HHS Public Access

Author manuscript

J Safety Res. Author manuscript; available in PMC 2024 January 09.

Published in final edited form as:

J Safety Res. 2023 December ; 87: 508–518. doi:10.1016/j.jsr.2023.10.001.

Analysis of social determinants of health and individual factors found in health equity frameworks: Applications to injury research

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Abstract

Introduction: This research evaluated existing health equity frameworks as they relate to social determinants of health (SDOHs) and individual factors that may impact injury outcomes and identify gaps in coverage using the Healthy People (HP) 2030 key domains.

Methods: The study used a list of health equity frameworks sourced from previous literature. SDOHs and individual factors from each framework were identified and categorized into the Healthy People 2030 domains. Five injury topic areas were used as examples for how SDOHs and individual factors can be compared to injury topic-specific health disparities to identify health equity frameworks to apply to injury research.

Results: The study identified 59 SDOHs and individual factors from the list of 33 health equity frameworks. The number of SDOHs and individual factors identified varied by Healthy People 2030 domain: Neighborhood and Built Environment contained 16 (27.1%) SDOHs and individual actors, Social and Community Context contained 22 (37.3%), Economic Stability contained 10 (16.9%), Healthcare Access and Quality contained 10 (16.9%), and Education Access and Quality contained one (1.7%). Twenty-three (39.0%) SDOHs/individual factors related to traumatic brain injury, thirteen (22.0%) related to motor vehicle crashes and suicide, 11 (18.6%) related to drowning and older adult falls. Eight frameworks (24.2%) covered all HP 2030 key domains and may be applicable to injury topics.

Conclusions: Incorporating health equity into research is critical. Health equity frameworks can provide a way to systematically incorporate health equity into research. The findings from this study may be useful to health equity research by providing a resource to injury and other public health fields.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Practical Applications: Health equity frameworks are a practical tool to guide injury research, translation, evaluation, and program implementation. The findings from this study can be used to guide the application of health equity frameworks in injury research for specific topic areas.

Keywords

Injury; Framework; Health equity; Social determinants of health; Healthy People 2030

1. Introduction

The prevention of injuries, both intentional and unintentional, is a significant public health challenge. In 2021, unintentional injury, suicide, and homicide were the first, second, and fourth leading causes of death, respectively, among all decedents aged 1–44 (CDC NCIPC, 2021). The burden of intentional and unintentional injuries varies across the lifespan and recent publications have illustrated the disproportionate distribution of injuries among people from racial and ethnic minority groups, and by geography, urbanicity, and other social determinants of health (SDOHs) such as economic stability and health care access, and individual factors such as age (Kegler et al., 2022; Miller et al., 2021; Moreland et al., 2022; Shaw et al., 2022; Stone et al., 2022; Wulz et al., 2022). SDOHs are defined as “the conditions in the environments where people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks”(Department of Health and Human Services, 2022). SDOHs are factors that impact health equity, which is defined by the Centers for Disease Control and Prevention (CDC) as the fair and just opportunity for all persons to attain their highest level of health (CDC NCCDPHP, 2022). SDOHs along with individual factors, or a person’s behaviors or individual characteristics (e.g., biology, age), (WHO, 2017) can impact health inequities (Pirkis et al., 2023; CDC OMHHE, 2022) and may affect outcomes differently in various injury topic areas—for example, suicide, traumatic brain injury (TBI), older adult falls, drowning, and motor vehicle crashes. These individual factors and SDOHs can influence health outcomes. For example, although race/ethnicity is not considered an SDOH according to the HHS definition, the way society uses race or ethnicity in systems, policies, actions, and attitudes can influence health outcomes.

Achieving health equity across populations requires making the connection between identified health disparities and their root causes. Underlying these health disparities may be inequities in economic, social, or environmental factors that serve as barriers or opportunities for people to achieve their highest level of health (CDC OMHHE, 2022). Addressing these underlying inequities may help inform the public health field regarding resource allocation, particularly for culturally sensitive, tailored interventions, and advancing health equity. Health equity frameworks may inform metrics for measuring changes in the key determinants of and barriers to achieving better health. These metrics may provide measures for the reductions in health disparities between populations to help gauge progress towards health equity (Braveman et al., 2017).

The use of health equity frameworks in disparities-focused research may be one potential avenue for assessing how disease, injury, and violence prevent some populations from

achieving optimal health. Healthy People 2030 (HP 2030) framework uses data-driven objectives to measure health equity progress on a national level by addressing the upstream factors that impact health disparities (Department of Health and Human Services, 2022). The HP 2030 framework consists of measurable objectives grouped into five key domains which emphasize the importance of addressing upstream factors to improve health and eliminate health disparities. The five key domains include:

- Economic Stability (e.g., affordable housing and homes)
- Education Access and Quality (e.g., education among people with disabilities)
- Health Care Access and Quality (e.g., availability of health insurance)
- Neighborhood and Built Environment (e.g., transportation safety), and
- Social and Community Context (e.g., positive relationships at home) (Department of Health and Human Services, 2022).

