Provide Co-Benefits and Foster Equity

Pittman observed that all of the speakers raised the issue of equity in their presentations and highlighted the mismatch between those in power and where the dollars are most needed. For example, she reiterated Rogers' point that the booked value of current carbon reserves is $30 trillion, but action at the state and local levels is directed toward the people who are most affected (e.g., by unemployment due to change in energy generation). Rogers responded that place-based strategy development can help address this gap by adding value, reducing waste, and

capturing and sharing the benefits of doing those two things. Place-based approaches can be used in a variety of policy areas, including energy efficiency, transportation, and housing, and they can be pursued in alliance with the business community. It is possible for businesses to be profitable by "taking the high road," Rogers said, noting that many firms are willing to pay workers decent wages and provide pensions and other benefits in order to produce a quality product. The challenge is that their "low road" competitors (firms that are not willing to treat employees as valuable assets) are constantly threatening their profit margins. Furthermore, Rogers said, the "high road" companies do not have effective champions in the political arena in most states. He observed that there are many smaller communities that have lost significant human capital (which can be seen in, for example, the increasingly empty high schools that are being shuttered). The members of these communities have, in a sense, lost the narrative of their lives, and they often turn against each other and against those who are even more vulnerable. There is a healing process that needs to occur, Rogers said. The people in these communities have the same interest in having clean water, good local schools, or broadband Internet access as residents of cosmopolitan areas do, he said, and he suggested the need for urban–rural progressive political coalitions.

Bodaken agreed with the place-based approach and suggested that most Americans do not really want to relocate to some distant place and give up their identities in the process. He predicted that electric utilities will need to change their entire way of doing business in the relatively near future. Some states, including California and New York are beginning to change how they operate with regard to power generation, he said. In Maryland, the government sought to build a new, billion-dollar power plant on the Eastern Shore and explained to local citizens that they would have to pay more for their electricity once that power plant was built. After the residents responded that they did not want that power plant in their community, the company developed a strong energy efficiency program that actually reduced resident's costs and provided jobs. Bodaken acknowledged that such approaches cannot address the $30 trillion of embedded investment in carbon energy sources, but it is a start, and there are co-benefits to consider as well, such as the health of the community. From a financing perspective, insurance companies would likely have a significant interest in reducing their members' exposure to contaminants from traditional power-generation approaches.

Rogers concurred with the importance of co-benefits in these approaches, and he reminded participants to look for such co-benefits as they might not be obvious. He cited Bodaken's example of the apartment complex in the District of Columbia that was stripped down and rebuilt as a green building and how residents were happy with their rent and the space, but they were most pleased about the unexpected co-benefit that their children were healthier and were not missing school because of asthma attacks.

Hummel pointed out that clean energy clearly has the advantage over traditional energy sources when all the social costs of pollution are counted. In the current market conditions, many of these costs are externalized by the companies and then internalized by society. And as discussed, those costs are not spread equally. Hummel advocated for 100 percent clean energy, which means clean energy for everyone. Many current financing solutions in use are disqualifying large segments of the population. Hummel suggested that inclusive financing options can produce inclusive results and can accelerate the rapid scaling-up of the necessary capital deployment. Inclusive financing can also help to build a political constituency for the policies that will change the market conditions framing private-sector investment decisions.

There is good work to be done in the intersection among energy, environment, and finance, Hummel said, and public health benefits that can accrue when people who are burdened by energy costs are relieved of the sacrifices they make to keep the lights on.

Bodaken described a longitudinal study that is assessing the public health benefits of upgrading the energy efficiency of 8,500 apartments in Chicago, New York, and San Francisco. The findings will available in 2020. The study is being done by the JPB Foundation, in partnership with the National Center for Healthy Housing, the Icahn School of Medicine at Mount Sinai; the University of California, San Francisco; and the University of Illinois at Chicago.

The Human Impact of an Evolving Commercial Sector

Flores said that corporate maneuvers, such as changing where energy is sourced from, are not necessarily transparent to the public. Enormous amounts of money are exchanged, and those involved are far outside the realm of middle-class and lower-class America. All that the consumers understand is that they are not necessarily any better off. Flores stressed that policy discussions should include representation from labor organizations and from the communities that will be affected by these significant changes. For example, shifts in energy policy will affect people employed in the coal or oil industries, and the towns where these industries are can be decimated when jobs are eliminated. Flores stressed the need to have solutions for the people who will no longer be employed or who will lose a major portion of their income as a result of these shifts in energy policy (e.g., retraining, re-employment).

Rogers said that his center at the University of Wisconsin has released three reports on the issues facing people displaced by changes in the industry and on the likelihood of reemployment in other sectors (Walsh et al., 2008; White and Gordon, 2010; White et al., 2012). He suggested that there will be numerous employment opportunities in the United States to either create or maintain the clean energy infrastructure that will be needed going forward. One issue will be whether displaced employees will be willing to move to where the new jobs are.

Bodaken agreed with the concerns raised by Flores. The answer will probably be a combination of re-employment (i.e., of displaced energy sector workers) and defining the new jobs and determining what the required skills and training are. Bodaken noted that NHT previously purchased solar panels that were manufactured in China, but this year and last year they were able to buy solar panels from a company in Buffalo, New York. He agreed that there are jobs being created in the United States, but he added that there will also be potentially millions of jobs lost.

Hummel likened the impending economic dislocation to what took place at the end of the whaling industry or during the decline of the tobacco industry following public health anti-smoking campaigns. For most of the 20th century the Eastern Kentucky region has been the source of most of the coal burned in the most densely populated parts of the United States, Hummel said. It has also been the site of massive fossil fuel extraction. Inclusive financing programs for clean energy in the coal fields of Kentucky have demonstrated that this approach can be successful in a region with persistent poverty, Hummel said.

Hummel referred participants to a 1990s tobacco settlement in which public health experts were instrumental in framing the costs and benefits to society of managing the dislocation of workers. The point from that example is that workers who lose their employment

in the energy sector should be given the opportunity to access education and support for entrepreneurship to pursue jobs in any part of the economy and should not simply be tracked from one part of the energy sector to another.

The goal should not be simply neutrality or doing no harm, Flores said, but recompense. For example, perhaps new factories for solar panels could be built in the communities that are losing other employment. Financing should be embedded in places where there has been disinvestment, he said. He offered the revitalization of Detroit as a case example. Reinvesting in these places and populations across America can help to build back equity.

Rogers agreed with the need for strategic reinvestment in the infrastructure and industries necessary to make the clean energy transition in the United States equitable. He added, however, that this approach will not solve all of the problems in these areas of poverty and that there are other issues beyond the energy sector that are affecting these populations and that need more attention.

A participant pointed out that these arguments are finding their way into the political conversation and cited an example of a person running for office calling for plans to help those displaced in the shutdown of a refinery in the area.

5

Realigning Resources for Population Health: Small Group Conversations

Following the panel discussions of the case studies, participants broke into small groups to discuss potential strategies to restructure, realign, and reallocate resources for population health that borrow from successful examples in other sectors and industries. Bobby Milstein, director at ReThink Health, set the context for the breakout discussions with a brief overview of financing structures and well-known examples. After the small group discussions, the workshop reconvened, and facilitators reported on their groups' deliberations. (Highlights are presented in Box 5-1.)

BOX 5-1
Highlights and Main Points Made by Individual Speakers and Participants*

- When arrangements work well, it is often because the parties see some synergy in their efforts. The solutions that lead to a more interdependent health economy are often those where the parties see a potential to generate greater value together than alone. (Milstein)
- The principle of inclusive financing could be implemented across the array of financing structures. (Milstein)
- There are potential opportunities for public health to support other sectors in their work, whether or not those efforts are explicitly viewed as health interventions. Public health can help other sectors articulate how health is affected by their priority issues. (LaVeist)
- If the health sector is truly committed to co-benefits, it has to be willing to have some sort of mutual contribution to other sector's outcomes as well to its own. (Kelly)

* This list is the rapporteur's summary of the main points made by individual speakers and participants (noted in parentheses) and does not reflect any consensus among workshop participants or endorsement by the National Academies of Sciences, Engineering, and Medicine.

SETTING THE CONTEXT FOR DISCUSSION

The cases presented at the workshop thus far have been stories of economic transition, Milstein said. The prison industrial complex in the United States has generated mass incarceration and manifest waste, in both human and economic terms, he said. The examples discussed showed how investment and reinvestment can lead to very different sets of results for offenders and communities. Similarly, in the energy sector, Milstein added, the petro-industrial complex causes some harms, and efforts are under way to transition to greener, more efficient energy.

The challenge for population health is how to effect an economic transition and an "industrial revolution" in the way that health care is structured and financed that results in better population health, greater health equity, and and greater development of human potential. Milstein reiterated the point by Rogers that anything of value can be financed. The challenge is not just to promote evidence-based population health approaches, but to also define strategies for how to pay for them, with the mindset that financing should not be a constraint at the outset. How, with the assistance of financing experts and by taking lessons from other industries that have restructured to achieve similar co-benefits, can greater value and efficiencies be gained through focused innovations that improve population health?

Milstein acknowledged that the presentations only scratched the surface of how justice reinvestment actually works financially and barely explored the nuances of inclusive financing in the energy arena. However, even such high-level case examples demonstrate that there is an array of innovative financing options. The examples can thus foster a discussion about how to bring clarity to the action agenda for population health and how to define both the institutional arrangements and sources of money that could bring that agenda to fruition.

Menu of Financing Structures

To facilitate the group discussions, Milstein summarized potential financing structures for population health and classified them into ten main categories (roughly ordered by relative dependability), providing selected examples in each category (see Figure 5-1). He reminded participants that Internet links to further information about these and additional financing examples were provided in the background materials for the workshop.13 Milstein noted that part of the mission of the roundtable is to discuss what is needed to assure dependable resources for population health, and he observed that the vast majority of initiatives undertaken by multi-sector stakeholder collaboratives to advance their agendas are based on very short-term, very fragile financing.

[13] The workshop attendee packet is available at http://nationalacademies.org/hmd/~/media/Files/Activity%20Files/PublicHealth/PopulationHealthImprovementRT/16-OCT-19/Attendee%20Packet.pdf (accessed December 1, 2016).

TABLE 5-1 Menu of financing structures (in order of relative dependability).

Structures	Selected Examples
1. Grants, contracts, donations, prizes	• Convergence Partnership • BUILD Health Challenge
2. In-kind or barter agreements	• Cross-Jurisdiction Agreement
3. Hospital community benefit	• Community Health Improvement • Community Building
4. Healthcare payment reform	• Value-based Contracts (and MACRA) • Global Payment
5. Loans and investments	• Community Reinvestment Act • Community Development • Pay-for-Success, Impact Invest (and Divest)
6. Dues, earnings, legal settlements	• Tobacco Settlements • Deepwater Horizon
7. Gain sharing agreements	• Clean Energy Funds • Justice Reinvestment • ACOs & Accountable Communities for Health
8. Taxes, credits, trusts, payments, mandates	• Tobacco, alcohol, gambling, sugar, carbon, etc. • Low income housing • Wellness trusts
9. Community-wealth building	• Kaiser Total Health Impact (Anchor Mission)
10. Commercial market	• CVS No Tobacco

SOURCE: Milstein presentation, October 19, 2016.

