

## RESEARCH ARTICLE

# Social determinants of health as a framework to identify and assess cross-sector funding opportunities

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**Abstract**

**Objective:** To present a content analysis and method for applying a social determinants of health (SDOH) analytical framework to legislation.

**Data Sources and Study Setting:** Secondary data include 215 sections of the American Rescue Plan Act of 2021 (ARPA) and related information from federal government websites (e.g., press releases, notices of funding announcements, and funding tables).

**Study Design:** Researchers conducted a qualitative content analysis of legislative text, recording all sections, appropriations, allocations, and administrators. Using an SDOH analytical framework defined by Healthy People 2030, researchers coded each section, appropriation, and allocation within the legislation.

**Data Collection/Extraction Methods:** Researchers reviewed all ARPA sections, appropriations, and allocations separately, resulting in 328 entries. Descriptive characteristics were calculated using Tableau and Microsoft Excel. Researchers coded each appropriation or allocation using definitions and key words presented in the SDOH analytical framework.

**Principal Findings:** Applying an SDOH analytical framework to the legislation's funding amounts reveals an overlap of investment opportunities that cross-sector initiatives can leverage. This overlap is seen primarily in two ways: (1) specific allocations and appropriations that can be used to meet multiple SDOH goals and (2) federal administrators receiving money that can be categorized according to multiple SDOHs. For example, approximately 99% of tracked ARPA funds can be used to support one or more SDOHs. Thirty-five appropriations or allocations can support programs categorized for more than one SDOH category. Eight departments received funds that could be designated for two or more SDOHs. All five SDOH categories can potentially receive funding from 3 to 11 federal administrators.

**Conclusions:** Using an SDOH analytical framework is an innovative approach to conceptualizing and synthesizing the contents of complex legislation. This approach demonstrates funding patterns across SDOH that can encourage cross-sector collaborations. Future content analysis of legislation can employ this SDOH framework to demonstrate cross-sector initiative funding opportunities.

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**KEYWORDS**

aligning, cross-sector, health equity, health policy/politics/law/regulation, integrated delivery systems, qualitative research, social determinants of health

**What is known on this topic**

- Research and advocacy organizations recommend that policymakers and practitioners engage cross-sector solutions when intervening to improve health outcomes.
- The federal government typically designs and administers policy in ways that make cross-sector initiatives challenging to conceptualize and fund.
- There is a research gap in using theory-driven approaches to describe funding legislation characteristics that might appeal to cross-sector collaboratives to advance cross-sector solutions for urgent public health issues.

**What this study adds**

- This feasibility study addresses the limited application of frameworks to public health funding analysis by using social determinants of health (SDOH) as an analytical framework to analyze legislative text.
- SDOH can help conceptualize the health implications of monies outside of sources historically viewed as relevant to improving health outcomes.
- Applying an SDOH analysis framework to US legislation reveals an overlap of investment opportunities that cross-sector initiatives can leverage.

**1 | INTRODUCTION**

Cross-sector investments are needed to solve complex public health problems and advance health equity.<sup>1,2</sup> However, the federal government typically designs and administers policy in ways that make cross-sector initiatives challenging to conceptualize and fund.<sup>3</sup> Moreover, no consistent methodology exists to analyze and frame federal legislation for its potential support of cross-sector investments. To that end, this feasibility study describes a qualitative approach using a social determinants of health (SDOH) analytical framework to identify and assess available federal funding for cross-sector initiatives that advance health equity.

To date, academic descriptive analyses of health-related federal funding primarily summarize funding mechanisms, including the origin of funding; budget impacts; funding targets, usually specific issues or diseases; and the general underinvestment in the public health field.<sup>4-8</sup> Practitioner-focused research and advocacy organizations summarize federal legislation to support lay synthesis of the federal directives' local implications<sup>9-11</sup> and create accountability dashboards, tracking publicly available information on expenditures and use of funds.<sup>12-21</sup> Many practitioner-focused organizations also urge investments in cross-sector initiatives.<sup>1-3,22-24</sup> For example, Aligning for Health, a member association that advocates for cross-sector strategies, identified legislation introduced to Congress that could impact SDOH.<sup>24</sup> However, few of the above-described analyses use a theory-driven approach to describe legislation characteristics that might appeal to cross-sector collaboratives and others working in partnership to advance cross-sector solutions for urgent public health issues.