The SDOHs and individual factors that apply to the five key domains of the HP 2030 framework may have differing levels of relevancy depending on the injury topic area. Reporting health disparities between groups is common in injury literature and is an essential part of surveilling and monitoring injury within populations. A recent literature review of injury-related meta-analyses and systematic reviews highlighted a variety of health equity frameworks and indices that have been used in research to measure and characterize health equity within populations (Lennon et al., 2022). However, only three of the meta-analyses and reviews identified in the literature search applied health equity frameworks to injury topics. While some of these tools for measuring health equity may not be universally applicable to all injury topic areas, relatively few studies to date have explored the utility of well-referenced health equity frameworks for injury research (Lennon et al., 2022).

Health equity frameworks have been used in the literature to conceptualize health equity. There remain areas of opportunity for exploring the applicability of health equity frameworks to injury topic areas to aid in conceptualizing health equity in injury and understand what factors may be most at play in causing inequities in injury outcomes. Conceptualizing health equity in a framework can help researchers understand relationships between different SDOHs and individual factors and help instill a health equity lens during research, translation, evaluation, and program implementation. Health equity frameworks are also a practical tool that can be used to translate research into public health action by informing the development of equitable interventions that address the complex, interrelated factors that influence health equity (Peterson et al., 2021; Woodward et al., 2021). The CDC National Center for Injury Prevention and Control (NCIPC) commonly utilizes the Social-Ecological Model—which is a four-level model to understand the interplay of risk and protective factors between the individual, relationship, community, and societal levels—to conceptualize SDOHs and health equity (CDC NCIPC, 2022a). Other recent research has created a blended injury equity framework using the Social-Ecological Model, Three Levels of Racism, and the Haddon matrix (Kendi & Macy, 2023). The purpose of this research is to evaluate existing health equity frameworks as they relate to SDOHs and individual factors that may impact injury outcomes, to characterize frameworks that may be considered to

apply to injury topic areas, and to identify gaps in coverage of frameworks by using the HP 2030 key domains.

2. Methods

For the purposes of this research, a health equity guiding framework was defined as a theoretical construct that assesses key domains and concepts associated with health equity. This study assessed 33 health equity frameworks from a previous literature review (Table 1) (Lennon et al., 2022). Additional information regarding these frameworks are noted elsewhere. Due to the effect of both SDOHs and individual factors on injury health outcomes, both were included in this study.

This study used the HP 2030 Framework to categorize SDOHs and individual factors into five key domains: Economic Stability, Education Access and Quality, Health Care Access and Quality, Neighborhood and Built Environment, and Social and Community Context (Department of Health and Human Services, 2022). Each health equity framework was analyzed by two independent reviewers to assess which SDOHs and individual factors the frameworks addressed. Then, the SDOHs and individual factors were categorized by the key domains of the HP 2030 Framework using a best fit model, based on alignment with the objectives outlined in the HP 2030 Framework, to identify and understand gaps in coverage in the five key domains (Department of Health and Human Services, 2022). The authors identified SDOHs and individual factors from the full list that most related to injury, including drowning, older adult falls, motor vehicle crashes, suicide, and traumatic brain injury (CDC NCIPC, 2022b; CDC NCIPC, 2023a; CDC NCIPC, 2023b; CDC NCIPC 2023c; CDC NCIPC 2023d). The authors used the list of health disparities from the referenced CDC NCIPC webpages to compare to the SDOHs and individual factors from the frameworks. If the two reviewers did not agree on key domain categorization, all authors were engaged in a discussion to reach consensus. The HP 2030 Framework domains which encompassed the SDOHs and individual factors specifically related to injury topic areas were compared with the health equity frameworks to understand potential alignment of health equity frameworks with injury topic areas.

3. Results

There were 33 health equity frameworks included in this study (Table 2). Of the 33 health equity frameworks, eight frameworks were found to cover all five of the HP 2030 key domains: Dahlgren and Whitehead Model; Environmental determinants of health; Life Course Approach; Policy-Oriented Approach; Social and Cultural Determinants of Mental Disorders; Social-Ecological Model; the Frieden Framework; and the World Health Organization's (WHO) Conceptual SDOH Framework. Most of the health equity frameworks contained SDOHs and individual factors that addressed at least one domain (n =29; 87.9%). The most common domain was Social and Community Context (n =30; 90.9%), followed by Neighborhood and Built Environment (n =26; 78.8%), Economic Stability (n =26; 78.8%), Healthcare Access and Quality (n =23; 69.7%), and lastly Education Access and Quality (n =10; 30.3%) (Table 2).