Grants, Contracts, Donation, and Prizes

Most population health initiatives are funded by grants, contracts, donations, and prizes. Milstein highlighted multi-philanthropic initiatives, such as the Convergence Partnership and the BUILD Health Challenge, which he said are demonstrating pioneering ways of pooling philanthropic money for much longer-term and more profound types of investments.[14]

In-Kind or Barter Agreements

Another financing structure is in-kind or barter agreements. These can sometimes be more durable than short-term grants, as people see themselves as being in business with one

[14] For more information on these examples see http://www.convergencepartnership.org (accessed December 1, 2016) and http://buildhealthchallenge.org.

another. As an example, Milstein highlighted the cross-jurisdiction sharing agreements that are negotiated among multiple regional health departments. These operating agreements help to deliver economies of scale, with the partners providing in-kind contributions. These agreements sometimes lead to more formalized or contracted arrangements as well. Milstein said that this financing structure has real economic force to it, but it can be difficult to count.

Hospital Community Benefit

Milstein acknowledged the ongoing conversation around hospital community benefit, and the actual value to the public of programs that stem from the tax break that nonprofit hospitals receive. He referred participants to analyses by roundtable co-chair David Kindig and colleagues on the size of that value (Rosenbaum et al., 2015). The field is changing rapidly, Milstein said, pointing specifically to some modest expansions of investments in community health improvement and community building from nonprofit hospital sectors.

Health Care Payment Reform

Health care payment reform is bringing a shift from fee-for-service, volume-based payments to a system of payments based on value and quality. As examples, Milstein noted the Medicare Access and CHIP Reauthorization Act and the concept of global payments to health care providers. The regulatory framework around payment reform is a significant economic incentive which Milstein said could signal the need for other types of investments to flow differently.

Loans and Investments

There are numerous examples of loans and investments as financing structures that could be applied to population health. In the banking sector, the Community Reinvestment Act allowed for new ways of lending to occur. Milstein said that the community development and health sectors are frequently coming together to achieve co-benefits, and an equity agenda for investment is much more prominent. There is also a growing field centered on the pay-for-success approach to funding and another on impact investment (including explicit consideration of divesting from harms, such as oil or tobacco).

Dues, Earnings, and Legal Settlements

Milstein spotlighted dues, earnings, and legal settlements as a class of financing that often goes unnoticed. These funding sources are particularly important for multi-sector collaboratives. Famous and well-funded examples include tobacco settlements and the BP Deepwater Horizon settlements. Milstein mentioned the Public Health Institute in California, which has a program that invests legal settlement funds to improve public health and seeks public discourse about how the finds should be invested.[15]

Gain-Sharing Agreements

The case examples of justice reinvestment and clean energy funding that were discussed at the workshop were concentrated on a class of financing structures that are essentially about

[15] For more information see http://www.phi.org/focus-areas/?program=public-health-trust (accessed December 1, 2016).

gain sharing, Milstein explained. These agreements recognize co-benefits and are predicated on the idea that investments can deliver yield and that yield, in turn, can be strategically applied as the next new investment in something else.

Milstein said that the development of accountable care organizations (ACOs) and accountable communities of health raised questions about who should share in the savings that result from the redesign of the health care delivery system. The field is beginning to experience expansions in both the number of parties who are working to lower the total cost of care in a region and the scope of investments and reinvestments that are made over time.

Taxes, Credits, Trusts, Payments, and Mandates

Another category of funding is associated with the functions of government, including taxes and tax credits as well as various appropriations and mandates. As examples, Milstein mentioned the so-called "sin taxes" on gambling, alcohol, tobacco, sugar, and now carbon emissions. He said that funds acquired through the carbon cap and trade system will likely be invested in initiatives that help people and the planet, and he suggested that public health professionals should consider whether they are truly prepared to help prioritize how funding from this program could be invested in population health. He reiterated the point made by Debbie Chang in the opening session regarding the potential of existing financing structures. Tried and true mechanisms (e.g., tax credits, low income housing tax credits, and enterprise zones) are not being used as fully or as strategically as possible, he said.

Another mechanism in this category is wellness trusts, Milstein said, although he acknowledged that these are evolving with regard to management. He explained that the first-generation wellness trusts were funded by taxes on health care expenditures; however, the new generation of wellness funds associated with accountable communities for health are nongovernmental.

Community Wealth Building

One important aspect of community wealth building recognizes that institutions have a more significant impact on the economic life of their communities than just the services they provide. Anchor institutions (such as hospitals, universities, foundations, government, and others) also have a significant role and a long-term economic stake in the success of the communities in which they do business. Kaiser Permanente, for example, has incorporated a "total health impact" approach into its mission and its investing strategy. Employee ownership is another example of an approach that gives people in the community a much greater stake in the local economy. Milstein suggested that a local living economy that works economically likely also supports health and equity.

Commercial Market

Finally (and not necessarily most dependable), the business models of institutions can have a role in financing population health. There are many examples of businesses adapting to the changing world and redesigning what they do, what they sell, who they sell it to, or at what price. As an example, Milstein pointed to CVS Pharmacy's unilateral decision to stop selling tobacco.

In summary, there are at least 10 categories in which financial innovation is flourishing, Milstein concluded. The question is, How can these resources be strategically directed so that they yield multi-sector co-benefits and deliver opportunities for health, equity, and regional economic prosperity?

DISCUSSION

Participants raised several additional points to supplement Milstein's overview. Flores observed that in many cases spending is poorly tracked. A better understanding of where money is spent could help to enable trades, barters, and other agreements across different parts of government. Milstein agreed and emphasized the importance of transparent accounting in identifying opportunities for investments that yield co-benefits. He added that ACOs are recognizing that the insurance and health care delivery functions of the business are not actually disconnected and that, for example, changes in care delivery can lower the cost to the insurer. If care can be delivered more cheaply and the resulting savings invested more effectively in population health and well-being, the result will be a virtuous cycle and increased capital.

Isham suggested that the actor that employs the financing structure is a critical element. Milstein agreed that who the parties are in these kinds of arrangements is important. When arrangements work well, it is often because the parties see some synergy in their efforts. The solutions that lead to a more interdependent health economy are often those where the parties see a potential to generate greater value together than alone, he said. Isham referred participants to the Institute of Medicine report, *For the Public's Health: Investing in a Healthier Future*, which considered mechanisms for funding governmental public health (IOM, 2012).

Magnan raised the issue of waste reduction as a financing mechanism. Milstein said that the two principle sources of economic benefit are generating value and eliminating waste. To some degree, any investment could deliver one or both benefits. There are many grant programs that are designed to achieve greater efficiency but that do not address what happens when that efficiency is achieved (i.e., what to do with the savings). Magnan lamented that most journal articles that describe a cost savings as a result provide no information about the next step, that is, what was done with the savings and who got to decide. Milstein also emphasized the need for benchmarks for investments in the population health agenda as well as and multi-sector goals (Kindig, 2015).

Bridget Kelly, the co-founder and chief delivery officer of Bridging Health and Communities, asked where inclusive financing fits into the strategies listed, given that those with the most limited resources and in the poorest health also tend to have very little voice in the financing process. Milstein responded that any one of these strategies could be done with greater or less democratic integrity and that the principle of inclusive financing could be implemented across the menu. One could, for example, implement a grant program or negotiate a gain-sharing agreement through community co-design. It is challenging, he added, because health care cost savings are a reflection of a large cast of actors who have to cooperate in order to realize results. This includes not only health professionals, but also families and people far outside of the clinical space. If their actions combined to deliver an ultimate reduction in cost, it is a fair question to ask why they would not be included in the conversations about how to best to use the savings.

CHARGE TO THE BREAKOUT GROUPS

Following the overview of financing structures and examples by Milstein, participants broke into three groups to discuss what they felt were the key takeaway messages from the workshop presentations to this point. Audience facilitator Chris Parker of the Georgia Health Policy Center charged participants to consider:

- What was intriguing, exciting, and/or confusing based on what you have heard?
- How has your thinking or understanding changed or shifted since this morning (if it has)?
- How generalizable or transferrable are these types of efforts from other sectors? Why or why not?

Groups were provided with blank templates to help guide their conversations about ways in which the different financing structures could be used, in principle, to fund population health improvement (see Figure 5-2). Participants were also asked to consider their own roles and responsibilities in potentially catalyzing these kinds of efforts.

What sector(s)?	Doing what?	Under what conditions?	With what likely co-benefits?
Education/Juvenile Justice	Teen mentorship initiative that reduces truancy, and boosts payments to schools, which is then reinvested in expanded developmental opportunities for youth	• A payment model that is linked to attendance and outcomes	• Improved scholastic achievement • Reduction in juvenile delinquency

FIGURE 5-2 Sample completed template used for collecting small group discussion points.
SOURCE: Parker presentation, October 19, 2016.

REPORTING BACK AND DISCUSSION

Key Takeaway Messages from the Workshop

Parker called on each group facilitator to report on some of the key takeaways identified in his or her group discussion. Thomas LaVeist, chair of the Department of Health Policy and Management at George Washington University, said his group discussed how bold action was taken in the education and criminal justice sectors with what seemed to be limited evidence—something that would be much harder to do in the health sector. The group was also very interested in the concept of co-benefits. As discussed in the presentations, actions taken in the

energy sector can benefit other sectors, including health. There are potential opportunities for the public health sector to support other sectors in their work, whether or not those efforts are explicitly viewed as health interventions. Public health can help other sectors to articulate how health is affected by their priority issues. Supporting other sectors' objectives, such as improving childhood education, reducing poverty, reducing incarceration rates, or improving housing quality, can lead to health benefits. It was also pointed out, LaVeist said, that one person's efficiency can be another person's topline, and that investments in public health are often viewed as costs rather than investments. The group also discussed further the possibility of identifying financing models from other sectors.

Bridget Kelly said that her group felt that several of the examples presented throughout that day might be limited in how well they can be generalized to this roundtable's conceptualization of population health (i.e., not focused at the individual level) because they were more individually oriented interventions. The justice case examples were about reinvesting in individual- and family-level care, as opposed to community-level criminal justice issues. Similarly, the Moving to Opportunity example was focused on individual families as opposed to the broader population. Kelly suggested that these examples might be more analogous to risk-factor-based prevention than to the more general field of population health that is the focus of the roundtable.

Kelly's group also reflected on co-benefits and the place of health in other sectors, and she said that the group members were excited to learn that many of the examples were measuring health outcomes. It was noted, however, that very few health institutions or programs offer to hold themselves accountable for their non-health outcomes. For example, health clinics and hospitals are not held accountable for educational outcomes, housing outcomes, or jobs outcomes. If the health sector is truly committed to co-benefits, it has to be willing to have some sort of mutual contribution to other sector's outcomes as well to its own.

