



Advancing the Science to Improve Population Health: Proceedings of a Workshop

DETAILS

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Advancing the Science to Improve Population Health

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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This Proceedings of a Workshop has been reviewed in draft form by individuals chosen for their diverse perspectives and technical expertise. The purpose of this independent review is to provide candid and critical comments that will assist the institution in making its published Proceedings of a Workshop as sound as possible and to ensure that the Proceedings of a Workshop meets institutional standards for objectivity, evidence, and responsiveness to the study charge. The review comments and draft manuscript remain confidential to protect the integrity of the process. We wish to thank the following individuals for their review of this Proceedings of a Workshop:

Ellen Beckjord, UPMC Health Plan

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Bobby Milstein, ReThink Health

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Although the reviewers listed above have provided many constructive comments and suggestions, they did not see the final draft of the Proceedings of a Workshop before its release. The review of this Proceedings of a Workshop was overseen by **Bruce N. Calonge**, The Colorado Trust. He was responsible for making certain that an independent examination of this Proceedings of a Workshop was carried out in accordance with institutional procedures and that all review comments were carefully considered. Responsibility for the final content of this Proceedings of a Workshop rests entirely with the rapporteur and the institution.

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Acronyms and Abbreviations

ACA	Affordable Care Act
ASPE	Office of the Assistant Secretary for Planning and Evaluation
BIC	Broader Impacts Criterion
CBO	Congressional Budget Office
CDC	Centers for Disease Control and Prevention
CHIP	Children’s Health Insurance Program
FDA	U.S. Food and Drug Administration
HHS	U.S. Department of Health and Human Services
HIA	health impact assessment
HUD	U.S. Department of Housing and Urban Development
ICER	Institute for Clinical and Economic Review
IOM	Institute of Medicine
MTO	Moving to Opportunity
NACCHO	National Association of County and City Health Officials
NSF	National Science Foundation
PAF	population attributable fraction
PCORI	Patient-Centered Outcomes Research Institute
WMD	weapon of mass destruction

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Introduction¹

On September 30, 2015, of the National Academies of Sciences, Engineering, and Medicine Roundtable on Population Health Improvement hosted a workshop to explore the basic and translational research needs for population health science, and to discuss specific research priorities and actions to foster population health improvement. The vision of the roundtable is for a strong, healthful, and productive society that cultivates human capital and equal opportunity, said George Isham, senior advisor at HealthPartners and co-chair of the roundtable, in his introductory remarks. This vision rests on the recognition that outcomes such as improved life expectancy, good quality of life, and health for all are shaped by interdependent social, economic, environmental, genetic, behavioral, and health care factors. As such, population health science is not a single discipline but an interdisciplinary field involving cross-sector collaborations to address complex population health problems with multifactorial interventions (Bachrach et al., 2015). As discussed by Adler and colleagues, “The growing field of population health research can contribute to the movement for population health action,” and “A population health movement will be most effective if it integrates both research and action, and finds new ways to ensure that each informs the other (Adler et al., 2013, p. 1).

WORKSHOP OBJECTIVES

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. The workshop agenda was developed by an independent planning committee chaired by Paula Lantz, professor and associate dean for Research and Policy Engagement at the Gerald R. Ford School of Public Policy, University of Michigan, and included Lila Finney Rutten, Michelle Frisco, Robert Kaplan, Phyllis Meadows, Bobby Milstein, Kathleen Mullan Harris, and Lisa Simpson (see Box 1-1). Lantz explained that the workshop was designed to

¹ The planning committee’s role was limited to planning the workshop, and the workshop proceedings has been prepared by the rapporteur as a factual account 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. They should not be construed as reflecting any group consensus.

- provide frameworks for understanding population health research and its role in shaping and having an effect on population health;
- identify individual and institutional facilitators and challenges regarding the production, communication, and use of research for population health improvement; and
- identify key areas for future research critical to the advancement of population health improvement.

BOX 1-1

Planning Committee Statement of Task

An ad hoc committee will plan and convene a workshop examining the state of, and the opportunities and challenges facing, population health science—the multiple disciplines and the research networks that inform efforts to improve the public's health.

The planning committee will develop the agenda and identify meeting objectives, select appropriate speakers, and moderate the discussions. The workshop may highlight and explore such topics as basic and translational research needs, the interdisciplinary nature of population health science, and the range of resources needed to support a robust population health research enterprise commensurate with the health sector's growing recognition that creating health happens in spaces beyond those occupied by clinical care and requires cross-sectoral solutions. 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 AND PROCEEDINGS

This Proceedings of a Workshop summarizes the presentations and discussions that took place at the workshop, Advancing the Science to Improve Population Health. The workshop began with a keynote presentation on an ecosocial approach to framing health equity (Chapter 2), followed by a background presentation on research designs and frameworks for population health improvement (Chapter 2). The first panel discussion focused on population health research in practice (Chapter 3). In preparation for the workshop, the planning committee conducted a brief survey of population health research needs and priorities, the results of which were presented (summarized in Chapter 4 with more detailed results provided in Appendix B). In the second panel discussion, speakers representing local health departments, consumers, the federal government, and the private sector provided their perspectives on research priorities (Chapter 5). After the presentations, participants broke into five small groups for facilitated discussions on a research agenda for population health. Participants were asked to identify several top research priorities based on their own experiences and what they heard over the course of the workshop discussions. Attendees then reconvened in plenary session, and the group facilitators reported on their groups' discussions (Chapter 6).

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Setting the Context

This chapter summarizes the presentations of Nancy Krieger and Paula Lantz, which outlined some key concepts and issues important to moving population health science forward.

EMBODIED HISTORY, STRUCTURED CHANCE, AND FLEXIBLE PHENOTYPE AS CONTRIBUTORS TO HEALTH¹

In her presentation, Nancy Krieger of Harvard University described how despite repeated robust refutations, for over a century numerous scientists and scientific reports have attempted to make causes of disease add up to 100 percent, for example, X percent due to “genes” and $(100-X)$ percent due to “environment” (or “chance”). However, Krieger stated, it is well known that interactions between causes means that population attributable fractions (PAF) necessarily must add up to more than 100 percent. Challenging deep-rooted beliefs that underlie persistent erroneous efforts to force causes of population health to add up to 100 percent, Krieger drew on the ecosocial theory of disease distribution, which takes into account both embodied history and structured chance when analyzing population attributable risk. Embodiment refers to how people literally embody, biologically, their societal and ecological conditions, thereby creating population patterns of health, disease and health inequities. Structured chance helps clarify how and why population parameters and individual risk are necessarily linked. Observed socially structured patterns of health inequities cannot be explained by either chance or population genetic structure. These health inequities are, in principle, preventable. Krieger stated that recognizing that causes must necessarily add to more than 100 percent can aid in framing and motivating the many different pathways and levels for historically grounded, multilevel cross-sectoral action to promote equity, improve population health, and rectify health inequities.

¹ This section is based on the presentation by Nancy Krieger professor of social epidemiology, Department of Social and Behavioral Sciences, Harvard T.H. Chan School of Public Health, director, Harvard School of Public Health Interdisciplinary Concentration on Women, Gender, and Health, and the statements are not endorsed or verified by the National Academies of Sciences, Engineering, and Medicine. Krieger’s presentation “Embodied history + structured chance + flexible phenotype = \sum ‘causes’ always $>100\%$ ” presented material that will be part of a future publication, thus, a speaker-prepared synopsis is provided in lieu of a more detailed summary of the speaker’s remarks, along with an extensive bibliography to which the speaker referred in her remarks, which is found in Appendix C.

RESEARCH DESIGNS AND FRAMEWORKS FOR POPULATION HEALTH IMPROVEMENT

To inform the discussions about research agendas for population health improvement, Paula Lantz, of the University of Michigan, provided a brief background on research designs, highlighted some of the current debates in the field of population health science, and offered a framework for identifying population health research priorities and actions (highlights are presented in Box 2-1).

BOX 2-1 Highlights and Main Points Made by Lantz²

- Setting a research agenda for population health involves understanding disciplinary strengths and differences, and embarking on interdisciplinary research that creates new approaches and insights.
- There is a need for both new research and better dissemination and use of the large volume of existing research.
- Priority areas for population health research would be those for which there is both not enough evidence or consensus and a lack of evidence-based action on policy and practice (see Figure 2-1).

²This list is the rapporteur's summary of the main points made by Paula Lantz, Associate Dean for Research and Policy Engagement, Professor of Public Policy, University of Michigan, and the statements are not endorsed or verified by the National Academies of Sciences, Engineering, and Medicine.

RESEARCH QUESTIONS, DESIGNS, AND METHODS

Research questions drive everything, Lantz began, and different disciplines think about research questions in different ways. She described three major types of research questions, and offered examples from the field of public health.

- Exploratory questions describe initial hypotheses on a new topic or idea, such as “How might more stable housing improve quality of life?”
- Descriptive questions develop a deeper understanding and define trends and patterns, such as “What are adolescents’ most trusted sources of health information? What are historical trends and patterns in prescription drug abuse?”
- Explanatory questions seek to establish causal relationships, as in “How does chronic social stress increase cardiovascular disease risk? Will a tax on sugar-sweetened beverages reduce obesity?”

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Once the research questions are defined, research design is the architecture of the plan for answering those questions. Basic components of a research design are the following:

- Purpose—To explore, describe, or explain
- Topic
- Unit of analysis, such as individual or micro level, organizational or mezzo level, and population or macro level
- Time dimension—cross-sectional or longitudinal
- Comparisons over time or across groups

Strong research designs are essential for explanatory research. The randomized controlled trial is the gold standard experimental design for studying causal relationships, Lantz said. In population health and policy research, where randomization to different situations is generally not possible, natural experiments (e.g., time-series designs) and quasi-experimental designs are used. Explanatory research designs also include economic analyses of the cost-benefit or cost-effectiveness of different interventions.

Within the context of research design, research methods are the specific ways in which data will be obtained and analyzed to answer the stated research questions, Lantz said. Design and methods are both important, she emphasized. A well-designed trial that does not produce quality data is of no value, as is data collected from a poorly designed study. Data can be primary data, newly collected directly by researchers, or secondary data from surveys, administrative systems, the U.S. Census, or other existing data sources. Data analysis to answer the research question includes statistical procedures and qualitative analyses, and can be highly specialized.

CURRENT DEBATES AND CHALLENGES

Debates about definitions in population health persist, Lantz said, starting with defining what is meant by the terms *population*, *health*, and *population health*. There are also debates surrounding the definitions of *community*, *socioeconomic status* or *position*, and *race*. Lantz noted that race has been defined differently over time and across cultures and societies. Another debate revolves around quantitative versus qualitative methods, although Lantz noted a growing recognition of the value of qualitative data and mixed methods. Concerns remain, however, about attempts to use qualitative research to make causal arguments.

Disciplinary differences also come into play. Population health requires that a wide range of disciplines work together and learn from each other, Lantz said. Different disciplines bring different theoretical perspectives, conceptual frameworks, and methods to population health science, to develop new understandings, theories, and methods. Lantz described a recent exchange on Twitter that highlighted critiques of social epidemiology, echoing those she had previously heard from economists working on housing, transportation, and other social determinants of health. Frequent critiques include that epidemiology has weak study designs, and that bad epidemiologic studies are widely disseminated in the popular press, often driven by public relations offices of journals and universities that may overstate the findings of studies. Exchanges such as the one she experienced on Twitter reveal some of the issues with media coverage and the translation of research findings to the public, Lantz said, but they may also reflect some of the disciplinary differences in research design and methods, and legitimate concerns about the evidence required to establish a causal relationship.

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IDENTIFYING RESEARCH NEEDS VERSUS DISSEMINATION NEEDS

Setting a research agenda for population health involves understanding disciplinary strengths and differences, and embarking on interdisciplinary research that creates new approaches and insights. In particular, Lantz highlighted the need for new exploratory research, a better understanding of population health phenomena, and better evidence regarding which policies and interventions work and which do not. In addition to new research, Lantz emphasized the need for better dissemination and use of the large volume of existing research. She noted the need for both improved translation and dissemination of research, and research about translational science (i.e., how to best translate and disseminate findings for action).

In preparation for the small group discussions of priorities for a population health research agenda, Lantz offered a framework for considering where more evidence is needed, and where the evidence already exists but better dissemination and more action are needed (Figure 2-1). She called upon participants to consider research priorities relative to the current state of evidence and consensus around that evidence, as well as the current state of evidence-based action (e.g., implementation by decision makers and stakeholders) on the issue.

Lantz provided examples of where she would rank some of the current population health issues in her sample framework, acknowledging that there could be debate about each. She suggested, for example, that there is strong evidence on the public health effects of climate change and gun violence, but weak action, including policy interventions, as these are highly politicized issues. As another example, Lantz placed the Drug Abuse Resistance Education (DARE) program in this box, as the evidence and consensus are strong that the program does not work, yet action responding to that evidence has been weak and the program persists in 75 percent of elementary schools. Using this approach, Lantz said that priority areas for population health research would be those for which there is not enough evidence and for which evidence-based action on policy and practice is lacking (i.e., the bottom-right cell in Table 2-1).

TABLE 2-1 A Framework for Identifying Priorities for Population Health Research.

State of Evidence and Consensus	State of Evidence-Based Action		
	Strong	Medium	Weak
Strong	Fluoride in H ₂ O Seat belts Tobacco taxation	Needle exchange Child vaccinations	Climate change Gun violence D.A.R.E.
Medium	Environmental tobacco smoke	Menu labeling Supportive housing	Early childhood trauma and health LARC education
Weak	--	Super-utilizer interventions	Priority for research

NOTE: LARC = Long-term reversible contraception.

SOURCE: Lantz presentation, September 30, 2015.

Research in Practice: Opportunities and Challenges

The first panel discussion of the workshop focused on population health research in practice. Maya Brennan, vice president for housing at the Urban Land Institute Terwilliger Center for Housing, shared several case examples of where putting research into practice resulted in policy change, promising dialogue, or unintentional outcomes. David Holtgrave, professor and chair of the Department of Health, Behavior, and Society at Johns Hopkins Bloomberg School of Public Health, examined the role of population health research in the development of policies that contributed to the decline in deaths caused by AIDS in the United States. Brendan Nyhan, assistant professor in the Department of Government at Dartmouth College, highlighted the importance of effective communication in informing health policy action on controversial issues. Lisa Simpson, President and CEO of AcademyHealth, discussed motivating and incentivizing researchers to focus not just on knowledge generation but also on knowledge transfer. Main points from the session are summarized in Box 3-1.

