



AcademyHealth

How Evidence Drives Policy Change:

A Study of Return on Investment in Public
Health and Multi-Sector Collaborations

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Executive Summary

Investment in public health has traditionally been justified as a public good, with initiatives designed to protect health or improve health outcomes at the individual and community levels. More recently, given the constraints associated with limited resources, there are additional pressures to justify spending based on economic returns on investment. A recent AcademyHealth study reviewed the data and methods used to generate evidence about the return on investment (ROI) for public health; it confirmed that higher total public health spending is associated with better health outcomes (McCullough, 2018). In some cases, the returns to society from public health interventions were found to be greater than the initial financial investments, as measured by cost savings for treatment of disease; reduced disease burden for the public; a healthier and more productive local workforce; and other indicators of community health.

Beyond McCullough's work on direct public health spending and activities, health advocates have increasingly focused on the role of broader actors (including health care institutions, businesses, and other sectors) in addressing health systems issues, as well as underlying social and economic determinants of health. Engaging these partners requires a stronger business case for investments in health-related initiatives, with accompanying demand for a more robust and targeted evidence base on ROI. McCullough noted that there is a limited understanding of the ways in which multi-sector spending affects health outcomes; further, the evidence documenting the capture of returns on investment (across distinct sectors) is limited.

This study assesses the extent to which ROI evidence is used to inform or support policymaking that has implications for public health, with a particular emphasis on multi-sector approaches. The study also identifies opportunities to strengthen the production and use of such evidence.

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To conduct the study, we searched peer-reviewed and gray literature to find examples of cross-sector collaboration in which (1) public agencies were involved and (2) ROI evidence was generated and used for making, justifying, and evaluating value-based spending decisions. We also interviewed 11 experts in public health management, safety net hospitals, public health services and systems research, policy research, community health, multi-sector collaboration around social determinants of health (SDoH), and evidence-based decision-making. During these interviews, we asked informants to identify barriers, challenges, and examples of successes in the use of ROI evidence to make policy decisions.

We most commonly found strong examples of influential ROI evidence use documented in the gray (rather than peer-reviewed) literature. The clearest and most compelling examples of ROI use were documented by organizations for which economic considerations are critical, and in which leaders are empowered to make evidence-based decisions - such as Accountable Care Organizations. However, we found that though ROI was an *element* in a number of published works, there does not yet exist a comprehensive or cohesive body of work that demonstrates the role of ROI evidence as a *dominant* factor in public health-related decision-making.

Our review helped identify limitations of existing research methods as well as challenges to applying ROI research in practice. Such challenges include disconnects in the level of relevance and applicability of research, and limitations of many organizations and officials to act on even compelling evidence of ROI. We identified steps that might promote the use of ROI-related evidence in the future by: (1) more clearly linking research to the needs of real-world decision-makers; (2) improving access to research results (including unpublished work); and (3) building the analytic capacity of users/consumers of such evidence via improved translation of research.

Background

Public investment in public health has traditionally been justified as a public good, and policy initiatives designed to protect health or improve health outcomes typically are implemented at the community level. Broadly speaking, investments in health come from multiple public and private sources, and may be justified on both health and economic grounds. In 2002, for example, an Institute of Medicine (IOM) committee on the future of the public's health in the 21st century expressed the national vision of “healthy people in healthy communities.” This multi-stakeholder enterprise included governmental public health along with partners such as the health care delivery system, employers, academia, business and industry, and community leaders (Institute of Medicine, 2002; HealthyPeople 2020, 2018).

Ten years later, another IOM committee asserted that “population-based prevention efforts can improve Americans' health more efficiently than clinical care alone,” and that excessive US spending on clinical care “overshadows” the important population-based interventions that render greater health impact at a lower cost (IOM, 2012). By that time, it was becoming clear that the US was spending far more on health care than any other nation. However, the overall health of the US population lagged behind that of many other countries – based on several key indicators (e.g. lower life expectancy, higher chronic disease burden, higher infant mortality rates, and higher maternal mortality rates) (Kaiser Family Foundation, 2018; Martin & Montagne 2017).

Elizabeth Bradley and her team of researchers reported that the Organisation for Economic Cooperation and Development (OECD) countries with better population health status also were investing a higher proportion of public funds in social and environmental services (such as food security programs, housing, and transportation) (Bradley et al., 2011). After these findings captured the attention of the mainstream US media, the levels of interest and investments in social and environmental determinants of health in the US began to increase significantly. The Bradley team observed similar spending patterns in the US when they focused on Medicare and Medicaid data. States with a higher ratio of social to health spending had better outcomes for adult obesity, asthma, and several other health indicators (Bradley, Canavan, Rogan et al., 2016).

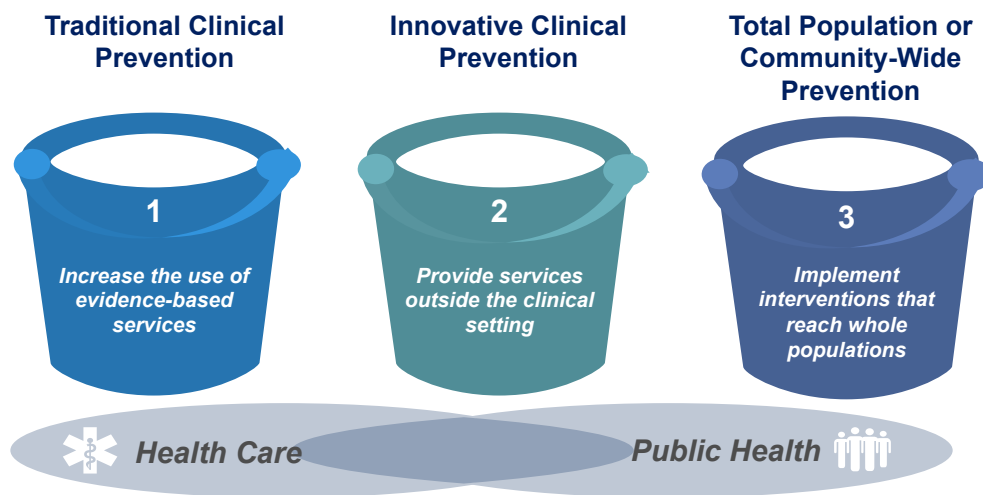
Published work on the impact of US public health spending was recently captured and reviewed in a July 2018 AcademyHealth paper by J. Mac McCullough, entitled “The Return on Investment of Public Health System Spending.” The author, a health economist, reviewed the strengths and limitations of data and methods used to generate evidence on the relationship between public health spending and measurable health outcomes – as well as the financial impacts of those investments. He concluded that higher total public

health spending was associated with better health outcomes; he further found that, in some instances, there was a positive economic return on investment (McCullough, 2018).

McCullough defined return on investment (ROI) as the “net financial gains from an investment divided by the cost of the investment,” and he noted that specific public health programs and settings show variations in ROI (McCullough, 2018). Beyond the traditional public health players noted in McCullough's work on direct public health spending, health advocates have increasingly focused on the role of health care institutions, businesses, and other sectors in addressing health systems issues – as well as the underlying social and economic determinants of health. Partners from these other sectors may require more robust evidence on ROI to make the “business case” for investments or involvement in health-related initiatives. Notably, McCullough concluded that there is a limited general understanding of the ways in which multi-sector spending affects health outcomes. The evidence documenting ways that investment returns are captured by different sectors is similarly limited.