The group came up with two additional lenses to apply when considering financing structures. One was to consider both operating expenses and capital expenses, acknowledging that public health has very little capital expense. The other one was to keep in mind the potential for the structure to work in a multi-sector initiative or collaboration. Some structures might be better suited to single-sector or bilateral efforts, versus broader multilateral activities. Kelly added that some group members were encouraged by the success of the justice examples in Georgia, in what would seem to be a very difficult political environment.

Milstein reported that his group had a comparable discussion about the similarities and differences across these sectors. Participants also expressed interest in the concept of co-benefits and discussed the need to be much more specific in anticipating and calculating those co-benefits.

It was noted that one challenge in population health is dealing with multiple causal factors and deciding where to start. Attempting to cover the entire space of all of the multiple drivers of population health can be paralyzing. It was observed that the cases presented all cut through this predicament, beginning with a menu of options, and launching initiatives on select options.

Milstein's group also considered the time horizon for planning. It was noted that, generally speaking, one year's budget will be only a slight variation on the previous year's budget. If the population health sector starts investing differently now, will it lead to a different

path, allow for much longer time horizon projects, or facilitate partnerships that may not have been possible in the past but could deliver greater value into the future?

Defining Co-Benefits

Participants in all three breakout groups highlighted various aspects of co-benefits as a key takeaway message from the workshop presentations. Since a focus of the workshop was to foster fiscal fluency, Parker highlighted the need to ensure a common understanding of what is meant by the term "co-benefits." For example, does each party benefit independently, or is there something both parties share in common that is a benefit to both?

LaVeist suggested that, from a population health perspective, everything is a co-benefit because the drivers of population health are all from other sectors and improving public health has positive benefits for all those other sectors. For example, a healthier population results in a healthier workforce, and a healthier workforce can generate more revenue, and so on. LaVeist suggested that "co-benefit" is perhaps a communication or framing device to help garner political support in a policy-making setting.

A participant said that, when taking a health-in-all-policies approach to a problem, part of the analysis is to consider who benefits and what portions of the benefits they get. The premise of the approach is that there is not one single entity or sector that will benefit, but rather it is multi-sectoral in both its effort and its benefits. Russo suggested that co-benefits are a mutual win-win and that having a co-benefit can help to propel initiatives forward. Isham observed that the definition is somewhat culturally dependent. For the purpose of promoting population health improvement in the United States, understanding the benefit from a historical or cultural standpoint can help to inform actions and open up possibilities.

Magnan said that a co-benefit can be tangible dollars, and it is important to negotiate how the sectors would share in that benefit. How those dollars would be reinvested to finance other approaches in population health will also need to be discussed.

Financing Solutions

Parker observed that in nearly every example from other sectors that was discussed throughout the day, the health benefit was essentially collateral—that is, it was not necessarily the main intention. The challenge now, as population health considers financing strategies, is to start working with other sectors as partners in making population health happen.

Cross-Sector Agreements for Mutual Regulation Impact Assessments

Kelly reported two pathways to the solutions discussed during her breakout session. The first was inspired by the use of social costs in the energy case examples and by the justice reinvestment model. The group chose the education and health sectors to illustrate the solution, but Kelly noted that it is not necessarily specific to those two sectors. The approach involves agreeing to mutual regulation impact assessments in the involved sectors. For example, if there is a requirement that schools conduct needs assessments, they would include health in their needs assessments, and, correspondingly, community health needs assessments would include education outcomes in their scope.

The preconditions for this approach would be mutual agreement and reciprocity around how assessments are done, accountability, and how decisions are made regarding what to do with any yields. The hope, Kelly explained, is that this approach would yield co-investment opportunities because of avoided costs or savings or because of new investments. There might be interventions that both sectors would want to invest in because the assessment reveals a clear benefit to both. Other necessary conditions include developing trust between the parties and approaching the assessments in a way that is inclusive of the community the interventions are intended to benefit. The group noted that different entities might interpret the potential co-benefits differently. For example, hospital systems think of population health relative to their patient populations, while those in the public health sector think of population health relative to the broader population.

Isham asked whether these types of approaches could lead to a reciprocal of health-in-all-policies such that whatever the population health sector does, it must consider energy in all of its policies, criminal justice in all of its policies, and so forth. Kelly responded that limits would need to be set as part of the mutually reciprocal, inclusive negotiations. She observed that at this time other sectors are being asked to conduct health impact assessments, and health is not offering anything back. A participant suggested that the scope of these agreements would be determined around shared goals and the available evidence regarding potential impacts of the interventions to be funded. For example, if the intent is to invest in social/emotional learning programs in schools, there would be a limit concerning academic outcomes, health outcomes, and perhaps unemployment outcomes as well.

Health–Justice Co-Investment for Broader Reach of Outcomes

The second main approach that Kelly's group discussed was to broaden the justice reinvestment programs to be slightly less individual-focused. Could there, for example, be joint investment across sectors in programs such as violence prevention, community policing, or behavioral health? A broader population- or community-level approach to the justice initiatives could potentially yield greater safety, which in turn would be expected to lead to a variety of health benefits (e.g., reduced stress).

Tapping Existing Multi-Sector Investments

Milstein said that his group observed that there are many stories of multi-sector investment where multiple parties took actions that they perceived as being in their respective interests but that have not been discussed specifically as co-benefit situations. Several participants suggested it would be worthwhile to reexamine these past examples and gain a better understanding of the different investment philosophies of different sectors and to see where existing relationships in communities could have more population health traction. Milstein also drew the audience's attention to the Trust for America's Health report *Blueprint for a Healthier America*, which was released the morning of the workshop.[16] The report contains examples of multi-sector local health improvement collaboratives and identifies and recommends investments that could improve health.

[16] The Trust for America's Health report, *Blueprint for a Healthier America 2016: Policy Priorities for the Next Administration and Congress*, is available at http://healthyamericans.org/report/129 (accessed December 1, 2016).

The Role of Business Organizations

Milstein reported that his group discussed the role of businesses and economic development corporations in financing population health. These organizations have choices to make about the types of corporate actor they will be in a particular region. Conditions that would foster their participation include an ethical sense of shared responsibility and also a recognition that there are certain costs of doing business in a region that can be figured into corporate budgets, or investments that can yield returns and build a shared economy. There would be a variety of co-benefits to the businesses related to attracting and retaining talent as well as decreasing costs, for example.

Investment of Sin Taxes

Sin taxes on products such as sugar-sweetened beverages, cigarettes, and alcohol are intended to have the benefit of reducing associated harms such as obesity, cancer, heart disease, and other conditions. A related benefit is potentially reducing health care costs because of a reduction in these health conditions. LaVeist's group proposed using that tax income to invest in lead-free and clean water, physical education in schools, after-school programs for physical education, and other programs that would have the co-benefits of improving health and improving educational outcomes.

Establish a For-Profit Company with Profits Directed Toward Public Health

Several participants in LaVeist's group also suggested the notion of establishing a for-profit company with profits directed into equity-based, evidence-based public health interventions. This could be a sustainable model for supporting public health interventions that would improve health outcomes and create jobs.

6

Reflections on the Workshop

In the closing session of the workshop, Pamela Russo and Sanne Magnan called on roundtable members and participants to share their final observations. David Kindig, a professor emeritus of population health sciences and the emeritus vice chancellor for health sciences at the University of Wisconsin School of Medicine, spoke to the importance of population health financing as a key priority area for the roundtable to focus on over the next few years. Russo emphasized the value of having speakers from other sectors inform the discussions of the roundtable. The question of whether anything presented from other sectors is transferrable to population health is very difficult to answer, she said. George Isham added that there is a lot of nuance and texture to these examples from other sectors, and an opportunity to take advantage of expertise from adjacent sectors to gain deeper insights. Many of the comments that followed focused on working more effectively—and reciprocally—with other sectors to solve multiple problems and achieve co-benefits.

WELL-BEING IN ALL SECTORS

Isham spoke of the need for population health to consider its overall aim or objective. Is there a broader framing of health in all policies that is, perhaps, "well-being" in an economic and educational sense, that could be agreed upon across sectors? Are there tangible pathways to that larger objective that can be drawn to the different sectors?

José Montero, the vice president of population health and health systems integration at Cheshire Medical Center/Dartmouth Hitchcock Keene, agreed with Isham on the concept of

well-being spanning sectors. He also observed that the system, in theory, is not designed for interdependence and that investments are generally made within one's purview. While the health sector might wonder why other sectors do not recognize the health impacts of their actions, it is also true that the health sector does not recognize its own impact on other sectors. For example, it does not study the impact on educational outcomes of its interventions in children's health.

Montero said there is a need to refine the language of population health to reach different audiences. For example, there is a common perception concerning health that it is purely medicine-related, and talking about health in all policies seems to mean "hospitals in all places" to some. If population health is not able to reach those constituents, it cannot achieve the impact needed.

Catherine Baase, the global director of health services for The Dow Chemical Company, also noted with interest the focus of the discussions on co-benefits, which she said reinforced the connectedness of the sectors from the macroeconomic perspective as well as from the systems perspective of the creation of human flourishing.[17] She referred participants to a forthcoming report from the Samueli Institute on well-being for the nation.[18]

In response to the takeaway messages shared by one of the small groups (see Chapter 5), a participant countered that while the restorative justice intervention is at the individual level, the result is well-being at the community and population level.

ADDRESSING THE POLITICAL DETERMINANTS OF HEALTH

Bob Griss of the Institute for Social Medicine and Community Health suggested that the four models discussed at the workshop are exceptions in those sectors, although it might be nice to think that these sectors are all going the way of prevention models in the health sector. All of these sectors, including health, have models that look logical, but all have had to fight political battles. The political determinants of health, he said, underly the social determinants of health. In beginning to look at these successful models, it is important to recognize the political constraints and to determine how to address them. Community participation and other approaches are

[17] A term used to refer to a holistic notion of health and well-being that goes beyond typical biomedical indicators.
[18] See Wellbeing in the Nation at http://www.samueliinstitute.org/research-areas/health-policy-communities/wellbeing-in-the-nation (accessed December 1, 2016).

important to translate into political strategies, he said. This is more than a communication problem, Griss said; it is a political problem, and it needs to be framed in such ways that social movements can act on it.

BETTER COOPERATION WITH OTHER SECTORS

Several participants emphasized the need for better cooperation and engagement between health and other sectors. Marthe Gold of The New York Academy of Medicine, Kindig, and Montero mentioned the need for more outreach to other non-health organizations, getting health experts invited to other sectors' discussions, and finding ways that the health sector can help other sectors accomplish their agendas. Gold and others mentioned moving beyond "health as the center of the universe" to health as part of a broader coalition. Discussion is needed regarding what role the range of actors in the health sector should play. One important role mentioned was that the health sector should make sure it is ready to engage with the other sectors and talk about what creates health. Montero said that even though some of the examples discussed might be more at the individual level, they will get to the population prevention level in the future. The question is, Will the health sector be ready to work with other sectors on objectives that seem so well aligned?