BOX 3-1

Highlights and Main Points Made by Individual Speakers and Participants^a

- Research demonstrating potential cost savings can influence policy makers. (Brennan)
- Successful demonstration projects can influence the policy debate, but there can be barriers, including public opposition, to implementing such projects. (Brennan)
- Not framing a research question correctly, or framing it from a mistaken standpoint, can potentially harm policy outcomes. (Brennan)
- Research is needed on how to communicate most effectively about controversial issues. People are naturally skeptical of information that contradicts their existing beliefs and attitudes; simply providing more data is generally ineffective in changing their minds and may actually reinforce belief in false information. (Nyhan)
Knowledge transfer activities are not incentivized or rewarded in traditional academic settings in the United States. Other countries are further ahead in evaluating research effect and aligning allocation of funding. The increasing focus in the United States on health care organizations serving the public good and engaging the community provides an opportunity to improve the translation of knowledge to practice. (Simpson)

- Retrospective research can carefully examine large-scale observed changes in population health (such as temporal changes in human immunodeficiency virus (HIV) incidence and deaths in the United States) so as to help disentangle the possible causes of these population health shifts. (Holtgrave)

^a This list is the rapporteur's summary of the main points made by individual speakers and participants (noted in parentheses), and the statements are not endorsed or verified by the National Academies of Sciences, Engineering, and Medicine.

POPULATION HEALTH AND HOUSING¹

The website How Housing Matters is focused on collating the existing research on the importance of housing for health, education, and economic well-being, and on disseminating this information to foster evidence-based action to promote quality, affordable, housing.² Where a person lives matters for their health opportunities and for many of the drivers of health, Brennan said. Housing affordability is the core issue. People who cannot find affordable housing that is the right size for their family and near enough to their work are often unable to pay for necessities such as food and medication. Housing affordability affects stress, stability (e.g., eviction, relocation), and quality of the home (e.g., lead paint, pest infestations). Housing affordability also influences the character of a neighborhood, and many families in the United States find it impossible to afford a home in a low-crime, high-opportunity neighborhood. Housing is a portal to opportunity, Brennan said, and she shared three examples of putting research into practice with varying outcomes.

Best-Case Scenario: When Evidence Improves Policy

An influential 2002 report by Culhane and colleagues found that the costs of service provision by a variety of public agencies in New York State were reduced when homeless persons were placed into supportive housing, and that the savings from reduced use of public services fully covered the cost of the housing (Culhane et al., 2002). These findings led to major changes in the thinking about ending chronic homelessness, Brennan said, and spurred further research on a “housing first” approach. This approach does not mandate that a homeless person be on medication, or off drugs or alcohol, to receive housing; housing is provided as the base through which they can then access other services that allow them to thrive. The research on ending homelessness was popularized by Gladwell in an article in *The New Yorker* (Gladwell, 2006). The article told the tale of Murray, a homeless New Yorker who cost the city \$1 million as a result of his many hospital admissions and use of other services.

This research has been very influential in changing policy and outcomes, Brennan said, in part because the cost-saving aspect attracts the attention of policy makers, and in part because of the coverage in the popular press. Federal and local efforts to end homelessness have led to a 21

¹ This section is based on the presentation by Maya Brennan, Vice President for Housing, Urban Land Institute Terwilliger Center for Housing, and the statements are not endorsed or verified by the National Academies of Sciences, Engineering, and Medicine.

² How Housing Matters is operated by the Urban Land Institute Terwilliger Center for Housing, with funding from the MacArthur Foundation. See <http://howhousingmatters.org> (accessed November 30, 2015).

percent reduction in the number of chronically homeless in the United States between 2010 and 2014, and a 33 percent reduction in the number of chronically homeless veterans over the same period, she said.

Promising Results: When Evidence Affects the Dialogue

An extensive body of research has established the connection between living in high-poverty neighborhoods and poor health outcomes, including preterm births, heart disease, obesity, mental illness, and other conditions. The Moving to Opportunity (MTO) demonstration project in the 1990s provided a cohort of public housing residents in five different cities with vouchers to relocate to more affluent neighborhoods. Brennan noted that MTO followed a similar effort that was the result of a racial discrimination suit against the city of Chicago. In the legal settlement of the Gautreaux case, families living in public housing were given specific vouchers to be able to move from a primarily minority area to a primarily white area. The difference for MTO, Brennan pointed out, was that it was focused on moving to more affluent neighborhoods rather than to more white or integrated neighborhoods.³

Health and other outcomes of those moving to an opportunity neighborhood (i.e., a low-poverty neighborhood) were tracked. After 10 to 15 years, there was an estimated 34 percent reduction in new cases of diabetes in the families that had moved, which Brennan noted was comparable to the reductions seen in medical interventions designed to treat diabetes. Families that moved were also less likely to have severe obesity, physical limitations, or psychological distress.

Although the health benefits of leaving concentrated poverty continue to influence policy, Brennan noted that there are barriers to implementation. One challenge is “not in my backyard” syndrome or “NIMBYism.” Current residents stated they did not want “those people coming here”; therefore, the MTO ended after the initial demonstration period and never became a full program. Another challenge was a backlash from the communities of color because relocation raises concerns about urban renewal, which often means homes and communities torn apart and devalued. Although these two negative forces could in the end limit the potential of the MTO study to effect change, the study has substantially influenced the policy debate about relocation and revitalization, Brennan said.

Unintentional Harm: The Importance of Framing the Research Questions Correctly

As a cautionary tale, Brennan described a 2012 health impact assessment (HIA) of the U.S. Department of Housing and Urban Development (HUD) Rental Assistance Demonstration, a pilot program to convert public housing to privately owned, affordable housing. There is a \$25.6 million backlog of repairs needed for public housing. Families are living in terrible conditions in housing that the federal government is paying for but that it is not paying to adequately repair, she said. The HIA analyzed the Rental Assistance Demonstration as if it were a relocation program instead of a quality improvement/housing rehabilitation program, despite the fact that families would have been able to stay there. Newspaper articles suggested that the program would privatize public housing in a way that would create instability. As a result, HUD

³ For a discussion of the so-called Gautreaux One vs. Gautreaux Two/Moving to Opportunity program, see Duncan, G. J., and A. Zuberi. 2006. Mobility lessons from Gautreaux and moving to opportunity. *Northwestern Journal of Law & Social Policy* 1(1):110-126., <http://scholarlycommons.law.northwestern.edu/njls/vol1/iss1/5> (accessed May 9, 2016).

finds itself constantly having to reinforce what this program is actually about. Brennan concluded that this is an example of how not framing the research question correctly, and framing it from a mistaken standpoint, can potentially harm policy outcomes.

PREVENTING HIV TRANSMISSION: A BRIEF HISTORY⁴

Holtgrave reflected on how research contributed to reducing the incidence of HIV in the United States. The first U.S. cases of HIV infection began to emerge in the late 1970s, peaking at about 130,000 new infections per year in the mid-1980s, and then leveling off to about 50,000 new infections each year by the early 1990s (Hall et al., 2008). The most recent data from the Centers for Disease Control and Prevention (CDC) estimated that incidence was still roughly at 50,000 new cases per year for 2007 through 2010 (CDC, 2012). Another way of looking at the spread of HIV is transmission rate, which Holtgrave explained as the incidence to prevalence ratio. The transmission rate was very high early in the epidemic, but it has remained very low since the early 1990s (Holtgrave et al., 2009).

With the advent of new treatments in 1995 and 1996, the annual death rate from AIDS was less than expected (based on incidence). Holtgrave suggested that this decline in AIDS deaths was caused by the combination of past prevention efforts and new treatments (Holtgrave, 2005). In the mid- to late 1980s and early 1990s, a variety of prevention tools were available:

- New information about modes of transmission
- Social activism as a direct result of the tremendous health disparities
- Information campaigns
- Behavioral interventions, such as promoting condom use
- HIV testing coupled with risk-reduction counseling
- Syringe exchange
- Housing
- Food security and social support
- Behavioral factors in care

Holtgrave highlighted some of the population health research that might have led to this decline in deaths from AIDS. Early in the epidemic, it was not clear how HIV was transmitted, and behavioral epidemiology research helped to elucidate that one major mode of transmission was sexual contact (Auerbach et al., 1984). This research defined the initial U.S. response to HIV. He added that the CDC website lists 84 evidence-based risk-reduction behavioral interventions for HIV prevention.⁵ Behavioral intervention trials were undertaken in the late 1980s and early 1990s, and in the early 1990s CDC instituted HIV prevention community planning (Holtgrave et al., 1996). Each jurisdiction in the United States was tasked with devising an HIV prevention plan built directly upon the evidence-based literature. This was a very direct link between science and local priority setting, Holtgrave said.

⁴ This section is based on the presentation by David Holtgrave, Professor and Chair of the Department of Health, Behavior and Society, Johns Hopkins Bloomberg School of Public Health, and the statements are not endorsed or verified by the National Academies of Sciences, Engineering, and Medicine.

⁵ See <http://www.cdc.gov/hiv/prevention/research/compendium/rr/complete.html> (accessed August 8, 2016).

The first licensed HIV antibody test became available in 1985, and the first confirmatory western blot test was available in 1987. Also in 1987, CDC released its first counseling and testing guidelines for the field (CDC, 1987). There is a large and complex literature on the effects of counseling and testing, Holtgrave said. He shared one example, a clinical study of behavior change and sexually transmitted disease incidence among HIV seronegative individuals as a function of receiving counseling and testing, which found that counseling did have an effect on reducing risky behavior and sexually transmitted infection incidence (Kamb et al., 1998). Another way to look at the effects of counseling and testing is to assess the transmission rate at the population level. Holtgrave studied transmission rates for persons who were unaware of, and aware of, their HIV infection. Among those who were aware, transmission rates were broken down according to viral load (suppressed or unsuppressed) and risk behaviors with a serodiscordant partner (Hall et al., 2013).

The final example described by Holtgrave was needle exchange, which began in the United States in the late 1980s. The federal government stopped funding needle exchange programs in the late 1990s, despite their proven effectiveness in preventing HIV transmission and no evidence they lead to increased drug use.⁶ However, there are ongoing state, local, and privately funded needle exchange programs (CDC, 2010). Holtgrave shared a slide juxtaposing graphs of HIV incidence in New York between 1990 and 2002 alongside the mean number of needles distributed during the same time, showing an inversely proportional relationship.

Currently, only about 30 percent of the 1.2 million people in the United States living with HIV have suppressed virus. There are major gaps in care, Holtgrave said, and addressing this gap is the focus of the new U.S. National HIV/AIDS Strategy⁷ through 2020, which was released in July 2015.⁸ Based on lessons learned and new knowledge from research, the strategy details actions focused on key populations, geographic areas, and treatment and prevention practices. The target outcomes for 2020 include many important population health research opportunities, Holtgrave concluded.

WHY FACTS DO NOT ALWAYS CHANGE PEOPLE'S MINDS⁹

People frequently believe things that are not true, Nyhan said, and it can be very difficult to change their minds, especially about controversial issues. Widespread misinformation is often accepted as fact despite clear and overwhelming evidence to the contrary. As examples, Nyhan mentioned the Affordable Care Act (ACA) myth of “death panels” and false claims that vaccines are poisoning children. Further research is needed into why this happens and how best to deal with it, Nyhan said.

The instinct of most scientists is that people who are misinformed lack the correct information and if they are provided with that information, they will update their beliefs and attitudes, Nyhan said. This is sometimes called the deficit model of science communication.

⁶ See, for example, Nguyen et al., 2014.

⁷ The three goals of the strategy are (1) reducing HIV incidence; (2) increasing access to care and optimizing health outcomes; and (3) reducing HIV-related health disparities (see <https://www.whitehouse.gov/administration/eop/onap/nhas> for more information) (accessed May 9, 2016).

⁸ See <https://www.aids.gov/2020> (accessed August 8, 2016).

⁹ This section is based on the presentation by Brendan Nyhan, Assistant Professor, Department of Government, Dartmouth College, and the statements are not endorsed or verified by the National Academies of Sciences, Engineering, and Medicine.

Unfortunately, just supplying accurate information often does not solve the problem. People often resist factual information about issues that are controversial or implicate aspects of their identity, Nyhan explained. This reaction is an example of what psychologists call disconfirmation bias, our fundamental tendency as humans to be unduly skeptical of information that contradicts our existing beliefs and attitudes.

Nyhan shared examples of how some of the efforts undertaken to try to correct widespread myths may be ineffective or even counterproductive. One well-known example from the field of political science was the supposed threat of weapons of mass destruction (WMDs) from Iraq before the U.S. invasion. Following testimony by then-Secretary of State Colin Powell before the United Nations that Iraq had WMDs, a U.S. government report ultimately found no WMDs or active WMD programs. Nonetheless, the misperception that Iraq had WMDs persisted for years after the Iraq war despite massive overwhelming evidence to the contrary that was very widely circulated. Nyhan and his coauthor Jason Reifler investigated what might have happened if the media had been more aggressive in fact-checking claims that were still being made after the war suggesting Iraq had WMDs at the time of the U.S. invasion (Nyhan and Reifler, 2010). They experimentally manipulated an article to provide corrective information (i.e., that in fact the official report of the U.S. government said there were no WMDs or WMD programs). Relative to a controlled condition where people did not see the corrective information, belief in the misperception went down among liberals presented with the experimental article. Nyhan noted that liberals were less likely to believe this myth in the first place. Among conservatives, who were more likely to believe the myth to begin with, the opposite reaction occurred. Their belief in the myth approximately doubled when they were provided with the corrective information (Nyhan and Reifler, 2010). Nyhan dubbed this the “backfire effect,” which he said is driven by disconfirmation bias. He noted that similar results were found when he studied beliefs about death panels in the ACA (Nyhan et al., 2011).

There are similar concerns about misinformation in health. For example, an infamous 1998 *Lancet* article by Wakefield et al. (1998) falsely alleged a link between the measles, mumps, and rubella (MMR) vaccine and autism. The article was subsequently retracted by the *Lancet* in 2010 and the lead author discredited and stripped of his medical license, but this myth persists to this day in the debate over vaccines. More than half of parents in the United States say they are worried about serious adverse effects of vaccines, and one-quarter of parents agree or strongly agree that some vaccines cause autism in healthy children (Freed et al., 2010). The question, Nyhan said, is what can be done about such widespread misinformation—is corrective information the right way to promote vaccines? Again, our instinct is to provide parents who are hesitant about vaccines with evidence that vaccines do not cause autism, he said, but this approach has not been experimentally validated. CDC, for instance, has taken this approach and provides information refuting vaccine myths on its website, including studies debunking the vaccine autism myth.¹⁰

To investigate the efficacy of this approach, Nyhan and his co-authors studied the effects of correcting autism myths in a nationally representative survey of parents with children under age 18 (Nyhan et al., 2014). Although the corrective information resulted in fewer parents expressing agreement with the myth that vaccines cause autism, parents who received it were also less likely to say they would vaccinate a future child relative to a control group. This effect was concentrated among the parents who had the least favorable attitudes toward vaccines, which Nyhan said suggests it was the result of counterarguing caused by disconfirmation bias.

¹⁰ See <http://www.cdc.gov/vaccinesafety/concerns/autism.html> (accessed August 8, 2016).

Parents may accept that vaccines do not cause autism, but they bring to mind other concerns that make them less likely to intend to vaccinate their children.

