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Addressing Social Determinants of Health: Examples of Successful Evidence-Based Strategies and Current Federal Efforts

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KEY POINTS

- Long-standing health inequities and poor health outcomes remain a pressing policy challenge in the U.S. Studies estimate that clinical care impacts only 20 percent of county-level variation in health outcomes, while social determinants of health (SDOH) affect as much as 50 percent. Within SDOH, socioeconomic factors such as poverty, employment, and education have the largest impact on health outcomes.
- SDOH include factors such as housing, food and nutrition, transportation, social and economic mobility, education, and environmental conditions. Health-related social needs (HSRNs) refer to an individual's needs that might include affordable housing, healthy foods, or transportation. This report provides select examples of the evidence in several of these areas.
- *Housing* – Studies show strong evidence of the benefits for "housing first" interventions that provide supportive housing to individuals with chronic health conditions (including behavioral health conditions). Benefits include improved health outcomes and, in some cases, reduced health care costs. In addition, interventions that reduce health and safety risks in homes, such as lead paint or secondhand smoke, can also improve health outcomes and reduce costs.
- *Food and Nutrition* – Efforts to improve food access through healthy food environments, public benefit programs, health care systems, health insurers, and evidence-based nutrition standards can lower health care costs and improve health outcomes.
- *Transportation* – Enhanced built environment interventions including sidewalks, bicycle infrastructure, and public transit infrastructure can make physical activity easier, safer, and more accessible. Non-emergency medical transportation has been shown to be cost-effective by increasing use of preventive and outpatient care and decreasing use of more expensive care.
- *Social and Economic Mobility* – Multiple randomized trials show that cash payments to families and income support for low-income individuals with disabilities are associated with better health outcomes. Early childhood care and education are also associated with positive health outcomes.
- *Social Service Connections* – Some studies of care management and coordination using multi-disciplinary teams that support HRSNs show reduced total cost of care and improved health outcomes, but the evidence overall on these effects is mixed.
- Building on this evidence base, the U.S. Department of Health and Human Services is taking a multifaceted approach to address SDOH across federal programs through timely and accessible data, integration of public health, health care, and social services, and whole-of-government collaborations, in order to advance health equity, improve health outcomes, and improve well-being over the life course.

INTRODUCTION

Despite significant investments to improve access to high-quality health care, health inequities in the United States persist by race, ethnicity, sexual orientation, gender identity, and disability, as well as by economic and community level factors such as geographic location, poverty status, and employment. Black, Latino[*], American Indian and Alaska Native (AI/AN), Asian American, Native Hawaiian, and Pacific Islanders (AANHPI), and LGBTQ+, individuals, people who live in rural areas, and people with disabilities fare worse than their White, heterosexual, and urban counterparts and people without disabilities. These disparities exist for many health outcomes, including infant and maternal mortality, heart disease, diabetes, hypertension, chronic illness, disability, cancer, mental illness, substance use, and overall life expectancy.[1-10]

While opportunities to advance health equity through clinical care continue to be important,[11] addressing the ways in which social determinants of health (SDOH) increase or decrease the risk of poor health outcomes is critical to improving the nation's health and wellbeing. SDOH are the conditions where people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes.[12] When one or more of these conditions pose challenges, such conditions can become risk factors for poor health outcomes. SDOH are fundamental social and structural factors that touch people's lives and impact their wellness and longevity. Health and wellness are shaped by and within overarching systems, including structural racism, ableism, homophobia, and transphobia; and broad neighborhood and community structures including physical safety, environmental quality, and occupation-related hazards. Educational attainment, income, and the stress of financial hardship, along with discrimination due to nativity and racial or ethnic origin, disability, sexual orientation, and gender identity, are key determinants that influence a variety of more proximal factors (such as access to affordable housing) that impact the risk of morbidity, mortality, and health throughout the life course.

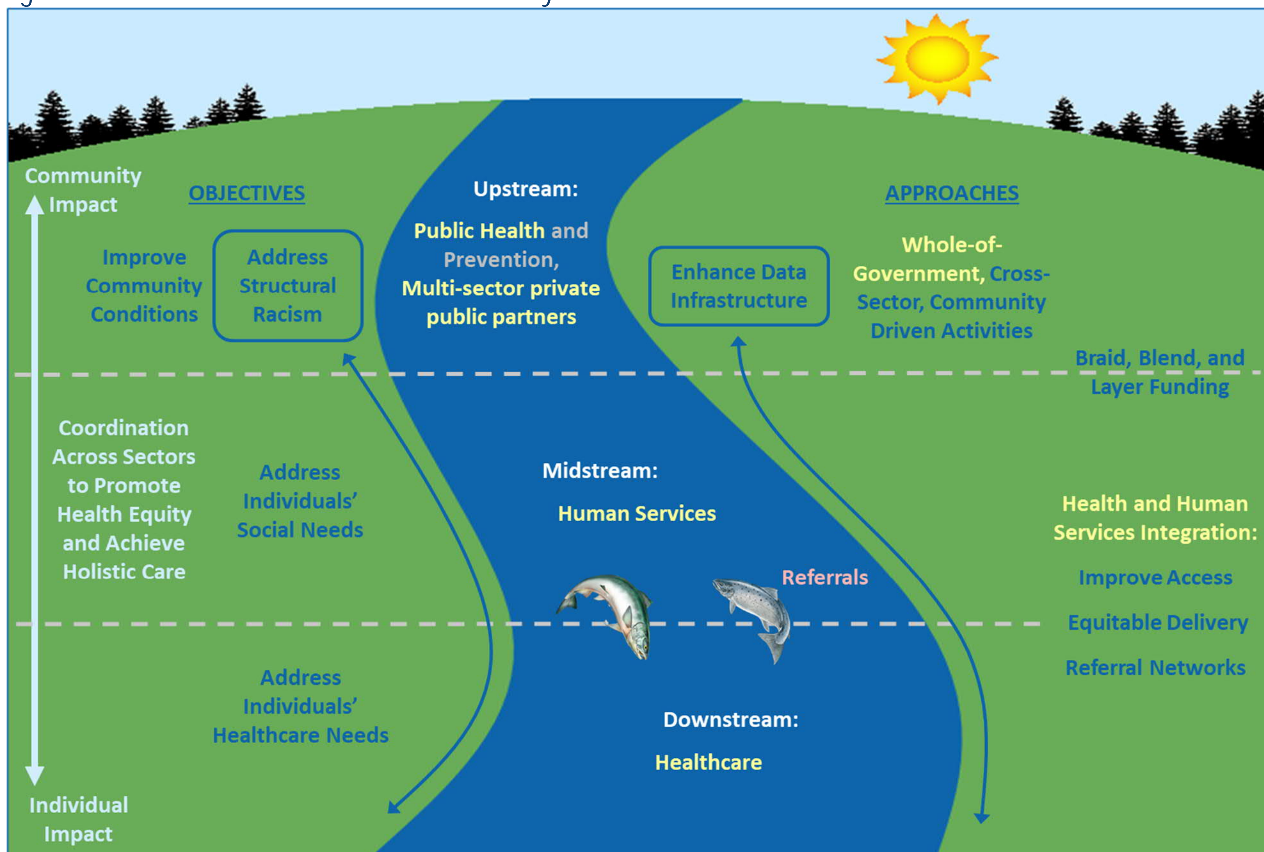
Social and structural factors play a critical role in driving disparate health outcomes. One study estimated that, on average, clinical care impacts only 20 percent of county-level variation in health outcomes, while SDOH affect as much as 50 percent of health outcomes.[13] More specifically, socioeconomic factors alone may account for 47 percent of health outcomes, while health behaviors, clinical care, and the physical environment account for 34 percent, 16 percent, and 3 percent of health outcomes, respectively.[14] Moving from the county level to the individual level, a given person's physical health, behavioral health, and well-being are also influenced by factors that are specific to the individual. At the individual level, we use the term health-related social needs (HRSNs) to refer to an individual's needs that might include affordable housing, healthy foods, or transportation. An unequal distribution of SDOH is the root cause of HRSNs at the individual level. For example, a particular community may lack abundant affordable housing, but local individuals may experience housing needs differently. Distinguishing between SDOH and HRSNs is critical for developing measures, evaluating data sources, assessing evidence and especially for formulating policy responses.