Gold also emphasized the need further discussion on the role that evidence plays in making the arguments for financing. Based on the presentations, there would appear to be very rich datasets in other sectors that the health sector is not aware of or does not have access to. Is there a way for individuals in the health sector to make better use of these data resources and be more ingenious as to where they look for information?

Multi-Solving

Milstein offered the term "multi-solving," coined by Climate Interactive, as the name for finding good solutions to solve multiple problems.[19] This term reflects a movement away from the style of practice where one topic is always in the foreground while the others are the means to that end. Milstein referred also to a February 2016 workshop of the Frameworks Institute and a comment there by Julie Sweetland, who said that Americans will strongly endorse solutions to

[19] See https://www.climateinteractive.org/programs/multisolving (accessed December 1, 2016).

problems that they refuse to believe even exist, because pragmatism is a powerful ethic. It could be, he suggested, that multi-solving is the discipline of population health pragmatism at its best. The examples discussed are exceptions to the norm, but they have been successful in accomplishing what people heretofore had not believed was possible. The dollars saved are real. Milstein suggested that the population health sector focus on the problems that can be solved together. The hope, he said is that those problems, when solved well, can be financed well.

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B

Workshop Agenda

Roundtable on Population Health Improvement

Building Sustainable Financing Structures for Population Health: A Workshop
October 19, 2016

AGENDA

National Academy of Sciences Building
2101 Constitution Avenue, NW, Washington, DC

Workshop Objectives:

In the context of multi-sector collaboration, a focus on dependable (not one-time) resources, and with the aim of improving health, wealth, well-being and health equity:

1. Improve the fiscal fluency of decision makers and the public—to move toward common purpose at community scale—explore frameworks for funding reinvestment and reallocation.

2. Identify existing opportunities and constraints on realigning funding in ways that are conducive to co-benefits (for all sectors involved).

3. Discuss the strategies, including conditions, needed to realign resources, i.e., what it takes to move funding from one arena to another.

4. Explore what decision makers, communities, and other stakeholders need to speak about realignment with confidence, including the possible opportunities to move funds from one part of the system to another.

8:30 a.m. **Welcome and overview of the day**

George Isham, senior advisor, HealthPartners, senior fellow, HealthPartners Institute for Education and Research; co-chair, Roundtable on Population Health Improvement

Pamela Russo, senior program officer, Robert Wood Johnson Foundation; member, Roundtable on Population Health Improvement; chair, workshop planning committee

9:00 a.m. **Overview of audience participation plan**

Christopher Parker, associate project director, Georgia Health Policy Center; member, workshop planning committee

9:15 a.m. **Sustainable financing structures for population health: Historical patterns and insights for the future**

Moderator: Debbie I. Chang, senior vice president of policy and prevention, Nemours

Anthony Orlando, doctoral student, Sol Price School of Public Policy, University of Southern California

Raphael Bostic, professor, Judith and John Bedrosian Chair in Governance and the Public Enterprise; chair, Department of Governance, Management and the Policy Process; Sol Price School of Public Policy, University of Southern California

9:45 a.m. **Q&A/Discussion**

10:15 a.m. **Network break**

10:30 a.m. **Case example 1: Justice reinvestment**

Moderator: Paula Lantz, associate dean for academic affairs and professor of public policy, Gerald R. Ford School of Public Policy, University of Michigan

Elizabeth Lyon, deputy director, state initiatives, Council on State Governments Justice Center

Judge Steven Teske, Juvenile Court, Clayton County, Georgia

11:15 a.m. **Q&A/Discussion**

11:45 a.m. **Lunch**

12:45 p.m. **Case example 2: Clean energy financing**

Moderator: Mary Pittman, president and chief executive officer, Public Health Institute

Michael Bodaken, president, National Housing Trust

Holmes Hummel, principal, Clean Energy Works

Joel Rogers, Sewell–Bascom Professor of Law, Political Science, Public Affairs, and

	Sociology, University of Wisconsin–Madison; director, Center on Wisconsin Strategy
1:45 p.m.	**Q&A/Discussion**
2:15 p.m.	**Overview of examples from other sectors to seed small group conversations** *Moderator: Christopher Parker, associate project director, Georgia Health Policy Center* *Bobby Milstein, director, ReThink Health*
2:45 p.m.	**Energy break**
3:00 p.m.	**Small group work**
4:15 p.m.	**Reporting back and discussion**
4:35 p.m.	**Audience participation** *Christopher Parker, associate project director, Georgia Health Policy Center; member, workshop planning committee*
4:45 p.m.	**Closing remarks and reflections on the day** *Pamela Russo, senior program officer, Robert Wood Johnson Foundation; member, Roundtable on Population Health Improvement; chair, workshop planning committee* *Sanne Magnan, co-chair, Roundtable on Population Health Improvement*
5:15 p.m.	**Adjourn**

C

Sustainable Financing Structures for Population Health: Historical Patterns and Insights for the Future: Commissioned Paper

Raphael W. Bostic and Anthony W. Orlando[1]
University of Southern California
December 12, 2016

Improving population health and reducing health disparities requires identifying interventions that will cause people to make choices that result in positive health outcomes. However, success requires more than just knowing what to do. Importantly, there must be financing and institutional structures in place that support the implementation of the policies that are ultimately selected.

Policy can be delivered via multiple financing and institutional arrangements. Using a broad brush that is not intended to be fully exhaustive, one can categorize the ways that programs and policies can be funded according to who provides it and how. Governments can provide funding or resources through targeted appropriations, tax policy, programmatic expenditures, or mandates. Nongovernmental organizations can offer support through investments where either market-rate or below-market returns are expected, grants where no returns are expected, or the in-kind provision of expertise or services.[2]

From an institutional perspective, policy can obviously be implemented by public institutions at the federal, state, and local levels. However, in recent decades the policy action domain has expanded to include organizations in the private, nonprofit, and philanthropic sectors. In some cases, policy can be implemented solely by these nongovernmental organizations through contracts with government that establish performance guidelines and funding rules.[3] In other cases, policy can be implemented through the combined effort of organizations from multiple sectors, resulting in a web of possible institutional combinations through which policy can be delivered.

This paper provides an overview of these issues in the context of policies in non-health domains that promote public health. We first present a framework for thinking about the types of interventions that can promote improved public health. We then review four specific strategies

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[1] Research support for Anthony Orlando was provided by the Low Income Investment Fund and the Roundtable on Population Health Improvement. The authors are responsible for the content of this article, which does not necessarily represent the views of the National Academies of Sciences, Engineering, and Medicine or those of the Roundtable on Population Health Improvement.

[2] ReThink Health has developed a useful framework for categorizing the various way that programs can be financed. ReThink Health. 2016. *Sustainable financing: A job for the field*, mimeograph.

[3] An example of this is job training, which in the United States is almost exclusively contracted out.

that have been found to be effective and analyze the combination of institutions and rules to determine which levers have been important for achieving the observed success. Our goal is to provide a range of examples of successful policies for mitigating the adverse effects of social determinants of health and for the financing and institutional structures that produced them. These should offer a jumping-off point for deliberations about the types of financing and institutional arrangements that are most likely to produce sustained activity at scale.

INTRODUCTION

By almost any measure population health in the United States has improved dramatically over history. For example, while the average male born in 1776 was expected to live to around 35 years (Steckel, 2002), the life expectancy of the average male born today is nearly 80 years (Steckel, 2002). Similarly, infant mortality in the United States was more than 20 times higher at the nation's beginning than it is today (Steckel, 2002). These gains have been truly remarkable.

Recent years, however, have produced a different, more troubling trend, one that has raised concerns. Over the past 50 years we have observed a widening gap between the health of certain segments of the U.S. population. For example, African-Americans are about 50 percent more likely to have heart failure than members of non-minority groups, are about twice as likely to have diabetes (and the same is true for Latinos), and are 68 percent more likely to be severely obese (Mead et al., 2008; Russell, 2010). We see similar relationships when we compare health outcomes between more affluent population groups and the poor.

The widening gap in public health is largely due to factors that can be grouped into a number of broad categories. Clearly, differences in access to health care services and in the quality of those services is a contributing factor to observed disparities. But differences in four non-health categories—environment, neighborhood, home, and economics—also contribute to the widening differentials in public health that we observe between more affluent and the poor as well as between minorities and non-minorities. There is a vast and growing literature showing how these social determinants affect population health, yet far less attention has been paid to the design and financing of programs and policies that mitigate these factors. In the rest of this paper, we present four case studies of these types of effective interventions, and we document how institutional structures contributed to their success.

ENVIRONMENT

The environment is perhaps the most straightforward social determinant of health. Because human existence and survival relies upon natural resources—air, water, food, and climate—breakdowns in the environment will have clear links to degradations in health.

Broad-based attention to the link between environmental health and personal and public health began in the United States at the same time as technological innovations were changing how goods were produced. In the late 19th century, scientists began to discover that airborne and waterborne particulates in pollution generated by factory production and engine-powered vehicles had a variety of negative health effects, from respiratory illness to cancer to cholera (Davis, 2003; Ebenstein, 2012; Kampa and Castanas, 2008; Katsouyanni, 2003; Schwarzenbach et al., 2010; Thorsheim, 2006). Importantly, these effects were not equally distributed. In recent decades, a large "environmental justice" literature has documented that poor and minority

households are disproportionately exposed to these particulates and other environmental toxins (Ash et al., 2009; Cole and Foster, 2001; Mohai et al., 2009; Taylor, 2014).

When looking at policies that are designed to fix the environmental challenges, we see activities at multiple levels. The federal government, through multiple agencies, offers resources that can be used to reduce environmental degradation. For example, the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Housing and Urban Development (HUD) both offer grants to clean up brownfields (EPA).[4] At the state and local level, governments use their planning and grant resources to put in place infrastructure that reduces the need for driving and other activities that increase air pollutants. Finally, philanthropic organizations also provide resources that can help improve environmental conditions and thereby help to reduce health impacts.[5]

Arguably the clearest example of a successful intervention is the reduction of smog in Los Angeles, California. Significantly, the barrier to progress was not financial or human resources but rather political will. A century ago, air pollution in Los Angeles was so bad that one day residents mistakenly thought there was an eclipse (Rosenberg, 2012). By the 1970s the Los Angeles basin was exceeding federal health limits for ozone on more than 200 days per year. Schools were refusing to let students go outside, as ozone levels would reach peak "emergency levels" during the day. The brown skies in Los Angeles at that time closely resembled the skies of Beijing, China, today (Nichols, 2015). What changed? According to experts who studied and lived through the transformation, it was the Clean Air Act, signed into law by President Richard Nixon on December 31, 1970.