Auerbach's *Three Buckets of Prevention* framework illustrates the broader view of public health, which more fully acknowledges the diverse decision-makers critical to improving health outcomes (Auerbach, 2016). Auerbach's work captures the aspirations of public health officials, who seek to use evidence of *value* for encouraging partners and other stakeholders to engage in health system transformation – through collaborative interventions at multiple points of entry. As Auerbach illustrates (**Figure 1**), opportunities for improvement and innovation exist in traditional clinical care settings, population-level public health initiatives, and partnerships operating at the intersection of the two. Auerbach concludes that “public health practitioners should have at their fingertips specific, evidence-based, prevention-related proposals that fit multiple settings – from the doctor's office to the insurer's conference room to the neighborhood meeting to the state house.”

In an effort to build on McCullough's work, and to newly account for broader aspects of public health investments and cross-sector efforts, the purpose of this project was to assess the extent to which ROI evidence is used to inform decision-making about initiatives that are intended to improve the public's health. Our work specifically emphasizes emerging multi-sector approaches to collaboration, and we identify opportunities to strengthen the production and use of ROI evidence. Drawing on key informant interviews and gray / peer-reviewed literature, we seek to provide researchers, policymakers and other public health stakeholders with actionable insights for improving the relevance and accessibility of ROI evidence to inform decision-making.

Figure 1: 3-Bucket Continuum of Prevention Moves from Clinical Care to Community-Wide Settings

Source: Auerbach, 2016.

Why Focus on Value in Public Health?

Our development and conduct of this study was motivated by five major trends in public health practice, analytics, and spending.

First, competition for resources is growing at all levels. State and local public health budgets declined significantly during the 2008/9 recession and have not been restored to pre-recession levels. Overall public spending for governmental public health systems is unstable from year to year; public health spending remains vulnerable in an era of federal budget deficits and partisan divisions, as questions regarding the role of government in health care and public health arise (Leider et al., 2018; IOM/NAM, 2012; Himmelstein & Woolhandler, 2016).

Advocates feel pressure to bolster traditional arguments about the public interest, with “proof” that spending has a positive economic impact – or ROI. Similarly, proponents for investments in public health seek to broaden the range of engaged stakeholders by demonstrating value to specific sectors and decision-makers. For example, in justifying budgets for governmental public health systems, experts regularly seek to demonstrate budget neutrality or savings resulting from spending (Hsuan & Rodriguez, 2014; Leider et al., 2014). Economic impact can be evaluated in terms of greater productivity, increased economic growth, and bottom line returns to businesses and treasuries. By taking this approach, public health stakeholders can enlist non-traditional allies (e.g. community business leaders) who are motivated both by their self-interest and their commitments to the broader community.

Second, new data sources are available and new analytic approaches are being adopted. The fields of health services research (HSR) and public health systems and services research (PHSSR) have supported development of new analytics approaches that

leverage increased access to new sources of health data via electronic health records (EHRs) and registries. Concurrently, there is an increased interest in data sharing across agencies, organizations, and sectors. Decision-makers now have the opportunity to draw on a more robust evidence base, to inform advocacy and prioritization of services and interventions. The use of value measures, which account for tangible and intangible benefits, supports advocacy for investments (in cases where budgets are justified based on the magnitude of returns). For example, childhood vaccines return \$10 for every \$1 spent, and reducing bloodstream infections saves \$3.3 billion annually – accounting for averted productivity losses (CDC, no date). As the evidence base expands, comparisons across programs and interventions can play an increasing role in supporting and informing budgetary decision-making (CDC, no date).

Third, recent efforts to redefine the role of public health have emphasized the importance of public health engagement in cross-sector partnerships at local, regional, state, and national levels (e.g. DeSalvo et al, 2016; BUILD Health Challenge, no date). These new approaches to integrate and align cross-sector efforts involve direct partnerships between public health agencies and sectors such as transportation, housing, education, health care and others that address social and economic factors affecting health. Beyond simply expanding the support for public health budgets, in these cross-sector partnership models, public health officials seek to encourage players from other sectors to invest their own resources. To do this, and ultimately to be successful in motivating and sustaining partnerships, public health officials increasingly have to present potential collaborators with convincing arguments – demonstrating that investments are of mutual economic and community benefit. These arguments may be presented in the form of a “business case” or a “relative value proposition” that lever-

ages evidence of financial ROI or other benefits, to articulate the advantages of cross-sector collaboration. Value propositions most successful in motivating and sustaining partnerships are intentionally tailored to highlight the different types of benefits that apply most directly to different sectors or stakeholder types.

Fourth, there is an increasing interest in and understanding of the value of non-clinical interventions that improve health, and that can potentially lower health care costs. A basic tenet of public health is that a large proportion of our total health spending is directed towards costly “downstream” treatment options that are provided by health care delivery systems. Simultaneously, there is a lack of investment in “upstream” efforts, which address root causes of disparities and health inequities and ultimately serve to prevent disease. These primary prevention efforts often address the non-clinical health needs of patients and communities; mitigate the negative impacts of social and economic health factors such as parental unemployment or substandard housing; or reinforce broad public health systems designed to protect communities against threats such as disease outbreaks, environmental hazards, or man-made and natural disasters.

Simultaneously, payment reform efforts and the shifting of financial incentives within health care systems (e.g. community benefit reporting, penalties for unnecessary hospital readmissions) have motivated searches for evidence of effective investments that generate greater value for health care systems and their surrounding communities, such as safer streets or access to healthier nutrition for area residents. There is an ever-increasing array of health plans that bear financial risk – for example: Accountable Care Organizations, Medicare Advantage Plans (Gottlieb, Wing & Adler, 2017), and Medicaid Managed Care providers. Compared with traditional fee-for-service providers, these new entities are more likely to look for evidence of the ROI for different models for care coordination, and for means of addressing gaps in social needs (such as transportation, unhealthy housing, and other non-clinical needs that can affect patients’ health).

Fifth, a growing body of evidence on ROI is helping to accelerate the emergence of new financing instruments for public health-related investments, such as social impact bonds (Ragin & Palandjian, 2013; Levi & DeSalvo, 2017). These new instruments can generate up-front investment capital for important public investments, but they require evidence of predictable returns to funders and other stakeholders. For example, socially conscious investing by charitable foundations is often predicated on provision of evidence that anticipates financial returns – helping to ensure

that funders maintain the health of their endowments. As such, securing up-front capital from private investors often requires providing demonstrable evidence that anticipates the future returns an investor can expect to capture. More traditional public sector “pay for success” contracts provide for payment to private vendors if they achieve specific outcomes. Federal Reserve Banks in Boston, San Francisco, and other locations have used another form of social investing by funding “anchor institutions” (often medical centers or universities, referred to as “eds and meds”) that can bolster communities by supporting locally owned for-profit businesses and non-profit organizations – particularly those launched by women and people of color (Clarke, 2017).

Goals of the Project

We undertook this study to contribute to the understanding and advancement of the use of ROI-related evidence, to support decision-making that affects the public’s health. Our research goals were to:

1. Assess the extent to which ROI-related evidence is currently a documented factor in decision-making in the public health sector;
2. Identify the extent to which ROI-related evidence is a factor in emerging multi-sector partnerships to improve the public’s health; and
3. Understand barriers and limitations that inhibit greater use of such evidence.

Our Approach

We undertook three inter-related streams of work:

1. **Peer-reviewed literature review:** We conducted a semi-systematic review of peer-reviewed literature, published in journals and other publications that focus on public and population health, health services research, and public health systems and services research.
2. **“Gray literature” review:** We conducted a review of online “gray literature” (e.g. online programmatic information, annual reports) that describes current, ongoing programmatic efforts to address social determinants of health (SDoH) and promote positive population health outcomes. We reviewed these sources because we recognized from earlier efforts (Edmunds, Johnson & Kang, 2018; Brodt, Kang & Rein, 2017) that much work in this area does not make its way into the body of refereed literature. For example, work in the public sector may be limited by a lack of resources, analytic expertise, or incentives to widely or visibly disseminate findings. In the private sector, such information may be viewed as proprietary and confidential.