A total of 59 SDOHs/individual factors (Table 3) were identified from the 33 health equity frameworks included in this study (Lennon et al., 2022). The SDOHs and individual factors identified by the health equity frameworks varied by HP 2030 domain: 22 (37.3%) SDOHs/individual factors fit under Social and Community Context, 16 (27.1%) under the Neighborhood and Built Environment domain, 10 (16.9%) under Economic Stability, 10 (16.9%) under Healthcare Access and Quality, and one (1.7%) under Education Access and Quality (Table 3).

The most frequently identified SDOHs and individual factors in the list of health equity frameworks (N =33) within each respective domain were social context/environment (n = 19; Social and Community Context HP 2030 key domain), socioeconomic status (n = 17; Economic Stability), residential location/neighborhood (n = 17; Neighborhood and Built Environment), education (n = 12; Education Access and Quality), and health status/conditions (n = 14; Healthcare Access and Quality) (Fig. 1).

When comparing to injury topic areas, 23 (39.0%) SDOHs/individual factors related to TBI, thirteen (22.0%) were related to motor vehicle crashes and suicide, and 11 (18.6%) were related to drowning and older adult falls (Table 4) (CDC NCIPC, 2021). Four domains were most relevant to suicide and TBI (Economic Stability, Health Care Access and Quality, Social and Community Context, and Neighborhood and Built Environment), three for falls (Economic Stability, Social and Community Context, and Neighborhood and Built Environment) and two were found most relevant for both motor vehicle and drowning (Social and Community Context and Neighborhood and Built Environment).

4. Discussion

To our knowledge, this is the first study of its kind to assess SDOH and individual factor coverage within existing health equity frameworks and assess applicability of these frameworks to injury topic areas. SDOHs and individual factors by injury topic area were analyzed to demonstrate how health equity frameworks that incorporate these factors may align with injury outcomes through comparison with topic-specific health disparities. To understand commonalities between SDOHs and individual factors abstracted from the health equity frameworks, this study used the HP 2030 key domains. The HP 2030 key domains have ties to injury-related outcomes. For example, one of the HP 2030 Neighborhood and Built Environment objectives is to reduce the rate of minors and young adults committing violent crimes (Department of Health and Human Services, 2022). Frameworks reviewed in this study addressed different types of SDOHs and individual factors, which may make them more or less suitable for application to injury topic areas (Department of Health and Human Services, 2022).

The SDOHs and individual factors identified in the health equity frameworks varied across the HP 2030 key domains. As shown in Fig. 1, the Social and Community Context and Neighborhood and Built Environment key domains had more coverage compared to the Economic Stability, Health Care Access and Quality, and Education Access and Quality key domains. One potential reason for this may be because this study used a best fit model, meaning that each SDOH and individual factor was categorized into one of the five

HP 2030 key domains and overlap between domains was not assessed. Another potential reason may be that some SDOHs and individual factors such as age, genetic predictors, and environmental factors, which are part of the Neighborhood and Built Environment and Social and Community Context key domains, are more commonly included in health equity frameworks compared to SDOHs and individual factors found in other domains. Eight frameworks in the study covered all five of the HP 2030 key domains. These frameworks appear to be most universally applicable for conceptualizing health equity broadly based on alignment with the HP 2030 key domains. However, the SDOHs and individual factors found to be relevant to the suicide and TBI topic areas appeared in all but the Education Access and Quality domain, so additional frameworks that did not cover the Education Access and Quality key domain could be considered, such as A Public Health Framework for Reducing Health Inequities, the health equity measurement framework, World Health Organization (WHO) International Classification of Functioning, Disability and Health (ICF) model, the Multi-level Systems Approach, Pathways Model, PROGRESS/PROGRESS Plus, Rural Community Health and Well-Being Framework, social determinants of child health, and the WHO Social Political, Economic and Cultural Conceptual Model. For falls, the Weathering Hypothesis and social and demographic determinants of health-related quality of life could be considered as well, since these frameworks cover the three key domains identified for falls. Additionally, the Community Stress Theory and the framework for understanding racial/ethnic disparities in environmental health could be considered for motor vehicle and drowning.

The health equity field is constantly evolving and expanding, making relationships between terms difficult to comprehend and apply to research. However, incorporating health equity frameworks into research is important for understanding and contextualizing the underlying drivers of health disparities. The application of health equity frameworks in research may be an effective strategy to help researchers evaluate and conceptualize why health outcomes may differ between populations, which can lead to more tailored upstream prevention strategies and progress towards health equity (Braveman et al., 2017). The findings from this study may serve as a useful tool for researchers in injury and other public health fields to reference and utilize when considering health equity frameworks to include in their disparities-focused research.