In conclusion, Nyhan said that research is needed on how to communicate most effectively about controversial issues that inform practice and health policy. The myth-busting approach may be appealing and intuitive, but it runs the risk of entrenching these beliefs more deeply or generating counterproductive responses. It may be more effective, he suggested, to use sources perceived as credible by people to address their concerns. Someone who has a personal relationship of trust may also be a more effective advocate. For vaccines, parents overwhelmingly respond that their child's doctor is their most trusted source of information, not government agencies or scientists (Freed et al., 2011). Similarly, experts who oppose the ACA would likely be perceived as more credible in saying there are no death panels than experts who support it. It is important to consider who might be the most effective advocate in communicating controversial information as well as the messages being delivered. Simply providing science and facts is rarely an effective approach.

TRANSLATING POPULATION HEALTH RESEARCH INTO POLICY AND PRACTICE¹¹

In population health research, as with many other fields, researchers are trained to produce peer-reviewed publications, secure research grants, make conference presentations, and teach, and there are clear incentives—financial and professional—that drive researchers to pursue those activities, Simpson began. Although behavioral economics is often discussed as an approach to get patients or providers to change behaviors and advance health, Simpson suggested that it could also be applied to modifying the behaviors of researchers. Academic institutions are entrenched in tradition and difficult to change, but she suggested that a new paradigm of scholarship is emerging, one that is interdisciplinary, includes nonacademic partners in problem identification, and includes a focus on knowledge transfer (Phaneuf et al., 2007).

AcademyHealth is the professional society for health services research, and population health has been a focus of the association, Simpson noted. She referred participants to a 2010 study by AcademyHealth that highlighted the challenges of translating research findings into policy and practice and discussed the role of academic incentives in applied health services research and knowledge transfer (Pittman et al., 2010). Although the situation is better now than it was 5 years ago, she said, there are many pressures on the academic sector. Increasingly, there is recognition of the need for academic medical centers to focus on the population health of the surrounding community (Gourevitch, 2014; Szilagyi et al., 2014). There are increasing demands on academic medical centers to serve the public good and be accountable for contributing to community and population health (e.g., the requirement for tax-exempt 501(c)(3) institutions to demonstrate community benefit). Federal initiatives, such as clinical translational science awards, also emphasize community engagement. Under the ACA, accountable care organizations are also measured and rewarded based on contributions to population health. Overall this shift is an opportunity for the country to do a much better job on knowledge translation, she said.

One dimension of knowledge translation is research impact assessment, in other words, what difference did the research make? There is a growing interest by public and private funders

¹¹ This section is based on the presentation by Lisa Simpson, President and CEO, AcademyHealth, and the statements are not endorsed or verified by the National Academies of Sciences, Engineering, and Medicine.

in research impact assessment, so that the limited funding available for research can be put to the best use and provide the most societal benefits (Holbrook and Frideman, 2011). Traditional tools to evaluate research impact include bibliometrics (e.g., how often is the work cited, downloaded?), case studies, economic cost–benefit analyses, and peer review/assessment by scientific panels of the impact of the science from a particular department (Jones and Grant, 2013). Another approach is the “payback framework,” a multidimensional, model for paybacks from research, including contributions to knowledge, benefits to future research and research use, benefits from informing policy development, health and health-sector benefits, and broader economic benefits (Donovan and Hanney, 2011).

Funders are also developing assessment approaches. The Research Excellence Framework is a new peer-assessment system for evaluating the quality of research in UK higher education institutions.¹² The Research Excellence Framework defines impact as “any effect on, change, or benefit to the economy, society, culture, public policy or services, health, the environment, or quality of life, beyond academia,” Simpson said. The outcome of this assessment is used for funding allocation, accountability, and benchmarking. There is a very direct link between demonstrating impact and the level of research funding academic institutions receive, she explained. The assessment is based on the quality of the research outputs (65 percent), the impact of the research beyond academia (20 percent), and the research environment (15 percent).

In the United States, merit review of proposals by the National Science Foundation (NSF) includes intellectual merit (e.g., importance, innovation), and broader impacts (e.g., societal impacts). The NSF uses the Broader Impacts Criterion (BIC). The BIC outcomes considered during evaluation of proposals are

- teaching and education;
- broadening participation of underrepresented groups;
- enhancing infrastructure;
- public dissemination;
- other benefits to society;
- improved national security;
- increased economic competitiveness; and
- increased partnerships between academia, industry, and others.

No metric is perfect, Simpson said, and effective assessment of research impact involves both quantitative and qualitative strategies. These can be labor intensive and cost prohibitive, she noted. In general, while Australia, Canada, the United Kingdom have made significant strides in evaluating research impact and using the results as part of future research funding allocations, the United States lags behind, Simpson said. To date, demonstration of measurable population or community impact from prior research is not a criterion for future research funding at the National Institutes of Health or other U.S. governmental agencies. In addition, knowledge transfer activities are still not rewarded in traditional academic incentives in the United States, including the promotion and tenure processes of most academic institutions. Demonstrating impact may be particularly challenging for population health research, given the time lag to realize population health outcomes. There is an opportunity for population health researchers to

¹² See <http://www.ref.ac.uk> (accessed August 8, 2016).

consider the impact of their work in new ways that will resonate with funders and the public, she concluded.

DISCUSSION

During the open discussion that followed the panel presentation, participants expanded on the topics of incentives and approaches to drive translation of research findings, the value of partnerships, the influence of social media as a communication channel, and additional issues around assessing the impact of research.

Driving Translation

Lantz raised a concern that incentives for impactful work might drive researchers toward the “low-hanging fruit” or the easy wins that demonstrate impact, and dissuade researchers from studying some of the more complex issues in public health. Simpson agreed and suggested looking to other countries (e.g., the UK Research Excellence Framework) for lessons learned and unintended consequences. Brennan reported from anonymous conversations with grantees that, while they may be required to demonstrate some policy relevance of their research, many of them still say their focus is to look for the truth, not to change anything. Incentives are needed to ensure that there is a research base as part of the change process.

It was pointed out that one of the recommendations in the IOM report on clinical translational science awards was to engage the community across the research spectrum (IOM, 2013). While there is a focus on proving that research has an impact on community health in the end, it is much more difficult as one move backs in the spectrum, the participant said. Simpson said there is an opportunity to learn from each other, but information sharing has been difficult, and lack of knowledge about the progress being made is slowing replication and additional learning.

A consultant with AcademyHealth observed that there is an assumption that simply doing a demonstration project will lead others to implement the knowledge, or that placing an innovation in an innovations exchange will lead to others picking it up. She suggested that there needs to be more explicit thought about how dissemination and translation could happen, and funding for the translation. Holtgrave added that there should be investment in research on how best to translate findings.

A participant pointed out that during the early days of the HIV epidemic, learning and doing were co-occurring, applying research findings with a focus on reducing deaths. She suggested that a learning-and-doing strategy is essential for population health, but noted the risks of moving ahead with an approach that may not work and could, as discussed, add to the myths as a result of asking the wrong question. Holtgrave agreed and noted that the updated strategy for HIV is more focused on explicit metrics, which is helpful for managing both process and outcomes (e.g., whether approaches are making a difference in meeting diagnoses goals, access to treatment goals). If an approach is not working, different approaches should be tried. Simpson emphasized the importance of deimplementation, that is, how to stop doing things that are not working. This can be very challenging in the policy context, she noted, because once a policy is passed it can be very difficult to reverse it. Brennan agreed and added that the challenges of deimplementation hold doubly true in the context of housing—affecting both one’s actual home and one’s neighborhood.

The Role of Partnerships

A participant who was a former state public health official said that researchers often sought letters of support for their funding proposals, but there was no collaboration and, after the grants were awarded, no tieback to state health department efforts on the same topics. She suggested there could be much greater impact if researchers engaged with state and local public health officials. Simpson agreed and noted that it is not the culture of research to develop questions with the end user, although that is starting to change with the push toward community-based participatory research. She repeated that until that type of research is rewarded (e.g., promotion, tenure, funding), it will continue to be very limited. Holtgrave echoed the importance of research in partnership with public health agencies. He observed that in the social sciences, these partnerships are becoming more valued now because they offer opportunities for access to data and for conducting studies that would be otherwise impossible. Nyhan raised the role of the private sector in partnerships to translate research into practice.

Getting the Information to the Public: Social Media

A participant asked about the role of the information environment (e.g., social media, citizen science, social participation) in shaping the way people think about scientific evidence. Nyhan responded that people have long believed in various conspiracy theories and misinformation, and in many cases, social media platforms reflect the same issues that have moved through other channels of communication in the past. These issues are perhaps more visible now, and circulate more rapidly, because of social media. There have also been cycles of thinking that social media could be used to more efficiently deliver information to people to change their minds, followed by pessimistic views that there is so much misinformation to try to counter. Nyhan said that social media needs to be considered within the larger context of what is known about how people process information. In this regard, he noted that most people actually are not interested enough to look at any of these issues in depth online. For those that are interested, they can readily find information to support their preexisting view.

Assessing Impact

Krieger pointed out that the health equity component can easily be overlooked in trying to understand the impact of research on population health. For example, it is important to understand how HIV is affecting some populations more than others (e.g., African Americans). Another aspect to consider is differences in the timelines of effect, specifically, that the effects for population health will not occur as fast as those for clinical research. The bench-to-bedside timeline for a treatment is not the metric for timelines for changing health inequities in a population. Holtgrave agreed that the issue of health equity is key, as is the need to consider and balance both short-term and longer-term effects of research. The updated National HIV/AIDS Strategy calls for a reduction in new diagnoses, but he said that the epidemic of undiagnosed young black gay men is so severe in Baltimore that there is a need for increased diagnoses over the next 6 months so there can be a reduction in the longer term. Simpson also agreed, and underscored the need for frank conversations on issues of equity.

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Building a Population Health Research Agenda: Views from the Field¹

In preparation for the workshop, and to inform the small group breakout discussions, the planning committee chair conducted a brief survey of population health research needs and priorities, as well as of how research was being used. The results of the survey were presented by Phyllis Meadows, Associate Dean for Practice at the University of Michigan School of Public Health and a senior fellow at The Kresge Foundation.

The survey was coordinated by the University of Michigan, under the leadership of Lantz, with approval from the University of Michigan institutional review board. The survey employed a snowball sampling technique, Meadows explained, with members of the planning committee listing at least 10 people they thought would respond to the survey. A total of 203 individuals were sent an invitation and link to the survey, and 110 responded (response rate of 54 percent).

Survey questions were designed to be brief and require minimum response time. Respondents were asked about their organization type, the role of the person responding, and the importance of research to the types of activities being done at their organizations. Respondents were then asked to identify the top three research priorities in each of three specific areas:

1. Research that helps identify the root causes of a problem or issue, and the implications for a community or population;
2. Research that helps to design and evaluate effective programs, policies, and other interventions; and
3. Research that helps to improve the translation, dissemination, and use of research findings and evidence.

More than 450 unique ideas for research priorities were submitted as research questions or issues. Responses in the three research areas were then sorted into main theme areas. Meadows noted that, organizationally, respondents were primarily from academia, but there were responses from local, state, and federal governments; the private sector; trade or membership associations; health systems; nonprofit organizations; and others. The individuals responding were primarily in executive leadership and in research and evaluation. Other respondents were in service delivery, government relations or advocacy, and other areas. Meadows noted that one of

¹ This section is based on the presentation by Phyllis Meadows, Associate Dean for Practice, Clinical Professor of Health Management and Policy, University of Michigan School of Public Health, Senior Fellow, The Kresge Foundation, and the statements are not endorsed or verified by the National Academies of Sciences, Engineering, and Medicine.

the limitations to the snowball sampling approach is that it tends to draw representation from similar circles (e.g., there was a high representation from academia). Lantz pointed out, however, that response rates differ among different populations, and the response rate was highest among the researchers who received the survey. Other methods may need to be implemented to elicit the views of different groups interested in the topic.

Respondents were also asked how important published research and scientific evidence was, in general, to their organizational activities (see Table 4-1). A large percentage of respondents said that research was very important for priority and agenda setting, for their public education activities, for external policy interests and goals, and for setting their own research agendas.

TABLE 4-1 Importance of Published Research/Scientific Evidence to Organizational Activities

Types of Activities	% Very Important	% Somewhat Important
Vision and mission	46	44
Priority/agenda setting	67	32
Setting our own research agenda	67	22
Public education activities	62	29
External policy interests and goals	60	35
Communication and outreach	58	38
Strategic planning activities	56	41
Lobbying (if applicable)	47	43
Resource allocation	36	52
Government relations	35	55
Internal organizational policy	35	49
Budget process	19	54

SOURCE: Meadows presentation, September 30, 2015.

Meadows listed some of the themes that emerged across the three research areas and provided examples of some of the research questions provided by respondents. Themes and examples are provided in Box 4-1; see Appendix D for more detailed survey results, including examples for each of the themes in each of the three research areas. In summary, Meadows said, more analysis needs to be done; however, the information resulting from this short survey provides a significant number of ideas for research needs and priorities across research areas that can inform the discussions of a population health research agenda.

BOX 4-1**Survey Results: Some Themes and Examples of Research Questions (detailed survey results in Appendix D)****Root Causes of Problems, Implications for Populations and Communities**

- Social/socioeconomic determinants of health
 - Does poverty affect children from different race/ethnic groups differently?
 - The effects of housing
- Racism, segregation, immigration
- Early childhood/family
 - Increase understanding of adverse childhood experiences and risks to adult health
- Health risk behaviors
 - What are the major drivers of the epidemic of opioid addiction in United States?
- Health care/health system reform
- Public health systems/cross-sector collaborations

Interventions and Policy Action

- Effect of general and specific interventions
 - How to shift wealth distribution to eliminate poverty
 - How to reduce racism and other forms of social stigmatization
 - The effect of the availability of affordable housing on public health
- Interventions related to obesity, food, nutrition, physical activity
 - How to establish incentive structures to attract markets to food deserts

How to Improve Research Translation and Impact

- Research dissemination to policy makers, clinicians, other practitioners
 - What approaches to adoption and spread of evidence-based practices are most successful?
- Public communication and media
 - What are the best communication strategies for describing population health?

SOURCE: Meadows presentation, September 30, 2015.

Population Health Research Priorities: Perspectives from Users of Research

In the second panel discussion, speakers representing different categories of users of research, such as local public health practice, consumers, the federal government, and the private sector provided their perspectives on research priorities. LaMar Hasbrouck, executive director of the National Association of County and City Health Officials (NACCHO), provided his perspective from working with the local health officials NACCHO represents. The consumer perspective was provided by Ron Pollack, executive director of Families USA. A federal perspective was shared by Linda Elam, Deputy Assistant Secretary for Disability, Aging, and Long-Term Care Policy in the Office of the Assistant Secretary for Planning and Evaluation (ASPE) in the U.S. Department of Health and Human Services (HHS). Jenelle Krishnamoorthy, executive director for U.S. Policy and Government Relations at Merck & Co., Inc., shared her perspective based on her experience in both the pharmaceutical industry and as a congressional staffer. Following the panel presentations, an open discussion was moderated by Jeffrey Levi of Trust for America's Health and the George Washington University. (Highlights are presented in Box 5-1.)