Three years earlier, Governor Ronald Reagan had created the California Air Resources Board (CARB), but it had very little impact at first. It had neither the legal authority nor the political will to regulate ozone strictly. The Clean Air Act (CAA) gave it both. The chairperson at the time was a chemistry professor named Arie Haagen-Smit. Having this scientific authority was necessary in the beginning, says communications expert Larry Pryor, in order to convince the public and the policy makers that regulations were necessary. The second key element was someone with the communications and political savvy to enact those regulations. That person was Haagen-Smit's successor, Tom Quinn, who had just finished a successful run as Governor Jerry Brown's campaign manager when he was appointed to the role. Haagen-Smit and Quinn pushed for mandatory smog tests in vehicles, the installation of catalytic converters, and cleaner natural gas in power plants (Nichols, 2015; Rosenberg, 2012).

The results have been dramatic. Angelenos can now count "red alert" smog days on one hand each year. Brown skies have virtually disappeared (Rosenberg, 2012). A recent study in the *New England Journal of Medicine* documents "significant improvements" in lung function, particularly for children with growing lungs. Pollutants like nitrogen dioxide and fine particles have declined over 50 percent in the last two decades alone (Gauderman et al., 2015). Meanwhile, the California economy has grown at a strong rate, often outpacing the national average.

Against these benefits, one must weigh the policy's costs. From a public sector perspective, the CAA and other CARB regulations were fiscally feasible in large part because

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[4] According to the Environmental Protection Agency, a brownfield is defined as "a property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant."

[5] We recognize that there are also legal remedies that can be used to minimize environmental impacts, such as enforcement of the clean air and clean water acts, but we did not emphasize those in this paper.

they shifted the direct costs on the automobile, electric utility, and other industries that were forced to adapt to the new reduced level of emissions. Pollution abatement raised the cost of investment required per unit of output, though some of these costs would be recovered in the future. It is infeasible to estimate the costs of the CAA in the context of Los Angeles alone, given that industry adjustments were frequently applied to goods sold nationwide. However, many have attempted to estimate the cost of the CAA overall. Some have argued that its costs are substantial (in the tens of billions of dollars annually) and likely outweigh benefits, while others argue that the costs are small relative to the size of U.S. industry (Greenstone, 2002; Krupnick and Portney, 1991; Melnick, 2010). The EPA has estimated that the CAA initially cost producers and consumers one-third of one percent of their income, with the percentage declining over time. This is not trivial, but it is important to note that the long-term benefits by some estimates has been far greater (EPA, 1997). A 2011 March EPA report estimated that the benefits of the CAA between 1990 and 2020 will outweigh costs on the order of 30 to 1 (EPA, 2011).

The political environment has changed significantly since the 1970s. It is not clear whether a "policy window" will open for another reform on the scale of the CAA.[6] For such a large-scale transformation to occur, the authors of this paper assert, a coalition of both scientific experts and political strategists will be needed to convince the public that it is in their interest, both in terms of health and economics, to enact regulations that come with a short-term cost and a long-term benefit. It is also necessary for state policy makers to have federal support in order to make sweeping changes, especially in today's tight budgetary environment. For this social determinant in particular, local and philanthropic efforts have never been scalable enough to address the grand scope of environmental problems. Federal–state partnerships provide a much more promising way forward.

NEIGHBORHOOD

In addition to the broader environment, the environment in a person's immediate neighborhood is also a social determinant of health. Concentrated poverty, crime, and food deserts, among other factors, have all been shown to be associated with poorer health outcomes. For example, the latest research shows that concentrated poverty devastates children who grow up in it. The cognitive development of children living in the midst of concentrated poverty is stunted, their physical safety is threatened, their mental health is damaged, they resort to violence, and they succumb to substance abuse and hopelessness (Bostic, 2016a, 2016c; Goffman, 2015; Kneebone and Holmes, 2016). Because these conditions are place-based, meaning that they concentrate more in some areas than in others, some populations—poorer, and often minority—are more at risk of these health ailments than others.

As in the case with the environment, policies of the federal, state, local, and nongovernmental levels have been brought to bear on challenges associated with neighborhoods. In some regards, nongovernmental organizations have taken a more visible role in trying to improve neighborhood trajectories. For example, MacArthur Foundation, the Annie E. Casey Foundation, and The California Endowment, among others, have initiatives that are focused on

[6] For more on the importance of "policy windows," see the classic work: Kingdon, John W. 2010. *Agendas, alternatives, and public policies: Updated second edition*. London: Pearson Education.

bringing back specific communities.[7] This area has seen considerable policy innovation, such as stop and frisk as a policing strategy, urban gardens as a healthy food effort, and moving to opportunity as a strategy to move people to neighborhoods that have better amenities.[8]

We use this last example as a case study. In 1994 HUD began an experiment known as Moving to Opportunity, or MTO. Motivated by the deterioration of public housing and the increasing concentration of poverty, HUD partnered with Abt Associates to randomly issue $70 million in vouchers. Some came with the requirement that the recipients move from their public housing in high-poverty neighborhoods to low-poverty neighborhoods, while some came with no requirements. The experiment also included a control group that did not receive a voucher (Shroder and Orr, 2012).

MTO was not an unqualified success. It was initially believed that the largest benefits would be economic, but the evidence consistently showed that families who used the vouchers did not reap immediate monetary benefits. While this was puzzling at first, more recent evidence has made clear that the economic consequences of these changes can take time to manifest themselves. It was only in the last year that researchers discovered that children living in those families had significantly higher rates of college attendance, higher earnings, and lower single parenthood rates (Chetty et al., 2016a). Viewed from a health perspective, however, the findings were less surprising. In the short run, the most significant outcomes were improvements in mental health and safety. Families who used the vouchers moved to neighborhoods with less crime and experienced much better cognitive outcomes (Kling et al., 2007; Ludwig et al., 2008). On balance, the short- and long-term benefits of MTO have been significant and persistent.

One underappreciated driver of this success, however, has been private philanthropy. Approximately one-third of the cost for data collection was funded by private foundations (HUD, 2011). Rather than being a top-down solution in the model of the CAA, the MTO demonstration represented a different and innovative institutional approach: a partnership between the federal government and private charitable organizations. It is clear that charities could not have undertaken such a large experiment on their own, but it is less well known that the government did not venture into this enterprise unassisted. It relied on the expertise of Abt Associates and the matching funds of private foundations. In this era of budgetary restrictiveness, these relationships pose a useful option to scalable assistance for targeted populations.

The cost of the data collection was much smaller than the $70 million allocated to the vouchers themselves. According to the final evaluation conducted by the National Bureau of Economic Research, the federal government spent approximately $12 million collecting and evaluating the data from 1994 to 2011 (National Bureau of Economic Research and University of Michigan—ISR (Institute of Social Research), 2011). While this is nontrivial, this total amount pales when compared with the $45 billion *annual* budget for HUD(0.027 percent) or the trillions

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[7]See, for example, MacArthur Foundation, *Chicago commitment*, https://www.macfound.org/programs/chicago/strategy (accessed July 7, 2017) ; Annie E. Casey Foundation, *Baltimore Civic Site*, http://www.aecf.org/work/community-change/civic-sites/baltimore-civic-site (accessed July 7, 2017); California Endowment, *Investing in place,* http://www.calendow.org/places (accessed July 7, 2017).

[8] For more details on stop-and-frisk, see: Matthews, Dylan. 2013. Here's what you need to know about stop and frisk—and why the courts shut it down, *Washington Post*, Wonkblog, August 13, https://www.washingtonpost.com/news/wonk/wp/2013/08/13/heres-what-you-need-to-know-about-stop-and-frisk-and-why-the-courts-shut-it-down (accessed July 7, 2017). For more details on urban gardens, see: Ward, Donnajean. 2015. Urban farms, gardens, and food desert myths, USC Bedrosian Center, June 5, http://bedrosian.usc.edu/blog/urban-farms-gardens-and-food-desert-myths (accessed July 7, 2017).

spent by the federal government during that time (0.0000003 percent).[9] The resources for continuing such an expansion of housing vouchers exist, though it is important to remember that the cost of making it an entitlement available to all qualifying households across America would be orders of magnitude higher. Experts estimate that the cost of a universal housing voucher program would be an additional $20 to $40 billion; of course, a less generous expansion could improve population health at much lower cost, as MTO has demonstrated (Blumgart, 2016).

HOUSING

The average American spends more time in his or her home than in any other location. Housing is therefore one of the greatest sources of opportunity and challenge in improving population health. Housing affects population health through two channels: housing quality and housing affordability. Together, they constitute one of the United Nation's basic human rights, "adequate housing" (Office of the United Nations High Commissioner for Human Rights).

The earliest housing policy interventions arose because of public health concerns associated with poor housing quality. The tenement homes that were common in cities during the industrial revolution of the late 1800s exposed residents to contaminated water, raw sewage, bacteria, and contagious illnesses, and concern about these dangers sparked the establishment of building codes (Shaw, 2004). While the codes did produce progress in reducing exposure to pathogens and toxins, the recent revelations in Flint, Michigan, and the book *Evicted* show that this remains an issue for many today (Bostic, 2016b; Desmond, 2016). Living in the presence of lead, for example, is highly detrimental, particularly for children, who can suffer permanent significant cognitive and physiological damage as a result of the exposure (Coley et al., 2013; Orlando, 2014). A second channel by which housing quality affects public health is through the interior climate it creates. Poor quality housing results in people living in homes that are damp and cold in the winter and, depending on where one lives, too hot and humid or dusty in the summer. This exacerbates difficulties for people with respiratory conditions such as asthma and for those with compromised immune systems, among others (Shaw, 2004).

The policies to address housing-related factors that affect individual and public health span the public–private continuum. The public sector at both the federal and local level provides grants to improve housing quality, including grants for improved energy efficiency and climate control, and local communities are continually revising zoning and building codes to reflect new understandings gained about the costs and potential remedies of adverse housing quality.[10]

There has been an emergent movement to use social impact investing to raise funds to mitigate poor housing quality (Clay, 2013). On the affordability side, HUD provides rental assistance to help those whose income is not sufficient to avoid being housing cost burdened, though this assistance is available for only about one-third of all eligible households (Dreier and

[9] Calculated using Table 1.1—Summary of receipts, outlays, and surpluses or deficits:1789–2021, from the Office of Management and Budget, Historical Tables, https://www.whitehouse.gov/omb/budget/Historicals (accessed July 7, 2017).

[10] Improvements in warmth and energy efficiency tend to yield significant improvement in respiratory health, especially asthma. They also have the ancillary economic benefit of reducing fuel bills, improving social cohesion, and increasing work hours, all of which have indirect health benefits. See, for example, Thomson, Hilary, Sian Thomas, Eva Sellstrom, and Mark Petticrew. 2009. The health impacts of housing improvement: A systematic review of intervention studies from 1887 to 2007, *American Journal of Public Health* 99(S3):S681–S692.