5. Limitations

There are a few limitations to this study. This study utilized a compilation of health equity frameworks that were identified from a limited number of sources (e.g., PubMed, CINAHL) (Lennon et al., 2022). Therefore, additional health equity frameworks found in other citation databases or resources may have been excluded. The authors added the SDOHs and individual factors into the five key domains recommended by HP 2030 using a best fit model; therefore, some SDOHs and individual factors may have overlapped into other key domains, and instances of potential overlap were not reported in the study. Given that the health equity frameworks used in this study were developed and used at different points in time in the past decades, terminology for describing the same SDOHs and individual factors may have varied over time, which could have caused an increase in number of SDOHs and individual factors reported. Additionally, the CDC webpages that were used to determine

health disparities for injury topic areas to compare to underlying SDOHs and individual factors did not necessarily mention all health disparities that are present within the topic areas, which could have led to the exclusion of other SDOHS and individual factors when determining applicability of health equity frameworks to injury topic areas.

6. Conclusions

The importance of incorporating health equity into the public health field, including injury, is critical. Health equity frameworks can provide a way for those in the fields of research, implementation, translation, and program development to incorporate health equity into their research. During this process, it is important to note which SDOHs and individual factors are covered by the frameworks and how these apply to specific fields of research. This study adds to the existing literature by identifying SDOHs and individual factors addressed by 33 health equity frameworks used in the literature and providing a tool for researchers to begin identifying health equity frameworks that can be applied to their work. The findings from this study could be used to develop a health equity framework for specific injury topic areas or other public health areas. Further research may observe how frameworks can be applied to new and existing injury research, using SDOHs and individual factors as a guide to select the most fitting framework based on the populations most disproportionately affected by injury outcomes.

7. Practical Applications

Health equity frameworks are a practical tool to guide injury research, translation, evaluation, and program implementation. The findings from this study can be used to guide the application of health equity frameworks in injury research for specific topic areas. Moving forward, researchers may use these findings to develop and apply health equity frameworks that address the specific SDOHs and individual factors most relevant to framing and understanding health equity in injury prevention.

Acknowledgments

The Journal of Safety Research has partnered with the Office of the Associate Director for Science, Division of Injury Prevention, National Center for Injury Prevention and Control at the CDC in Atlanta, Georgia, USA, to briefly report on some of the latest findings in the research community. This report is the 75th in a series of “Special Report from the CDC” articles on injury prevention.

Disclaimer

The findings and conclusions in this manuscript are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Biography

Andrea Carmichael, MPH graduated from George Mason University in 2018 with her MPH in Epidemiology and completed her practicum at the EPA’s Office of Children’s Health protection. She is currently a Health Scientist for the Division of Injury Prevention in the CDC’s Injury Center, where she has presented and published on various injury topics including health equity, suicide prevention, drug overdose, and nonfatal injury data. She

completed two COVID-19 response deployments, which involved monitoring and reporting cases among the general population and among people experiencing homelessness.

Natalie Lennon, MPH graduated from Emory University in 2021 with her MPH in Behavioral, Social, and Health Education Sciences. She currently works on the Suicide Prevention Team in the National Center for Injury Prevention and Control, Centers for Disease Control and Prevention (CDC). In her current role, Natalie serves as a suicide subject matter expert for CDC's Comprehensive Suicide Prevention Program and conducts research focused on suicide and suicidal behaviors among disproportionally affected groups.

Judy Qualters, PhD, MPH is the director of the Division of Injury Prevention (DIP) in the National Center for Injury Prevention and Control (NCIPC) at CDC. In this role, Dr. Qualters provides leadership to bridge science and practice in an effort to move the field of violence and injury prevention forward. She also leads a diverse portfolio of work that includes surveillance, data and economic analysis, information technology, policy research, evaluation, and technical assistance to state health departments.