BOX 5-1

Highlights and Main Points Made by Individual Speakers and Participants^a

- Local health officials need better access to research that can inform their work. Researchers need to partner with local health departments in a meaningful way (beyond simply asking for access to data or letters of support), as they are the experts on the health and health needs of the local population. (Hasbrouck)
- Research priorities from the perspective of local public health are (1) evidence to support upstream interventions (i.e., on the high-level factors that influence health, such as income and education); best practices for public health and health care delivery to improve population health outcomes beyond the health care facility; and innovative models of public health financing. (Hasbrouck)

- Priority areas for population health research from the consumer perspective are: insuring the uninsured; assessing and improving insurance literacy; the role of insurance navigators and assistors; the evolution of employer-sponsored insurance; variability across Medicaid systems; and the effect of rising premiums, deductibles, and copays on accessibility of coverage and care. (Pollack)
- Federal research priorities must balance identified needs with the potential effect that HHS efforts could have. Needs include both immediate health needs and political imperatives. Research is needed on leveraging the many existing public programs, and data from these programs more effectively. (Elam)
- Economic analysis is needed to understand the costs and savings associated with population health strategies and interventions. (Ewig, Krishnamoorthy, Pollack)
- Research is needed on how best to communicate population health research findings and connect with people outside the field, including policy makers. Language and framing of the message may need to be tailored according to the audience. (Hasbrouck, Krishnamoorthy, Pollack, Russo)

^a 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, and the statements are not endorsed or verified by the National Academies of Sciences, Engineering, and Medicine.

LOCAL HEALTH DEPARTMENT PERSPECTIVE¹

NACCHO represents about 3,000 local health departments across the country, assisting them in their work through public health advocacy, capacity-building assistance, development of tools, professional development, and other activities. Hasbrouck said that local health officials, administrators, and subject matter experts need better access to research so they can make use of it in their work. He urged researchers to partner with local health departments in a meaningful way (i.e., not just ask for access to data). As the experts on the health of the local population, the local health department can be an asset to researchers. Local public health regularly interfaces with and convenes community members around community health needs assessments, community health improvement plans, and other activities.

NACCHO uses research to understand the needs of its members and maintains a state-of-the-art national database of all local health departments, Hasbrouck said. For example, NACCHO releases a National Profile of Local Health Departments, as well as a survey, called Forces of Change, of the trends and factors that affect local public health (e.g., workforce composition, implementation of the ACA).² These data and surveys are used to inform the development of policy positions and guidance by workgroups of subject matter experts and NACCHO members. In response to a question, Hasbrouck noted that the data from the various surveys are accessible to researchers, and he encouraged researchers to contact NACCHO.

NACCHO members use a broad spectrum of research (e.g., science, management, marketing, organizational strategy, psychology, economics) for surveillance and epidemiology,

¹ This section is based on the presentation by LaMar Hasbrouck, Executive Director, National Association of County and City Health Officials, and the statements are not endorsed or verified by the National Academies of Sciences, Engineering, and Medicine.

² See <http://nacchoprofilestudy.org> (accessed August 8, 2016).

to identify root causes of poor health outcomes, to inform public health practice, and to shape policy. Research is also needed to assert the value proposition for local public health, as funding and support for their work has been eroding, he noted. Hasbrouck highlighted three main research priorities from the perspective of local public health:

1. **Upstream interventions**—More empirical evidence is needed to support the idea that population-level interventions and policies have a positive effect on the broad factors that influence health, and that these interventions and policies provide a real return on investment for population health. Hasbrouck emphasized the role of collaborative efforts between public health, population health experts, and the health care delivery system, and cited the State Innovation Models Initiative as a step in that direction.
2. **Drivers of health**—Research is also needed to identify the drivers of health and the best practices for public health and health care delivery to improve the health outcomes of populations beyond the walls of the health care facility. Areas for research include social determinants of health, workforce development, and information sharing and interoperability of informatics systems (e.g., tracking patients across care systems).
3. **Financing**—New research is needed in the area of public health financing, Hasbrouck said. This includes sustainability research on innovative and alternative models of funding for public health. In this regard, Hasbrouck referred participants to the Foundation for the Public’s Health,³ a philanthropic foundation launched by NACCHO to support community public health through public–private collaboration.

CONSUMER PERSPECTIVE⁴

Families USA is committed to achieving affordable, high-quality health care for all Americans, and is deeply concerned about those who are least advantaged, Pollack said. He emphasized the need for more attention to safety net programs, noting that the single largest provider of health coverage today is the Medicaid program. Pollack highlighted six key areas around access to care where he said it would be very helpful to have a better understanding:

1. **The uninsured**—The Congressional Budget Office (CBO) estimated that, even with the implementation of the ACA, about 35 million people would remain uninsured.⁵ Although there has been significant progress made in enrolment, Pollack suggested that the original CBO estimate likely was low. Families USA has been very involved in enrollment-related efforts. There is a lot of information about the demographics of the uninsured. Some are undocumented immigrants who are not helped by the ACA. However, there are many others who are eligible for significant assistance under the ACA, who are not receiving it. Decision makers need to better ascertain the strongest impediments to getting this remaining population covered.

³ See <https://tfph.org> (accessed August 8, 2016).

⁴ This section is based on the presentation by Ron Pollack, Executive Director, Families USA, and the statements are not endorsed or verified by the National Academies of Sciences, Engineering, and Medicine.

⁵ See, for example, <https://www.cbo.gov/sites/default/files/51298-2015-03-ACA.pdf> (accessed May 9, 2016).

2. **Insurance literacy**—Among people who do get enrolled (many of whom were uninsured for a lengthy period of time), many do not understand even basic definitions (e.g., deductibles, copayments), or other key aspects of accessing care. An assessment is needed of the insurance literacy of newly enrolled individuals, and what is needed to improve their ability to convert an insurance card into actual health care.
3. **Navigators and assistors**—The ACA calls for insurance marketplaces to have navigators to guide consumers through enrollment. A related function is assistors, who have a similar role. These functions are a vital link to getting people enrolled in health care, Pollack said; however, there are concerns about sustained funding of such services in the future. He cited the need for an apolitical analysis of the significance of the role of navigators and assistors and offered as an example the HHS call for navigators to be active not only during the 3 months of the open enrollment period, but also year-round to help people who get coverage to access care.
4. **Employer-sponsored insurance**—Employer-sponsored insurance is still the predominant way people obtain their coverage, however, Pollack predicted that the coming years would bring significant transformation in employer-sponsored insurance. Small and medium-sized businesses may consider dropping out and referring employees to the marketplace, he said, particularly as premiums rise and enrollees experience significant increases in deductibles and copayments. Analytical data will be needed to explain what happens to the approximately 150 million people who now get their coverage through employer-sponsored plans (e.g., insurance status, quality of coverage obtained).
5. **Medicaid**—Together, Medicaid and the Children’s Health Insurance Program (CHIP) cover almost 72 million people, or more than one out of every five people in the country. Pollack predicted that, with the expansion, Medicaid would cover between 80 and 90 million people in the near future. Research is needed on the experiences of people with Medicaid, especially the differences from state to state in terms of traditional Medicaid versus premium support options. It will be important to understand how those different systems are serving low-income populations (e.g., affordability, employment requirements, time limits on coverage).
6. **Premiums, deductibles, and copays**—Pollack cited a recent Kaiser Family Foundation report that found that while premiums are increasing modestly (about 4 percent), deductibles and copays are rising significantly.⁶ As these trends continue, data are needed on how many people will continue to maintain coverage, and the extent to which those with coverage can realistically access care in the face of increasing personal cost for that care.

⁶ See <http://kff.org/report-section/ehbs-2015-summary-of-findings> (accessed August 8, 2016).

FEDERAL PERSPECTIVE⁷

The Office of the Assistant Secretary for Planning and Evaluation at HHS is the principal policy advisor to the Secretary on issues of health, disability, human services, science and data, and economics. Elam explained that ASPE coordinates the evaluation work, research and demonstration activities, legislative planning, strategic planning, and other activities on behalf of the Secretary of HHS. ASPE also conducts and contracts research and evaluation activities, policy analysis, and cost–benefit estimates of policy alternatives that are under consideration by HHS or Congress. This cross-cutting role affords ASPE the ability to see overlaps and gaps, she said, to highlight opportunities to better streamline and coordinate work, and to set a research agenda.

Setting and coordinating research priorities for an enterprise as large as HHS can be a challenge, Elam said. The process seeks to balance the tension between identified needs and the estimated impact that department efforts could make in that space. Needs include both immediate health needs and political imperatives. As an example, Elam said that ASPE has responsibility for updating and maintaining the National Plan to Address Alzheimer’s and Related Diseases, and facilitates the Federal Advisory Council on Alzheimer’s Research, Care, and Services. Despite the current efforts, there are concerns that Alzheimer’s disease is not receiving the appropriate level of support. Certain stakeholders in the community of organizations working on dementia have expressed concerns that responses such as that to Ebola in Sierra Leone is taking precedence over Americans suffering with Alzheimer’s disease, which is the sixth leading cause of death and affects both individuals and their caregivers. Similarly, there are calls for a response to Alzheimer’s disease on the level of attention given to developing drugs for HIV. Elam pointed out that there are fundamental differences between HIV and Alzheimer’s disease, in particular, the etiology, potential treatments, and threats of an infectious disease versus those for a disease with multiple complex etiologies. These are difficult conversations to have, but they are part of the exercise of balancing need and impact, she said.

Another aspect of the federal portfolio is the many public programs that have a tremendous influence on the health of the nation, and which also serve as vast repositories of data. Research is needed on how to leverage those data resources effectively. Elam relayed that the secretary of HHS has announced initiatives on health care delivery system reform, including alternative payment models for Medicare based on value and quality. Research areas include identifying effective incentives, mitigating unintended consequences of delivery system reform, the outcomes of reform on vulnerable populations, and coordinating programs to serve vulnerable populations and the duly eligible. There are also opportunities to better use and coordinate disparate programs across governments to promote health. Elam cited the housing example discussed by Brennan and noted that ASPE is also studying supportive housing for the chronically mentally ill and for seniors, including the financing aspect.

Elam highlighted several other research priorities for ASPE. The Departments of Justice and Labor and HHS are considering how to address the health needs of those reintegrating into the community after incarceration. Although getting them enrolled in health care is a primary

⁷ This section is based on the presentation by Linda Elam, Deputy Assistant Secretary, Disability, Aging, and Long-Term Care Policy, Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services, and the statements are not endorsed or verified by the National Academies of Sciences, Engineering, and Medicine.

concern, there are also significant needs for employment and training, and other aspects of living in a community successfully.

There are many opportunities for research on the implementation and effectiveness of the ACA. For example, research is needed on how best to help people make decisions in the face of volumes of new information in areas they have not dealt with before (e.g., the roles and effectiveness of facilitators, navigators, assistants). There is also much to be learned about insurance coverage, including elements that limit usefulness of coverage (e.g., availability/distribution of providers, realities of accessing care).

PRIVATE-SECTOR PERSPECTIVE⁸

Krishnamoorthy highlighted some of the work of Merck & Co., Inc. in the area of population health. Merck has long had a strong focus on vaccine development. The Merck for Mothers program is a 10-year, \$500 million initiative to reduce maternal mortality around the world. Merck is also focused on antibiotic resistance, in particular, addressing the dwindling pipeline of antibiotics, and developing policies for the stewardship of new antibiotics. The company also conducts research and development of products in other areas of unmet need, including diabetes, oncology, hepatitis C, and Alzheimer's disease.

Drawing on her experience in the private sector and as a congressional staffer, Krishnamoorthy said that congressional members and staff often do not understand community prevention and population health, and she noted the ongoing challenges of funding the Prevention and Public Health Fund established under the ACA. Population health can be very politicized, and she asked if a different vocabulary might be needed to get the message across.

An area for research suggested by Krishnamoorthy was the possibility of incorporating population health into the health system so it is part of the reimbursement system in the way that clinical prevention is. Research is also needed to understand the integrated person. When developing interventions, it is imperative to understand the entire community, and the factors that affect use of the interventions. Research on medication adherence and vaccination practice also inform product development. It is important to understand the beliefs and barriers related to someone adhering to the intervention or receiving the vaccine. She also emphasized the need to assess health systems relative to their effects on population health. There is currently a focus on quality and value measures for reimbursement, but it is also important to assess whether the population is actually becoming healthier.

Another area for research is the potential economic effects of improved population health. How does better health and longer life affect entitlement programs (e.g., increased Medicare costs)? This is a multifaceted issue, and unbiased facts are needed to inform budget discussions. Another aspect of population health is cost containment and the extent to which preventive interventions result in reduced health care costs (e.g., smoking cessation, diabetes prevention). Economic analysis is needed to bolster the case that increasing the health of the population would save money overall, she said, and such analysis would help to support the passage and funding of more health policies by the federal government. Krishnamoorthy agreed with Pollack about the need to better understand the effect of Medicaid expansion programs. She

⁸ This section is based on the presentation by Jenelle Krishnamoorthy, Executive Director, U.S. Policy and Government Relations, Merck & Co., Inc., and the statements are not endorsed or verified by the National Academies of Sciences, Engineering, and Medicine.

noted that several states are including health risk assessments or a commitment to healthy behaviors in the Medicaid enrollment process. It would be interesting to study the effect of this approach on population health, she said, including whether it actually creates a barrier to people accessing the Medicaid program.

In closing, Krishnamoorthy encouraged participants to reach out to policy makers and advocate for population health. Members of Congress have health advisors on their staff, and this information is vitally important to them, she said. Population health is not just “the nice thing to do,” she said. It is the future of where the health system needs to go, and it is important that this topic be part of the dialogue on value, quality, and an accessible health system.

DISCUSSION: FRAMING THE MESSAGE TO ENGAGE POLICY MAKERS

Participants discussed further the need to frame the messages around population health such that the messages more effectively engage policy makers and others outside the health care system. Krieger relayed a comment from a conference she attended; the speaker had said that, in the context of urban planning, reframing the message as one of livable cities and sustainability helped to get the attention of policy makers outside of the health care system. The language of population health is necessarily different from that of individually oriented clinical care, Krieger noted, and both languages are needed. To seriously start discussing societal determination of health, what are the terms that would be relevant and useful?

Pollack said that although terms such as *population health* and *societal determinants of health* are used regularly in population health research, few outside the field really understand what they mean. The population health research community also needs to conduct research on how best to communicate its findings and connect with people outside the field. A better understanding is needed of what communication approaches work for which audiences. Krishnamoorthy encouraged participants to reach out beyond the usual partners on population health to let others know what is going on in the community and in population health, and engage them in helping to spread the message.