Figure 1, below, provides a pictorial representation of the SDOH and HRSNs ecosystem. The diagram includes three segments depicting different points at which there are opportunities to address SDOH, with the river representing the level of action and primary actors, and the banks representing the objectives and approaches for each segment. Importantly, addressing structural racism and enhancing data infrastructure, noted in boxes, are key factors for success. In the upstream segment are the underlying social and economic conditions that create differences in SDOH. Interventions relevant to this segment apply at the community level and attempt to address the root causes of socioeconomic and health inequities (such as poverty, employment, and education). The midstream segment is human services (i.e., social service providers and community-based organizations) that address individuals' HRSNs in order to mitigate the effects of SDOH. The downstream segment focuses on individual health care, which may refer or connect an individual to assistance for a social

[*] This brief uses the term "Latino" to refer to all individuals of Hispanic and Latino origin.

need. While the diagram indicates that human services and health care primarily address the needs of individuals, the bi-directional arrows indicate the need for coordination across each of the three segments. The Figure depicts the nation's investment in health care spending as downstream of investments in community conditions (including public health) and social services. While health care in the U.S. is by far the most highly resourced sector of the three, improving health outcomes requires adequate support for all three sectors. To develop comprehensive strategies and policies to address SDOH, it is important that those involved in each of the three segments partner with each other to identify community-based approaches towards addressing the underlying root causes of health disparities.

Figure 1. Social Determinants of Health Ecosystem



Note: Adapted from Castrucci B, Auerbach J. Meeting Individual Social Needs Falls Short of Addressing Social Determinants of Health. Health Affairs Blog. January 16, 2019

This brief provides a high-level overview of select strategies to address SDOH and HRSNs that have demonstrated success in reducing impediments to health and well-being, improving health outcomes, or lowering health costs, as well as a discussion of some of the current HHS efforts to address SDOH and improve the conditions that impact health and longevity among the American people. This brief surveys the evidence on successful interventions designed to address SDOH and the HRSNs of people at various points in the lifespan including infancy, childhood, adulthood, and older age; people who live in particular areas, such as major cities or rural communities; and people with particular conditions such as asthma, HIV, and others. It should be noted that interventions may improve health outcomes, utilization, or costs for one group but not necessarily for other groups. In many cases, data on health outcomes are not available, so data on health care utilization, costs, or healthy behaviors are presented as proxy measures. These may or may not represent improved health and well-being and is therefore a critical limitation in evaluating impacts. As noted in the conclusion, additional research is needed on the longer-term impacts of many of these interventions. Conversely, even when interventions don't improve utilization measures or lower health care costs, there may

be value in the intervention in the form of improved health outcomes, well-being, or long-term impacts not included in the studies' time horizon. A key prerequisite for both addressing health disparities related to SDOH and HRSNs and measuring progress after intervention implementation is a more robust and interconnected data infrastructure to support evidence-based policies and better identify improved outcomes associated with such policies.

This brief is *not intended as a comprehensive review* of all of the evidence on SDOH and HRSNs. It highlights only a few of the many interventions that have been evaluated and largely focuses on selected domains where there is at least some evidence to suggest potential health effects. There is a rich literature on SDOH and HRSNs, some of which is referenced throughout this paper, and several systematic reviews and resource libraries survey the full landscape of this evidence base.[15-21]

Important methodological challenges exist in assessing the effects of interventions for SDOH and HRSNs. At the community level, randomized designs are rare and the evidence is often not sufficient to make causal conclusions. In addition, many interventions focus on individuals who have experienced adverse outcomes, such as a hospitalization, high health care costs, or other negative health or social events. In such cases, simple pre-post assessments, without a control or comparison group, will often suffer from regression to the mean – the phenomenon in which people experiencing higher-than-expected outcomes in one period (e.g., total health care spending) will typically experience closer-to-average results in the subsequent period simply by chance. Other challenges include lack of comprehensive data for both health and social outcomes; lack of large sample sizes, particularly for subgroup analyses; and differences in unmeasured characteristics between those who participate in HRSN interventions and those who do not. In addition, methods for evaluating SDOH and HRSNs are not static and research innovation continues to evolve to enhance our understanding of the effects of intervening on SDOH and HRSNs. For these reasons, this brief, which provides a broad view of the current state of the research, attempts to highlight whenever possible the study design and the relative strength of the evidence, preferentially reporting results from randomized trials and natural experiments with defined comparison groups. This brief also references several systematic reviews that use consistent, transparent, and scientifically rigorous methods, which provide the opportunity to look across many studies at once in order to understand what interventions work and under what conditions.

EVIDENCE REGARDING SELECTED SOCIAL DETERMINANTS

Safe and Stable Housing

Safe and stable housing has been associated with improved health and well-being. For example, housing instability among families has been associated with fair or poor caregiver and child health, maternal depressive symptoms, child lifetime hospitalizations, and household material hardships, such as food insecurity and foregone care.[22] The Community Preventive Services Task Force (CPSTF), which provides guidance on available scientific evidence about community-based health promotion and disease prevention interventions, recommends tenant-based housing voucher programs to improve health and health-related outcomes.[23] Permanent supportive housing (PSH), a model which pairs affordable housing assistance with voluntary supportive services,[*] has been shown to be effective in improving housing stability.[24,25] Existing evidence reviews have also found strong evidence of the benefits of providing supportive housing to individuals with chronic health conditions, including behavioral health conditions, with studies demonstrating reduced

[*] Services provided as part of PSH are designed to build independent living and tenancy skills and connect individuals to needed services. These supportive services can include case management, mental health services, primary health services, substance abuse treatment, employment services, and parenting skills. National Alliance to End Homelessness. Permanent Supportive Housing. https://endhomelessness.org/ending-homelessness/solutions/permanent-supportive-housing/ and Corporation for Supportive Housing. Understanding Supportive Housing. https://www.csh.org/toolkit/understanding-supportive-housing/

inpatient, emergency department (ED), and long-term care utilization, and in some cases improved health outcomes or reduced overall costs.[26,27,28]