In searching peer-reviewed and gray literature, we looked for patterns across cross-sector collaborations that involved public health agencies. We also looked for cases in which ROI evidence was generated and used for making, justifying, and evaluating value-based spending decisions. Through this effort, we sought to find real-world examples of evidence-based decision-making regarding public investments, primarily at state and local levels, that resulted in policy changes – as well as relevant policy decisions made by private entities and/or partnerships.

3. **Expert interviews:** We conducted key informant interviews, with subject matter experts (SMEs) who have had public and private sector experience in population health and evidence-based decision-making. These experts helped us to source additional literature and other cases, and to identify factors that limit or enable use of ROI in health-related decision-making.

Sources of Information

To better understand the range of relevant available evidence, and its relationship to the policymaking landscape, we conducted a scan of selected peer-reviewed literature. We developed the search string and strategy, and the inclusion and exclusion criteria, in a responsive and collaborative fashion. This process was guided by iterative feedback provided to the authors, by partner SMEs and other key informants. Additional information can be found in **Appendices A-C**.

Peer-Reviewed Literature

We identified peer-reviewed literature published between 2008 and 2018, using a Boolean search of the PubMed database. We also manually searched the archives of notable journals such as *Health Affairs*, and *Health Politics, Policy and Law* – in order to capture other potentially relevant or recently-published articles (or those suggested by key informants) that may have been missed by our structured search.

These searches produced 309 total articles. A select group of 22 peer-reviewed articles recommended by SMEs and key informants (including articles selected from the *Health Policy Journal* archives, and chronicled in PubMed), was also reviewed. This served to supplement the resources pulled from our semi-systematic search – helping to augment our search efforts, and to ensure that we captured high-value literature.

Once we removed duplicate articles, 287 total articles were confirmed for review. Of these, we excluded 95 articles because they presented research efforts or analyses not specific to the US; we excluded 52 articles for which full-text access was not available. During the screening and review processes, an additional 102 articles were excluded based on their presentation of normative or commentary-oriented findings – which did not align with the parameters or objectives articulated for our search.

Ultimately, a total of 38 peer-reviewed articles underwent full-text screening. Data abstraction involved reviewing each article, and determining its alignment with key priority coding categories related to research features (e.g. publication type, funder type); content (e.g. articulated study aims, studied priority populations, engaged stakeholder groups, prioritized sectors and thematic areas); analysis (e.g. analysis methods, stated limitations); and results (e.g. measured outcomes, policy implications, research findings). Additional details regarding the peer-reviewed literature scan search string and strategy are documented in **Appendix A**.

Gray Literature

Building on our previous multi-sector analytic work, we began our search with a portfolio analysis of SDoH programs supported by the Robert Wood Johnson Foundation, the W. K. Kellogg Foundation, the Kresge Foundation, and the de Beaumont Foundation. We also included the Centers for Disease Control and Prevention, PolicyLink, and other sources suggested by colleagues and key informants. Ultimately, 79 resources served as the basis for our scan. The exclusion criteria and data abstraction processes were similar to those for the peer-reviewed search, but slight changes were made to the definitions for coded categories – based on stylistic and content differences between peer-reviewed and gray literature sources. Additional details regarding the gray literature scan sources and strategy are documented in **Appendix B**.

Expert Interviews

Recognizing that valuable content was most likely to emerge from substantive discussions with real-world public health practitioners and policy decision-makers, we decided early on to supplement our findings from the literature scans with insights from selected key informants. We interviewed 11 experts representing multiple sectors (e.g., payers, providers, public health) who were identified using convenience and snowball sampling methods.

We specifically inquired about experts' views regarding (1) priority areas for future research on health-related ROI, and (2) their perceptions of the importance of ROI assessment in the field of public health. In particular, we explored the extent to which members of the public health community have embraced ROI assessment in their own work or in advocating with others – as well as the barriers to widespread and visible use of ROI evidence. The full list of interview questions can be reviewed in **Appendix C**.

These experts helped to (1) inform the search string and strategy; (2) introduce additional resources or contacts to account for; (3) contribute to research findings; (4) shape the interpretation of results; (5) inform our thinking about the implications of, and next steps for, this work; and (6) in some instances, review the draft manuscript.

Analysis

In order to validate the proposed data abstraction process, we completed a pilot coding activity. Each reviewer completed data abstraction for two to five resources. Collectively, the team made decisions regarding the coding categories (and associated definitions), and whether they needed to be refined – in order to more fully and accurately capture findings and themes emergent in the literature.

Limitations

We made every attempt to be systematic and thorough; however, we are aware of some limitations to our approach. We recognize that the emerging area of cross-sector collaboration does not have a single, universal set of terminology. Terms such as “return on investment,” “public health,” and “evidence-based policy making” are defined differently (and have different connotations), from the perspectives of diverse stakeholders. Further, different sectors use different metrics to measure success – and they use different channels to disseminate their findings. We iteratively refined our search strategies, as the study went on, to capture as many potentially relevant information sources as possible. However, we acknowledge that the search was not exhaustive. Notably, we reviewed only a subset of project materials from each of the key funder portfolios surveyed for in the gray literature. Future research activities might explore these portfolios in greater detail, and could involve reviewing the comprehensive bodies of work supported by each funder.

Very few of the reviewed resources provided any documentation of the policy or programmatic decision-making processes; even fewer discussed the extent to which ROI evidence was directly, or indirectly, used to inform these processes. Thus, we relied on the expert interviews to help provide insights into those activities – which were central for our exploration of the defined research questions, but not widely available to the public. Due to constraints of time and resources, we were not able to conduct as many expert interviews as we might have done to ensure coverage of all the sectors included in our scan.

Thus, our semi-systematic approach offered the flexibility to leverage multiple resources and incorporate multiple perspectives; however, we believe much more work needs to be done to further our understanding of how to assess and demonstrate the impact of multi-sector collaborative efforts to measure and demonstrate impact. In the Discussion section, we propose some questions that may guide further inquiry in this area.

Findings

Here, we summarize the coded research elements and article features used to guide data abstraction for the literature scan, and to organize information gleaned from key informant interviews.

Peer-Reviewed Literature

After de-duplication, and application of our inclusion and exclusion criteria, a total of 38 peer-reviewed sources were selected for full-text review and data abstraction. These included journal articles (n=11), reports (n=11), and evaluation studies (n=6) and other types of resources. Highlighted examples from the review can be found in **Table 1**.

Funding Amounts. None of the sourced literature reported on the funding levels provided to support the work; however, several sources reported a specific identification number with which it might be possible to determine the amount awarded for a particular grant. Approximately half of the studies were supported, at least in part, by funding from philanthropic foundations (n=20). Notably, many of these same foundations supported work reviewed as part of the gray literature search. Research articles cited financial support from government and public entities (n=14), most of which constituted either the Department of Health and Human Services (DHHS) or national-level research and advocacy organizations conducting work on behalf of localized communities or organizations.

Priority Populations. Nearly half (n=24) of the reviewed sources focused on one or more of the selected priority populations. Approximately one third of the sources focused on low-income populations (n=13), which aligns with the prevalence of studies looking at Medicaid and Accountable Care Organizations (ACOs) in the peer-reviewed literature. There was also focus on children (n=8), older adults (n=4), and people of color (n=3).

Trends in Peer-Reviewed Literature

- Many studies stated a focus on priority populations (e.g. low-income groups, children)
- Many studies described relevant policy issues and implications
- Most commonly referenced sector was health care, and studies commonly focused on the work of ACOs and Medicaid agencies
- Beyond cost and health outcomes, others (e.g. recidivism, access to care) were used as proxies for ROI

Table 1. Highlights from the Peer-Reviewed Literature**Examples of Relevant Work by ACOs and Medicaid Agencies:**

“Hennepin Health has strategically used reinvestment funds from previous years to provide additional training; hire additional team members; and further the overall strategy of coordinating medical, behavioral, and social services for its Medicaid population, thus creating the potential for additional cost efficiencies.”