While there is evidence that cross-sector partnerships can coordinate federal investments at the local level,<sup>3,22</sup> it is important to note that some initiatives have difficulty sustaining their services after receiving start-up funding.<sup>25</sup> This is exacerbated by the siloed nature of federal funding for health-improving initiatives. Historically, there has been a narrow view of what constitutes and who accomplishes public health work. Federal public health dollars flowed primarily through the United States Department of Health and Human Services (HHS) via the Food and Drug Administration and the Centers for Disease Control and Prevention.<sup>26</sup> Importantly, this funding is typically designated to mitigate specific diseases or address medical health-related problems.<sup>4,26</sup> In recent years, however, there has been broadened understanding of the environmental, social, and systemic factors that influence health outcomes and erode health equity.<sup>27</sup> Given the growing recognition of the responsibility to address public health across government, some federal departments and agencies have aligned around cross-sector initiatives.<sup>28-30</sup> For example, many prioritize and encourage interagency collaboration and are integrating frameworks, including SDOH, into public health priority setting and funding strategies.<sup>5,30-33</sup>

This feasibility study addresses limitations to public health funding analysis by using SDOH as an analytical framework to examine legislative text. Widely used by practitioners and researchers alike to conceptualize public health problems, SDOHs are well-known constructs that describe social, physical, and economic environments that influence health outcomes. Healthy People 2030, which outlines the federal government's public health objectives, defines SDOH as a primary way to address health disparities and inequities

across multiple sectors.<sup>34</sup> These domains illustrate that factors previously viewed as distinct and unrelated to healthcare delivery are integral to improving health outcomes. Interventions, programs, and policies that address SDOH<sup>35,36</sup> via cross-sector approaches<sup>4-6,37</sup> can improve population health and reduce health disparities because they lessen health inequities' root causes. While practitioners already strive to work across sectors and to describe their initiatives by SDOH, further work is needed to help bridge policy opportunities and practice.<sup>2,38</sup>

The primary aim was to present a content analysis and method for applying an SDOH framework to legislation. It organized descriptive characteristics of a piece of legislation to reveal patterns across SDOH categories, administrators, and appropriations and allocations.

Study findings present new opportunities for analysis and discussion of public health funding to better meet health goals while working across sectors and government jurisdictions.

## 2 | METHODS

### 2.1 | Study design

Researchers conducted a qualitative content analysis of the American Rescue Plan Act of 2021 (ARPA) from January to March 2022. An independent researcher then coded each section of ARPA using Healthy People 2030 as a framework to identify and define relevant

**TABLE 1** Codes and descriptions for American Rescue Plan Act (ARPA) content analysis.

Code name	Code description	Examples of key words and phrases
Food and nutrition	Terms related to food security, healthful eating, and agricultural production	Farm loan, socially disadvantaged farmers, and SNAP
Business recovery	Supporting business operations to recover from economic loss	Revenue loss, small business, financial recovery, and employee retention
Target populations	Individuals, groups, and communities that are the target of specific programs, initiatives, or support	Women and children, pregnant women, veterans, and students
Family support (economic)	Initiatives or programs that provide financial support to families, caregivers, or children	School lunch program, child tax credit, dependent care, sick leave, family leave, childcare assistance, and emergency assistance
Health/medical	Healthcare or medical services and resources	Vaccine distribution and telehealth
Industry	Industry operations, administration, and management	Construction administration, oversight and management, rail workers, airports, restaurants, and technology
School environment	School or educational facilities and learning environments	Elementary school, secondary school, higher education, Head Start, and library
Family support (outreach)	Initiatives or programs that provide professional support or resources to families, caregivers, or children	Home visiting programs, violence prevention and response, and family services outreach
Financial aid	Financial assistance programs or initiatives	Indian/Tribal education, homelessness, emergency financial aid, student aid, and high poverty school
COVID response	Healthcare or medical services in services of prevention or response to COVID-19	Testing, contact tracing, surveillance, monitoring, and COVID-19 health and safety and response
Healthcare workforce	Healthcare workforce training and development	Public health workforce, nurse corps, and teaching health centers
Mental health	Services, resources, and programs to address and respond to mental health	Mental health, behavioral health, substance abuse prevention and treatment, and suicide prevention
Health insurance	Programs and services related to healthcare benefits	Health exchange, health benefits, COBRA, Medicaid, and Medicare
Wildlife	Services and programs in support of wildlife preservation	Fish and wildlife, endangered species, and wildlife disease outbreak
Environmental protection	Services and programs supporting environmental protection, restoration, and preservation	Clean air, safe drinking water, and pollution
Housing	Assistance and support related to safe, quality, and affordable housing	Housing and homes, and rental assistance
Transportation	Access to reliable, affordable, and safe public transit	Public transportation
Violence	Violence response and prevention	Sexual assault response, trauma, and child abuse prevention
Community development	Programs and initiatives that strengthen community development and community partnership	Community training, culturally sensitive training, collaboration, and community service
Infrastructure	Development and maintenance of the build environment	Water, sewer, and broadband