Hasbrouck agreed that nomenclature and lexicon are very important. He suggested that one of the unintended consequences of the ACA in introducing population health was that there was no formal definition of population health in the law. Exactly what it means remains an open question, and it means different things to different people. For a clinician, it might mean their patient population. For a local health commissioner, it might mean their catchment area. For a critical access hospital, it might mean the people they serve.

Hasbrouck highlighted the concept of a “culture of health.” Cultures are very local and intimate, he said. He suggested talking about the health expectancy of a community, rather than the life expectancy. A reasonable expectation of health in a community requires more than access, literacy, and appropriate use of care. These are the downstream (i.e., at the patient level, in the clinical setting) elements for when care is needed, he said. A culture of health incorporates elements that reinforce, enable, drive, and determine a person’s ability to be healthy. These include systems, structures, policies, health department, schools, places of worship, segregation or desegregation, and other elements.

Pamela Russo of the Robert Wood Johnson Foundation noted that building a culture of health is the stated vision of the foundation. She asked whether, regardless of terminology used, there is a growing awareness in federal, state, and local government that actions taken in other sectors (e.g., transportation, housing) have an effect on health? She also asked whether there are

examples of where a politicized issue benefited from reframing it around a health outcome. Krishnamoorthy said there is some awareness. She cited a highway bill where a senator attempted to add an amendment to consider sidewalks in the plan. She also mentioned the Active Living Programs, supported by the Robert Wood Johnson Foundation, to promote healthy communities. There are competing concerns, she noted. The asphalt lobby, for example, might be concerned about funding being diverted from building roads. A challenge when discussing population health with members of Congress, she observed, is that issues fall within different silos, and there are different staff supporting health, education, transportation, agriculture, and other issue areas. It helps to have the scientific community coming together and making an integrated case, and to engage and influence the staff from the different sectors.

Brent Ewig of the Association of Maternal and Child Health Programs commented that his association has found using concrete examples to be effective in engaging congressional staffers and lawmakers on population health. They show, for example, that although there are fewer uninsured children than ever before because of Medicaid and CHIP, this has not resulted in a reduction in the childhood obesity epidemic. Similarly, injury is the leading cause of death for children, and coverage is essential to be able to treat them when they are injured, but there is not enough investment upstream in preventing injuries. Such examples open the door for conversations about strategies, he said. The challenge, he continued, is defining and supporting funding requests. He shared his experience in lobbying for funding in the Labor HHS appropriations bill for maternal and child health, requesting a modest \$2 million increase to the \$635 million program. When asked what that \$2 million would buy, his response was that each state that has deployed evidence-based strategies with accountable performance measures would be able to extend those interventions. This is not nearly as satisfying an answer, he said, as being able to say that the money will buy a certain number of clinics, perhaps in that member's district, and provide a specific number people with free comprehensive primary care, and other specific cost details. What is needed is more economic analysis of what effective population health strategies and interventions cost. Estimates are suitable, he said, and exact costs are not needed. Without cost information, population health is competing against much more politically appealing messages (e.g., how many more constituents will be served, versus some benefit to a population that may or may not be voting for that member).

Pollack added that it is not sufficient to analyze how effective and intervention is, it is also important to analyze how cost-effective it is. He noted that the Patient-Centered Outcomes Research Institute (PCORI) is constrained in this area by the ACA. Families USA, in partnership with the Institute for Clinical and Economic Review (ICER), is analyzing half a dozen clinical problems to consider both the clinically effective options and the cost-effective options people have. This is the type of analysis that must be done if population health wants to encourage interventions which are nonmedical but which have a real effect on health care. For example, for a child with asthma, how cost-effective is mold removal in the home for avoiding an asthma attack? This type of analysis can be done for a variety of different chronic health conditions, he said.

Hasbrouck pointed out the need to consider the political cycle. Often there will be buy-in from an elected official, but upstream strategies and approaches takes time, and that official cannot wait that 4 or 5 years for a return on that investment and to get credit for supporting it. The culture needs to change to prioritize value, and people need to be advocates for these sustained changes.

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6

Toward a Research Agenda for Population Health¹

A portion of the workshop was set aside for facilitated small group discussions on a research agenda for population health. Participants were asked to identify research priorities based on their own experiences and what they heard over the course of the workshop discussions. Attendees divided into five groups to consider research questions and issues in one of three broad research areas:

- Research on understanding population health problems or issues, their root causes, trends over time, differences within subpopulations, and related issues;
- Research on designing, implementing and evaluating the effect of different types of policies, services or other interventions that aim to improve population or community health and/or reduce socioeconomic and health inequities; and
- Research to improve the dissemination of data, research results, and evidence to wide audiences, and to improve the translation of evidence into policy and practice in ways that have a positive effect on communities and populations.

Each group was tasked with listing three top research priorities to help focus their discussion, and they were asked to answer the following questions for each topic:

- What are the primary audiences for the results or answers from this research?
- Who is most likely to conduct the desired research (e.g., academics, health systems, government, industry)?
- What resources and incentives are needed for this research to get done?

¹ This section is based on the reports by Christine Bachrach, Research Professor, University of Maryland; Alina Baciu, Senior Program Officer, National Academies of Sciences, Engineering, and Medicine; Michelle Frisco, Associate Professor of Sociology and Demography, Pennsylvania State University; Amy Geller, Senior Program Officer, National Academies of Sciences, Engineering, and Medicine; Mary Lou Goeke, Executive Director, United Way of Santa Cruz, California; Marthe Gold, Visiting Scholar, New York Academy of Medicine; Lyla Hernandez, Senior Program Officer, National Academies of Sciences, Engineering, and Medicine; Paula Lantz, University of Michigan; Michelle Larkin, Assistant Vice President, Robert Wood Johnson Foundation; Phyllis Meadows, Associate Dean for Practice, Office of Public Health Practice, Clinical Professor, Health Management and Policy, University of Michigan, Senior Fellow, Health Program, The Kresge Foundation; Sarah Linde, Chief Public Health Officer, Health Resources and Services Administration; Creagh Milford, President, Population Health Services at Mercy Health; Lynn Parker, Scholar, National Academies of Sciences, Engineering, and Medicine; Lisa Simpson, President and CEO, AcademyHealth; and Steven Smith, Clinical Assistant Professor, Pharmacotherapy and Translational Research, University of Florida. These reports were not meant to infer a consensus from the discussions, and the statements are not endorsed or verified by the National Academies of Sciences, Engineering, and Medicine.

- Are there any significant challenges to producing this research, and how can these challenges be overcome?

Attendees reconvened in plenary session and the group facilitators reported on their groups' conversations, followed by an open discussion moderated by Lisa Simpson of AcademyHealth. Highlights shared by individual facilitators are presented in Box 6-1.

BOX 6-1
Highlights and Main Points Made by Individual Speakers and Participants^a

Priority areas for research:

- *Understanding population health problems and issues*: Cross-sector interventions, prioritizing resources, framing "health" (Gold)
- *Understanding root causes*: Employment, education, housing, updated research methods and strategies (Bachrach, Larkin, Meadows)
- *The impact of policies, practices, and interventions*: Measuring value, measuring impact, raising awareness of existing research and tools (Goeke)
- *Improving dissemination and translation*: Framing research communications to influence change, incentives for translation of knowledge to practice, connecting researchers and end users of research (Meadows, Smith)
- *Overarching principles*: Equity subgroup analyses in all studies; capturing cost information; integrating data systems; funding and studying multifactorial interventions; developing standards of evidence (Gold, Larkin, Simpson)

^a 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, and the statements are not endorsed or verified by the National Academies of Sciences, Engineering, and Medicine.

UNDERSTANDING POPULATION HEALTH PROBLEMS AND ISSUES

Facilitator Marthe Gold, of the New York Academy of Medicine and City College of New York, reported that her group considered the methods and infrastructure needed for research on understanding population health problems or issues. Various group participants mentioned several principles to inform researchers, including

- the need for equity subgroup analyses in all studies;
- the importance of capturing cost information;
- the need for integrated data systems that connect electronic health records, public health data, and data on social determinants of health; and
- the challenges of funding and studying multifactorial interventions.

Participants also focused their conversation on the following areas for research.

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Cross-Sector Interventions

Participants discussed the need for research on interventions that span across sectors, Gold said. This would be done by transdisciplinary teams of investigators, and the audience would be decision makers in government, and funders. The research would likely be conducted with support from health foundations but also, more broadly, from foundations that are interested in quality of life, or the social circumstances of people, for example. It was suggested that highlighting the benefits of the research for other sectors would help to garner their support.

Prioritizing Resources

Some participants noted that research is also needed to determine how best to prioritize resources and efforts when funding is scarce. One model discussed by participants was how funding might be allocated if all governmental monies were considered together and a global budget developed across sectors. Gold added that this is a complicated modeling scenario. Another suggestion was a global budget that considers health and health care together, in both the public and private sectors, and how to invest in what creates health. The audience for this research was identified as policy makers at the local, state, and federal levels, and Gold added that the Office of Management and Budget would be an important audience in itself. Economists and experts in modeling would be needed for this research. Some participants also noted that decision makers from different sectors can help inform development of the research questions by reflecting on the challenges and decisions they face. Funding for research prioritized in this manner could come from foundations focused on health, or broader sources for cross-sector issues (including government funding).

Framing “Health”

The third priority for research identified by some participants was the need to evaluate the effectiveness of using the term *health* as a motivator for action in other sectors (non-health sectors, as well as health care partners outside of population health). Participants discussed, for example, whether framing issues in terms of health-in-all-policies was effective, or whether different kinds of language would be more effective. The audience for this research would be population health researchers and advocates, Gold reported, and the research would be conducted by communication scientists and public policy analysts. Foundations would be key funders of this work, Gold said, as they have been pivotal in thinking about broadening the notion of health and social determinants of health.

UNDERSTANDING THE ROOT CAUSES OF POPULATION HEALTH ISSUES

Two breakout groups considered the priorities for research on understanding the root causes of population health problems. Facilitator Michelle Larkin of the Robert Wood Johnson Foundation summarized the discussions by her group on research to identify the root causes of population health problems. Participants were interested in focusing the discussion on three main categories of research: employment, education, and housing.

Employment

Larkin reported that the group discussed many potential research questions and issues in the area of employment. Topics included the effect of wage levels and benefits on health outcomes; the role that labor plays in health broadly; the continuity of employment and its role in health; disparities in the labor force; participation in the labor force (unemployed and looking for work, as well as those who are not part of the labor force by choice); and job insecurity. A point was made about the need to understand the time dimension of research in this area, and the payoff for an intervention over a specific time period. This would be particularly important for funders, as well as for businesses that would look to implement job creation investments. Participants in this group also discussed the need to look at the history of federal job creation efforts, and the implications of those efforts for population health; state and local social costs of joblessness; and the evidence for developing toolkits for employers to help them better facilitate health through employment.

The primary audiences for these research questions were identified as state and local policy makers, mayors, the National Conference of State Legislatures, local chambers of commerce and business leaders, owners and investors in business, workforce investment boards, the public, and anchor institutions in the community in their role as employers. Participants discussed that this research would best be conducted by multidisciplinary teams, and the need to engage business schools and public health schools was noted.

With regard to resources, Larkin reported that several group participants discussed the need for the support of business, including individuals, companies, and associations that are starting to understand the value of a healthy and engaged workforce. It was also noted that the body of global research on employment and its effect on health is an available resource, and that there were models to learn from (e.g., trade apprenticeship models).

A variety of barriers were discussed, including existing federal and state policies around benefits requirements, and efforts by some employers to keep employees under 25 work hours per week to avoid those requirements. There are also trust issues associated with engaging business as a true partner in this type of research and translation. Other concerns raised were the overgeneralizing of findings, the funding needed, and how to identify true translators and champions from the employment sector to help move this forward.

Education

A priority identified by some participants for research in the area of education is to consider the mechanisms that connect health and education, Larkin reported. The audiences are similar to those for employment, with a focus on local school systems and anchor institutions. Key challenges noted were the entrenchment in the way education is paid for, school system equity challenges, and tax policy.

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Housing

Larkin summarized that research questions under the topic of housing focused on the effect of housing conditions on health, and connecting remediation programs with health outcomes (e.g., reduction in asthma). Participants also discussed how investments by children's health care institutions could take the form of tapping into community benefit funds to improve the housing conditions of the community. Research could also be done on the role of neighborhood quality in economic vibrancy; social connectedness and civic engagement; the importance of having affordable housing; and the implications of gentrification (i.e., when housing is no longer affordable and residents are pushed out of a community) on the health of a community. The audiences identified for these research issues were developers, zoning boards, community development, financial institutions, bankers, and anchor institutions.

Facilitator Phyllis Meadows of The Kresge Foundation and the University of Michigan reported that her group's discussion of priority research needs also focused on the area of root causes of population health problems. Meadows noted that there were many diverse views in the group, making for a lively discussion. Some in the group felt that the root causes are already understood, while others, particularly participants who work in the social and behavioral sciences, felt there was more to be done to have a full understanding those issues. For example, much is known about the effect of poverty on health, and it was noted that the effect of capitalism cannot be discounted. An issue raised was the need to recognize that "root causes" has different meaning in different fields or to different audiences (e.g., the medical profession versus communities). The primary audience for research on root causes was identified as the practice community, which Meadows said includes policy makers and other decision makers. It was noted that the audience for research would ideally be engaged throughout the process, not just at the end when results are delivered. Specifically, the engagement of the practice community was discussed as a necessary element to really be able to move forward on addressing root causes. This includes community leaders and people who can implement the solutions identified. A few participants observed that the workshop discussions thus far had not raised the notion of social movements, and they felt it was an important element for consideration.

The group discussed a range of challenges to conducting research on root causes, Meadows reported. Funding was raised in this group a research need (e.g., funding levels, what is needed for dissemination, for adequately answering the research question[s]) and it was pointed out that funding that is allocated often will only cover one piece of the work. As such, Meadows explained, the research is lacking in its ability to capture the complexities of the issues and the root causes. Some in the group observed that some of the systems in place are perpetuating many of the problems. One specific area for research suggested was the need to consider how these often fragmented systems are affecting efforts in population health. Other challenges mentioned during the group discussions were the disconnection between researchers both within and across disciplines; a lack of sharing of information; the research capacity of partners; and the difficulties of determining causality. A question was raised about whether the focus should be on causality or association. A group participant suggested that very few people have a vested interest in changing existing structures and addressing root causes, and it is unclear whether there is actually a commitment to changing these structures.

Who should conduct this research on root causes depends on the situation, Meadows said. It was noted that, even though academia has the capability and capacity, academics might not always be the best ones to conduct this research. Group participants discussed the need to take into account the vested interest of those doing the research, and the potential for bias. In addition

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to funding, a key resource needed to move an agenda on the root causes of health is time, and Meadows relayed that the time needed for this kind of research is significant, especially when engaging community. Participants also discussed the infrastructure needed to collect, use, and share data.