Housing interventions for adults experiencing homelessness who have chronic illnesses (such as heart disease, diabetes, renal failure, cirrhosis, asthma, and HIV) have been shown to reduce hospitalizations, hospital days, and ED visits.[29] Individuals with HIV experiencing homelessness who received permanent housing with intensive case management had better outcomes than those receiving typical discharge planning, including higher one-year rates of survival with intact immunity and a higher percentage with undetectable viral loads than the usual care group.[30] The study also found reduced utilization among high cost individuals. A 2012 study looking at individuals with chronic medical illnesses experiencing homelessness in Chicago found that those who received a housing and case management intervention experienced 2.6 fewer hospitalized days, 1.2 fewer ED visits, 7.5 fewer days in residential substance use disorder (SUD) treatment, 9.8 fewer nursing home days, and 3.8 more outpatient visits each year, compared to individuals who received usual care.[31]

Evidence is more mixed regarding the impact of housing on total cost of care. However, in a systematic review, the CPSTF found that the economic benefits of PSH with Housing First programs in the United States exceed the cost of intervention, with a substantial portion of savings attributable to health care.[32] In the 2012 study discussed earlier, among Chicago patients with chronic medical illnesses experiencing homelessness, those receiving a housing and case management intervention had an estimated annual cost savings of $6,307 compared to the control group, accounting for health care, legal, housing, and case management costs. Another study in Los Angeles compared the average monthly cost savings for persons in supportive housing based on various characteristics and found the highest cost savings among individuals with HIV/AIDS, mental illness and/or SUD, and those who were 45 to 65 years old. Conversely, costs increased among individuals who worked in the last three years, as the average monthly cost savings for public services did not offset the cost of providing supportive housing.[33]

Ensuring housing is safe also has positive health impacts. There is evidence that improving individual's existing housing via home improvements or modifications improves outcomes.[34-39] A study comparing children with public insurance living in *redeveloped public housing* (distressed and dilapidated urban public housing rebuilt into lower density, townhome-style communities), *non-redeveloped public housing*, and *nonpublic housing* found that children living in non-redeveloped public housing were 39 percent more likely to have repeat visits within one year for acute care services unrelated to their initial visit, while there was no difference between those in redeveloped and nonpublic housing.[40] Fixing housing issues related to health impacts can also improve outcomes. An intervention that provided dust mite covers, a professional house cleaning, and roach bait and trays to households of children with asthma found that the intervention group had lower dust mite levels and better functional severity scores compared to a delayed intervention group, though overall asthma severity scores did not change.[41] Healthy home environment assessments, which use home visitors to assess and remediate environmental health risks within the home, have also been shown to decrease use of urgent care and improve health outcomes.[42] A review by the CPSTF found such interventions resulted in a median reduction of 21 symptoms days per year and 0.57 asthma acute care visits per year among children and adolescents.[43] Smoke-free housing policies can also improve health outcomes through reduced exposure to secondhand smoke.[44] Further, an 2014 analysis of national state cost savings associated with prohibiting smoking in subsidized housing estimated that such prohibitions in all US subsidized housing would result in $310 million in annual cost savings from reductions in secondhand smoke-related health care.[45]

In some cases, housing modifications have also been associated with health care cost savings. Community Aging in Place, Advancing Better Living for Elders (CAPABLE), which provides home repair and modifications relevant to individuals' functional goals along with other efforts to improve their self-care ability and functional goals, resulted in $867 less Medicaid spending per month in 2018, on average, for dual-eligible beneficiaries over age 65 who experienced difficulties with at least one activity of daily living (ADL).[46] Another study found

that the CAPABALE intervention reduced ADL disabilities by 30 percent in five months.[47] Modifications like those done by CAPABLE can support individuals with a disability in living safely at home.[48] Reducing lead exposure in homes by eradicating lead paint hazards from older homes and removing lead drinking water service lines have also demonstrated health savings and benefits in health (measured via quality-adjusted life years, QALYs). A 2019 analysis estimated that eradicating lead paint hazards from older homes of children from low-income families would provide $3.5 billion in future benefits, including $60 million in health savings and $110 million in health benefits, while removing lead service lines would result in $10 million in health savings and $30 million in health benefits.[49]

Nutrition and Food Access

Having healthy food available and affordable in food retail and food service settings allows people to make healthier food choices. When healthy foods are not available, people may settle for foods that are higher in calories and lower in nutritional value. Many strategies can contribute to healthy food environments, including applying nutrition standards in childcare facilities, schools, hospitals, and worksites; providing incentives for supermarkets or farmers' markets to establish their businesses in underserved areas; and having nutrition information and caloric content on restaurant and fast-food menus.[50,51]

School-based interventions that combine meal or fruit and vegetable snack interventions with physical activity interventions for elementary school students (through grade 6) increase students' physical activity, modestly increase their fruit and vegetable consumption, and decrease the prevalence of overweight and obesity.[52] Intervention approaches reviewed and recommended by the CPSTF to promote good nutrition include community-based digital health and telephone interventions to increase healthy eating and physical activity; digital health and telephone interventions to increase healthy eating and physical activity among students at institutions of higher education; gardening interventions to increase vegetable consumption among children; home-delivered and congregate meal services for older adults; and worksite digital health and telephone interventions to increase healthy eating and physical activity.[53] For example, their review of community-based digital health and telephone interventions to increase healthy eating and physical activity found that these interventions resulted in a median 1.12 percent weight reduction, 10.25 milligrams/deciliter triglycerides reduction, 4.00 milligrams/deciliter total cholesterol reduction, and 1.00 mmHg diastolic blood pressure reduction.[54]

Public benefit programs providing food assistance have been associated with lower health care costs, lower health care utilization, and improve health outcomes.[55,56] However, it should be noted that most studies on the impacts of such programs compare individuals who have enrolled in a given program versus those who have not, and are subject to confounding due to differences between such individuals, *which prevents drawing any conclusions on cause and effect.* A 2017 study of low-income adults participating in the Supplemental Nutrition Assistance Program (SNAP) found an association between SNAP participation and lower health care expenditures, with approximately $1,400 lower expenditures per year among SNAP participants.[57] A 2018 study found 5.8 percent lower expenses among older adult SNAP participants who were hospitalized as compared to hospitalized older adults without SNAP, as well as 1 percent lower odds of hospitalization for each $10 increase in SNAP monthly benefit amounts among individuals dually eligible for Medicare and Medicaid.[58] The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) also has been associated with improved maternal and child health outcomes, including reduced likelihood of preterm births, lower odds of mortality within the first year, and reductions in disparities in low birthweight, extended infant hospitalizations, and NICU outcomes, though with similar methodological limitations.[59,60,61] In addition, an analysis of the National Health Interview Study found that respondents who participated in WIC were less likely to forego or delay filling a prescription, skip medication doses, or take less medication than prescribed due to costs.[62] The Older Americans Act (OAA) funded nutrition services is also associated with reduced health care utilization and improved health outcomes for older adults. A study of OAA funded nutrition services

found that lower-income older adults who participated in the congregate meal program were significantly less food insecure than nonparticipants, and 61 percent of home-delivered meal participants and 42 percent of congregate meal participants indicated they would skip meals or eat less if the program was not available.[63] Individuals receiving home-delivered meals had greater improvements in anxiety and self-rated health, and reduced rates of hospitalizations and falls compared with individuals on waiting lists.[64]