codes pertaining to SDOH categories. Refer to the Appendix for a detailed description of the codes used in this analysis.

### 2.1.1 | Data source

The COVID-19 pandemic underscored health disparities that have long persisted in the United States (US) and spurred nationwide conversations about improving health equity. ARPA was designed to stimulate economic recovery and bolster public health capacity by deploying \$1.9 trillion nationwide.<sup>39,40</sup> These funds offered an unprecedented opportunity to invest in transformative public health change. Recipients of ARPA funds were encouraged to think strategically across sectors while developing plans to improve health and increase health equity within communities.<sup>1,2,40</sup> However, no federal guidance was offered describing how to coordinate projects across federal entities administering the ARPA funds.<sup>41</sup> For these reasons, ARPA was chosen as the dataset for this content analysis.

## 2.2 | Sample size and analytic approach

ARPA consists of 215 sections. Researchers documented all sections, reading the entire legislation line by line, and calculated descriptive characteristics using Tableau and Microsoft Excel. Most ARPA sections contained an appropriation, funds obligated to a particular purpose. However, at times, a portion of these appropriations were allocated for one or more specific tasks nested within the original appropriation purpose. Therefore, one section of legislation might contain multiple appropriations and allocations. Each section, appropriation, and allocation were recorded separately in a Microsoft Excel spreadsheet, resulting in 328 entries.

Researchers extracted and recorded the following variables from the legislation: section number, section title, department or government entity, fund administrator, appropriation or allocation title, funding

amount, funding type (e.g., appropriation, allocation), purpose (e.g., use of funds), and expenditure timeframe. Additionally, researchers extracted supplemental variables from US department and independent agency websites: eligibility requirements or criteria and the funding mechanism (e.g., discretionary, mandatory, formula, and block). Information and estimates from the Congressional Budget Office were used when ARPA did not list appropriation or allocation amounts.<sup>42</sup>

For this analysis, researchers consolidated 77 federal administrations, services, and other agencies that ARPA named fund administrators. Their funding potential is summarized according to the federal department, independent agency, or executive entity under which they fall (e.g., funds appropriated or allocated to the Centers for Disease Control and Prevention are tabulated under the HHS).

Researchers then coded each appropriation or allocation using the definitions and key words presented in the analytic framework for SDOH. The following steps were applied to conduct this qualitative content analysis: (1) data immersion, (2) identifying data units, (3) coding, and (4) grouping.<sup>43</sup> Data immersion included reading and re-reading all 328 allocations and appropriations from ARPA to understand the nature of the content and identify emergent topics. If a particular section in ARPA referenced a federal program or initiative (e.g., Sec. 1101 references the Supplemental Nutrition Assistance Program), the researchers would visit the federal department or agency website to understand the objectives, goals, purpose, and target audience for those initiatives. This process also helped identify related SDOH topics that would inform the subsequent steps.