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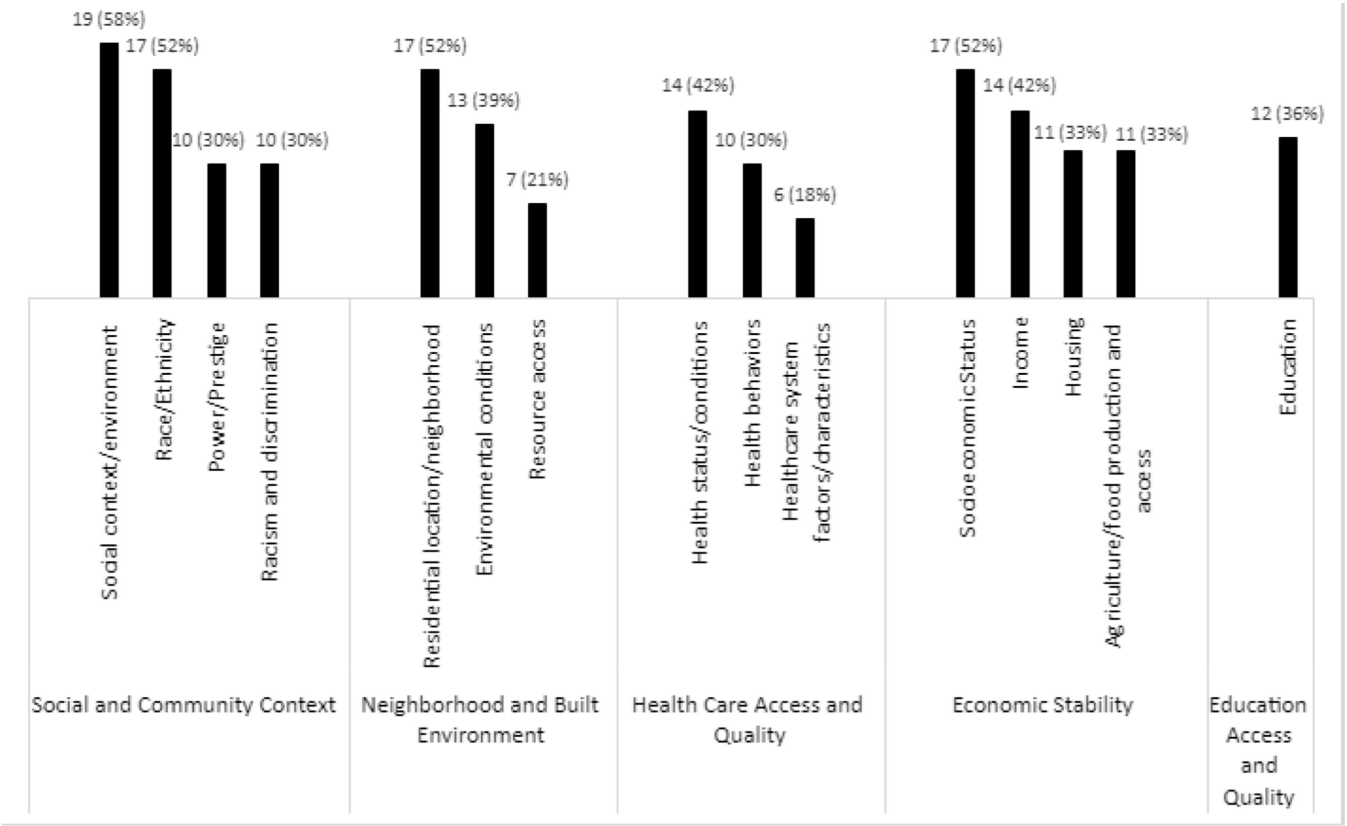

Fig. 1. Top Three Social Determinants of Health[a] and Individual Factors Most Frequently Identified in Health Equity Guiding Frameworks Categorized by Healthy People 2030 Key Domains[b-d] (N =33).

[a] Social determinants of health (SDOHs) are broader in scope and include the social, economic, and environmental factors that influence the health and well-being of communities. SDOHs and individual factors can be categorized in the five different domains in the Healthy People 2030 model: Economic Stability, Education Access and Quality, Health Care Access and Quality, Neighborhood and Built Environment, and Social and Community Context.

[b] Includes health equity frameworks found in Table 1.

[c] Only one SDOH was categorized in the Education Access and Quality domain, therefore only one is shown.

[d] Definitions for select terms:

Agriculture/food production and access addresses “supply side” of food security at the national or international level and is determined by economic and physical access factors such as the level of food production, stock levels, and net trade (this includes food access, which refers to household level food security and whether individuals can obtain food, food stability, food availability, food deserts, rurality, agriculture and food production).

Healthcare system factors/characteristics refers to access to quality, affordable, and timely preventive and curative health care that recognizes individual patient needs, including their health history and personal preferences.

Power/Prestige refers to an imbalance in status and opportunities between populations based on factors such as race and ethnicity, gender, income, or sexual orientation.

Social context/environment are factors and circumstances in the broader social setting (such as exposure to community stressors or personal/life experiences) that shape behaviors, beliefs, and/or perceptions of individuals and groups of people.

Table 1

Health equity frameworks included in analysis of social determinants of health and individual factors.