Efforts to increase access to food via food pharmacies (pharmacies, health care clinics, or hospitals that store and dispense healthy food[65]), food prescription programs (prescriptions from doctors for healthy foods that can be used to subsidize the purchase of these items through community partners[66]), and home-delivered meals, which are often funded through health care systems or health insurance, have been associated with lowering health care costs and health care utilization.[67,68] Beginning in January 2016, a Geisinger Health Systems hospital offered diabetic patients prescriptions for five days of breakfast and dinner ingredients per week at their Fresh Food Farmacy, along with other supportive services. HbA1c levels (which indicate the level of sugar in an individual's blood) decreased by 20 percent among participants and Geisinger estimated that every percentage point decline in HbA1c levels saved approximately $8,000 in health care costs, compared to an annual investment in the program of $1,000 per patient per year; notably, however, this study did not include a comparison group.[69,70] Similarly, health clinic produce prescription programs that provide funds to purchase fresh produce from farmer's markets have also found significant improvements in health outcomes, including lower body mass indices (BMIs) among participants and improved glucose control among diabetic participants, as well as improved patient-provider relationships.[71,72] Another intervention that has been shown to improve outcomes is home-delivered meals. The provision of three free, nutritionally balanced meals, seven days a week, to Medicaid beneficiaries in Philadelphia and southern New Jersey found a significant decrease in total health care spending, fewer inpatient visits with shorter length of stays, and a greater number of discharges home rather than to acute care facilities, compared to a similar group of Medicaid beneficiaries who did not receive these services.[73] Another study found that, as compared to matched nonparticipants, beneficiaries dually eligible for Medicare and Medicaid participating in a food delivery program had fewer emergency department visits and lower medical spending.[74]

Transportation

Transportation systems help ensure that people can reach everyday destinations, such as jobs, schools, healthy food outlets and health care facilities, safely and reliably.[75] Transportation issues impact individuals' ability to obtain needed medical care, with 3.6 million people in the U.S. missing medical services due to transportation issues annually.[76] Transportation barriers to accessing medical care are complex and include transportation infrastructure, transportation costs, vehicle access, distance and time burden, and transportation policy.[77] Non-emergency medical transportation (NEMT) is one way to address some of these issues, including transportation cost and vehicle access. NEMT has been shown to be cost-effective by increasing preventive and outpatient care and decreasing more expensive care.[78] In a 2008 survey of Medicaid beneficiaries in New Jersey, Louisiana, and Michigan receiving dialysis, SUD treatment, or diabetic wound care who used NEMT to attend medical appointments, 58 percent of respondents indicated that they would make none of their treatment appointments if NEMT were not provided.[79] Based on the results of this survey, study authors estimated that per respondent, per month, Medicaid avoided $3,423 in costs for dialysis patients and $792 in costs for wound care patients based on appointments that would likely be missed if not for NEMT, but did not save on SUD treatments, as NEMT costs more than the additional medical costs from missed SUD treatments. Another study comparing the costs and benefits of providing NEMT to individuals who lack access to transportation found that for all 12 of the medical conditions analyzed, providing additional NEMT was cost-effective, and it was cost-saving for four conditions (prenatal care, asthma, congestive heart failure, and diabetes).[80] Cost-effectiveness was determined by establishing cost estimates for the provision of NEMT and comparing the per capita cost of care for well-managed patients and poorly-managed patients for each condition, accounting for additional factors such as QALYs. While NEMT is provided as a standard Medicaid

benefit, as of February 2022, four states have demonstration programs that waive provision of these benefits.[81]

Increasing access to safe, equitable public transportation infrastructure can also help address some of the transportation barriers to accessing medical care and is also associated with positive health behaviors and other positive health impacts. Public transportation is safer than travel in passenger vehicles, with motor vehicle crashes being the leading cause of death for people ages 1-34.[82,83] In addition, air pollution from motor vehicles contributes to adverse respiratory and cardiovascular health effects.[84] Public transportation is also associated with increased access to health care and healthy food as well as improvements in mental health and physical activity levels.[85,86] A study comparing train commuters to car commuters found that train computers walked an average of 30 percent more steps per day and were four times more likely to walk 10,000 steps per day.[87] Similarly, a systematic review found an additional 8-33 minutes of walking per day attributable to public transportation use.[88] However, given the disparities in traffic-related pedestrian death rates, it is important that safe walking routes are included in efforts to support public transportation infrastructure.[89] Further, a review from the CPSTF found that built environment strategies that combined one or more interventions to improve pedestrian or bicycle transportation systems with one or more land use and environmental design interventions increased physical activity.[90]

Social and Economic Mobility

Social and economic factors such as socioeconomic status, income levels, poverty, and educational attainment are fundamental drivers of poor health outcomes because they facilitate or impede access to important resources that affect health outcomes directly and through multiple mechanisms.[91] In a study of societal health burden and life expectancy, social and economic factors accounted for two of the three largest impacts on health and life expectancy. Experiencing poverty or near poverty (living at incomes below 200 percent of the federal poverty level) imposed the greatest burden and lowered quality-adjusted life expectancy more than any other risk factor, with 8.2 QALYs lost per person exposed over his or her lifetime.[92] Poverty limits opportunities and access to resources conducive to healthy behaviors, affects the physical "built" environment, and limits service availability within communities, all of which have independent effects on health outcomes.[93,94] Further, the cumulative effect of poverty over the life course also matters. For example, the greater the number of years a child spends living in poverty, the more elevated the child's cortisol levels and the more dysregulated the child's cardiovascular response to acute stressors.[95] These changes may impact children's cognitive development and chronic disease development, with larger exposures increasing the risk of adverse outcomes later in life.[96]

Cash transfers aimed at increasing income and reducing poverty can be particularly impactful for improving health outcomes.[97] A recent meta-analysis examining health effects of randomized social experiments in the United States identified seven cash-transfer interventions and found that they were associated with improvement in self-rated health, though not with smoking status or obesity.[98] For example, the Stockton Economic Empowerment Demonstration, a universal basic income experiment in Stockton, CA, gave randomly selected residents $500 per month for two years with no strings attached, which measurably improved participants' overall well-being and physical and emotional health.[99] Another income maintenance experiment in Gary, IN, found that supplemental income provided to mothers was associated with higher birth weights for their children in the absence of any health intervention, with the supplemental income linked to greater changes in birth weight than tobacco use or race.[100] In addition, a study of low-income American Indian children in families that received an annually increasing supplemental case income benefit found that by the fourth year of the program, formerly poorly resourced children's level of psychiatric symptoms was comparable to those of children who were never poor.[101]