The second step involved identifying the data units (e.g., unit of meaning), which best represented how to examine federal funding through a cross-sectoral lens. For this study, the data units included the ARPA section title, appropriation and allocation titles, and use of funds description ( $n = 328$ ). If a specific section did not have all the relevant data units listed above (e.g., Sec. 1106 WIC program modernization), then the entire paragraph for this section was considered the data unit. The coding stage involved a multistep approach. In the initial coding phase, each data unit was read, and relevant key words or

**TABLE 2** Grouping of codes into social determinants of health (SDOH) categories using Healthy People 2030 framework.

Healthy People 2030 SDOH label	Healthy People 2030 definition of SDOH category	Relevant codes for each category (grouping from Table 1)
Economic stability	Stable employment and income and external environmental factors that enable individuals and families to prosper.	Food and nutrition, business recovery, target populations, family support (financial), health and medical support, industry, and housing
Education access and quality	Access to quality education services and opportunities for children and adolescents that allow them to prosper and thrive.	School environment, family support (outreach), and financial aid
Healthcare access and quality	Availability and accessibility of quality, timely, comprehensive, and respectful healthcare services, and resources.	COVID response, healthcare workforce, mental health, health insurance, and violence
Neighborhood and built environment	Development and maintenance of health and safe neighborhoods and environments where people live, work, play, pray, and relax.	Wildlife, environmental protection, housing, transportation, and infrastructure
Social and community context	Strengthening of social and interpersonal relationships and networks that provide emotional, material, informational, and other types of supports to individuals, families, and communities.	Family support (financial), family support (outreach), violence, and community development

phrases (e.g., small business loans, women and children, and elementary schools) were extracted and added to a Microsoft Excel spreadsheet for each appropriation and allocation in ARPA. Table 1 demonstrates the labels and codes used in this first coding step.

In the second coding phase, each code and key word (see Table 1) for the appropriation or allocation were grouped into larger categories

using the SDOH analytic framework. These categories, as defined by Healthy People 2030, include economic stability, education access and quality, healthcare access and quality, neighborhood and built environment, and social and community context. If the appropriation or allocation had overlapping themes per Healthy People 2030 (e.g., both economic stability and neighborhood and built environment

**TABLE 3** Appropriations and allocations designated to each social determinants of health (SDOH), listed by federal administrator.

SDOH/federal administrator	Number of appropriations and allocations	Number of sections	Potential funding
<b>Economic stability</b>	<b>127</b>	<b>84</b>	<b>\$1 247 228 375 000</b>
Treasury	50	36	\$925 899 900 000
Labor	13	11	\$205 168 000 000
Small Business Administration	12	6	\$53 600 000 000
Transportation	16	6	\$27 722 000 000
Agriculture	17	12	\$21 762 000 000
Health and Human Services	8	5	\$8 550 000 000
Commerce	1	1	\$3 000 000 000
Social Security Administration	2	2	\$848 000 000
Office of Personnel Management	1	1	\$570 000 000
Veterans Affairs	1	1	\$80 000 000
Railroad Retirement Board	6	3	\$28 475 000
<b>Neighborhood and built environment</b>	<b>65</b>	<b>24</b>	<b>\$482 116 130 841</b>
Treasury	17	3	\$393 561 000 000
Transportation	24	7	\$62 498 130 841
Housing and Urban Development	8	5	\$10 590 000 000
Homeland Security	1	1	\$10 000 000 000
Health and Human Services	3	3	\$5 010 000 000
Interior	7	2	\$225 000 000
Agriculture	2	2	\$132 000 000
Environmental Protection Agency	3	1	\$100 000 000
<b>Education access and quality</b>	<b>29</b>	<b>22</b>	<b>\$182 431 707 000</b>
Education	21	15	\$133 694 707 000
Health and Human Services	4	4	\$40 115 000 000
Federal Communications Commission	2	1	\$7 172 000 000
Interior	1	1	\$850 000 000
National Science Foundation	1	1	\$600 000 000
<b>Healthcare access and quality</b>	<b>72</b>	<b>58</b>	<b>\$125 963 000 000</b>
Health and Human Services	60	48	\$108 593 000 000
Veteran Affairs	1	1	\$17 080 000 000
Housing and Urban Development	1	1	\$280 000 000
Labor	10	8	\$10 000 000
<b>Social and community context</b>	<b>28</b>	<b>13</b>	<b>\$18 872 500 000</b>
Health and Human Services	21	7	\$10 322 000 000
Agriculture	5	5	\$7 630 000 000
Interior	1	1	\$772 500 000
Treasury	1	1	\$148 000 000

**TABLE 4** Total American Rescue Plan Act (ARPA) funding analyzed by federal administrators and designated social determinants of health (SDOH).