Framework	Description	Citation(s)
A Public Health Framework for Reducing Health Inequities	Depicts the relationship between social inequalities and health, with a specific focus on inequities related to social, institutional, and living conditions.	National Academies of Sciences, Engineering, and Medicine, 2016
Community Stress Theory	Stressors, such as issues related to inequality, can weaken the body's ability to respond to external challenges.	Gee & Payne-Sturges, 2004
Dahlgren and Whitehead Model	Maps the influence of individual (e.g., lifestyle factors) and environmental factors (e.g., community influences, living and working conditions, etc.) on health.	de Lima Silva et al., 2014; Driscoll et al., 2013
Dimensions of Food Security (Food and Agricultural Organization)	Measures the availability of food and an individual's ability to access it through the following four dimensions: (1) availability, (2) access, (3) utilization, and (4) stability.	Bowers et al., 2020
Environmental Determinants of Health	Environmental determinants include the physical, chemical, and biological factors external to a person and their impact on health (e.g., sanitation, exposure to toxins, climate change, pollution, etc.).	Salgado et al., 2020
Equity-Effectiveness Model	The effectiveness of community-level interventions decreases along a set of parameters which measures access to, and quality of, care.	Nooh et al., 2019
Expansive Gender Equity Continuum	Expands upon previous gender equity models that define equity on a continuum from gender unequal to gender transformative, by including a broader definition of gender identity ranging from exclusive (i.e., only considers cisgender identities) to gender inclusive (i.e., considers people of all gender identities, including trans people and nonbinary individuals).	Restar et al., 2021
Framework for Understanding Racial/ethnic Disparities in Environmental Health	Health disparities are partially caused by differential access to resources and exposures to hazards and can be grouped into four categories: (1) social processes, (2) environmental contaminants/exposures, (3) body burdens of environmental contaminants, and (4) health outcomes.	Payne-Sturges & Gee, 2006
Fundamental Cause Model	Examines the relationship between socioeconomic inequalities and health; the ability to control disease/death is influenced by access to fundamental resources (e.g., knowledge, money, power, prestige, and beneficial social connections).	Tulier et al., 2019; Diez Roux, 2012
Health Equity Framework	Outlines how health outcomes are influenced by complex interactions between people and their environments and centers around three foundational concepts: (1) equity at the core of health outcomes; (2) multiple, interacting spheres of influence; and a (3) historical and life-course perspective.	Peterson et al., 2021
Health Equity Measurement Framework	Comprehensive model that describes the social determinants of health in a causal context and can be used to measure and monitor health equity; includes an expansive list of social determinants of health, such as the socioeconomic, cultural, and political context, health policy context, social stratification, social location, material and social circumstances, environment, quality of care, etc.	Dover & Belon, 2019
Health in All Policies	Health in All Policies HiAP) is a collaborative approach that integrates and articulates health considerations into policymaking across sectors to improve the health of all communities and people. HiAP recognizes that health is created by a multitude of factors beyond healthcare and, in many cases, beyond the scope of traditional public health activities.	Lorenc et al., 2014
Healthy People (2020 and 2030)	Provides science-based, national objectives each decade dedicated to improving the health of all Americans. Healthy People 2020 developed a framework that organized the social determinants of health into five key domains: (1) Economic Stability, (2) Education, (3) Health and Health Care, (4) Neighborhood and Built Environment, and (5) Social and Community Context. Healthy People 2030 established a framework to describe the initiative's rationale and approach, including its vision, mission, foundational principles, plan of action, and overarching goals (new objectives are underway).	Welch et al., 2022; Chen et al., 2020; Mohan and Chattopadhyay, 2020; Sokol et al., 2019; Min et al., 2022; Yelton et al., 2022, Maness & Buhi, 2016; Abbott and Williams, 2015
Interaction Model	Emphasizes the interaction between genes and their environment, such that individuals with different genotypes experience differential effects of environmental exposures and disease risk.	Diez Roux, 2012