Bostic, forthcoming). HUD and the tax code also provide incentives for capital to flow to the development of affordable housing through grants and programs such as the Low Income Housing Tax Credit (Bostic and Rodnyansky, 2016).

For our home-related policy example, we highlight housing quality and lead in particular. Though lead contamination has received marked attention recently, we look to the lead aspect of the built environment not because it is so problematic, but rather because it used to be so much worse (Fox, 2016). Lead reduction is an example of a *successful* investment that has some consistent scale, though it could be scaled even further.

Nearly a century and a half ago, when America's cities were swimming in pollutants, the vast majority of cities used lead pipes. The lead level in New York City was more than 100 times higher than the EPA now allows. One in 10 Massachusetts residents suffered from lead poisoning. What changed? Better construction materials played an important role. New buildings do not use lead pipes and paint anymore. As recently as 1976, though, 13.5 million children under the age of 5 had an unhealthy incidence of lead in their blood. New development, it seemed, was not replacing existing infrastructure fast enough. Meanwhile, the old pipes and paint corroded over time, increasingly exposing residents to the lead contained within them.

What changed was the Residential Lead-Based Paint Hazard Reduction Act, also known as Title X of the Housing and Community Development Act of 1992, which was signed into law by President George H. W. Bush.[11] It created the Office of Lead Hazard Control, which issued grants to communities reduce lead in residential housing. The office currently has four main programs. Two competitive grant programs—the Lead Hazard Control (LHC) and Lead Hazard Reduction Demonstration grant programs—provide small grants (usually $3 million for the LHC program and up to $4 million for the demonstration program) to local communities, which must provide a local match and devote the bulk of funds to activities directly associated with the removal of lead. LHC grant funds must be devoted to private housing, and demonstration grant funds are reserved for the 100 highest-risk cities in terms of lead exposure (Malone, 2014). The demonstration grants alone have made 200,000 homes lead-safe (Malone, 2014). They have also spurred local governments, including those in Boston, Milwaukee, and Rochester, to fund their own lead hazard control initiatives. Studies have found all these programs to be successful in making homes safer and children healthier (CGR, 2008; Litt et al., 2002; Strauss et al., 2004; The National Center for Healthy Housing and The University of Cincinnati Department of Environmental Health, 2004). The third program the office operates is the Healthy Homes Initiative, which expands the focus beyond lead to include a wider array of health and safety hazards, including allergens, carbon monoxide, mold, pesticides, and radon. Finally, there are resources reserved for conducting research in this area.

A key characteristic of this suite of programs is its emphasis on the local implementation of federal policy priorities. This has at least three benefits. First, it promotes increased collaboration through the public–private partnerships that result from the program.[12] Second, the competitive structure of the main programs ensures that resources are directed to the institutions that are best positioned to effectively use them. Third, they produce a local buy-in that expands

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[11] Title X was not the first federal action taken to try and reduce exposure to lead in the home, but it was a reaction to the ineffectiveness of policies enacted through its predecessors, such as the Lead-Based Paint Poisoning Prevention Act. Alliance to End Childhood Lead Poisoning. 1993, *Understanding Title X: A practical guide to the Residential Lead-Based Paint Hazard Reduction Act of 1992*, Alliance to End Childhood Lead Poisoning report, http://rst2.edu/ties/lead/university/resources/leadsuite/Manuals/14FTITX.pdf (accessed July 7, 2017).

[12] In some instances, funds must be used in conjunction with a nongovernmental service provider. (Malone, 2014).

the political coalition and enhances the resilience of the program and its ability to weather funding threats.

The passage of the act was driven by several factors. First, the focus on children was critical. Federal policy has historically been more generous in providing support to poor children than poor adults, and the evidence was clear that the lead in units was stunting their physical and cognitive development. The poor condition of public and low-cost housing—and its adverse impact on developmental health—allowed advocates to point to governmental policy, as opposed to personal responsibility, as a main driver of the cycle of poverty. Finally, a considerable fraction of the funds is earmarked for private housing as opposed to public housing, which is widely viewed as being poorly managed.

This combination of factors has proven to be potent politically. The Office of Lead Hazard Control, now called the Office of Lead Hazard Control and Healthy Homes, has consistently secured significant funding from the Congress with bipartisan support. Over $1 billion in grants to has been awarded over the life of the program. Annual funding has varied since its enactment, but it has averaged about $120 million over the past 7 years, with recent proposed significant cuts by either the administration or Congress successfully rebuffed on a consistent basis.[13]

ECONOMICS

The richest percentile of American women live 10 years longer, on average, than the poorest percentile of women. For men, the life expectancy gap is 15 years (Chetty et al., 2016b). By this measure, economic factors dwarf all other drivers of health inequity. One factor that affects those in the lower percentiles is the stress and distraction that comes from burdensome expenses. A factor relevant to those in the upper percentiles, which is related to the factors above, is the ability to live in a neighborhood that fosters good health, which typically requires nontrivial wealth. These indirect reasons only partly explain the life expectancy gap, however. Research suggests that the economics itself matters. Specifically, having a job and having the pay and benefits of a "good" job are directly related to a person's health (Forstater, 2015; Pharr et al., 2011; Rosen, 2014; Strully, 2009). And even among the employed, economic circumstances are starkly unequal. The majority of poor people who can work, in fact, have a job. But, they are either working part-time or earning a wage so low that they cannot escape poverty (Gould, 2015). The result is worse health outcomes. Many studies confirm the causal effect of income on health—and vice versa, reinforcing the problem as worse health leads to worse economic outcomes, which lead to worse health (Frijters et al., 2005; Lindahl, 2005; Thomas and Strauss, 1997).

The economics-based health gap begins early. By the time they are two years old, children start to display significant cognitive differences. These differences—between black and white, rich and poor—grow wider with each passing year of childhood (Dobbie et al., 2011). Closing the gap at later ages becomes an increasingly difficult and costly endeavor. Economists have come to the conclusion that pre-kindergarten intervention is one of the most cost-effective

[13] For example, in fiscal year 2016, while the House initially voted to reduce funding for this program by one-third, the final appropriation was for 92 percent of the President's request. National Center for Healthy Housing, Policy: *Federal Appropriations – FY 17,* http://www.nchh.org/Policy/National-Policy/Federal-Appropriations.aspx (accessed July 7, 2017).

ways to address poverty and inequality. For example, the Nobel Prize–winning work of James Heckman has shown that high-quality preschool programs generate high rates of return, both to the individual in terms of lifetime earnings and to society in terms of less crime, more productivity, and better health (Elango et al., 2016; Heckman et al., 2010). The authors of this paper believe that these findings have rightfully served as a catalyst for large urban metropolitan areas, including Los Angeles and New York City, to expand their publicly funded pre-kindergarten programs and schooling (Goldstein, 2016; Kohli, 2015). Early childhood education has also become a high priority for national policy makers, including presidential candidates.

The caveat is that these programs must be "high quality." The push for universal preschool has much to learn from the U.S. experience with universal elementary, middle, and high school, where economic gaps are often exacerbated, rather than ameliorated by differences in school spending.[14] Schools in the wealthiest districts spend up to nine times as much per pupil as schools at the bottom of the socioeconomic distribution (Orlando, 2013). These economic differences—both in family wealth and school spending—account for the vast majority of the gap between student achievement, far more than school qualities like class size or teacher experience (Ravitch, 2010). Still, recent research gives reason for hope. There *are* proven strategies to raise student achievement, even for the most disadvantaged children.

More generally, policies to reduce economic-based inequities focus on improving a person's specific or general job skills. Programs designed to improve specific skills include job training programs run or sponsored by the U.S. Department of Labor, local public and private vocational school programs, community college specialized training courses, and apprenticeship programs run by unions, often in conjunction with employers (Holzer, 2014). General skills development is supported by funds designed to make education available (Head Start) or more accessible (Pell grants). There has also been innovation among providers of education, such that private and nonprofit education providers, often supported with public funds, are now more prevalent in the marketplace (Schwartz, 2014).

Perhaps the most prominent example of the latter type of education reform has been the Harlem Children's Zone (HCZ). A 97-block area in this historically low-income minority neighborhood in New York City, HCZ pairs two interventions: (1) Promise Academy charter schools serving more than 1,000 students and (2) community services to support all 5,000-plus children living within the zone from birth through college. The Promise Academy operates under the "No Excuses" philosophy of education, so called because they "make no excuses based on students' background." The community services include early childhood programs, after-school tutoring, extracurricular activities, college preparation, and even tax assistance. This model has been notably successful in narrowing the achievement gap, especially in math test scores. These results have been most pronounced for the students in the school itself, leading researchers to conclude that the "No Excuses" model was most responsible for HCZ's success (Dobbie et al., 2011). To further test this conclusion, the researchers investigated 39 charter schools across New York City to see if other high achievers were doing what HCZ was doing. Consistent with previous literature, they found that traditional school characteristics such as class size and teacher certification did not improve test scores. Rather, they found that the "No Excuses" policies—"frequent teacher feedback, data driven instruction, high-dosage tutoring, increased instructional time, and a relentless focus on academic achievement"—were strong predictors of

[14] Research has identified some concrete practices that constitute "high-quality," as exemplified by the "No Excuses" charter schools we describe below.

success (Dobbie and Fryer Jr, 2013). They took these lessons out of New York City and implemented all five policies in 20 low-performing schools in Houston, Texas, where they found that the results continued to hold (Fryer Jr, 2014). In every case, the achievement gap narrowed significantly.

HCZ did not achieve such success from the very beginning. In fact, it took several decades to reach this pinnacle of student achievement. If one is looking for a catalyst in this transformation, it would be hard to ignore the fact that HCZ's budget rocketed from $12 million to $95 billion in the first decade of the 21st century. Big-donor philanthropy has been the driving force behind the HCZ revolution (Callahan, 2014). With assets in the vicinity of $200 million, HCZ has been criticized for its lack of scalability (Otterman, 2010). If there were such a mechanism, the authors of this paper assert that America's public schools would undoubtedly be better equipped to compete on the global stage, given the impressive test scores that HCZ has generated.

Whether these results last, however, is the question that matters for long-run health. Here, researchers have encountered mixed evidence. HCZ students continue to outperform in math years after they win the lottery to enter the Promise Academy. They are also more likely to enroll in college after high school, though their peers eventually catch up. HCZ students are less likely to get pregnant in their teenage years, less likely to be incarcerated, and more likely to eat healthfully, but they do not perform any better in terms of drug and alcohol use, criminal behavior, asthma, obesity, or mental health (Dobbie and Fryer Jr, 2015). Most concerning, however, is the recent discovery that students who attended high-achieving "No Excuses" charter schools in Texas did not experience any significant increase in earnings after they graduated—and charter school students as a whole actually experienced a *decrease* in earnings relative to their peers who attended public schools (Dobbie and Fryer Jr, 2016). This finding is consistent with a large body of evidence indicating that charter schools do *not* perform better, on average, than public schools (Dobbie et al., 2011; Fryer Jr, 2014; Ravitch, 2010). It is only a small subset that consists of significantly high achievers—and, as this evidence suggests, even they cannot claim to be closing most of the gap in the long run.