Tax credits and supplemental income support for low-income individuals with disabilities also reduce poverty and are associated with better health, including improved birth outcomes, maternal mental health, and perceptions of health.[102,103] By reducing poverty and increasing income for working families, the Earned Income Tax Credit (EITC) has been linked to positive health outcomes, particularly for infants and mothers.[104,105] The EITC has led to improvements in infant health, including overall increases in birth weight and reductions in low birth weight rates.[106,107] A study of the association between the EITC and health outcomes found that compared to similar households that were not eligible for the credit, families eligible for the credit were more likely to have all of their children covered by health insurance.[108] The same study also found that infant mortality was lower in states with greater EITC penetration. The magnitude of this relationship was strong: each 10-percentage point increase in EITC penetration (within or between states) was associated with a 23.2 per 100 000 reduction in infant mortality rate ($P = 0.013$). Studies also show greater health improvements when larger, more generous EITC benefits are available.[109] Supplemental Social Security Income has also been associated with health improvements. A quasi-experimental study on Supplemental Social Security Income (SSI) that examined within-state changes to maximum SSI benefits found that an increase of $100 per month in the maximum benefit reduced mobility limitations among older adults.[110]

In addition to programs providing economic support, educational supports such as high-quality preschool programs also have been shown in studies to improve health outcomes.[111] Early childhood education is associated with improved child development and can serve as a protective factor against future disease and disability.[112] A review of research on early childhood education programs found that model programs, such as Abecedarian, the Perry Preschool Project, and the Infant Health and Development Program, improved health and health behaviors, including reduced smoking, improved cardiovascular health, and improved metabolic health among participants in adulthood, compared to controls.[113] The review also found that such programs, as well as Head Start, a federally-funded nationwide preschool program for low-income families, were associated with reductions in depression and disabilities in adolescence and early adulthood.

Social Service Connections

In studies of programs that use multiple types of providers, such as social workers, nurses, physicians, and case managers, to offer services that coordinate care across provider types and assist individuals with managing their health care conditions and HRSNs some studies have found reductions in total health care spending and health care utilization, and improved health outcomes, while in other cases results have been mixed.[114,115] Health Homes, which provide comprehensive care management, care coordination, health promotion, patient and family support, and referral to community and social support services to individuals with multiple chronic conditions or a serious mental illness, have been associated with improvements in linkages to SDOH-related services, reduced ED utilization and inpatient admissions, and improvements in performance on process of care measures among the first 11 states to launch the program.[116]

Other models that provide linkages to social services and supports have been successful as well. However, several evaluations have noted the need to do more than refer individuals to social services and supports. For example, an evaluation of the Centers for Medicare & Medicaid Services Accountable Health Communities model, which connects beneficiaries to community resources, found that only 14 percent of beneficiaries referred to social service navigation had their needs resolved, while 33 percent were lost to follow up, 4 percent were connected to resources but their needs were unmet, 10 percent opted out after accepting navigation, and 8 percent of needs could not be met.[117]

Evidence suggests when partnerships are coordinated and well-funded, they are more likely to be successful. WellCare Health Plans, Inc., a national managed care health plan that primarily serves patients in Medicaid, Medicare, or dually eligible for both programs, in 2011 launched WellCare "CommUnity" Health Investment Program, which included grants to social service providers and referred members and non-members to the

funded partners. Patients for whom a social barrier had been removed as a result of a referral to WellCare CommUnity partners were more likely to have a better BMI, a better medication assessment score, and to schedule and go to their annual primary care visit than patients without an intervention or referral.[118] Further, as of 2017, these services provided through WellCare CommUnity partners generated $3,200 in per member per year savings, including $3.47 health care savings for every $1 invested in the program. In addition, studies have found improved outcomes when health systems partner with community-based organizations (CBOs) to provide social services. For example, one study concluded that Accountable Care Organizations (ACOs) were more likely to succeed in integrating SDOH when they implemented networking initiatives that connect them to CBOs.[119] Another study found that hospitals in Hospital Service Areas that performed well on ambulatory care-related hospitalizations, readmission rates, and average reimbursements per Medicare beneficiary had deeper and more consistent collaboration with CBOs that provided social services.[120] Similarly, partnerships between hospitals and Area Agencies on Aging (AAA), which coordinate and offer services such as case management, home-delivered meals, and transportation that help older adults who desire to remain in their homes were associated with a $136 reduction in average annual Medicare spending per beneficiary between 2008 and 2013, as well as a significant reduction in hospital readmissions within a year.[121,122]

Studies looking at the use of Community Health Workers (CHWs, frontline public health workers who are trusted members of a community and have a close understanding of the community in which they are serving[123]) to connect individuals to health or social supports have found reductions in Medicaid spending and utilization of ED visits and an increase in use of ambulatory care.[124] For example, a randomized trial of adults participating in ACOs found that individuals with contact with a CHW were less likely to experience a hospital readmission within 30 days of discharge.[125] Among women with depression, women enrolled in a CHW intervention had a reduction in the frequency of high-cost encounters and lower average total charge amounts, compared to women enrolled in an enhanced screening and referral control group.[126]

ILLUSTRATIVE EXAMPLES OF ACTIONS HHS IS TAKING TO ADDRESS SDOH

There are many efforts underway across HHS to address SDOH and HRSNs, several of which are highlighted below. Table 1 shows illustrative examples of the relationship between the HHS agency initiatives described below and the evidence base described in the preceding section. While many of these initiatives are in progress and do not yet have completed evaluations at this time, in many cases, agencies are planning to conduct evaluations of the programs discussed in order to document the programs' successes, challenges, and opportunities for improvement.

Table 1: Selected Evidence-Based Interventions Used In HHS Agencies: Illustrative Examples[*]

AGENCY	CMS	HRSA	CDC	ACL	ACF	SAMHSA
Housing Related Services	X	X		X	X	X
Home Modifications and Improvements	X	X	X	X		
Food Access	X		X	X	X	
Non-Emergency Medical Transportation	X	X		X		
Public Transportation			X	X		
Case Management & Social Service Connection	X			X	X	X
Community Health Workers	X	X	X	X		
Social and Economic Mobility			X		X	

Note: This table is not an exhaustive list of HHS activities in these areas and also does not necessarily reflect specific funding or designated programs in each area.

[*] Agencies included may have additional programs that support evidence-based interventions listed on this table.

Centers for Medicare & Medicaid Services

Medicaid: Though Medicaid rules limit spending on non-medical services, nearly all states have implemented at least some policies or initiatives to address HRSNs through their Medicaid programs for various populations. In January 2021, the Centers for Medicare & Medicaid Services (CMS) issued a State Health Official letter identifying opportunities for states to better address SDOH under Medicaid and CHIP and to support states with improving outcomes and lowering costs by addressing SDOH. Using a variety of mechanisms, including using section 1905(a) State Plan Authority, Home and Community Based Services (HCBS), section 1115 demonstrations, section 1945 Health, and managed care contract requirements, among others, states are addressing HRSNs, including housing-related services and supports, non-medical transportation, home-delivered meals, educational services, employment, community integration and social supports, and case management.[127]