(Sandberg et al., 2014)

“Wisconsin’s experience in covering low-income childless adults suggests the Medicaid expansions to this population have the potential to lead to substantial declines in hospitalizations and increased access to outpatient services, along with increased use of the ED for at least the large subgroup of newly covered uninsured people with chronic illnesses.”

(Deleire et al., 2013)

Examples of Non-traditional Stakeholders Engaged:

“[E]mployers [may] adopt and increase insurance-based wellness incentives [which] may lower associated hospitalizations and may spur increases in individual health status and workplace productivity.”

(Gowrisankaran et al., 2013)

“Today, many employers are implementing health promotion programs that include regular behavioral and biometric screenings with the expectation that these initiatives will lead to cost savings.”

(Goetzel et al., 2016)

Examples of Proxy Outcomes for ROI:

“Health disparities have significant economic impacts, and reducing and eliminating disparities is a moral imperative that is also advantageous to the US economy. Eliminating disparities in morbidity and mortality for people with less than a college education would have an estimated economic value of \$1.02 trillion.”

(Thornton et al., 2016)

“To protect the public’s investment in inmate health, jail-involved individuals must continue to receive appropriate health care in the community upon release. Research from several states, including California, suggests that this could help improve the health of the population and even help end the cycle of recidivism for some.”

(Marks & Turner, 2014)

Examples of Multi-sector Collaboration Documentation:

“The HIA specifically opened up communication among health, planning, and other city officials regarding the links between urban policy decisions and health. The Department of Planning cited the HIA as a contributor to policy decisions regarding the alcohol-related elements of the proposed new zoning code.”

(Thornton et al., 2013)

Examples of Applications of Broader ROI Definitions:

“HUD’s 2010–2015 strategic plan explicitly links community development policy to health through two of its five goals. The first goal is to ‘utilize housing as a platform for improving the quality of life,’ with the subgoal of ‘utiliz[ing] HUD assistance to improve health outcomes.’ The second goal is to ‘build inclusive and sustainable communities free from discrimination,’ with the subgoal of ‘promot[ing] energy efficient buildings and location-efficient communities that are healthy, affordable, and diverse.’”

(Bostic et al., 2012)

“While the 2.0 system focuses on achieving value, defined as the efficient production of high-quality health care services, the 3.0 system expands the concept of value to include the production of population health as a social investment.”

(Halfon et al., 2014)

Key Sectors. The most commonly referenced thematic area was health care (n=33) given that most of the articles took place within the context of Medicaid Managed Care and Accountable Care Organizations. There were also references to food security (n=8), housing / homelessness (n=8), education (n=8), employment (n=6), transportation (n=5), urban planning / infrastructure (n=5), environment (n=4), and criminal justice (n=4).

Translation and Dissemination. Many of these articles included sections detailing anticipated policy implications and future recommendations, or highlighting potential ways to advocate for the adoption or uptake of their results. This is notable because the effective translation and dissemination of ROI research findings directly influences the uptake of results – and the potential incorporation of these into policy decision-making processes.

Policy Relevance. Some studies constituted efforts to articulate (n=12) and quantify (n=6) issues for which policy or programmatic solutions are needed. Others focused on the development and prioritization of policy or programmatic efforts (n=14); they were intended to support active and ongoing development of potential policies, or to recount historical development efforts (usually related to implementation of the Affordable Care Act). Others focused on testing and evaluating policy and programs that had already been implemented (n=12). Finally, a few articles focused on determining what is known about an issue (n=4), which usually precludes efforts to articulate and quantify the issue at hand.

Outcomes and Impact. Many studies measured outcomes related to cost and cost savings (n=27) and health outcomes (n=23). Researchers also identified service utilization (n=10), access to care (n=4) and prevention (n=2) as outcomes of interest. Several studies (n=4) also used quality adjusted life years (QALYs) as a metric for assessing the health impacts of tested interventions or policies. Other studies called out the reduction of disparities (n=4) or achievement of equity (n=1) as important policy or intervention outcomes. Other outcomes (e.g. recidivism, reduced crime, healthier communities, employment, and productivity or reduced absenteeism) highlighted the intersectionality of cross-sector research efforts – demonstrating that health and multi-sectoral efforts influence beyond-clinical outcomes.

Notably, we observed a relative lack of resources comprehensively discussing (1) the role of ROI evidence in advocating for public health and cross-sector collaboration, and (2) the importance of broadening the scope of ROI considerations. Overall, very few of the reviewed articles directly documented both use of ROI data, and collaboration between actors or agencies in public health and other sectors. Most reviewed studies either discussed the increased role of public health and SDoH interventions within the context

of health care provision (particularly in accountable care organizations), or demonstrated by its use for nontraditional stakeholders (such as businesses and employers, likely to be swayed by ROI evidence).

The search did produce a notable number of studies documenting robust cross-sector collaborations. However, many of these were excluded from full-text review because they were deemed beyond the scope of this particular paper (e.g. they offered an insufficient discussion of ROI or had a non-US focus). Articles that met all inclusion criteria (detailed in **Appendix A**) tended to offer a purely economic definition of ROI. Clinical health and service utilization outcomes were often cited as proxies for cost-related “value assessments” – as were outcomes that deemed more relevant by other sectors (e.g. recidivism, in the case of the criminal justice system). Given that organizations and agencies working in these sectors are rarely responsible for ensuring a purely financial ROI for their allocations of money (or time and effort), discussions regarding cost effectiveness of interventions tended to be contextualized in descriptions of existing efforts. This suggests a need to broaden the accepted definitions of ROI, in order to fully account for the broader scope of evidence generated and used – to influence broader public health and cross-sector policy decision-making.

Gray Literature

The inclusion criteria were adapted from those used in the peer-reviewed literature. We removed the research-oriented terms (e.g. study type, analysis methods, stated limitations, dissemination strategies and unanticipated costs / benefits) and added two more applied categories: barriers to implementation and policy implications. After applying our selection criteria, the gray literature scan ultimately produced 52 total sources for review. Highlighted examples from the review can be found in **Table 2**.

Trends in Gray Literature

- Work was primarily supported by philanthropic organizations
- Most focused on people of color, low-income populations, or children
- Nearly all included meaningful stakeholder engagement
- Majority emphasized the intersections of public health and education
- Nearly all reported tangible outcomes for interventions implemented

Table 2. Highlights from the Gray Literature**Examples of Improved Clinical Health Outcomes:**

“SPARC reduced emergency room and hospitalization rates caused by high blood pressure...”

*Oakland, CA
BUILD Challenge*

“The heart of BBZ [Best Babies Zone Initiative] is reducing racial disparities in premature and low-weight births, and infant mortality.”

*Berkeley, CA
Kellogg*

Examples of Business Community Engagement in Health:

The Greater Kansas City Chamber of Commerce took the lead in “Healthy KC” – an effort to improve community health, create a positive business environment, and reduce health costs to employers. In one initiative, the Chamber used evidence of savings in health care costs to advocate for stronger tobacco control measures, including raising to 21 the age for tobacco sales. KC was also cited for other partnership initiatives with a RWJF “Culture of Health” prize.

*Kansas City, KS
Practical Playbook*

Examples of Program and/or Initiative Implementation:

“[C]ollaborative network launched the ‘Healthy Neighborhood Strategy’ initiative and accelerated recent efforts to restore the areas around the park – clustering education, recreation, conservation, and green infrastructure around a community gathering space to improve safety, make it easier for residents to stay active, and rebuild a cohesive neighborhood.”