Federal Administrator (Federal Department, Executive Entity, or Independent Agency)	Total ARPA funding	Potential economic stability funding <sup>a</sup>	Potential neighborhood and built environment	Potential education access and quality funding <sup>a</sup>	Potential healthcare access and quality funding <sup>a</sup>	Potential social and community context funding <sup>a</sup>
Department of the Treasury	\$951 880 900 000	\$925 899 900 000	\$393 561 000 000			\$148 000 000
Department of Labor	\$205 478 000 000	\$205 168 000 000			\$10 000 000	
Department of Health and Human Services	\$168 040 000 000	\$8 550 000 000	\$5 010 000 000	\$40 115 000 000	\$108 593 000 000	\$10 322 000 000
Department of Education	\$133 694 707 000			\$133 694 707 000		
Department of Transportation	\$62 498 130 840	\$27 727 000 000	\$62 498 130 841			
Small Business Administration	\$53 600 000 000	\$53 600 000 000				
Department of Agriculture	\$22 844 000 000	\$21 762 000 000	\$132 000 000			\$7 630 000 000
Department of Veterans Affairs	\$17 080 000 000	\$80 000 000			\$17 080 000 000	
Department of Homeland Security	\$11 610 000 000		\$10 000 000 000			
Department of Housing and Urban Development	\$10 870 000 000		\$10 590 000 000		\$280 000 000	
Department of State	\$10 000 000 000					
Federal Communications Commission	\$7 172 000 000			\$7 172 000 000		
Department of Commerce	\$3 153 000 000	\$3 000 000 000				
Department of the Interior	\$1 855 000 000		\$225 000 000		\$850 000 000	\$772 500 000
General Services Administration	\$1 150 000 000					
Social Security Administration	\$848 000 000	\$848 000 000				
National Science Foundation	\$600 000 000			\$600 000 000		
Office of Personnel Management	\$570 000 000	\$570 000 000				
Institute of Museum and Library Services	\$200 000 000					
United States Digital Service	\$200 000 000					
Corporation for Public Broadcasting	\$175 000 000					
National Endowment for the Arts	\$135 000 000					
National Endowment for the Humanities	\$135 000 000					
Office of the Law Revision Counsel of the United States	\$103 000 000					
Environmental Protection Agency	\$100 000 000		\$100 000 000			

TABLE 4 (Continued)

Federal Administrator (Federal Department, Executive Entity, or Independent Agency)	Total ARPA funding	Potential economic stability funding <sup>a</sup>	Potential neighborhood and built environment	Potential education access and quality funding <sup>a</sup>	Potential healthcare access and quality funding <sup>a</sup>	Potential social and community context funding <sup>a</sup>
Government Accountability Office	\$77 000 000					
Consumer Product Safety Commission	\$50 000 000					
Pandemic Response Accountability Committee	\$40 000 000					
Federal Trade Commission	\$30 400 000					
Railroad Retirement Board	\$28 475 000	\$28 475 000				
White House	\$12 800 000					
TOTAL	\$1 663 930 412 841	\$1 247 228 375 000	\$482 116 130 841	\$182 431 707 000	\$125 963 000 000	\$18 872 500 000

<sup>a</sup>Administrator funding across the five SDOH domains is nonexclusive; funds may be coded for multiple SDOH or no SDOH.

SDOH categories identify housing and homes as key variables), then that section was given both SDOH labels. Table 2 shows how the codes and key words extracted in the first coding phase were grouped into Healthy People 2030 SDOH categories. Refer to the Appendix for a detailed description of the analytic framework, including the Healthy People 2030 SDOH labels, definitions, and examples of key words and phrases for each of the five categories.