- Section 1905(a) State Plan Authority: States have used Section 1905(a) to establish peer supports and case management services, which are then used to link beneficiaries to HRSN supports. As of 2018, 19 states indicated that case management is a covered benefit in their program, and 36 indicated that targeted case management is a covered benefit (though this benefit may be provided under section 1915(g)[*]).[128,129]
- Home and Community Based Services (HCBS): Several states have utilized HCBS to implement housing-related services, including 46 states with section 1915(c) waivers; [†] four states with section 1915(i) benefits; and eight states with section 1915(k) benefits as of 2021.[130,131] For example, Minnesota is using section1915(i) state plan authority to provide housing stabilization services to certain individuals that are experiencing homelessness or are at risk of becoming homeless.[132] In their first year, the state reported that they served 7,203 individuals.
- Section 1115 Demonstrations: As of 2021, 25 states have utilized the flexibility provided by section 1115 demonstrations[‡] to address HRSNs, such as housing-related services, nutrition, transportation, and interpersonal violence.[133] For example, CMS recently approved an 1115 waiver for California's Medicaid program (Medi-Cal) to launch California Advancing and Innovating Medi-Cal (CalAIM), which seeks to integrate the Medi-Cal program with other social services through a "no wrong door" approach that couples clinical care with Medicaid reimbursable nonmedical services, including housing supports, medical respite, personal care, medically tailored meals, and peer supports.[134] However, as of February 2022, four states have also used section 1115 demonstrations to waive NEMT, a benefit that is typically required.[135]
- Section 1945 Health Homes: As of April 2021, there are 37 Health Home models across 21 states and the District of Columbia, all of which must include comprehensive case management, individual and family support, and referrals to community and social services, among other required services.[136]
- Managed Care Programs: As of 2018, 37 states have implemented requirements in their managed care contracts related to HRSN and SDOH.[137] These requirements include:
    - Relationships with social service providers (31 states);

[*] Section 1915(g) enables plans to provide case management services under Medicaid.

[†] Section 1915(c) waivers allow states to pay for housing transition and tenancy services for beneficiaries to individuals meeting an institutional level of care; Section 1915(i) benefits allow states to offer housing-related services for individuals who do not necessarily meet an institutional level of care; Section 1915(k) benefits allow states to pay for services and supports identified as part of a person-centered care plan, which can include home modifications or transition costs for moving an individual from an institution to a home or community-based setting.

[‡] Section 1115 demonstrations allow states to implement experimental, pilot, or demonstration projects that are likely to assist in promoting the objectives of the Medicaid program.

- Inclusion of SDOH in care coordination (24 states);
- Social determinant screening (24 states);
- Dedicated staff for SDOH (17 states);
- SDOH quality performance measures (11 states);
- Provider training on SDOH (10 states);
- Collection and reporting on SDOH information (7 states);
- Value-added services related to SDOH (7 states);
- Member education on SDOH (5 states); and
- Social determinant expenditure requirements or incentives (3 states).[138]

In addition to state flexibilities to address SDOH and HRSNs, CMS is partnering with the U.S. Department of Agriculture to connect people enrolled in food assistance programs, such as SNAP, with Medicaid and vice versa.[139] This partnership aims to improve participation rates and drive progress on both health and food security.

Center for Medicare and Medicaid Innovation (CMMI): CMMI established the Accountable Health Communities (AHC) Model in 28 locations to promote clinical-community collaboration to address HRSNs of Medicare and Medicaid beneficiaries through screening, referral, and community navigation services.[140] The model, which focuses on five core HRSNs of housing instability, food insecurity, transportation problems, utility difficulties, and interpersonal violence, found that 15 percent of the nearly 483,000 beneficiaries screened were eligible for navigation services, and more than half of these navigation-eligible beneficiaries reported more than one core HRSN.[141] CMMI is working to incorporate learnings from the AHC model into future models. As part of their Strategy Refresh, CMMI will require all new models to collect and report on data on HRSNs and SDOH, as appropriate.[142] In addition, CMS will consider models that aim to address upstream, community-level SDOH.

Medicare: CMS is also working to address HRSNs and SDOH in the Medicare program. As of 2019, CMS expanded the definition of supplemental benefits in Medicare Advantage (MA) plans to better address SDOH.[143] As of 2019, MA plans can offer a broader array of benefits that are primarily health-related, such as transportation, meal delivery, and adult day care, and as of 2020, plans can offer non-primarily health-related benefits to the chronically ill, such as pest control.[144] In addition, Medicare ACOs provide high-quality care to Medicare beneficiaries to ensure that patients get the right care at the right time through care coordination.

In FY22, CMS also included a request for information in the final Hospital Inpatient Prospective Payment System (IPPS) and Long-Term Care Hospital (LTCH) rule that sought ideas to make reporting of health disparities based on social risk factors and race and ethnicity more comprehensive and actionable. Inclusion of such measures in future payment rules would also build on the work of the CMMI AHC model.[145]

Health Resources & Services Administration

Health Resources & Services Administration (HRSA) provides cooperative agreement funding for a number of initiatives to support training and technical assistance for community health centers on topics related to SDOH and HRSNs, including the Corporation for Supportive Housing (CSH) and the National Center for Medical-Legal Partnerships.[146,147] CSH provides no-cost training and technical assistance to health centers that serve individuals experiencing homelessness and/or operate Health Care for the Homeless programs. This assistance provides health centers with strategies for improving health care access, housing stability, and health outcomes for these patients.[148] The National Center for Medical-Legal Partnerships provides training and

technical assistance to health centers on implementing medical-legal partnerships. These partnerships bring together legal professionals and health care teams to detect, address, and prevent social conditions negatively impacting individual and community health. HRSA-funded health centers also play an important role in improving HRSNs through the provision of enabling services, such as transportation, community health workers, and other nonclinical services that enable people's access to health care.[149]

An important part of HHS's strategic approach to addressing SDOH and HRSNs is to enhance data infrastructure and how data is used. Aligned with this goal, as part of their Uniform Data System (UDS) Modernization Initiative, HRSA began collecting SDOH data in 2020 and will gather patient-level data starting in 2023, which will permit a better understanding of the impact of SDOH on clinical outcomes in health center populations.

Centers for Disease Control and Prevention

The Centers for Disease Control and Prevention (CDC) seeks to protect public health through preparedness, disease prevention, and health promotion. The focus of public health is on the health, safety, and well-being of entire populations, and strives to provide the maximum benefit for the largest number of people.[150] Through their focus on public health, CDC's data, research and programs address SDOH and HRSNs in a number of ways.

Within the National Center for Chronic Disease Prevention and Health Promotion, numerous programs focus on SDOH and HRSNs. For example, for over 20 years, CDC's Racial and Ethnic Approaches to Community Health (REACH) grants have funded locally-based, culturally-tailored solutions to addressing health inequities, many of which are focused on SDOH.[151] Between 2014 and 2018, REACH provided better access to healthy foods and beverages to over 2.9 million people, more opportunities to be physically active to approximately 1.4 million people, and access to local chronic disease programs linked to clinics for over 830,000 people.[152] In 2021, CDC also launched the Closing the Gap with Social Determinants of Health Accelerator Plans pilot project that funds 20 state, local, tribal, or territorial jurisdictions to develop action plans including evidence-based strategies to prevent and reduce chronic diseases among people experiencing health disparities.[153] In addition, the Good Health and Wellness in Indian Country (GHWIC), CDC's largest investment to improve American Indian/Alaskan Native tribal health, focuses on improving nutrition, physical activity, and breastfeeding, reducing commercial tobacco use and exposure, and strengthening links between community programs and access to clinical services in order to promote health and prevent chronic disease.