*Detroit, MI
BUILD Challenge*

“[T]he Fresh Food Retailer program brings grocery stores with a specified amount of fresh fruits and vegetables on their shelves to underserved communities.”

*New Orleans, LA
RWJF Culture of Health Prize Winner*

Examples of Policy Implementation:

The CityHealth initiative compiled evidence of effectiveness of health-related policies from multiple sources, including the Guide to Community Preventive Health Services. As a function of efforts to make this evidence readily available to city officials, the initiative has led to increased focus on these policies and to an increase in their adoption.

de Beaumont Foundation and Kaiser Permanente

“16 of the MPO’s 31 jurisdictions have adopted Complete Streets resolutions or guidelines of their own, and 17 cities have incorporated these street designs into their local investments.”

*Broward County, FL
Transportation for America*

Example of Partnerships and Coalitions:

“The HIA established an important relationship between the health department and the Valley Metro public transportation authority, and Valley Metro continues to consult the department for information, recommendations, and data. The health department is now collaborating with Valley Metro on smaller scale projects, including ‘wayfinding,’ disability accessibility, and first-mile/last-mile transit access related to both bus and rail. The HIA allowed the health department to identify their roles related to current and future transportation projects to introduce public health data for consideration, and to better inform built environment and transportation-related decisions.”

*Maricopa County, AZ
CDC*

Examples of Increased Funding:

“The [Seneca] Nation has invested \$180 million in local businesses, capital improvement projects, and infrastructure projects. Doing so has helped the Nation become more economically self-sufficient.”

*Seneca Nation of Indians, NY
RWJF Culture of Health Prize Winner*

“The Center for Michigan’s efforts contributed to passage of state legislation to expand preschool programs with a \$130 million investment.”

*Ann Arbor, MI
Kellogg*

Funding Amount. Approximately 20 percent of the sources (n=10) clearly documented information regarding the amount of funding that had been awarded to support their project(s), program(s) or initiative(s), which ranged from \$2.75K to \$120M – a majority (n=6) exceeded \$1 million. Much of the documented work was primarily supported by philanthropists (n=26). Government sources (n=4) and professional organizations (n=1) were identified as other sources of funding.

Priority Populations. Many of the sources reviewed (n=28) indicated that project and program work had focused on specific priority populations. Notably, most sources referencing a priority population focused on either people of color (n=20), low-income populations (n=11), or children (n=9).

Stakeholder Engagement. Nearly all sources (n=49) provided evidence of meaningful and intentional stakeholder engagement in research, programmatic, or policymaking activities. For the purposes of this study, engagement was defined as the intentional inclusion of non-traditional research stakeholders in the planning, implementation or evaluation of research or programming activities. As such, sources had to document substantive involvement to receive a positive code for stakeholder engagement. Of the sources documenting this engagement, a majority involved community-based organizations / nonprofits (n=32) policymakers (n=30), local government entities (n=23), or school systems (n=23). Community members / residents (n=18) were also frequently engaged throughout project or program design and implementation processes. Local public health departments (n=14), health care providers (n=14) and academic institutions (n=8) were also engaged in this work. State (n=3), federal (n=5) government entities, were also engaged; representatives from these agencies collaborated with community members and other stakeholders to create policies and interventions that had positive health impacts. Other engaged stakeholders included philanthropists (n=5), payers (n=3), investors (n=2), developers (n=1), and local research (n=1) or consulting companies (n=1).

Key Cross-Sector Collaborations. A focus of this effort was to explore the outcomes of cross-sector initiatives, which integrated funding or efforts to address public health challenges – but also those experienced in other sectors. Notably, a significant majority of sources indicated special emphasis on the intersections of public health and education (n=35). For the purposes of this work, sources focused on dental and/or medical care (n=26) were separated from those focused solely on public health – acknowledging the fact that the systems and structures in place to support care delivery and access to services differ across public health and clinical health care provision settings. Food security (n=26), housing / homelessness (n=23), transportation (n=22), urban plan-

ning / community infrastructure (n=20) and employment (n=19) also featured heavily in this literature. Multiple sources indicated special emphasis on environmental (n=20), agricultural (n=9), or other energy-related (n=2) issues. Additionally, there were some mentions of community criminal justice systems (n=6). Other (n=16) thematic focus areas were coded for, many of which were business and financial institutions.

Outcomes and Impact. Of the 52 sources we coded, 45 reported tangible outcomes for interventions implemented. These included metrics indicating improvement in overall community outcomes; documented design, adjustment, or implementation of relevant policies; successful completion of a given project or program; evidence of increased funding; and/or creation of a successful partnership or coalition.

Expert Interviews

As noted above, our semi-structured interviews were designed to identify additional examples of ROI evidence (including published and non-published work) use in practice. We also sought input on barriers to using such evidence, and ways that both researchers and decision-makers overcome real or perceived barriers.

Expert-Identified Challenges of Using ROI Evidence

- Targeting real-world decision-makers
- Adapting evidence to diverse contexts
- Existing barriers to evidence-based action
- Capturing returns on investment

In response to our questions, key informants provided insight into the use of ROI in evidence-based decision-making – as well as some of the barriers and limitations associated with these processes. Generally speaking, experts agreed that several key factors predispose some decision-makers to be particularly receptive to ROI evidence. They include:

- Those with budgetary authority and responsibility, or oversight responsibilities;
- Those whose sizable budgets afford them the ability to consider trade-offs;
- Those who have support from staff experts or consultants (such as budget analysts and analytics teams) who can access current and accurate data, and can generate those ROI estimates (and frame their presentations of the evidence in ways that are understandable by broad audiences);

- Those leaders who are legally and administratively empowered to make decisions – without, for example, the constraint of needing to seek legislation to implement change.

Our experts noted that public sector empowerment may be limited among decision-makers facing legislative constraints, compartmentalized budgets, and widespread professional staff shortages (particularly at the local level) (Edmunds et al., 2014). Informants also identified four other key factors inhibiting greater use of ROI evidence to inform policy decision-making:

1. Targeting Real-World Decision-makers. First, and perhaps most importantly, there are significant challenges to translating existing public health ROI research (which can be highly complex and detailed) and incorporating it into real-world decision-making processes. As noted previously, there is an increasingly diverse array of decision-makers who might be influenced to invest in ways that will improve the public's health, but it is uncommon for ROI evidence to focus on the preferences or perspectives of specific payers or stakeholders (McCullough, 2018). Our expert interviews reinforced the importance of bridging the gap between evidence generation and informed policymaking: ensuring that existing, real-world evidence sources get tailored and presented in ways that resonate for specific players who might use these sources to inform their decision-making. In the Discussion section, we provide examples of potential targets for ROI research.

2. Adapting Evidence to Diverse Contexts. Second, evaluating returns from investments in the public health system is complicated by the lack of comparability across public health agency budgets at both the state and local levels. Despite multiple efforts to standardize public health accounting, it is still challenging to identify and characterize what is actually spent on public health infrastructure and services from year to year – much less to accurately track and assess the returns on those investments. Payment models for health plans, Medicaid programs, and other health care financing and delivery systems are both diverse and complex. Therefore, it can be difficult to adapt evidence to the circumstances facing decision-makers – unless advance arrangements are intentionally made to track impact from the initiation of any investment-making (such as with a grant or contract). To achieve maximum impact, ROI research should be designed to:

- Address specific real-world questions;
- Facilitate adaptation of models to specific communities or systems; and
- Incorporate translation and dissemination plans, which involve garnering and allocating resources, to ensure that research findings reach those who can use them.