After coding and labeling each ARPA appropriation or allocation was completed, intercoder reliability was conducted. Two reviewers coded 20% (n = 66) of ARPA appropriations and allocations.<sup>44</sup> Intercoder reliability was 86%.

Researchers did not seek institutional review board approval as the data were publicly available online.

### 3 | RESULTS

One hundred eighty-nine sections of the legislation had one or more appropriations or allocations defined in the text, resulting in 328 unique database entries. Analysis revealed that 29 sections of the bill had no financial implications, and 18 appropriations were reduced to nil once related allocations were subtracted from the initial appropriation amount. There are 281 appropriations and allocations listed within ARPA for unique funding purposes.

The researchers assessed the potential scale and scope of ARPA funds via three primary summary characteristics: (1) according to funding amount, (2) the number of sections pertaining to a qualifier, and (3) the number of relevant appropriations and allocations. Each of these three descriptions revealed something about the priorities and flexibility of the funding put forth by the legislation: the funding amount indicating the scale of impact, the number of sections representing the high-level variety of purposes, and the appropriations and allocations demonstrating the specificity of fund purpose. When appropriate, all three characteristics are included in the findings. The percentage of funds is not named when describing SDOH because those monies may be counted in multiple categories.

Relative to the study objective, researchers aimed to determine how much ARPA funding aligns with one or more SDOH categories. Researchers accounted for \$1.66 trillion in appropriated and allocated funds. Approximately \$1.65 trillion of these funds (99%) can be used to support one or more SDOHs. As an economic stimulus bill, most appropriations and allocations (\$1.2 trillion) address economic stability (84 sections), as shown in Table 3. The least funding was designated for social and community context goals at nearly \$18.9 billion (14 sections). Thirty-six sections did not fit any SDOH categories, totaling \$15.7 billion (0.9%) in ARPA funding (e.g., administrative, policy changes, and no fiscal component). Table 4 organizes ARPA appropriation and allocation funding amounts across SDOH according to the 31 federal departments, executive branch entities, and independent agencies that administer ARPA funding. Over half of federal administrators distribute funds that could contribute to at least one of the five SDOHs. Thirteen

**TABLE 5** Multi-solver funding, only American Rescue Plan Act (ARPA) appropriations and allocations coded for more than one social determinants of health and their administrators.

Social determinants of health	Administrator(s)	Number of appropriations and allocations	Number of sections	Potential ARPA funds
Economic stability, <i>and</i> neighborhood and built environment	Health and Human Services, Treasury, <i>and</i> Transportation	28	9	\$394 772 000 000
Economic stability, <i>and</i> social and community context	Agriculture	5	5	\$7 630 000 000
Education access and quality, healthcare access and quality, <i>and</i> social and community context	Health and Human Services	1	1	\$150 000 000
Economic stability <i>and</i> healthcare access and quality	Veterans Affairs	1	1	\$80 000 000

federal administrators that received ARPA funding did not have appropriations or allocations that fit SDOH criteria (\$12.4 billion, 7% of the total funding).

Looking at specific appropriations and allocations within the legislation, 35 entries have the potential to be used as multi-solver funds, meaning that they can support programs categorized for more than one SDOH category (Table 5; 16 sections, \$402.6 billion, 24% of the total ARPA funding). Of those 16 sections, nine (\$394.8 billion) accounted for allocations that could support neighborhood and built environment or economic stability goals. The departments of HHS, Transportation, and Treasury administer sections of ARPA that funds could be spent on economic stability or neighborhood and built environment goals. One section of the legislation, administered by the HHS, has the potential to address three different SDOHs. While the COVID-19 pandemic and resulting decline in economic stability and health were the primary impetus for creating ARPA, the findings from this study demonstrate that the application of a SDOH framework fosters multisector collaborations and solutions.