Safe, stable, nurturing relationships and environments are essential to children's health and wellbeing. In addition to reductions in chronic health conditions, preventing adverse childhood experiences (ACEs) may also lead to reductions in socioeconomic challenges.[154] CDC's comprehensive approach to preventing ACEs uses multiple strategies derived from the best available evidence.

CDC's Stopping Elderly Accidents, Deaths & Injuries (STEADI) initiative, offers tools for health care providers to screen older patients for fall risk.[155] Components of STEADI include home modifications such as mounting grab bars near toilets and installing carpet on all surfaces that may get wet, coupled with referral to effective community-based fall prevention programs.

In August 2021, CDC launched the Community Health Workers for COVID Response and Resilient Communities initiative to put additional trained CHWs in communities with high rates of COVID-19 and long-standing health disparities related to race, income, geographic location, or other sociodemographic characteristics.[156] These CHWs will help build and strengthen community resilience to fight COVID-19 by addressing health disparities.

The Health Impact in 5 Years (HI-5) initiative highlights non-clinical, community-wide approaches that have evidence for reporting positive health impacts within five years.[157] The 14 evidence-based community-wide population health interventions included in this initiative fall into two categories – those that "change the context to make healthy choices easier," and those that address the SDOH. The six interventions aimed at addressing SDOH are:

- Early Childhood Education
- Clean Diesel Bus Fleets
- Public Transportation System
- Home Improvement Loans and Grants
- Earned Income Tax Credits
- Water Fluoridation

CDC has also established cross-departmental relationships aimed at addressing SDOH. CDC and the Department of Housing and Urban Development (HUD) have established an interagency agreement to build a sustainable, collaborative partnership to intentionally advance shared priorities related to health and housing. The first step is to provide evidence informed approaches for affordable senior housing programs. CDC and HUD are also working to develop a strategic framework or blueprint outlining goals to support state and local public health agencies and housing agencies to partner and achieve shared priorities locally. In addition, the Federal Transit Administration (FTA) in the Department of Transportation (DOT) has partnered with HHS, including CDC, on the Interagency Coordinating Council on Access and Mobility (CCAM), which is charged with increasing transportation access for low- income populations, older adults, and people with disabilities. The CCAM is jointly working across 11 federal departments to develop a 2023-2026 Strategic Plan for Human Services Transportation.

In addition to implementing and funding interventions aimed at impacting SDOH, CDC is also working to build the evidence base around effective interventions. The Guide to Community Preventive Services (The Community Guide), a collection of evidence-based findings of the Community Preventive Services Task Force (CPSTF), is a resource to help jurisdictions select interventions to improve health and prevent disease in states, communities, community organizations, businesses, health care organizations, or schools.[158] In 2020, CPSTF selected SDOH as one of nine priority topics to guide their systematic reviews on population health interventions for 2020-2025, and they formed a Health Equity Committee to assess and advance their work in this area. In 2020, CDC also awarded funds to the Association of State and Territorial Health Officials (ASTHO) and National Association of City and County Health Officials (NACCHO) to complete a retrospective evaluation of multi-sector coalitions to advance health equity by addressing SDOH. Year one findings of the 42 community multi-sector partnerships from across the country selected as a part of the Improving Social Determinants of Health–Getting Further Faster (GFF) pilot project showed that GFF partnerships built community capacity to address SDOH through new or strengthened partnerships, data and data systems, or strategic plans; leveraged resources; or engaged residents.[159] Ninety percent of GFF partnerships contributed to community changes that promote healthy living, such as building new walking trails, bike lanes, and playgrounds; creating new community and school gardens; and adopting tobacco-free policies. More than half of GFF partnerships reported positive health outcomes data for their SDOH initiatives, including improved health behaviors, clinical outcomes, and overall health and wellness, and decreased health care use and costs.

Administration for Community Living

The Administration for Community Living (ACL), in partnership with CMS, the Substance Abuse and Mental Health Services Administration (SAMHSA), ASPE, and HUD, recently launched the Housing Services Resource Center, which fosters collaboration and cross-sector partnerships to streamline services, better leverage resources, and make community living possible for more people.[160] This initiative offers innovative models and strategies to people who work at the organizations and systems that provide housing resources and

homelessness services, behavioral health services, independent living services and other supportive services, and others who are working to help people live successfully and stably in the community. It provides resources on how to develop and expand partnerships, tools for community collaborations, and information on supporting people with disabilities, older adults, and people experiencing homelessness to get and/or keep affordable and accessible housing and voluntary supportive services.

ACL also funds a nationwide network of aging and disability organizations that provide access to a variety of local community-based services that address social needs. Through this network, ACL provides 150 million home-delivered meals to over 883,000 individuals and 73.6 million congregate meals to more than 1.5 million seniors, funded through the OAA Nutrition Program.[161] Nutrition services help older Americans remain healthy and independent in their communities by providing meals and related services in a variety of community settings and via home-delivery to older adults who are homebound due to illness, disability, or geographic isolation. As compared to the U.S. population age 60 and older, participants in the OAA Nutrition Program are more likely to be in poor or fair health, have difficulties with three or more ADLs, live alone, and live in rural communities.[162] In addition to meals, the program provides nutrition screening, assessment, education, and counseling, and provides connections to other in-home and community supports. ACL also provides transportation services through their network, providing more than 20.4 million rides to doctor's offices, grocery stores, pharmacies, senior centers, meal sites, and other critical daily activities.[163] Forty-six percent of passengers on OAA-funded transportation are mobility impaired, meaning they do not own a car, or if they do own a car, they do not drive, and are not near public transportation.[164] Of the transportation participants, 71 percent have at least one chronic condition that could impair their ability to navigate safely, and 96 percent take daily medications, with over 16 percent taking 10 to 25 medications daily. In addition, ACL's network provided 3.3 million hours of case management services in Fiscal Year 2019 to assess needs, develop care plans, and arrange services for older persons or their caregivers. Over 82 percent of clients receiving case management reported that, as a result of the services arranged by the case manager, they were better able to care for themselves.[165]

In addition, ACL's Social Care Referrals Challenge is working to support health care systems and community-based organizations through health IT solutions.[166] The challenge seeks to cultivate care coordination, including the sharing of standardized data on SDOH, by developing or optimizing interoperable, scalable technology solutions that foster connections between community-based organizations and health care systems. Twelve proposals were selected for phase two of the competition, which will give the teams $30,000 and will allow teams to continue develop their solutions as they compete for a second award of $60,000 and a grand prize of $140,000.

Through grant awards made in September 2021, ACL is also supporting the infrastructure of 12 Network Lead Entities, or community hubs, that coordinate the activities of a broader network to efficiently contract with health plans and providers to address social needs. Increasingly, CBOs are organizing to form networks, allowing them to deliver a broad scope of services, expand populations served and geographic coverage, build stronger administrative functions, and offer a single point of contracting for payers.[167]

As part of their support for their disability network, ACL also offers several grants to enhance the cultural and linguistic competency of the disability network to ensure that all people with disabilities can access ACL-funded programs and services.[168] These include grants to build cultural competency within University Centers for Excellence in Developmental Disabilities, increase the diversity of leadership and staff in the development disability network, establish a diversity community of practice to create and share policies, practices, and systems in cultural and linguistic competence in disability programs, and conduct a gap analysis of cultural competency in the developmental disability network programs, among others.