3. Barriers to Acting on Evidence. Third, while research may show strong evidence of value, there are many barriers to acting on results. It bears repeating that a lack of analytic capacity limits the ability to use data to present a convincing case to stakeholders and decision-makers. Although highly motivated, the public health sector lacks access to the necessary investment capital, without the support of these external stakeholders and partners. Returns to public investments may occur outside of politically acceptable timeframes, which are typically quarterly or annual in the private sector – or which may correspond to an election cycle. Returns to public investments may occur outside of politically acceptable timeframes, which are typically quarterly or annual in the private sector – or which may correspond to an election cycle (Hunter, 2016). To address this concern, for example, CDC prioritized outcomes with a five-year period in its HI-5 initiative, and then focused on short-term savings in its 6|18 initiative.

Elected officials have to account for many considerations, beyond evidence presented by public health advocates. As such, some may be disinclined to support increased public spending, or an expanded role for the public sector *even if* economic benefits can be demonstrated. For example, a proposed initiative may demonstrate potential for positive ROI; however, if it is fundamentally misaligned with a policymaker's stated policy priorities or political persuasions, it may not be pursued. Conversely, public health advocates may view the generation of savings (or other economic returns) – somewhat like “monetizing” improved health outcomes – as providing inadequate or inappropriate justifications for public health investment decisions. They may believe that public health interventions deserve public support on social and ethical grounds, or fear that focus on economic returns might distort public health priorities.

4. Capturing Returns on Investment. Fourth, the broad responsibilities of public health systems, and the broad array of beneficiaries from successful investments, gives rise to issues generally associated with other “public goods.” Few are interested in bearing the cost of investments that generate substantial returns to others (“free riders”), and there are few models for pooling investments across private beneficiaries that might also benefit (Nichols & Taylor, 2018). Medicaid, for example, is constrained by its authorizing legislation from pursuing broad public benefits, so has limits in how far “upstream” its investments can reach even if there were evidence they would save program dollars. Public health agencies operating for the broad public good cannot capture the returns on their investments (often referred to as the “wrong pocket problem,” where one party makes the investment but the benefits or returns flow elsewhere) (Butler, 2018). For example, the medical cost of treating elderly people from falls is over \$50 billion a year to Medicare and Medicaid (CDC, 2016). Who is responsible for falls prevention? Older adults may not be able to afford home improvements (e.g., railings) to reduce their own fall risks; landlords have no incentives

to spend on improvements when they don't pay the medical bills; and not all agencies on aging or housing agencies have budgets that cover home improvement. In public health as in other areas of public good, systemic underinvestment is the result.

A recent proposal by Len Nichols and Lauren Taylor (2018) suggest a 12-step solution for communities to pay for social needs of patients. A provision in the Bipartisan Budget Act of 2018 known as the Social Impact Partnerships to Pay for Results Act (SIPPRA) is designed to support outcomes-based financing to address social determinants, and similar thinking needs to address such innovations for broader population-health spending.

Discussion: Looking Ahead

Based on our reviews and interviews, we believe that the future use of ROI approaches in the public health ecosystem will benefit from the improved quality and availability of data from a growing variety of sources; increasingly sophisticated analytic methods and tools; and greater awareness of the need for decision-making to be informed by evidence and rooted in real-world practicality – both within health care, and beyond the health sector.

We believe that the future use of ROI approaches in the public health ecosystem will benefit from the improved quality and availability of data from a growing variety of sources; increasingly sophisticated analytic methods and tools; and greater awareness of the need for decision-making to be informed by evidence and rooted in real-world practicality.

Increasing availability of evidence documenting health and economic impacts, and growing interest in leveraging that evidence for decision-making, are powering new opportunities to advance public health goals and encouraging cross-sector collaborative efforts. Our review demonstrated that advocating for prioritization of “upstream” investments, including addressing social determinants of health, can rely on a growing evidence base to demonstrate that such investments are in the public interest – and can also serve the interests of private entities.

As discussed above, however, there are notable gaps in the evidence-to-policymaking pipeline. Our expert interviews reinforced the need for stronger connections between researchers, analysts,

and decision-makers – and for evidence to be tailored to inform specific real-world situations. Those informants who previously had held leadership roles in public agencies noted that advocates for greater public health investment bear the burden of “making the case” to policymakers and private sector decision-makers – including those with whom public health officials seek partnership.






The following table (Table 3) illustrates multiple layers of decision-making – providing examples of decisions faced at each level by different decision-makers, and the kinds of evidence that (if available) would influence their decision-making processes. In effect, referencing Auerbach's “Three Buckets of Prevention” introduced earlier, decisions that achieve the greatest health and economic impact are more likely to be made if presentations of ROI evidence can be tailored and targeted – to address the particular needs and concerns of health or community decision-makers.

Opportunities to Generate New Information on ROI

Our review suggests a number of steps that may help make research more impactful, and may lead to more informed decision-making. These include:

1. **Establishing forums and mechanisms for researchers and decision-makers to collaborate in ROI research priority setting.** Initially, a forum convening researchers and users of ROI evidence could help expand the analysis outlined in Table 3. Such collaborations could help to clarify evidence needs and future research inquiries to explore. They could also help researchers to determine how best to frame and present their research findings, in ways that bolster business cases made to support upstream investments and advance public health goals. This could help inform a broader agenda for ROI related research and analysis and help to bridge the gap between evidence generation and informed policymaking.
2. **Improving mechanisms for compiling, organizing, and accessing research results.** Our work highlighted the challenges various stakeholders face in finding research results:
 - The multiplicity of definitions, approaches, and terminology complicates searches for relevant findings, particularly when working across sectors;
 - The rarity with which real-world successes in applying ROI evidence to inform decision-making are published;
 - The lack of access, for many public sector officials, to subscription-only journals – which include content that rarely applies to their work; and

Table 3: Decision-makers and their potential uses of ROI to inform evidence-based decision-making

Decision-Makers	ROI Evidence That Would Inform Decision-Making
<p>Public Officials</p> 	<ul style="list-style-type: none"> • To what extent do public health investment results in better health outcomes, quality of life, and positive economic returns? What are the non-health benefits that accrue from public health investments? • Which public health interventions provide the greatest returns on investment? • Does investing in social services (e.g., housing) at the community level improve health outcomes and lower health cost? • Does spending on social needs of beneficiaries (e.g., Medicaid, MA) save downstream costs? • How do health-related policies provide value in community health and economic outcomes?
<p>Businesses</p> 	<ul style="list-style-type: none"> • To what extent do businesses' investments in improving the health of their own employees generate savings in health care costs, absenteeism, etc.? • Can health benefits be structured in a way to save health costs as well as improve community health? • What community-level investments generate returns for the business itself, or the business community more broadly?
<p>Private Health Plans and Health Systems</p> 	<ul style="list-style-type: none"> • To what extent do investments to meet the health-related social needs of patients result in cost savings? • What "upstream" benefits can be covered that generate positive ROI and improved health outcomes? • What Community Benefit spending yields the best returns, to the institution and to the community? • What clinical interventions provide the greatest returns for population health?
<p>Public-Private Collaboration</p> 	<ul style="list-style-type: none"> • What models are there for allocating up-front investments that generate returns to both the community and individual private entities? • Are there services that have greater value if managed by the public sector, or population health services that can be managed more efficiently by health systems? • Can businesses capture returns from community-level investments in health-related programs? • What public investments generate the greatest returns for private entities? • What health-related policies should private entities support (i.e., are there policies that benefit the community overall and also have positive benefits to individual entities in the private sector)?
<p>Community-based Organizations (CBOs)</p> 	<ul style="list-style-type: none"> • What motivates community residents to engage in actions to improve community health? • What incentives encourage people to engage in community-based participatory research and the policy-making process? • What strategies can help community residents to identify interventions that yield the greatest return on investment to their communities?

- The limited real-world feedback researchers receive regarding the relevance and application of their work.

This suggests that investment in a clearinghouse of ROI research and its use would be valuable, along with efforts to build a common vocabulary that facilitates identifying work across sectors.