Recent research has suggested that it is the schools that improve the students' test scores, not the social services (see, for example, (Dobbie and Fryer Jr, 2015)[15]). While this finding may be empirically valid, it does not answer our overarching question about population health. The evidence documented in this paper suggests that social services are at least as important social determinants of health as education. HCZ thus poses an important model for reasons beyond its educational significance. It represents a powerful opportunity to investigate a holistic approach—blending neighborhood and education—to expand our frame of measurement beyond educational outcomes. The more "co-benefits" we can find, adopting programs that tackle multiple social determinants of health at once, the more cost-effectively we can achieve our goal of a healthy population.

[15] Because students are chosen for the Promise Academy by lottery, the researchers can isolate the effect of the school versus the neighborhood programs, which are experienced by all students living in the Harlem Children's Zone.

CONCLUSION

In the context of a framework for categorizing social determinants of health, this paper has tried to provide examples of successful policy interventions with some focus on the financing and institutional arrangements that facilitated their effectiveness. The case studies span a broad space:

- a federal government program, with funds given to local jurisdictions who then establish contracts or partnerships with nongovernmental entities to provide services (lead abatement in the home);
- a local program bolstered by philanthropic support, whose success generates interest at higher levels of government (education reform [and community services] to improve economic prospects);
- a political mandate that empowered an existing state agency to impose policies that impose broad costs that are collectively agreed upon (clear air initiative to better the environment); and
- a demonstration project that evolves into a partnership between government and philanthropy, with the results triggering consideration of new programs such as the Small Area Fair Market Rents program (effort to increase access to opportunity via moving to a neighborhood with better amenities).

Each of these represents a potential model for success in other contexts and offers lessons that should be internalized by those considering options. For example, the smog reduction in the Los Angeles basin shows that a health challenge that is considered to be sufficiently serious can be tackled, even in the face of significant costs. Similarly, the MTO experiment shows that interventions intended to serve non-health purposes can have significant co-benefits for population health.

Unfortunately, the budgetary and administrative structures of our public institutions often give them little incentive to invest in ways that benefit other sectors. Federal budget rules explicitly forbid agencies from getting credit—in the form of either direct supplemental resources or credits against future expenditures—if their investments provide savings or improve outcomes in another domain (Karabell, 2014). This has inhibited cooperation between agencies and also likely limits the range of policy options that agency policy makers consider.

This dynamic extends to state, regional, and local governments as well. A concrete example in the case of homelessness demonstrates this. It is widely recognized that much of the cost of homelessness occurs in the health sector, meaning that housing interventions will generate savings to the public health system (Gladwell, 2006). Yet in many regions public health is managed at the county or regional level, while housing resources are available through central cities. In such geographies where the county and central city do not coincide, the expenditures and savings are associated with different governmental bodies. Hence, we see housing-health cooperation occur more readily in San Francisco, which is both a county and city, than in Los Angeles, where Los Angeles County includes 88 cities in addition to the City of Los Angeles. This is because the expenditures and savings appear on the same effective budget in San Francisco, while in Los Angeles an intergovernmental agreement needs to be established between the county and city. Such agreements are very difficult to maintain over time. The

takeaways from these case studies therefore go beyond any individual intervention. More holistic approaches are necessary to increase the interdependence *between* sectors.

Successful place-based interventions necessarily leverage their local context to achieve maximum impact. But this represents a potential barrier to bringing them to a national scale, as local contexts can vary widely. Creativity in program design and implementation is therefore critical in understanding the essential elements for program success and how they work in different local circumstances. This consideration motivated the Small Area Fair Market Rents demonstration, an experiment by HUD that represents a first step towards introducing MTO-type mobility to the entire housing choice voucher program (Kahn and Newton, 2013). The demonstration was run in a small diverse set of cities, and the results suggest scaling is possible.

It is our hope that these examples and the lessons embedded in them spark conversations and inspire researchers and policy makers to find innovative ways to take effective policies to scale with financing structures that can be sustained over the long run.

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D

SPEAKER BIOGRAPHICAL SKETCHES

Michael Bodaken, J.D., serves as the president of National Housing Trust and as the vice president of Homes For America, Inc. He served as the head of the National Housing Trust for more than 13 years. Mr. Bodaken is chiefly involved in administration, business planning, technical assistance, and public policy. Mr. Bodaken has been directly involved in providing technical assistance to capable nonprofit organizations interested in purchasing affordable, multi-family housing developments. He served as the deputy mayor of the City of Los Angeles with the responsibility for, among other things, the housing and community development programs of the city. He is a frequent moderator and panelist at regional and national housing conferences concerning the preservation of multifamily housing. He is proficient in investment, tax, and legal matters concerning housing and community economic development. He practiced as a public interest lawyer with the Legal Aid Foundation of Los Angeles and the San Fernando Valley Neighborhood Legal Services. He is recognized as a key national leader in the affordable housing field and is a frequent moderator and panelist at regional and national housing conferences concerning the preservation of multifamily housing. He serves on the boards of numerous national housing organizations, including Homes for America, Inc., Housing Preservation Project, Urban Vision, Fairfax and Montgomery County Housing Tax Forces, and Stewards for Affordable Housing for the Future. Mr. Bodaken has a J.D. degree from Peoples College of Law and a B.A. degree from the University of Iowa.

Raphael Bostic, Ph.D., is the Judith and John Bedrosian Chair in Governance and the Public Enterprise at the University of Southern California's Price School of Public Policy and the chair of the Department of Governance, Management, and the Policy Process. For 3 years, he was the Obama administration's Assistant Secretary for Policy Development and Research at the U.S. Department of Housing and Urban Development (HUD). In that Senate-confirmed principal position, he advised HUD's secretary on policy and research in order to promote informed decisions on HUD policies, programs, and budget and legislative proposals.

Debbie Chang, MPH, is the vice president of policy and prevention for Nemours, in which position she focuses on developing and achieving Nemours' policy and advocacy goals; identifying, evaluating, replicating, and promoting model practices and policies in strategic areas such as innovation in child health promotion, prevention, and Nemours' integrated system of care; and developing and advancing Nemours' visionary child health prevention strategy across the enterprise. Ms. Chang is also leading a collaborative learning effort with eight communities across the country to harness and promote innovative policies and practices to improve the health and well-being of children in cross-sectoral (i.e., integrating health and other sectors serving children), place-based approaches. During the past 5 years at Nemours, she created and led Nemours Health & Prevention Services, an operating division devoted to improving children's health over time through a cross-sectoral, community-based model in Delaware that includes developing, implementing, evaluating, and promoting model prevention interventions. Ms. Chang has more than 22 years of federal and state government and private-sector experience in

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Holmes Hummel, Ph.D., is the senior policy advisor in the U.S. Department of Energy's Office of Policy and International Affairs. In earlier public service, Dr. Hummel served as a Congressional Science Fellow focused on energy and climate policy. Dr. Hummel's experience on Capitol Hill informed his Climate Policy Design Pro-Series, a program for Silicon Valley professionals and public interest organizers that remains an active online resource for educators and entrepreneurs alike. The series was developed from Dr. Hummel's graduate course on climate policy design offered by the Energy Resources Group at the University of California, Berkeley. Before moving to Washington, DC, Dr. Hummel designed corporate energy strategies for clients of the energy intelligence software firm Itron and later consulted with the Google energy and climate team. As one of the first candidates to earn a Ph.D. from the Interdisciplinary Program on Environment and Resources at Stanford University, Dr. Hummel researched methods for interpreting technology and policy implications of energy scenarios for climate stabilization. The techniques involved were developed with support from global thought leaders in the Greenhouse Gas Initiative at the International Institute for Applied Systems Analysis and subsequent work with Professor Zhang Xiliang at the Institute for Energy, Environment, and Economy of Tsinghua University in Beijing. Demonstrating the value of policy-relevant research beyond Stanford, Dr. Hummel immediately joined Jan Hamrin, the long-time president of the Center for Resource Solutions, to co-author A Review of Role of Renewable Energy in Global Energy Scenarios for the International Energy Agency's Implementing Agreement on Renewable Energy Technology Development. Dr. Hummel was first hooked on energy technology innovation in 1994 as a co-leader of the Clarkson University Solar Car Team, which designed and raced a highly efficient experimental electric vehicle across the country using only the power of the sun. In addition to receiving a Switzer Environmental Fellowship in the ensuing years, Dr.

Hummel has been recognized by the Environmental Leadership Program as a "visionary, action-oriented leader."

George Isham, M.D., M.S., is a senior advisor to HealthPartners, responsible for working with the board of directors and the senior management team on health and quality-of-care improvement for patients, members, and the community. Dr. Isham is also a senior fellow at HealthPartners Research Foundation and facilitates progress at the intersection of population health research and public policy. Dr. Isham is active nationally and currently co-chairs the National Quality Forum–convened Measurement Application Partnership, chairs the clinical program committee of the National Committee for Quality Assurances (NCQA), and is a member of NCQA's Committee on Performance Measurement. He is a former member of the Center for Disease Control and Prevention's Task Force on Community Preventive Services as well as the Agency for Healthcare Research and Quality's U.S. Preventive Services Task Force and currently serves on the advisory committee to the director of Centers for Disease Control and Prevention. His practice experience as a general internist was with the U.S. Navy, at the Freeport Clinic in Freeport, Illinois, and as a clinical assistant professor of medicine at the University of Wisconsin Hospitals and Clinics in Madison, Wisconsin. In 2014 Dr. Isham was elected to the National Academy of Medicine. He is the chair of the Health and Medicine Division's (HMD's) Roundtable on Health Literacy and has chaired three studies in addition to serving on a number of HMD studies related to health and quality of care. In 2003 Dr. Isham was appointed as a lifetime national associate of the National Academies of Sciences, Engineering, and Medicine (the National Academies) in recognition of his contributions to the work of HMD of the National Academies.

Paula Lantz, Ph.D., M.S., M.A., is the associate dean for research and policy engagement and a professor of public policy at the Ford School. She most recently was a professor and the chair of the Department of Health Policy and Management at the Milken Institute School of Public Health at George Washington University. From 1994 to 2011, she was a faculty member at the University of Michigan, with a primary appointment in the School of Public Health and affiliations with the Ford School and the Institute for Social Research. Dr. Lantz, a social demographer, studies the role of public health in health care reform, clinical preventive services (such as cancer screening and prenatal care), and social inequalities in health. She is particularly interested in the role of health care versus broad social policy aimed at the social determinants of health in reducing social disparities in health status. She is currently doing research regarding the potential of social impact bonds to reduce Medicaid expenditures. Dr. Lantz is a member of the National Academy of Medicine (elected in 2012) and received an M.A. in sociology from Washington University, St. Louis, and an M.S. in epidemiology and a Ph.D. in sociology from the University of Wisconsin.