In summary, Meadows said, the root causes of many population health problems are already known. What is needed to move forward is a clear definition of the problems, sustainable partnerships, and the political will. We have evidence, Meadows said, now we must agree that this is important research to do. Other participants noted the need for more public accountability, suggesting that public funds are not being dedicated toward work in population health. Updated methods and strategies might also be needed to develop a deeper understanding of these problems, and to move forward.

THE EFFECT OF POLICIES, PRACTICES, AND INTERVENTIONS THAT AIM TO IMPROVE POPULATION HEALTH

Facilitator Mary Lou Goeke of the United Way of Santa Cruz County summarized her group's discussions on the research needed to understand the effect of policies, practices, and interventions that aim to improve population health. The group had a wide-ranging conversation across many research topics, she said, and she highlighted three main ideas that cut across the different areas of discussion.

1. **Measuring value**—Group members discussed the need for better approaches to measuring the value of interventions that improve the health of a population, and better efforts to make the business case demonstrating the return on investment, or social return on investment, of these interventions. Goeke noted that some of the group warned against trying to monetize some of these interventions when discussing their positive effects. Participants also discussed the need for better ways to communicate the positive effects of population health interventions in general, in a simple understandable way to those who need to know.
2. **Measuring impact**—The difficulty in measuring multisector collective impact initiatives was also discussed, Goeke reported. Some initiatives incorporate many interventions, and it is very difficult to evaluate which interventions led to what effects.
3. **Raising awareness of existing research and tools**—Goeke relayed a sense of frustration among some participants about the general lack of compilations of existing research, the lack of awareness of the compilations that are available, and the lack of awareness among communities of the tools for evidence-based policies and practices they can draw upon.

IMPROVING THE DISSEMINATION AND TRANSLATION OF POPULATION HEALTH RESEARCH

Facilitator Steven Smith of the University of Florida shared the three research priorities identified by his group in the area of improving dissemination of research results and translation into policy and practice.

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Framing the Message

What is the best way to frame research communication? What is the role of social media in research communication? How do we choose the “right” messenger to best tailor the message for the intended audience? The primary audiences for the results of this research, Smith conveyed, would be researchers, academic communication offices, government communication offices, the public health sector, advocacy organizations, professional societies, and the various knowledge brokers who pass along results of research. This research would be conducted by communication scientists (Smith mentioned the Frameworks Institute as an example). The primary resources and incentives needed would be funding, and Smith relayed that the group suggested public–private partnerships could be a good resource for conducting this type of research. A key challenge identified by some participants was the ability to maintain integrity while providing results. In other words, Smith said, researchers are often not comfortable with having to report results before they are ready, or with having to simplify the message to the point where necessary information and caveats are not discussed. He also noted that traditional models of research may be a challenge in this particular area.

Incentives for Translation of Knowledge to Practice

What is needed to incentivize researchers, and more generally, the research enterprise (including academia), to increase their involvement in dissemination and implementation research? The primary audiences for this research are academia and research funders, as well as journals, Smith said. Agencies or research funders would likely be the drivers of this research, and possibly academic researchers as well. Again, the key resource needed is funding. Smith also relayed that suggestion that funders be encouraged to require demonstration of impact. He noted that grantees usually have to describe their dissemination and implementation plan, but this is not well enforced, and many get by with simply saying they will publish a paper and present at national conferences. Forcing accountability would be a challenge, Smith noted. Another challenge identified was defining exactly how much is needed to incentivize academic researchers. It was observed that most people support the concept of dissemination of information, but far fewer actually do it.

Connecting Researchers and End Users of Research

How can we meaningfully increase the exposure of researchers to the end users of their research, and vice versa? The primary audiences for this research would be researchers and end users, but also intermediary organizations (e.g., professional societies, advocacy groups, funders). Researchers and users would be the primary people involved in conducting this type of research, Smith reported. Participants in this group highlighted the importance of funding to support the time commitment necessary to build collaborative relationships. In this regard, there could be incentives for showing a strong level of collaboration (e.g., within academia there could be credit given for time devoted to building those relationships, beyond just an occasional meeting or letter of support from the end user or collaborators). Collaboration also could be incentivized by the accrediting bodies of academic institutions with which researchers are affiliated. A key challenge identified by the group was the time commitment for relationship building and interaction between researchers and end users at more than the surface level. It was suggested that greater value could be placed on pragmatic research and practical trials, Smith

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reported, and he added that some participants called for greater appreciation of the ability to translate rigorous research into practice in the community setting. One strategy suggested was to give researchers and end users a primer on the benefits to community members of the collaborative research relationship.

DISCUSSION

In the plenary discussion following the reports from the small group facilitators, participants discussed the issue of complexity, the challenges to generating political will and influencing change, and the need to better link costs and outcomes.

Complexity

Isham raised the concept of population health as a complex adaptive system that is situation dependent (e.g., affected by where people live and other factors). He asked whether enough attention is being given to the complex aspects of population health when considering root causes and identifying policy approaches to improve health across the country. Christine Bachrach of the Maryland Population Research Center responded that the idea that population health is a complex adaptive system does not necessarily change the questions about root causes. Rather, it emphasizes the need to pay much more attention to the interactions among root causes. In addition, it draws attention to the need to revolutionize the methods being used and the types of evidence being collected to provide answers for population health questions. As an example, she observed that the vast majority of researchers are still doing regression analysis. Simpson agreed and added that, with the explosion of data and technology, there is both a tremendous opportunity and the potential for making false associations that do not actually exist.

Simpson asked panelists for examples of complex interventions and evaluating multifactorial interventions. Where could the population health field turn for lessons and strategies? Gold mentioned the successes in tobacco control and said that researchers are often asked to identify the one element that had an impact on the lessening of use of tobacco (e.g., taxes, physician counseling, public campaigns). The answer is that a critical threshold of many different things must be achieved at the same time, she said, and funders need to understand the need to assess multifactorial interventions. Simpson questioned whether funding agencies have been receptive to this notion. A participant said that complexity science is a different way to frame how research is conducted, and that this is an area of expertise the Roundtable on Population Health Improvement might consider bringing on board. She agreed that traditional methods, such as the regression analysis approach that was mentioned, will not move the field to where it needs to go. Larkin added that generating standards of evidence for population health was also discussed in her group, including how those standards would work in a transdisciplinary research framework.

Political Will and Influencing Change

Bob Griss of the Institute of Social Medicine and Community Health expressed his opinion that the complexity issues are exaggerated, and what is really needed is a focus on the politics of the social determinants of health. He suggested that complexity is often used as an excuse by vested interests to stave off public policy and regulatory action. As an example, he

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cited the influence of the tobacco industry, which has stalled actions by the U.S. Food and Drug Administration (FDA) to regulate menthol in cigarettes and e-cigarettes. He raised a concern that public health practitioners are “tinkering with the system” instead of addressing the root causes, and that root causes include a lack of commitment to the principles of public health and the principles of equality. He noted the importance of community engagement in driving the process of addressing root causes of population health problems. He added that, although individual health status can be a measure of inequality, real differences become apparent from comparative research between systems. International comparisons are highly relevant, he said, in the way they integrate medical care and public health into a seamless financial system. He observed that there was much discussion at the workshop about the erosion of funding for public health but limited discussion of the political movement needed to address these issues.

Simpson noted that the political will to act on the science and address the root causes of health problems was identified as a need by the group facilitated by Meadows (summarized above). She also referred participants to the National Research Council and IOM report, *U.S. Health in International Perspective: Shorter Lives, Poorer Health*, which includes international comparisons. She shared one example that ranks the life expectancy at birth of U.S. women as 16th in a set of 17 peer Organisation for Economic Co-operation and Development countries (NRC and IOM, 2013). She expressed her disappointment at how little the findings of this report have affected the conversation on health in this country. The question persists, Gold added, as to where to put our energies and our will, and what falls into the research space versus the advocacy space.

There is an argument to be made, Simpson said, for continuing to produce evidence that is current in its context. It is not that one more study suggesting the root cause of poor health is poor living circumstances will finally change minds. It is that when the window of opportunity opens for translating evidence into policy, the evidence to support that change has to be recent, Simpson said. She has heard from policymakers that the findings provided to support policy change are often too old, especially when discussing insurance and costs.

Meadows suggested that the field sometimes fails to be strategic and seize opportunities to use population health research in a way that can effect change. The root causes of population health problems have become very entrenched, and it is difficult to make any real gains on them, she said. She suggested that, in addition to new methods of how to study root causes, new methods and approaches are needed for to how to influence change on these measures.

Isham raised the issue of shared value and said that a research agenda for population health needs to include implementation research on how to achieve shared value, including effective communication. He referred participants to the Roundtable on Population Health Improvement workshop summary, *Supporting a Movement for Health and Health Equity* (IOM, 2014).

Simpson suggested that individuals and associations, such as the newly formed Interdisciplinary Association for Population Health Science, could use the outcome of this workshop to discuss population health research needs directly with funders in both the public and private sector. The issues raised at the workshop (e.g., the need to focus on equity, development of new methods, understanding costs) will not be addressed unless those paying for research start asking for it, Simpson said.

Costs and Outcomes

Jean McGuire of Northeastern University suggested that some of the resources and obligations for achieving population health are within the health care industry, and that research is needed on the role of the health care industry. The health care industry needs to be able to drive and invest in population health, she said, but it faces a mixed incentive and even a disincentive to do so. She referred to the comments by Pollack about the potential negative effects of increasing copays and other consumer-level costs on an individual's ability to access care, and the question raised by Krishnamoorthy about the cost effect of successful population health initiatives on entitlement programs (e.g., individuals living longer has increased costs for Medicare). Simpson agreed and repeated the earlier comment by Gold that cost dimensions need to be included in studies. A challenge is that return on investment can occur in a different sector; for example, some of the benefits of better asthma care for children are returned to the schools in the form of decreased absenteeism.

Bachrach noted that accountable care organizations are taking action to improve population health, and research is needed to determine the extent to which these actions are affecting upstream determinants of health. There is a need to understand the outcomes of organizations that are still focusing at the individual level relative to those that are addressing upstream determinants of health. Simpson added the need to understand what initiatives are working, or not working, in different sectors so that time and resources are not wasted repeating unsuccessful strategies.

A participant highlighted the gap between health management and population health, and suggested the need for research on bringing these functions together. Provider systems need to know the impact of their work. Another participant emphasized the need to consider the effect of behaviors on health (e.g., tobacco use, physical activity, nutrition), and the interactions between behaviors and social determinants of health.

CLOSING REMARKS

The Roundtable on Population Health Improvement has been using six categories of drivers of population health improvement to organize its work: metrics, resources, relationships, policy, communication, and research/evidence, said David Kindig, professor emeritus at the University of Wisconsin School of Medicine and Public Health. Not all of these areas require new research, and there is much that can and should be done based on what is already known, he said. However, as noted during the workshop, he asserted that there are areas where new evidence is needed to move population health forward, particularly relative to metrics, resources, relationships, and communication. Research does not make policy, Kindig continued, but it is extremely important in the policy process. There is a need for increased funding and activity on policy-relevant research that can move the population health field forward, such as the research priorities identified by participants during the workshop discussions. In closing, he referred participants again to the framework presented by Lantz (see Table 2-1) and to the results of the survey on priorities conducted by the planning committee (see Chapter 4 and Appendix D) as resources for researchers and organizations to identify priorities for population health research and to inform the path forward.

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Appendix A

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Appendix B

Workshop Agenda

Roundtable on Population Health Improvement

Advancing the Science to Improve Population Health: A Workshop

September 30, 2015

AGENDA

Location: National Academy of Sciences, 2101 Constitution Ave. NW, Washington, DC

WORKSHOP OBJECTIVES:

1. To provide frameworks for understanding population health research and its role in shaping and having an impact on population health
2. To identify individual and institutional facilitators and challenges regarding the production, communication, and use of research for population health improvement
3. To identify some key areas for future research critical to the advancement of population health improvement

8:15 am **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

8:30 am **Keynote speaker**

Nancy Krieger, professor of social epidemiology, Department of Social and Behavioral Sciences, Harvard T.H. Chan School of Public Health; director, Harvard School of Public Health Interdisciplinary Concentration on Women, Gender, and Health

9:15 am **Q&A/Discussion**

9:30 am **Research designs and frameworks for population health improvement**

Paula Lantz, professor and associate dean for research and policy engagement, Gerald R. Ford School of Public Policy, University of Michigan; professor of health management and policy, University of Michigan School of Public Health; chair of the planning committee; member Roundtable on Population Health Improvement

10:00 am **Break**

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10:15 am	<p>Research in practice: Opportunities and challenges</p> <p><i>Moderator, David Kindig, professor emeritus of population health sciences, emeritus vice chancellor for health sciences, University of Wisconsin, School of Medicine and Public Health; co-chair, Roundtable on Population Health Improvement</i></p> <p><i>Maya Brennan, vice president, housing, Urban Land Institute Terwilliger Center for Housing</i></p> <p><i>David Holtgrave, professor and chair of the Department of Health, Behavior and Society, Johns Hopkins Bloomberg School of Public Health</i></p> <p><i>Brendan Nyhan, assistant professor, Department of Government, Dartmouth College</i></p> <p><i>Lisa Simpson, president and CEO, AcademyHealth; member, planning committee</i></p>
<hr/>	
11:00 am	<p>Q&A/Discussion</p>
<hr/>	
11:30 am	<p>Building a population health research agenda: Survey results</p> <p><i>Phyllis Meadows, associate dean for practice, clinical professor of health management and policy, University of Michigan School of Public Health; senior fellow, Health Program, The Kresge Foundation; member, planning committee; member, Roundtable on Population Health Improvement</i></p>
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12:00 pm	<p>Lunch</p>
<hr/>	
1:00 pm	<p>Population health research priorities: Perspectives from the field</p> <p><i>Moderator, Jeffrey Levi, Trust for America's Health</i></p> <p><i>LaMar Hasbrouck, executive director, National Association of County and City Health Officials (NACCHO)</i></p> <p><i>Ron Pollack, executive director, Families USA</i></p> <p><i>Linda Elam, deputy assistant secretary, Disability, Aging and Long-Term Care Policy, assistant secretary for planning and evaluation, U.S. Department of Health and Human Services</i></p> <p><i>Jenelle Krishnamoorthy, executive director, U.S. Policy and Government Relations, Merck & Co.</i></p>
<hr/>	
1:40 pm	<p>Q&A/Discussion</p>
<hr/>	
2:00 pm	<p>Setting a research agenda for population health improvement: Facilitated small group discussions</p> <p>What research is needed to foster population health improvement?</p> <p>Participants will arrange themselves at tables to focus on one of three research areas for discussion:</p> <ol style="list-style-type: none"> 1. research regarding the understanding of problems and basic phenomena 2. research regarding interventions and policy action 3. research regarding how to better facilitate dissemination and use of existing research results
<hr/>	
3:15 pm	<p>Break</p>
<hr/>	
3:30 pm	<p>Report back from groups</p> <ul style="list-style-type: none"> • Explore priority research questions • Explore research needs and challenges
<hr/>	
4:30 pm	<p>Discussion and reflections on the day</p> <p><i>David Kindig, professor emeritus of population health sciences, emeritus vice chancellor for health sciences, University of Wisconsin, School of Medicine and Public Health; co-chair, Roundtable on Population Health Improvement</i></p>
<hr/>	
5:00 pm	<p>Adjourn</p>

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Appendix C

Suggested Readings for Krieger Presentation (Chapter 2)

Ecosocial Theory, Embodied Histories, Populations, and Health Inequities

- Krieger, N. 1994. Epidemiology and the web of causation: Has anyone seen the spider? *Social Science & Medicine* 39:887-903.
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- Krieger, N. 2014. The real ecological fallacy: Epidemiology and global climate change. *Journal of Epidemiology & Community Health*. doi:10.1136/jech-2014-205027.