- 3. Expanding efforts to identify unpublished research, along with examples of evidence-based decision-making.** Our work identified some relevant examples; however, we conclude that much of the relevant evidence-based decision-making work (particularly in public agencies) is not published for reasons already discussed. This work would benefit from an expanded set of interviews used to solicit additional stakeholder perspectives and identify instances when research has been successfully applied.
- 4. Building greater analytic capacity in the public sector, so that there are stronger “consumers” of research.** In public health agencies, for example, this means addressing workforce gaps in policy, communications, and analysis (de Beaumont, 2017; Edmunds et al., 2014) so that officials can assert the kind of cross-sector strategic leadership envisioned in Public Health 3.0. (DeSalvo et al., 2016). This could be enabled through constructive partnerships between health agencies, academic researchers, public health institutes, and others.
- 5. Reinforcing efforts to help researchers translate their work and maximize its usefulness in policy and practice contexts.** This shift involves greater focus on understanding the users of research, and adopting more intentional and tailored approaches to communications outreach – in order to demonstrate the application of research to practice.

We hope that our findings will help to synthesize and highlight some of the promising existing work being done to address SDoH.

Conclusion

This study reviewed available published and personal accounts of cases in which ROI-related research was leveraged to inform decision-making and improve public health. We found that the best examples of influential ROI evidence use were documented in the gray (rather than peer-reviewed) literature. The clearest and most compelling examples of ROI use were documented by organizations for which economic considerations are critical, and in which leaders are empowered to make evidence-based decisions – such as AOCs.

We did find that ROI was an *element* in a number of published works. However, there does not yet exist a comprehensive or cohesive body of work that demonstrates the role of ROI evidence as a *dominant* factor in public health-related decision-making.

Our review helped us to identify limitations of existing research methods as well as challenges to applying ROI research in practice. Such challenges include disconnects in the level of relevance and applicability of research, and limitations of many organizations and officials to act on even compelling evidence of ROI. Through this work, we identified steps that might promote the use of ROI-related evidence in the future:

- More clearly linking research to the needs of real-world decision-makers;
- Improving access to research results (including unpublished work); and
- Building the analytic capacity of users/consumers of such evidence via improved research translation.

Consistent with the Healthy People 2030 objectives (Office of Disease Prevention and Health Promotion, 2018), we hope that our findings will help to synthesize and highlight some of the promising existing work being done to address SDoH. We also hope to promote awareness of the broader benefits of adopting cross-sector approaches to improving public health and community outcomes (e.g. culture of health Public Health 3.0, and health in all policies (RWJF “Building a Culture of Health”; 2016; DeSalvo et al., 2016; Public Health Institute, 2013). As a testament to this, we hope that the multi-sector work we reviewed will encourage the future generation, translation, and use of evidence – to inform impactful policymaking, to create and sustain healthy environments, and to promote good health for all.

Appendices

Appendix A: ROI Definition

To inform the development of the search string, we refined our definition of return on investment (ROI). We started with the following definition, which was used in *The Return on Investment of Public Health System Spending* report produced by J. Mac McCullough and commissioned by AcademyHealth (McCullough, 2018):

“Return on investment (ROI) is defined as the net financial gains from an investment divided by the cost of the investment. The strictest definition of ROI limits analysis only to the gains accruing to the entity that made the investment. However, formal and informal usage of the term ROI to refer to several different forms of economic analyses is common. This report uses ROI as others have, as a term referring to the analysis of financial gains in comparison to financial costs.”

This definition is strictly economic in nature; for our purposes, it was important to expand it – in order to capture some of the complexities, associated with how and *why* policy decision-makers use ROI data. To adapt the definition for use in the current context, we looked at various gray and peer-reviewed literature resources; this enabled us to account for different stakeholders’ (government agencies, grant making foundations, etc.) terminology, and to identify similarities in their use of ROI and related terms. Many resources (see *resource* section for additional information) were consulted, but two resources most directly informed our revised definition:

- Estimating Return on Investment for Public Health Improvements: Tutorial on Using the new Tool (Ensign, 2018)
- Return on investment (ROI) modelling in public health: strengths and limitation (Pokhrel, 2018)

This revised definition guided our search efforts, and determined the scope of our broader project work:

Return on investment (ROI) is defined as the **net benefits** accrued from an investment, **compared to the cost of the investment** over a defined period of time. These analyses can be used to compare types, and levels of investment. The strict definition of ROI limits analysis only to financial gains accruing to the investor. However, ROI can also be used to more broadly refer to several forms of economic analyses that account for benefits (economic, or otherwise) accrued by various entities. This report uses ROI to assess **net benefits accrued from an investment (expressed in the form of monetized outcomes, economic or otherwise)** relative to the **initial economic cost** of that investment.

Appendix B: Search Strategies For Peer-Reviewed And Gray Literature

To better understand the range of relevant available evidence and its relationship to the policymaking landscape, we conducted a scan of peer-reviewed and gray literature; selected articles were identified based on their (1) focus on public health and other cross-sector efforts, (2) mention of ROI or other notable terminology (e.g. cost effectiveness, health impact assessment, etc.), and (3) were U.S. focused and published within the last 10 years.

Peer-reviewed Literature

Our search strings and strategy were developed by the project team, in a responsive and collaborative fashion – based on iterative feedback provided to the authors by partner SMEs and other key informants. These search strings were carefully designed to generate literature investigating the relationships between cross-sectoral efforts, public health investments, and evidence-based policymaking.

We identified peer-reviewed literature published between 2008 and 2018, using a Boolean search of the PubMed database and journals such as *Health Affairs*, and *Health Politics, Policy and Law*. Given the nuanced search functions for each of these resources, separate (but related) search strings were developed to ensure capture of a comprehensive, but focused, sample of literature. All search strings represented some iteration of this comprehensive version:

((“business case”[tw] OR “net benefit”[tw] OR “cost effectiveness”[tw] OR “cost impact”[tw] OR “cost benefit analysis”[tw] OR “cost benefit ratio”[tw] OR “cost performance”[tw] OR “return on investment”[tw] OR “ROI”[tw] OR “value”[tw] OR “economic justification”[tw] OR “upstream”[tw] OR “rate of return”[tw] OR “cost saving”[tw] OR “health outcome”[tw] OR “savings”[tw] OR “public health expenditure”[tw] OR “instrumental variable”[tw] OR “econometric model”[tw] OR “modeling”[tw] OR “simulation”[tw]) AND (“public health”[tw] OR “population health”[tw] OR “behavioral health”[tw] OR “healthier lives”[tw] OR “social determinants of health”[tw] OR “social and emotional determinants of health”[tw] OR “social determinants”[tw] OR “public health agency”[tw] OR “public health department”[tw] OR health official”) AND (“policy analysis”[tw] OR “policy-mak*”[tw] OR “policy mak*”[tw] OR “data driven”[tw] OR “evidence based decision making”[tw] OR “decision mak*”[tw] OR “decision-mak*”[tw] OR “coalition”[tw] OR “partnership”[tw] OR “health system”[tw] OR “collective impact”[tw] OR integrat*”[tw] OR “intersectoral”[tw] OR “cross-sector”[tw] OR “multi-sector”[tw] OR “whole system”[tw])) AND (“agriculture”[tw] OR “Food security”[tw] OR “Housing”[tw] OR “Homelessness”[tw] OR “Education”[tw] OR “Urban planning”[tw] OR “city planning”[tw] OR “infrastructure”[tw] OR “Transportation”[tw] OR “Criminal justice”[tw] OR “Environment”[tw] OR “Energy”[tw] OR “Healthcare”[tw] OR “Employment”[tw])

Gray Literature

Guidance received from multiple collaborators reaffirmed that many sources – describing the outcomes of cross-sector efforts, or documenting instances in which generated evidence was used to inform policymaking – might not be found in the peer-reviewed, published literature. As such, we conducted a review of gray literature to identify research and policymaking activities that may either be in-process or disseminated via channels other than those associated with traditional academic publications, including online sources. Gray literature resources were selected based on recommendations from subject matter experts and key informants; these collaborators encouraged review of specific funded portfolios of work, supported by philanthropies (e.g. the Robert Wood Johnson Foundation, the Kresge Foundation) that prioritize cross-sector collaborative efforts, to promote improved health outcomes via policy change mechanisms.