Framework	Description	Citation(s)
Life Course Approach	Applies a temporal and social perspective to analyze people's lives within social, economic, and cultural contexts across different generations to understand current patterns of health and disease.	Taggart et al., 2020
Multi-level Systems Approach	Focuses on individuals within broader contexts, such as within neighborhoods or communities, who may share similar characteristics and therefore may experience similar health outcomes.	Payne-Sturges et al., 2006a
Pathways Model	This model aims to reduce health and social disparities in communities by connecting high-risk individuals to care and tracking the associated outcomes.	Diez Roux, 2012
Policy-oriented Approach	Analysis of patterns and trends of social inequalities in health over time and their determinants, with a specific focus on inequalities that are commonly viewed as unjust and avoidable.	Braveman, 1998
PROGRESS/ PROGRESS Plus	Acronym used to identify dimensions across which health inequities may occur, specifically, place of residence; race/ethnicity /culture/language; occupation; gender/sex; religion; education; socioeconomic status; and social capital.	Turnbull et al., 2020; Chhibber et al., 2021; Schröders et al., 2015; Lehne & Bolte, 2017; Schüz et al., 2021; Campos-Matos et al., 2016; Aves et al., 2017; Welch et al., 2022; Morton et al., 2016; Buttazzoni et al., 2020; Brown et al., 2017a; Brown et al., 2017b; Ahmed et al., 2022; Cohn & Harrison; 2022
Psychosocial Stress Model	Health disparities arise from the stresses associated with institutional and interpersonal racism.	Dressler et al., 2005
Rural Community Health & Well-Being Framework	Identifies key drivers (i.e., social, economic, and environmental factors) that influence health in rural communities and includes additional categories of important factors highlighted by rural residents.	National Academies of Sciences, Engineering, and Medicine, 2016
Social and Cultural Determinants of Mental Disorders	Conceptual framework to understand how social determinants interact with key genetic determinants to influence mental disorders.	Lund et al., 2018
Social and Demographic Determinants of Health-related Quality of Life (QoL)	An individual's overall sense of wellbeing including aspects of happiness, satisfaction of life, and physical, mental, psychological, and social perceptions.	Ghiasvand et al., 2020
Social Determinants of Child Health (SDCH)	Examines how social determinants impact child health across time and generations through distal social factors such as poverty, material deprivation, and social inequalities.	Rajmil et al., 2020
Social-Ecological Model	Theory-based framework for understanding how social and structural determinants influence health and wellbeing.	Habbab & Bhutta, 2020, Yiga et al., 2020, Pereira et al., 2019, Reno & Hyder, 2018, Greenbaum et al., 2018, Christidis et al., 2021, Allen et al., 2020, Karger et al., 2022, Taylor & Lamaro Haintz, 2018
Socioeconomic Status Model	Emphasizes that race/ethnicity and socioeconomic status (SES) are related, such that certain race/ethnicity groups are disproportionately represented in lower SES groups.	Dressler et al., 2005
Stress-Exposure Disease Framework	Conceptual framework that outlines the relationships between race, environmental conditions, and health.	Gee & Payne-Sturges, 2004; Payne-Sturges et al., 2006b
Structural-Constructivist Model	Integrates a dual perspective focused on (1) socially constructed cognitive representations within a society and (2) external factors that restrict individuals, specifically social relationships, and expectations of others (e.g., race, as a concept, is socially or culturally constructed).	Dressler et al., 2005
The Frieden Framework	Five-tier pyramid for improving public health; the base of the pyramid includes (1) interventions that impact social determinants of health (e. g., poverty, education), followed by (2) interventions that benefit the general population (e. g., fluoridated water), (3) interventions that help large segments of the population (e.g., immunizations), (4) clinical interventions for the prevention of certain conditions (e.g., cardiovascular disease), and (5) health education interventions (i.e., most labor-intensive and potentially lowest impact).	National Academies of Sciences, Engineering, and Medicine, 2016

Framework	Description	Citation(s)
Three Levels of Racism Framework	Theoretical framework for understanding racial health inequities and developing effective interventions to reduce inequities on three distinct levels: (1) institutionalized, (2) personally mediated, and (3) internalized.	Chandler et al., 2022
Warnecke's Model for Analysis of Population Health and Disparities	Defines factors impacting health disparities as proximal, intermediate, or distal and focuses on individual-level outcomes as they relate to specific determinants (i.e., social conditions and policies, institutional context, social context, and physical context).	Zahnd & McLafferty, 2017
Weathering Hypothesis	Proposes that cumulative exposure to social, economic, and political disadvantage leads to rapid decline in physical health.	Forde et al., 2019
World Health Organization (WHO) Conceptual Social Determinants of Health (SDOH) Framework	Outlines how social, economic, and political factors (e.g., income, education, occupation, gender, race, and ethnicity) impact an individual's socioeconomic position, which, in turn, influences their vulnerability and exposure to health conditions.	Chen et al., 2020, Bhojani et al., 2019; Dover & Belon, 2019; Wang et al., 2020; Allen et al., 2020; Armstead et al., 2021; Batista et al., 2018; Owusu-Addo et al., 2016; National Academies of Sciences, Engineering, and Medicine, 2016; Min et al., 2022
WHO International Classification of Functioning, Disability and Health (ICF) model	In-depth classification of holistic components of functioning, disability, and health-related domains.	Malele-Kolisa et al., 2019
WHO Social, Political, Economic and Cultural (SPEC) conceptual model	Explains social exclusions as a process rather than a state operating along different dimensions and individual, regional, and global levels.	van Hees et al., 2019

Table 2

Health equity frameworks[a] categorized by healthy people 2030 key domains.[b]