Public Health Disparities Geocoding Project: Putting Health Inequities on the Map

- Chen, J. T., D. H. Rehkopf, P. D. Waterman, S. V. Subramanian, B. A. Coull, B. Cohen, M. Ostrem, and N. Krieger. 2006. Mapping and measuring social disparities in premature mortality: The impact of census tract poverty within and across Boston neighborhoods, 1999-2001. *Journal of Urban Health* 83:1063-1085.

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Racial Discrimination, Jim Crow, Policing, and Health

Conceptual

- Krieger, N. 2003. Does racism harm health? Did child abuse exist before 1962?—On explicit questions, critical science, and current controversies: An ecosocial perspective. *American Journal of Public Health* 93:194-199.
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Empirical: Jim Crow

- Krieger, N., J. T. Chen, B. Coull, P. D. Waterman, J. Beckfield. 2013. The unique impact of abolition of Jim Crow laws on reducing health inequities in infant death rates and implications for choice of comparison groups in analyzing societal determinants of health. *American Journal of Public Health* 103:2234-2244.
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Appendix D

Results from University of Michigan Survey Regarding Priorities for Population Health Research

September 22, 2015
(N = 110 respondents)

EXAMPLE SURVEY RESULTS RESEARCH AREA 1 ROOT CAUSES OF PROBLEMS, IMPLICATIONS FOR POPULATIONS/COMMUNITIES

Social Determinants—General Research Questions

- Does poverty affect children from different racial/ethnic groups differently in terms of health outcomes?
- Determinants of improvement in self-reported health
- What percent of non–health care investments accrue to health outcomes, so that a true health budget can be established?
- Research linking multiple social priorities and illustrating alignment
- Identifying the key levers among the social determinants of health that would trigger ripple effects in eliminating inequalities in multiple systems that contribute to health inequalities

Socioeconomic Determinants—Income, Education, Housing

- Deeper understanding between the intersection of health and wealth
- The role of mass incarceration in health disparities in the United States
- As a society, where can we get better return on investment: education or plain wages increases?
- Understanding causality with relationship to the protective influence of education on health
- Role of educational interventions during K–12 on health disparities
- The effects of housing on *anything*

Racism, Segregation, and Immigration

- How does historic racism (structural and individual) affect population health?
- Effects of structural racism on health outcomes

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- How segregation produces health disparities
- Increased understanding of factors affecting health among immigrants and the variability of these factors across immigrant populations
- How does discrimination against immigrants affect physical and mental health?

Early Childhood and Family

- Increased understanding of childhood adverse childhood experiences and risk for mental and cardiovascular risk in adulthood
- Increased understanding of how to mitigate the effect of childhood trauma on morbid obesity in adult women
- Why do youth born into similar low social and economic circumstances have very different life outcomes?
- Does poor nutrition early in life have an irreversible effect on brain and neurodevelopment?
- What is the effect of depression in mothers on the healthy social and emotional development of their children?

Food and Obesity

- Evidence of multilevel determinants of obesity and diabetes
- Would reducing obesity reduce the number of older Americans with multiple chronic conditions and their health care costs?
- Does elimination of food and beverage marketing to children affect food preference?
- Seasonal fluctuations in food insecurity
- Causal link between healthy food access and high school graduation
- Relationship of the availability of healthy food and vegetables to lower socioeconomic neighborhoods to health status

Social and Psychological Factors

- Interaction between long-term environmental exposure (e.g., indoor air quality) and stress
- How does stigma (race/ethnicity, sexual orientation, socioeconomic status) affect health?
- How to reverse hopelessness in impoverished communities
- How does the experience of cultural isolation and depression affect health disparities in a population?
- Better understanding of the role of inequity in making people feel more and more impoverished even when absolute income and wealth are rising
- Increased understanding of the role of social cohesion in mental health conditions

Community, Neighborhood, and Contextual Factors

- How does geography affect population health apart from other variables such as income and education?
- The role of the built environment in urban areas in health and illness
- A stronger body of evidence around the contributions of neighborhood conditions to health, as opposed to individual or households attributes
- How does urban living contribute to the rise of type 2 diabetes?
- The role of community organizing in advancing health equity

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- What evidence exists regarding the effect of community health assessments and improvement plans and their effect on the needs and inequities experienced by subpopulations within communities?

Health Risk Behaviors

- How can behaviors be reinforced or changed when the individual is in a family or living setting that does not support change?
- How can employers effectively motivate employees in taking charge of their own health through exercise, better nutrition, and other habits?
- Aspects of behavioral economics most relevant to burden of health disease in a population
- How should public health and health care respond to e-cigarettes?
- What are the major drivers of the epidemic of opioid addiction in the United States?
- The epidemiology and causal models of the growing trend of substance abuse in all segments of communities

Communications and Public Opinion

- How to craft messages tailored to different cultural groups
- What particular element of population health motivates audiences with a range of political views the most regarding spending and policy action?
- Why are some groups opposed to family planning?
- Do changes in public opinion about public policy strategies affect policy action?
- Understanding how to overcome public misunderstanding of vaccines and vaccine research

Physiology and Genetics

- Effects of social conditions on gene expression and health
- Endocrine-disrupting chemicals and differential exposure

Health Care and Health Care Reform

- What are the potential negative consequences of reforming the health care delivery system?
- Increased understanding of barriers to prevention of disease and management of health
- How social determinants and clinical interventions interact to shape disparities in health
- Understanding how small primary care practices can achieve high levels of performance in a value-based context
- Increased understanding of what does and does not work in terms of wellness program lifestyle interventions
- How can payment for health care and social services be best integrated to improve patient outcomes?

Public Health Systems and Cross-Sector Collaboration

- What are the workforce skills and gaps needed for local health departments to effectively address population health?

- What are the best ways for local and state public health agencies to collaborate with such nongovernmental organizations as businesses, faith-based groups, and nonprofit organizations?
- How does the integration of health care, public health, behavioral health, housing, and human services lead to better outcomes in overall health and social well-being?
- Modeling the health and economic benefits of clinical medicine and public health integration
- Increased understanding of the use of similar metrics by health departments and health systems in measuring population health improvement

Other

- The role of climate change in producing or maintaining health disparities
- Calculation of health adjusted life expectancy
- What technologies are more adoptable by young people?

**EXAMPLE SURVEY RESULTS
RESEARCH AREA 2
INTERVENTIONS AND POLICY ACTION**

Effect of General Types of Interventions

- High-value policies and/or interventions that have been proven to reduce inequities
- What can employers do to reduce health inequities?
- How to reduce racism and other forms of social stigmatization in the larger culture
- How to shift wealth distribution to eliminate poverty
- The effect of economic and education policies on health in the short and long term
- Research aimed at improving school performance for inner-city youth
- How to increase purchasing demand for healthy foods in low-income communities
- How can behavioral economics be leveraged to foster uptake of efficacious, health-promoting and economically advantageous (to individuals) choices?

Effect of Specific Interventions

- What is the net effect on health of policies to increase physical activity, such as bicycle lanes and city bike programs?
- Which poverty reduction efforts actually work to reduce poverty and improve health?
- Effect of living wage laws
- Enforcement of housing codes: effects on childhood asthma and lead poisoning
- The effect of availability of affordable housing on public health
- Elements of wellness programs that actually have sustained impact on health status
- What is the effect of very low-cost but high-quality, high-speed broadband on health in a very low-income population?
- Interventions to increase the use of long-acting reversible contraceptives
- What are effective early interventions to address newly diagnosed mental illness?
- Effect of Medicaid expansion on health access for reentry population (criminal justice involved)

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- How can we increase medication adherence through community support?
- Policies to mitigate overprescription of opioid painkillers

Effect of Interventions Related to Obesity, Food, Nutrition, and Physical Activity

- The effect of a tax on sugar-sweetened beverages on obesity in different sociodemographic groups
- How to establish an incentive structure for government to use to attract markets to food deserts
- Use of built environment and health in all policies approaches to improve physical activity and reduce obesity
- How to use schools and other social institutions to help improve children's eating behavior
- Programming during the school day that increases physical activity among youth

Interventions for Specific Sociodemographic Groups and Populations

- How to tailor interventions to different cultural groups
- What interventions actually work to improve education for African Americans living in poverty?
- What sexual health education programs work best with Hispanic youth living in a border city?
- Further examination of the Hispanic paradox¹ and how that can be applied to other immigrant groups in supportive services
- Identifying effective approaches and models for engaging lower-income men in health promotion and disease prevention activities
- Identifying more effective ways for ethnic organizations to truly communicate and partner with mainstream organizations
- Public health organizations whose messaging and approach is not resonating with both ethnic community
- Best practices or evidence-based interventions to reach people in the beginning of a chronic condition

Communities, System-Level Interventions, and Cross-Sector Collaborations

- Do policy, system, and environment changes or interventions for various health issues (e.g., obesity, tobacco) at a community level result in improved health?
- What effect has the “health in all policies” approach had on health?
- Social and environmental interventions to promote health behavior (e.g., diet, physical activity, smoking)
- What are the best ways to build community connectedness?
- What are the best ways for local and state public health to collaborate with non-governmental organizations (NGOs)?
- What community health worker models (e.g., clinic based, NGO based, housing based) are most effective?

¹ The epidemiological finding that Hispanic and Latino Americans tend to have health outcomes that paradoxically are comparable to, or in some cases better than, those of their U.S. White counterparts, even though Hispanics have lower average income and education (Franzini, et al., 2001).

- How are hierarchical organizations best encouraged to engage in collaborative leadership with their local communities?

Cost-Effectiveness and Return on Investment Research

- What are the most cost-effective community change strategies?
- What is the cost-effectiveness of interventions involving efforts outside of the health care delivery system, and how generalizable are results from one initiative to another?
- Cost-effectiveness of school-based interventions
- Cost-effectiveness of workplace health interventions
- Cost-effectiveness of permanent supportive housing for chronically homeless persons
- Cost-effectiveness of integrating physical and mental health services

Evaluation Research Regarding Interventions That Involve Health Care and the Health Care System

- Effect of community navigators in the health care system
- What is the effect of an information system designed to e-prescribe community resources for self-care and disease management on health and economic vitality of a community?
- Effect of high-deductible plans on health inequities
- What are the best practices for getting hospitals to align their community benefit requirements within a community's population health plan?
- What is the effect on health outcomes from integrating behavioral health and general primary care?

Public Health Systems

- Meta-analysis of studies of other sectors (transportation, economic development, housing, etc.) to explore
- How is public health viewed?
- Determine strategies for strengthening partnership efforts.
- What are ways that local public health can be more effective partners with external partners?
- What are effective budgeting strategies to support a health in all policies approach?

EXAMPLE SURVEY RESULTS

RESEARCH AREA 3

HOW TO IMPROVE RESEARCH TRANSLATION AND ITS EFFECTS

Research Dissemination to Policy Makers, Clinicians, and Other Practitioners

- What approaches to adoption and spread of evidence-based practices are most successful?
- Effective ways to scale and replicate effective interventions that address social determinants
- How credible are models or modeling to governmental policy makers?
- Effectiveness of various methods to disseminate research evidence to policy makers

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- How is research that goes against conventional wisdom or strongly held assumptions best communicated to policy makers and their staff?
- What impactful policies addressing population health would have bipartisan support; what coalitions would need to be built?
- How can health system efforts on addressing social needs be made sustainable when there is so much else to do in health care?
- What elements of research are most useful to community advocacy efforts?

Public Communication, Media, and Increasing Awareness of Issues and Solutions

- What are the best communication strategies in describing population health to the public, policy makers, and payers?
- How do we best translate the effect of the social determinants of health on overall population health?
- What role—or how effective is—does the entertainment media play in bringing research messages to the general public?
- How to integrate health information into social media
- How can we tell the story of disadvantaged populations to policy makers and the general public in ways that would build empathy and political will to support the needed change?
- Most compelling language and messages to build buy-in for specific population health improvement approaches to audiences across a range of political viewpoints
- Best practices for communicating with the full spectrum of policy makers about health equity issues
- How do community-based organizations gain access to information systems and data that they can contribute and apply to demonstrate impact or to inform practice change?

How to Raise Awareness and Motivate Action

- How do all of us better distinguish between science and the values that may drive alternative responses to that science?
- How do you raise awareness about homelessness and inspire compassion and understanding?
- How can research findings be communicated more effectively in terms that get the attention of practitioners?

Identifying and Communicating Best Practices

- Best practice for providing health care to returning incarcerated persons
- Model policies for school districts on sexual health education
- Best practices for youth engagement, especially youth of color so they can become the leaders of tomorrow
- Best practices or synthesis of evidence about employer-based wellness initiatives
- Best practices for reducing impact of treatment cascade for HIV/AIDS

Research Funding and Priority Setting

- Best practices for getting funders to discontinue interventions or programs that research demonstrates are not effective
- Effective and acceptable means for transferring funding to prevention activities

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- How does policy and translation of research factor into health policy research?
- What would be the effect of policy requiring recipients of grants and philanthropy to receive sufficient funding for information system infrastructure, including hardware, software, and high-speed Internet access?
- Funding for multisector collaborative studies

Research Methods and Approaches

- Can we establish better low-cost longitudinal studies to really measure policy and program effect?
- How do we make research results actionable?
- Alternatives to institutional review boards for public health investigations or evaluations that are not considered research
- Identifying how best to use data to inform local and state health policy making
- Best practices for displaying information

Academic Challenges to Research Translation

- How can academics engage in translational research when those activities are inconsistent with tenure and promotion?
- How to incentivize universities to better encourage knowledge exchange
- How to incentivize implementation of evidence-based practices while also balancing the need for innovation
- How to raise the profile of “grey literature,” which is significantly more accessible than peer-reviewed literature—and likely more relevant

Evidence-Based Medicine

- What are the root causes of community variations in the use of evidence-based medicine?
- How to create meaningful continuity of care in primary care when physicians are reluctant to take on the responsibility
- Definition and rationale for primary prevention strategies as integrated into new payment reform systems
- Communicating changes in guidelines for clinical preventive services to increase uptake of the guidelines by health care providers
- Does the makeup of the board deciding on how to use hospital community benefits affect the types of uses of community benefits?