The content analysis and descriptive characteristics also identify administrative funding patterns across SDOH. Table 4 shows which federal entities were tasked with administering funds related to multiple SDOH categories. The HHS received ARPA funds that could be designated across all five SDOHs. Seven other departments received funds that could potentially be designated for two or more SDOHs. The Department of the Treasury administers ARPA sections that could fund economic stability, neighborhood and built environment, and social and community context goals. The Department of Transportation administers ARPA sections that could fund economic stability and neighborhood and built environment goals. The Department of Agriculture administers ARPA sections that could fund economic stability, neighborhood and built environment, and social and community context goals. The Department of Veterans Affairs administers ARPA sections that could fund economic stability and healthcare access and quality goals. The Department of the Interior administers ARPA sections that could fund neighborhood and built environment and education care access and quality goals.

## 4 | DISCUSSION

### 4.1 | Summary of key findings

ARPA is a complex piece of legislation. The funding appropriated within appears to be specifically designated to administrators without consideration of how multiple administrators might address complementary issues. Applying an SDOH analysis framework to the appropriations and allocations reveals an overlap of investment opportunities that cross-sector initiatives can leverage. This overlap is seen primarily in two ways: (1) specific allocations and appropriations can be used to meet multiple SDOH goals and (2) federal administrators receive money that can be categorized according to multiple SDOHs.

Multi-solver funding (allocations or appropriations that can be applied to multiple SDOHs) highlights the flexibility of appropriations or allocations that multiple sectors might be interested in addressing. For example, ARPA section 9101, administered by the HHS's Administration for Children and Families, can serve families with home visits or with virtual home visits, supplement additional staff costs (e.g., offering hazard pay), train home visitors, acquire technology to conduct virtual home visits, provide emergency supplies to eligible families, or reimburse suppliers of emergency supplies. According to the SDOH definitions, this legislation section can be categorized as potentially supporting healthcare access and quality, education access and quality, or social and community context goals. Initiatives looking to leverage funds from this appropriation (\$150 million) might collaborate with partners from the healthcare, information technology, education and training, or social services sectors.

Most multi-solver funds in ARPA could help further economic stability and neighborhood and built environment goals. ARPA section 9901, the Coronavirus State and Local Fiscal Recovery Funds, totals \$350 billion that are sent directly to localities. These monies have the most flexible purpose of any section in ARPA, a characteristic uncommon in legislation but ideal for cross-sector use.

This study also identified diverse administrators that handle funds whose dictated use relate to the SDOH categories. All five SDOH categories can potentially receive funding from 3 to 11 federal



administrators, indicating the potential for cross-sector collaboration to achieve common goals and improve health and well-being outcomes. For example, the Department of Education was the largest administrator of funds for education access and quality goals. However, the next largest administrators of related funds were HHS and the Federal Communications Commission. Additional examples include the Department of Agriculture and the HHS contributing money to neighborhood and built environment goals or the Department of Labor contributing funds that could meet healthcare access and quality goals.

## 4.2 | Compare and contrast with prior studies

This study applied a method for framing legislation according to SDOH to identify funding opportunities for SDOH across federal funding silos. No other studies were found that categorized legislative funding by SDOH.

To encourage engagement with this approach, researchers shared study findings on the webpage, *Funding Resilience: Advancing Multisector Investments for Equity*, which contains five interactive dashboards (<https://framingfunds.org>).<sup>21</sup> These dashboards were designed to help practitioners visualize the feasibility of the approach, navigate the legislation, and trace how money flows from the ARPA to federal departments, states, and local communities. The federal appropriations and allocations are listed in tables and can be filtered according to SDOH, revealing the diversity of federal departments associated with funds related to each SDOH.

Advocacy groups and state, county, and city governments around the USA have designed dashboards to track how administrators obligate ARPA funds. Generally, these dashboards reflect how much money has been obligated in one geographic area, a specific section of the legislation, or for a single issue.<sup>12-19</sup> For local government entities, these dashboards facilitate transparency and accountability as required by the Department of the Treasury for receiving State and Local Fiscal Recovery Funds (section 9901) from ARPA.<sup>40</sup> The Federal government has also made efforts to be transparent about how these funds are spent. Tasked with this work, the Pandemic Response Accountability Committee created resources and reports to provide aggregated spending information on all six laws that funded pandemic relief programs.<sup>20</sup> Instead of describing ARPA funding in terms of what has already been obligated, the present feasibility study and the accompanying dashboards layer information from disparate sources with the SDOH analytic framework to demonstrate the legislation's scale, scope, and potential. When used together, these dashboards help practitioners get a detailed understanding of how ARPA money may be used for cross-sector collaboration.