Elizabeth K. Lyon oversees the technical support provided to states that are participating in the Justice Reinvestment Initiative. Since joining the Council of State Governments Justice Center in 2012, Ms. Lyon has worked with leaders across 12 states to ensure that the policies enacted achieve the projected outcomes to reduce spending on corrections and to reinvest in strategies to improve public safety. Ms. Lyon provides technical assistance tailored to the specific policies in each state. Previously, Ms. Lyon was the director of governmental relations for the State Bar of

Michigan, where she directed the public policy program, which included a large state and federal agenda. She holds a B.A. from the James Madison College at Michigan State University.

Sanne Magnan, M.D., Ph.D., is the co-chair of the Roundtable on Population Health Improvement. Dr. Magnan served as the president and chief executive officer of the Institute for Clinical Systems Improvement (ICSI) until January 4, 2016. Dr. Magnan was previously the president of ICSI when she was appointed by former Minnesota Governor Tim Pawlenty to serve as Commissioner of Health for the Minnesota Department of Health. She served in that position from 2007 to 2010 and had significant responsibility for the implementation of Minnesota's 2008 health reform legislation, including the Statewide Health Improvement Program, standardized quality reporting, the development of provider peer grouping, the certification process for health care homes, and baskets of care. She returned as ICSI's president and chief executive officer in 2011. Dr. Magnan also currently serves as a staff physician at the Tuberculosis Clinic at St. Paul–Ramsey County Department of Public Health and as a clinical assistant professor of medicine at the University of Minnesota. Her previous experience includes serving as a vice president and medical director of Consumer Health at Blue Cross and Blue Shield of Minnesota, where she was responsible for case management, disease management, and consumer engagement. Dr. Magnan holds an M.D. and a Ph.D. in medicinal chemistry from the University of Minnesota and is a board-certified internist. She earned her bachelor's degree in pharmacy from the University of North Carolina. She currently serves on the National Academies of Sciences, Engineering, and Medicine's Roundtable on Population Health Improvement; she has served on the board of Minnesota Community Measurement, and the board of NorthPoint Health and Wellness Center, a federally qualified health center which is part of Hennepin Health. She was named 1 of the 100 Influential Health Care Leaders by *Minnesota Physician* magazine in 2004, 2008, and 2012. Since 2012 she has participated in the Process Redesign Advisory Group for the National Center for Inter-Professional Practice and Education coordinated through the University of Minnesota. Recently, she became a senior fellow of the HealthPartners Institute for Education and Research. She is participating in several technical expert panels for the Centers for Medicare & Medicaid Services on population health measures (2015–2016), and is a member of the Population-Based Payment Workgroup of the Healthcare Payment Learning and Action Network (2015–2016). She is also on the Interdisciplinary Application/Translation Committee of the Interdisciplinary Association for Population Health Sciences.

Bobby Milstein, Ph.D., M.P.H., directs ReThink Health's work in dynamics, systems strategy, and sustainable financing. An expert in health system dynamics and policy, Dr. Milstein oversees the ongoing development of the ReThink Health Dynamics Model. He spent 20 years at the Centers for Disease Control and Prevention, where he founded the Syndemics Prevention Network and coordinated planning and evaluation activities for a number of public health initiatives. Bobby has a Ph.D. in public health science from Union Institute & University, an M.P.H. from Emory University, and a B.A. from the University of Michigan Honors College.

Anthony W. Orlando is a Ph.D. candidate in public policy and management at the Sol Price School of Public Policy at the University of Southern California. He is a lecturer in the College of Business and Economics at California State University, Los Angeles, an op-ed columnist for the Huffington Post, and the managing partner of the Orlando Investment Group. His latest book, *Letter to the One Percent*, was published by Lulu Press in November 2013.

Chris Parker, M.B.B.S., M.P.H., is an associate project director at the Georgia Health Policy Center. He holds a leadership role in many of the center's projects related to public health and program evaluation. His areas of expertise include strategic planning and evaluation, with a particular interest in projects that link population health and health care. Mr. Parker is a skilled facilitator who has guided a significant number of multi-sectoral, state, and local organizational strategic and evaluation plans. He is the co-principal investigator for Bridging for Health: Improving Community Health through Innovations in Financing, sponsored by the Robert Wood Johnson Foundation. He also leads the center's growing health care workforce portfolio with a focus on Georgia's primary care assets to address gaps in light of the Affordable Care Act as well as leading the center's work on community health needs assessments. As a trained family physician who has worked with underserved populations and faith-based organizations, Mr. Parker brings his clinical and community linked experiences to addressing current and longstanding public health issues.

Mary A. Pittman, Dr.P.H., is the president and chief executive officer of the Public Health Institute (PHI). A nationally recognized leader in improving community health, addressing health inequities among vulnerable people, and promoting quality of care, Dr. Pittman assumed the reins at PHI in 2008, becoming the organization's second president and chief executive officer since its founding in 1964. Her primary focus has been guiding the development of a strategic plan that builds on existing PHI program strengths to achieve greater impact on public policy and practice in public health. "In a changing environment, strategic planning is an ongoing process, not an end product," she said. Dr.Pittman's overarching goal is for PHI to become known for leadership in creating healthier communities. To this end, PHI continues to work closely with the state on many programs, including the Supplemental Nutrition Assistance Program. What's more, she advocates that all PHI projects take the social determinants of health into account in order to better address health disparities and inequities. Under Dr.Pittman's leadership, PHI has emphasized support for the Affordable Care Act and the Prevention and Public Health Fund, the integration of new technologies, and the expansion of global health programming. Other top priorities are: increasing advocacy for public policy and health reform and addressing health workforce shortages and the impacts of climate change on public health. Under Dr. Pittman, PHI has created Dialogue4Health.com, the online platform for conferencing and social networking, and has been recognized as a preferred place to work. Dr. Pittman strives for PHI's independent investigators to work together to achieve a synergy among their contributions so that the whole is greater than the sum of the individual contributions. Dr. Pittman has deep, varied, and multi-sectoral experience in local public health, research, education, and hospitals. Before joining PHI, Dr. Pittman headed the Health Research and Educational Trust, a Chicago-based affiliate of the American Hospital Association, from 1993 to 2007. Previously, she was president and chief executive officer of the California Association of Public Hospitals and a director of the San Francisco Department of Public Health. Dr. Pittman has authored numerous peer-reviewed articles in scientific journals and two books. She has served on the PHI board of directors since 1996. Dr. Pittman also serves on numerous boards and committees, including the World Health Organization's Health Worker Migration Global Policy Advisory Council and the National Patient Safety Foundation's board of governors.

Joel Rogers is the Sewell–Bascom Professor of Law, Political Science, Public Affairs, and Sociology at the University of Wisconsin–Madison, where he also directs the Center on Wisconsin Strategy, a national high-road strategy center. Mr. Rogers has written widely on American politics and democratic theory. Along with many articles, his books include *The Hidden Election*, *On Democracy*, *Right Turn*, *Metro Futures*, *Associations and Democracy*, *Works Councils*, *Working Capital*, *What Workers Want*, *Cities at Work*, and *American Society*. Mr. Rogers has also worked with and advised many politicians and social movement leaders, and founded, co-founded, and helped operate several progressive nongovernmental organizations (including the New Party, Economic Analysis Research Network, Apollo Alliance, Emerald Cities Collaborative, and State Innovation Exchange). He is a contributing editor of *The Nation* and *Boston Review*. Along with various academic honors, he is a MacArthur Foundation Fellow, and he was identified by *Newsweek* as 1 of the 100 living Americans most likely to shape U.S. politics and culture in the 21st century.

Pamela Russo, M.D., M.P.H., has been a senior program officer at the Robert Wood Johnson Foundation since 2000. The major area of her work is improving health at the community level, based on the understanding of health as the result of interactions between social, environmental, behavioral, health care, and genetic determinants. This area of programming includes developing robust collaborative partnerships across different sectors, agencies, and organizations and requires addressing the root causes underlying inequities in the determinants between different populations or neighborhoods. Her program portfolio includes transforming the governmental public health system, including national accreditation as a platform for quality improvement; health impact assessment and more routinely bringing a health lens to decisions made in other sectors; working with communities to bridge sectors, including health care, public health, social services, and others, and to identify and implement financing innovations to sustain their progress in improving the health of all in their communities; and supporting predictive modeling showing the value of community-level prevention based on the best available evidence, and making those models useful to decision makers in communities and states. Dr. Russo is a member of the National Academies of Sciences, Engineering, and Medicine's Roundtable on Population Health Improvement. Prior to joining the Foundation, Dr. Russo was an associate professor of medicine, a researcher in clinical outcomes, and a program co-director for the master's program and fellowship in clinical epidemiology and health services research at the Cornell University Medical Center in New York City. Her education includes a B.S. from Harvard College, an M.D. from the University of California, San Francisco, and an M.P.H. in epidemiology from the University of California, Berkeley, School of Public Health, followed by a residency in primary care general internal medicine at the Hospital of the University of Pennsylvania and a fellowship in clinical epidemiology and rheumatology at Cornell.

Judge Steven C. Teske, J.D., M.A., B.I.S. is the chief judge of the Juvenile Court of Clayton County, Georgia, and regularly serves as a superior court judge by designation. He was appointed a juvenile court judge in 1999. Judge Teske authored the School-Justice Partnership Model to reduce delinquency by promoting academic success using alternatives to suspensions and school-based arrests. Judge Teske has testified before Congress on four occasions and before several state legislatures on detention reform and zero-tolerance policies in schools. The governor of Georgia has appointed him to the Children and Youth Coordinating Council, the Governor's Office for Children and Families, the Department of Juvenile Justice Judicial

Advisory Council, the Juvenile Detention Alternatives Institute Statewide Steering Committee, and the Georgia Commission on Family Violence. Judge Teske was also appointed to the Georgia Criminal Justice Reform Commission and serves as chair of the Oversight and Implementation Committee (juvenile justice). He has served on the Council of State Attorneys General of the Coalition of Juvenile Justice and the Federal Advisory Committee for Juvenile Justice, which advises the President and Congress on juvenile justice issues. He chairs the Southern Region of the Coalition of Juvenile Justice. He is a member of the National Council of Juvenile and Family Court Judges and has served on the Board of Directors. He currently chairs the School Pathways Steering Committee and is vice-chair of the Juvenile Justice Advisory Committee. He is a past president of the Georgia Council of Juvenile Court Judges and the Clayton County Bar Association. He has written several articles on juvenile justice reform published in the *Juvenile and Family Law Journal*, *Journal of Child and Adolescent Psychiatric Nursing*, *Juvenile Justice and Family Today*, *Family Court Review*, and the *Georgia Bar Journal*. His book, *Reform Juvenile Justice Now*, is a collection of essays on juvenile justice issues. He is a Toll Fellow of the Council of State Governments and received his J.D., M.A., and B.I.S. degrees from Georgia State University in Atlanta.