Prepared by Paula Lantz, Ph.D., Professor and Associate Dean, Ford School of Public Policy, University of Michigan.

Appendix E

Speaker Biographies

Maya Brennan is Vice President, Housing, of the Urban Land Institute's Terwilliger Center for Housing. Ms. Brennan joined ULI in 2014 and leads the center's research efforts, including the dissemination of interdisciplinary research through the How Housing Matters portal. Ms. Brennan joined ULI from the National Housing Conference's Center for Housing Policy, where for 7 years she wrote and spoke extensively about affordable housing issues, including how developers and policy makers can use housing to improve outcomes in education, health, aging, and economic self-sufficiency. Maya has authored or co-authored numerous publications, including *Veterans Permanent Supportive Housing: Policy and Practice*; *Comparing the Costs of New Construction and Acquisition-Rehab in Affordable Multifamily Rental Housing*; *The Impacts of Affordable Housing on Education*; and *Strengthening Economic Self-Sufficiency Programs: How Housing Authorities Can Use Behavioral and Cognitive Science to Improve Programs*. Ms. Brennan holds a master's of science in urban policy analysis and management from the Milano Graduate School at the New School in New York. She earned a Bachelor of Arts degree in liberal arts from St. John's College in Santa Fe, New Mexico.

Linda Elam, Ph.D., M.P.H., serves as the Deputy Assistant Secretary directing the office of Disability, Aging, and Long-Term Care Policy (DALTCP) within the Office of the Assistant Secretary for Planning and Evaluation (ASPE) at the U.S. Department of Health and Human Services (HHS). DALTCP provides leadership on HHS policies that support the independence, health, and productivity of elderly individuals and people with disabilities, including issues related to integrated care, rehabilitative services, mental health parity, postacute and long-term care, employment of people with disabilities, and the direct care workforce. The Office is home to and supports the congressionally established National Advisory Council on Alzheimer's Research, Care, and Services. Prior to joining ASPE, Dr. Elam was Senior Deputy Director and State Medicaid Director at the District of Columbia's Department of Health Care Finance (DHCF). During her time at DHCF, Dr. Elam had key responsibility for implementing critical programmatic changes related to the Affordable Care Act, including Medicaid expansion and the initial work that established the District's health benefits exchange. In addition, she spearheaded Medicaid long-term care reform activities designed to both right-size the program and improve the quality of benefits delivered to eligible residents. Before she began government service, Dr. Elam was a Principal Policy Analyst with the Henry J. Kaiser Family Foundation, where her areas of focus included Medicaid, prescription drug policy, racial and ethnic disparities in health

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care, and mental health. Dr. Elam received her B.S. in zoology with honors from Howard University, her M.P.H. in Health Policy and Administration from the University of California, Berkeley, and her Ph.D. in Health Policy and Management from the Bloomberg School of Public Health, Johns Hopkins University.

LaMar Hasbrouck, M.D., M.P.H., is a graduate of the University of California, Berkeley's School of Public Health, University of California, Los Angeles School of Medicine (Charles R. Drew-UCLA Program), and the New York-Presbyterian Hospital's Internal Medicine Residency Program. Dr. Hasbrouck is currently the executive director of the National Association of County and City Health Officials (NACCHO), the national nonprofit organization that represents the country's nearly 2,800 local health departments. As the executive director, Hasbrouck leads the association's mission to be a leader, partner, catalyst, and voice for local health departments to ensure the conditions that promote health and equity, combat disease, and improve the quality and length of all lives. Prior to joining NACCHO, Dr. Hasbrouck was the director of the Illinois Department of Public Health. Among Hasbrouck's achievements as director, he developed a 5-year strategy, implemented various aspects of the Affordable Care Act, applied for national accreditation by the Public Health Accreditation Board, and built successful partnerships to pass a state cigarette tax increase. Dr. Hasbrouck also led the development of the statewide blueprints for health workforce expansion and population health–health care integration, two key initiatives of the Governor's Office for Health Innovation and Transformation. Prior to his appointment as the “Top Doc” for Illinois, Dr. Hasbrouck was Public Health Director of Ulster County, and the only county official in New York State to simultaneously lead both the public health and mental health departments. Before that, he spent 11 years with the Centers for Disease Control and Prevention (CDC), the nation's premier public health agency, where his impressive record of service included coauthoring the first *Surgeon General's Report on Youth Violence* (2001) and the active engagement in two of the largest global health initiatives in history: polio eradication with the World Health Organization and the U.S. President's Emergency Plan for AIDS Relief (PEPFAR), where he served in a diplomatic assignment as the CDC Director in Guyana, South America. Formerly, Dr. Hasbrouck served on faculties of medicine and public health at Emory University, Morehouse College, New York Medical College, and the University of Illinois in Chicago. He is a diplomat with the American Board of Internal Medicine, a former Epidemic Intelligence Service (EIS) Officer at the CDC, and primary care health policy fellow at the U.S. Department of Health and Human Services, Health Resources and Services Administration (HRSA). He has received numerous awards for his governmental and nongovernmental work. His knack for making health make sense has made him a much sought after speaker and change agent for healthy living.

David Holtgrave, Ph.D., is Professor and Chair of the Department of Health, Behavior, and Society at the Johns Hopkins Bloomberg School of Public Health. He also codirects the Center for Implementation Research, and is the Interim Director of the Lerner Center for Public Health Promotion. Dr. Holtgrave's research has focused on the effectiveness and cost-effectiveness of a variety of HIV prevention and care interventions (including the provision of housing as a structural HIV/AIDS intervention), and the relationship of the findings of these studies to HIV prevention policy making. He has served on an Institute of Medicine panel charged with recommending methods to improve the public financing and delivery of HIV care in the United States. He has also previously served as the Director of the Division of HIV/AIDS Prevention—

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Intervention Research and Support at the Centers for Disease Control and Prevention (CDC). In addition, Dr. Holtgrave has investigated the relationship between social capital measures, infectious disease rates, and risk behavior prevalence. He has worked extensively on HIV prevention community planning, and has served as a member of the Wisconsin HIV Prevention Community Planning group. He is currently a member and Vice-Chair of the Presidential Advisory Council on HIV/AIDS (PACHA). Dr. Holtgrave received his Ph.D. from the University of Illinois in 1988.

Nancy Krieger, Ph.D., is Professor of Social Epidemiology, Department of Social and Behavioral Sciences, at the Harvard T.H. Chan School of Public Health, and is Director of the Harvard School of Public Health Interdisciplinary Concentration on Women, Gender, and Health. She has been a member of the School's faculty since 1995. Dr. Krieger is an internationally recognized social epidemiologist (Ph.D., Epidemiology, University of California, Berkeley, 1989), with a background in biochemistry, philosophy of science, and history of public health, plus more than 30 years of activism involving social justice, science, and health. In 2004, she became an ISI highly cited scientist, a group comprising "less than one-half of 1 percent of all publishing researchers." In 2013, she received the Wade Hampton Frost Award from the Epidemiology Section of the American Public Health Association, and in 2015, she was awarded the American Cancer Society Clinical Research Professorship. Dr. Krieger's work addresses three topics: (1) conceptual frameworks to understand, analyze, and improve the people's health, including the ecosocial theory of disease distribution she first proposed in 1994 and its focus on embodiment and equity; (2) etiologic research on societal determinants of population health and health inequities; and (3) methodologic research on improving monitoring of health inequities. In April 2011, Dr. Krieger's book, *Epidemiology and the People's Health: Theory and Context*, was published by Oxford University Press. This book presents the argument for why epidemiologic theory matters. Tracing the history and contours of diverse epidemiologic theories of disease distribution from ancient societies on through the development of—and debates within—contemporary epidemiology worldwide, it considers their implications for improving population health and promoting health equity. She is editor of *Embodying Inequality: Epidemiologic Perspectives* (Baywood Press, 2004) and coeditor, with Glen Margo, of *AIDS: The Politics of Survival* (Baywood Publishers, 1994), and, with Elizabeth Fee, of *Women's Health, Politics, and Power: Essays on Sex/Gender, Medicine, and Public Health* (Baywood Publishers, 1994). In 1994 she co-founded, and still chairs, the Spirit of 1848 Caucus of the American Public Health Association, which is concerned with the links between social justice and public health.

Jenelle Krishnamoorthy, Ph.D., is the Executive Director for U.S. Policy and Government Relations at Merck and is trained as a licensed clinical psychologist. Prior to joining Merck in January 2015, Dr. Krishnamoorthy was the Health Policy Director for the Health, Education, Labor and Pensions (HELP) Committee in the United States Senate for Chairman Harkin. Dr. Krishnamoorthy first joined Chairman Harkin's team as an American Association for the Advancement of Science (AAAS) Fellow in 2003 and 2004. During 2004 and 2005 Dr. Krishnamoorthy worked at the U.S. State Department in the Bureau of South Asian Affairs on health, science, technology, and environment issues with India on an AAAS Diplomacy Fellowship. Dr. Krishnamoorthy rejoined the Harkin office in January 2006 as the Senator's lead health staffer and has been responsible for the HELP committee's legislative agenda on health

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reform, public health and prevention, Substance Abuse and Mental Health Services Administration and mental health issues, Food and Drug Administration issues, National Institutes of Health/Centers for Disease Control and Prevention research, workforce issues, and all programs at agencies within the U.S. Department of Health and Human Services. Early in her career, Dr. Krishnamoorthy completed her pediatric clinical psychology internship and postdoctoral fellowship at Brown Medical School where she conducted research in the areas of childhood obesity and tobacco issues. Dr. Krishnamoorthy received her B.S. from Randolph-Macon College, M.S. from the University of Tennessee, and her Ph.D. from Virginia Commonwealth University.

Paula Lantz, Ph.D., is the Associate Dean for Research and Policy Engagement and a professor of public policy at the Ford School. She most recently was professor and 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 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 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 received an M.A. in sociology from Washington University, St. Louis, and an M.S. in epidemiology and Ph.D. in sociology from the University of Wisconsin.

Phyllis D. Meadows, Ph.D., R.N., M.S.N., is a Senior Fellow in the Health Program and engages in all levels of grant-making activity. Since joining The Kresge Foundation in 2009, she has advised the health team on the development of its overall strategic direction and provided leadership in the design and implementation of grant-making initiatives and projects. Dr. Meadows also has coached team members and created linkages to national organizations and experts in the health field. In addition, she regularly reviews grant proposals, aids prospective grantees in preparing funding requests, and provides health-related expertise. Dr. Meadows' 30-year career spans the nursing, public health, academic, and philanthropic sectors. She is associate dean for practice at the University of Michigan's School of Public Health and has lectured at Wayne State University's School of Nursing, Oakland University's School of Nursing, and Marygrove College. From 2004 to 2009, Dr. Meadows served as deputy director, director, and public health officer at the Detroit Department of Health and Wellness Promotion. In the early 1990s, she traveled abroad as a Kellogg International Leadership Fellow and subsequently joined the W.K. Kellogg Foundation as a program director. She also served as director of nursing for The Medical Team—Michigan.

Brendan Nyhan, Ph.D., is Assistant Professor in the Department of Government at Dartmouth College. His research, which focuses on political scandal and misperceptions about politics and health care, has been published or is forthcoming in journals including the *American Journal of Political Science*, *British Journal of Political Science*, *Political Analysis*, *Political Behavior*, *Political Psychology*, *Pediatrics*, *Medical Care*, *Vaccine*, *Journal of Adolescent Health*, and *Social Networks*. He is a contributor to “The Upshot” at *The New York Times* (March 2014–),

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and previously served as a media critic for the *Columbia Journalism Review* (November 2011–February 2014). He also blogs at www.brendan-nyhan.com and tweets at @BrendanNyhan. Previously, he was a marketing and fundraising consultant for Benetech, a Silicon Valley technology nonprofit, and Deputy Communications Director of the Bernstein for U.S. Senate campaign in Nevada. He received his Ph.D. from the Department of Political Science at Duke University in 2009 and served as a RWJ Scholar in Health Policy Research at the University of Michigan from 2009 to 2011.

Ron Pollack is the Founding Executive Director of Families USA, the national organization for health care consumers. Families USA's mission is to achieve high-quality, affordable health coverage for everyone in the United States. Mr. Pollack's work has been recognized through various honors. *The Hill*, a weekly newspaper covering Congress and their staffs, named Mr. Pollack one of the nine top nonprofit lobbyists. *Modern Healthcare* named Mr. Pollack 1 of the 100 Most Powerful People in Health Care. *National Journal* named him 1 of the top 25 players in Congress, the Administration, and the lobbying community on Medicare prescription drug benefits. Mr. Pollack is the Founding Board Chairman of Enroll America, an organization composed of very diverse stakeholders working together to secure optimal enrollment of uninsured people through effective implementation of the Affordable Care Act. In 1997, Mr. Pollack was appointed by President Clinton as the sole consumer representative on the Presidential Advisory Commission on Consumer Protection and Quality in the Health Care Industry. In that capacity, Mr. Pollack helped prepare the Patients' Bill of Rights that has been enacted by many state legislatures. Prior to his current position at Families USA, Mr. Pollack was the Dean of the Antioch School of Law. Mr. Pollack was also the Founding Executive Director of the Food Research and Action Center (FRAC), a leading national organization focused on eliminating hunger in the United States. Two of his notable accomplishment at FRAC include: (1) arguing two successful cases on the same day in the U.S. Supreme Court to secure food aid for low-income Americans; and (2) the successful federal litigation that resulted in the creation of the WIC program for malnourished mothers and infants. Mr. Pollack received his law degree from New York University where he was an Arthur Garfield Hays Civil Liberties Fellow.

Lisa Simpson, M.D., B.Ch., M.P.H., FAAP, is the president and chief executive officer of AcademyHealth. A nationally recognized health policy researcher and pediatrician, she is a passionate advocate for the translation of research into policy and practice. Her research focuses on improving the performance of the health care system and includes studies of the quality and safety of care, health and health care disparities, and the health policy and system response to childhood obesity. Dr. Simpson has published over 80 articles and commentaries in peer-reviewed journals. Before joining AcademyHealth, Dr. Simpson was director of the Child Policy Research Center at Cincinnati Children's Hospital Medical Center and professor of pediatrics in the Department of Pediatrics, University of Cincinnati. She served as the Deputy Director of the Agency for Healthcare Research and Quality from 1996 to 2002. Dr. Simpson serves on the Robert Wood Johnson Clinical Scholars Program National Advisory Council, and the editorial boards for the *Journal of Comparative Effectiveness Research* and *Frontiers in Public Health Systems and Services Research*. In October 2013, Dr. Simpson was elected to the Institute of Medicine. Dr. Simpson earned her undergraduate and medical degrees at Trinity College (Dublin, Ireland), a master's in public health at the University of Hawaii, and completed a postdoctoral fellowship in health services research and health policy at the University of

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California, San Francisco. She was awarded an honorary Doctor of Science degree by the Georgetown University School of Nursing and Health Studies in 2013.

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