As expected, portfolio resources were not necessarily presented in forms or formats that are traditionally associated with documentation of formal research activities or program evaluations. As such, we included resources providing written documentation of completed or ongoing programmatic activities – that aligned with our other search parameters and research objectives.

Appendix C: Interview Questions

Initial Guiding Interview

1. Are you aware of instances where evidence on ROI has been generated or used to drive policy change in the following areas:
 - a. Public health interventions realizing a return on investment; and/or
 - b. Interventions in non-health sectors showing a return on investment with benefits accruing to health?
2. Can you point us to:
 - a. Any sources where this information may be publicly available (e.g. peer-reviewed publications, gray literature, or other resources, such as websites);
 - b. Any non-published work that may inform our findings (i.e. where this work is shared if not public – conferences, peer networks, online forums, etc.); and/or
 - c. Key individuals that have been involved in these efforts?
 - d. Any audiences who might be interested in reading or hearing about our findings?
3. Do you have any other comments you would like to share that may inform the scan?

Interviews to Inform Interpretation of Results

1. Please comment on the following aspects of the scan summary:
 - a. What are your reactions to the findings from the scan?
 - b. Are there any key gaps in the literature, in terms of issues covered, results, etc.?
2. Do you have any comments on other aspects of the scan:
 - a. Methods that were used?
 - b. Sources reviewed?
3. What would you say are priority areas for future research on health-related ROI that could help to inform policy or program development?
4. What is the place of ROI assessment in the field of public health?
 - a. Has the public health community embraced ROI assessment as a way of making decisions in their own domain, or advocating for resources from others?
 - b. What are the barriers to more widespread or visible use of ROI assessment?
1. Can you point us to any audiences who might be interested in reading/hearing about our findings?
2. Do you have any other feedback or comments you would like to share?

Appendix D: Findings (Peer-Reviewed Literature)

Total sourced: 287

Total excluded: 249

Total reviewed: 38

Scope of Demonstrated / Potential Policy Change

State	17
Internal	17
Local	16
Federal	14
Unspecified	1

Publication Type

Journal Article	11
Report / Case Report	11
Evaluation	6
Editorial / Comment	5
Observational Study	3
Comparative	2

Funding Amount

(NOTE: This information was not provided for any entries.)

Funding Source (Sector)

Philanthropist/Foundation	20
Government/Public	14
Academic	5
Private	3
Unspecified	3

Priority Populations

(NOTE: ~24 entries documented emphasis on priority populations.)

Low Income	14
Children	8
Older Adults	5
Racial / Ethnic Minorities	3
Individuals w/ MCC	1
LGBT Individuals	1
Individuals w/ Disabilities	1

Stakeholder Engagement (NOTE: ~11 entries documented stakeholder engagement.)

Hospitals / Health Systems	7
Payers	4
Patients	3
Clinicians	3
Policymakers	3
Local Government / Agencies	3
Communities	2
CBOs	2
Industry	1
Researchers	1
Purchasers	1

Key Thematic Areas

Health care	33
Food Security	8
Housing / Homelessness	8
Education	8
Employment	6
Transportation	5
Urban Planning / Infrastructure	5
Environment	4
Other	4
Criminal Justice	4
Agriculture	1
Energy	0

Outcomes

Cost	27
Health Outcomes	23
Other	14
Service Utilization	10
Quality-Adjusted Life Years (QALYs)	4
Access to Care	4
Prevention	2

Appendix E: Findings (Gray Literature)

Total sourced: 79

Total excluded: 28

Total reviewed: 52

Scope of Demonstrated / Potential Policy Change

Local/Community	43
State	13
Federal	3

Publication Type

Case Study	33
Article	7
Brief	6
Report	3
Unspecified	2
Comment	1

Funding Source

Philanthropists	26
Unspecified	21
Federal Government	3
Local Government	1
Professional Organization	1

Priority Populations (NOTE: ~28 entries documented emphasis on priority populations).

Unspecified	24
People of Color	20
Low Income	11
Children	9
Immigrants	2
Rural	1
Pregnant women	1
Children with special health care needs (SHCN) and/or disabilities	1
Individuals with multiple chronic conditions (MCC)	1

Stakeholder Engagement (NOTE: ~49 entries documented stakeholder engagement).

CBOs/Nonprofits	32
Policymakers	30
Local Government Agencies	23
School Systems	23
Community Members / Residents	18
Local PH Departments	14
Health care Providers	14
Academic Institutions	8
Federal Agency	5
Philanthropists / Foundations	5
Other (e.g. consulting firms, research companies, developers, investors, dental health providers)	5
State Government	3
Payers	3
Government	2
Unspecified	2
Purchasers	1

Key Thematic Areas

Education	35
Food Security	26
Health care	26
Housing / Homelessness	23
Transportation	22
Urban Planning / Infrastructure	20
Environment	20
Employment	19
Other	16
Agriculture	9
Criminal Justice	6
Energy	2

Appendix F: Key Characteristics Of Funders And Portfolios Reviewed

<p>de Beaumont Foundation (and partners)</p>	<p>BUILD Health Challenge (a multi-funder initiative)</p> <ul style="list-style-type: none"> • Applies bold, upstream, integrated, local, and data-driven (BUILD) approaches to improve health in communities that are adversely affected by SDoH • Has supported 37 projects, across the United States, which work to support long-term influence and focus on the social, environmental and economic factors (rather than on access or care delivery) influencing community health • Requires that partnerships must engage community members, health / public health systems in creating a shared vision • Uses data from both clinical and community sources to identify key needs, measure meaningful change, and facilitate transparency <p>CityHealth: an initiative of the de Beaumont Foundation and Kaiser Permanente</p> <ul style="list-style-type: none"> • Provides leaders with a package of evidence-based policy solutions, to improve community health outcomes and quality of life • Evaluates the nation’s 40 largest cities, based on the number and strength of their policies
<p>W. K. Kellogg Foundation (WKKF)</p>	<ul style="list-style-type: none"> • Focuses on ensuring that children, working families, and equitable communities can thrive • Prioritizes provision of a healthy start and quality early learning experiences for all children • Invests in efforts to help families obtain stable, high-quality jobs • Supports efforts to create vibrant, engaged and equitable communities where children are nurtured • Commits to working with each community for at least a generation, and focuses grand-making efforts in priority regions: Michigan, Mississippi, New Mexico and New Orleans in the U.S.; Chiapas and the Yucatán Peninsula in Mexico; and Central / South Haiti
<p>Robert Wood Johnson Foundation (RWJF)</p>	<p>Culture of Health Prize: awarded to communities, in recognition of their efforts to ensure health, opportunity, and equity – via collaboration and inclusion (particularly engaging historically marginalized populations and those facing the greatest barriers to good health)</p> <ul style="list-style-type: none"> • Honors communities (with a \$25,000 award) that have improved health and wellbeing access to community members – including those often left behind • Offers customized communications consultation, related materials (e.g. videos, photos, journalistic stories), and dissemination efforts to leverage their stories to inspire others • Provides opportunities for award winners to connect with / learn from other national and community leaders working to build a Culture of Health (including past winners via the Prize Alumni Network)

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