Administration for Children and Families

The Administration for Children and Families (ACF) promotes the economic and social well-being of families, children, youth, individuals, and communities. Although not specifically designed to influence health, these anti-poverty and family support programs provide cash assistance, in-kind family support, and other individual, family and child services that can profoundly affect traditional health outcomes. All ACF programs, including childcare, Head Start, Child Support Enforcement, Child Welfare, Runaway and Homeless Youth, Temporary Assistance for Needy Families, healthy marriage and responsible fatherhood programs, community services, refugee resettlement, Low Income Home Energy Assistance, adolescent pregnancy prevention, and family violence prevention, address social determinants that can affect health and quality of life outcomes.

The Temporary Assistance for Needy Families (TANF) cash assistance benefits, which supported more than one million families in 2019 experiencing poverty, reduced poverty by 11.3 percentage points among recipients.[169,170] TANF funds are used to supplement income and for employment, education, and training that can promote economic mobility; to provide transportation assistance; to provide subsidies for utility payments to prevent utility shut offs; and to provide subsidies for food assistance. Case management provided through TANF can also screen for and identify health-related barriers such as mental health concerns or substance use disorder. During the COVID-19 pandemic, TANF programs across the country also used TANF funds to serve and support families experiencing or at risk of homelessness.[171]

HHS oversees the national Child Support program, partnering with state, tribal and local child support agencies, and others to encourage parental responsibility so that children receive financial, emotional, and medical support from both parents, even when they live in separate households. Child support payments help to increase income and reduce poverty among low-income custodial parents and their children. In fiscal year 2020, preliminary data shows the national program collected $34.9 billion and served 13.8 million children and their families.[172] Additional analyses shows that child support reduced poverty by 6.3 percentage points among individuals in families who received payments.[173]

ACF also provides grant funding and oversight to the programs that provide Head Start services across the country. Head Start promotes school readiness by offering educational, nutritional, health, social, and other services to children in low-income families.[174] In 2019, Head Start was funded to serve nearly one million children and pregnant women, and since its inception it has served more than 37 million children and their families.

Substance Abuse and Mental Health Services Administration

The Substance Abuse and Mental Health Services Administration (SAMHSA) provides programs and resources to help address social determinants of behavioral health, SDOH, and HRSNs for individuals with behavioral health conditions. For example, services provided through SAMHSA's grant programs help people with mental and substance use issues find housing and supportive services, increase access to disability income benefits for eligible adults who are experiencing or at risk for homelessness, and provide case management and other supports that assist in preventing or ending homelessness.[175]

The Office of the National Coordinator for Health Information Technology

The Office of the National Coordinator for Health Information Technology (ONC) seeks to improve the health and well-being of individuals and communities through the use of technology and health information, including SDOH information, that is accessible when and where it matters most. Advancing the use and interoperability of SDOH data is important to improving the health and well-being of all individuals and communities. Though not discussed in the evidence-based interventions above, accessible data is fundamental to the success of SDOH interventions. ONC is focused on ensuring that both patients and providers understand what capabilities are possible and required by the 21st Century Cures Act to ensure that with increased adoption of health information technology (IT), we can also more effectively capture

information about the conditions in which people live, learn, work, and play to improve health outcomes. Standardization of the way in which the data is obtained and exchanged will help providers more easily address non-clinical factors, such as food, housing, and transportation insecurities, which can have a profound impact on a person's overall health. For example, as of March 2022, almost all hospitals and roughly 75 percent of physicians use electronic health records (EHRs) certified through the ONC Health IT Certification Program, helping to enable widespread capabilities for the capture, reporting, exchange, and use of granular race and ethnicity data. This functionality will soon extend to the widespread use of interoperable SDOH data that can be electronically captured, used, and exchanged.

ONC works collaboratively with federal partners and the stakeholder community to advance the electronic exchange and use of SDOH data to help improve individual and population health by guiding the development, dissemination, and adoption of health IT standards; informing the development of policies to overcome SDOH data interoperability challenges and data use; supporting states and local governments as they build the infrastructures for SDOH data; and driving innovation in care delivery by using health IT tools and standards to integrate SDOH data into workflows.

CONCLUSION

Studies indicate that some SDOH and HRSN interventions, provided in the right settings and depending on the population, can improve health outcomes and well-being. In addition, some interventions may also decrease health care costs, though successful interventions can be cost-effective and worth undertaking even if they do not ultimately save money overall. Much of the research to date has focused on shorter-term outcomes and medically complex populations or those with high health care utilization. Research on community interventions has also demonstrated health improvements with long-term impact. However, as we focus our efforts on SDOH and HRSNs, more work to assess the impact of various interventions on multiple populations is warranted. Additional research can help us better understand how interventions to address risks related to SDOH and HRSNs in less medically complex individuals impact health and well-being over the life course, as well as the longer-term impacts of interventions; the impact on a wider range of populations, including rural communities and individuals without chronic illnesses; and the most appropriate "dose" of various interventions. Further, as discussed in the introduction, additional research is needed that focuses on health outcomes, in addition to health utilization, health costs, and healthy behaviors.

In addition to efforts to improve SDOH and HRSNs, HHS is committed to building the evidence base and measuring success related to these efforts. The Healthy People initiative identifies data-driven national objectives to improve the health of the nation. One of Healthy People 2030's five overarching goals is specifically related to SDOH: "Create social, physical, and economic environments that promote attaining the full potential for health and well-being for all."[176] The benchmarks set by Healthy People 2030 include targets to monitor progress and motivate and focus action and will help HHS in its efforts to track progress on improving SDOH.

Through a whole-of-government, multi-sector strategy, HHS is working to improve health and well-being of the U.S. population by investing in efforts to identify and address the underlying systemic and environmental factors that affect health status. As discussed further in "HHS's Strategic Approach to Addressing Social Determinants of Health to Advance Health Equity – At a Glance,[*]" HHS will drive progress through coordinated strategies and activities to better integrate health and human services and to advance public health initiatives involving cross-sector partnerships and community engagement to address specific SDOH drivers. These strategies and activities include strengthening data and data infrastructure, which can be used to improve evaluation and support other objectives moving forward; improving connections between health and social

[*] https://aspe.hhs.gov/sites/default/files/documents/aabf48cbd391be21e5186eeae728ccd7/SDOH-Action-Plan-At-a-Glance.pdf

services, including community partners, to address HRSNs; and adopting whole-of-government collaborations to address SDOH and enhance population health and well-being. HHS is not only supporting and implementing initiatives that are based on existing evidence but is also working to evaluate current efforts to contribute to our understanding of effective SDOH and HRSN interventions, refine existing efforts, and identify future initiatives to address HRSNs and SDOH that may also have a beneficial effect on health and well-being.

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