Although *Aligning for Health* advocates for coordinated programs to improve US health outcomes and promotes the value of categorizing laws as relevant to SDOH, there are limits to the utility of the information they provide about these laws.<sup>24</sup> Their list of bills introduced to the 116th and 117th Congresses does not analyze the

content in the list of bills, specify the SDOH to which it relates, or specify any relevant funding amounts, administrators, or eligible recipients. While considerable, the list is not organized so that a practitioner can discern the applicability of the legislation to their initiatives or parse details that make the benefits more accessible. The research presented in this feasibility study builds upon the work of *Aligning for Health* by analyzing a piece of legislation in its entirety in accordance with the SDOH categories, providing a way to assess the legislation from a cross-sector perspective.

## 4.3 | Limitations

This study is not without limitations. This study analyzed the contents of a single piece of legislation. The methods outlined in this article need to be applied to additional enacted bills to gain a more comprehensive understanding of legislation that impacts societal health and increases cross-sector use of funds. As a feasibility study, the analysis did not include detailed fund allocations nor expenditures at the jurisdictional level. Therefore, those interested in exploring more details about available funds will need to investigate jurisdictional allocation and expenditure decisions. This analysis and the resulting dashboards provide a broad framework on which deeper analyses and discussions can be built. Lastly, this study did not undertake a comparative policy analysis using the SDOH framework to compare two or more bills and thus understand trends or patterns across multiple pieces of legislation.

## 4.4 | Implications for practice

This SDOH analysis is a feasible and practical approach to reveal potential funding opportunities that increase health equity. SDOHs are conditions and language familiar to practitioners and researchers, many of whom already use SDOH to characterize health equity goals. Additionally, the federal government is actively working to incorporate SDOH into its strategic approaches and frameworks.<sup>5,30-33</sup> Applying this analytic approach can help facilitate conversations between government officials, researchers, and practitioners as they collectively work to address the needs of vulnerable communities.

SDOH can help conceptualize the health implications of monies outside of sources historically viewed as relevant to improving health outcomes. By using SDOH to analyze legislation, it becomes clear that the HHS and its agencies are not solely responsible for public health improvement; collectively, all federal departments have an opportunity to play a pivotal role in advancing the nation's health. Moreover, funding to promote health and equity can be found at the federal level and at the state and local levels. Using the methods outlined in this paper, researchers can use SDOH to analyze legislation that appropriates monies to demonstrate how they can help increase national health equity. Applying this framework to legislation and funding opportunities helps to broaden the potential support of a collaboration beyond the description of funding a specific initiative.

Legislative analysis is not often presented in a way that is easily accessible to those who are doing health-improving work in communities. To that end, this analysis is publicly available to help practitioners better understand the SDOH funding potential and ARPA funds administration.<sup>21</sup> Given that prior studies have not approached legislative analysis in this way, this study's SDOH-focused dashboards are unique. Applying an SDOH analytical framework, as this work does, may make it easier for practitioners to identify potential funds and ideas to support their cross-sector initiatives. Ideas generated by reviewing the dashboards may catalyze health-oriented cross-sector collaborations to (1) seek resources from previously untried federal departments or (2) collaborate differently to maximize funding potential.

## 4.5 | Conclusion

Using an SDOH analytical framework is an innovative approach to conceptualizing and synthesizing the contents of complex legislation. It builds upon momentum created by community-based organizations' practice, research recommendations, and approaches taken by the federal government. Future legislation content analyses can employ this SDOH analytic framework to identify and expand the inventory of relevant funding sources for cross-sector initiatives. This approach reveals administrator and multi-solver funding patterns across the SDOH that can encourage cross-sector collaborations and accelerate joint investments in health.

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## SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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