Health Equity Framework (N = 33)	Healthy People 2030 Key Domains				
	Economic Stability	**Education Access and Quality**	**Health Care Access and Quality**	**Social and Community Context**	**Neighborhood and Built Environment**
Dahlgren and Whitehead Model	X	X	X	X	X
Environmental determinants of health	X	X	X	X	X
Life Course Approach	X	X	X	X	X
Policy-oriented approach	X	X	X	X	X
Social and cultural determinants of mental disorders	X	X	X	X	X
Social-Ecological Model	X	X	X	X	X
The Frieden Framework	X	X	X	X	X
WHO Conceptual SDOH Framework	X	X	X	X	X
A Public Health Framework for Reducing Health Inequities	X		X	X	X
Health equity measurement framework	X		X	X	X
Health in All Policies	X		X	X	X
World Health Organization (WHO) International Classification of Functioning, Disability and Health (ICF) model	X		X	X	X
Multi-Level Systems Approach	X		X	X	X
Pathways Model	X		X	X	X
PROGRESS/PROGRESS Plus	X		X	X	X
Psychosocial stress model	X	X		X	X
Rural Community Health & Well-Being Framework	X		X	X	X
Social determinants of child health (SDCH)	X		X	X	X
WHO Social, Political, Economic and Cultural (SPEC) conceptual model	X		X	X	X
Warnecke's Model for Analysis of Population Health and Disparities	X		X	X	X
Weathering Hypothesis	X	X		X	X
Interaction Model			X	X	X
Social and demographic determinants of health-related quality of life (QoL)	X			X	X
Stress-Exposure Disease Framework			X	X	X

Health Equity Framework (N = 33)	Healthy People 2030 Key Domains				
	Economic Stability	**Education Access and Quality**	**Health Care Access and Quality**	**Social and Community Context**	**Neighborhood and Built Environment**
Community Stress Theory				X	X
Expansive gender equity continuum			X	X	
Framework for understanding racial/ethnic disparities in environmental health				X	X
Socioeconomic Status Model	X			X	
Structural-Constructivist Model	X			X	
Dimensions of food security (Food and Agricultural Organization)	X				
Equity-Effectiveness Model			X		
Fundamental Cause Model	X				
Three Levels of Racism Framework				X	
TOTAL (%)	**26 (78.8)**	**10 (30.3)**	**23 (69.7)**	**30 (90.9)**	**26 (78.8)**

[a] Includes health equity frameworks found in Table 1.

[b] Healthy People (HP) 2030 prioritizes focus on social determinants of health (SDOHs) and individual factors that contribute to health outcomes. Five key domains are used in the HP 2030 framework: Economic Stability, Education Access and Quality, Health Care Access and Quality, Neighborhood and Built Environment, and Social and Community Context.

Table 3

Social determinants of health and individual factors identified in health equity frameworks[a] categorized by the healthy people 2030 key domains.

Social Determinants of Health (SDOHs) and Individual Factors[b] Identified (N = 59)	Healthy People 2030 Key Domains				
	Economic Stability	Education Access and Quality	Health Care Access and Quality	Social and Community Context	Neighborhood and Built Environment
Active living/Activities and participation					X
Age				X	
Agriculture/food production and access[c]	X				
Biology			X		
Childcare	X				
Community resilience[c]				X	
Crime				X	
Culture				X	
Disability status					
Drug/Alcohol misuse					X
Economic security	X				
Education		X			
Employment class	X				
Employment status	X				
English proficiency				X	
Environmental Conditions/Exposure/Factors, including climate change					X
Gender				X	
Genetic predictors[c]				X	
Health beliefs				X	
Health insurance status			X		
Health literacy			X		
Health status/conditions			X		
Healthcare availability[c]			X		
Healthcare services			X		

Social Determinants of Health (SDOHs) and Individual Factors[b] Identified (N = 59)	Healthy People 2030 Key Domains				
	Economic Stability	Education Access and Quality	Health Care Access and Quality	Social and Community Context	Neighborhood and Built Environment
Healthcare system accountability[c]			X		
Healthcare system capacity building[c]			X		
Healthcare system factors/characteristics[c]			X		
Healthcare utilization			X		
Healthy aging				X	
Household structure/type				X	
Housing	X				
Immigration/refugee status				X	
Income	X				
Income inequality	X				
Minority status				X	
Mobility					X
Nativity/Country of origin				X	
Noise					X
Occupation/Employment	X				
Oral care			X		
Physical activity					X
Pollution					X
Population density					X
Racism and discrimination				X	
Religion				X	
Residential location/neighborhood					X
Resource access					X
Sanitation					X
Segregation				X	
Sex				X	
Sexual orientation				X	
Social context/environment[c]				X	

Social Determinants of Health (SDOHs) and Individual Factors[b] Identified (N = 59)	Healthy People 2030 Key Domains				
	Economic Stability	**Education Access and Quality**	**Health Care Access and Quality**	**Social and Community Context**	**Neighborhood and Built Environment**
Social support/relationships[c]				X	
Socioeconomic status	X				
Soil					X
Stigma				X	
Tobacco use					X
Transportation (including traffic)					X
Veteran status				X	
Violence					X
Work environment					X
TOTAL (%)	**10 (16.9)**	**1 (1.7)**	**10 (16.9)**	**22 (37.3)**	**16 (27.1)**

Note: SDOHs and individual factors were categorized in the key domains using a best fit approach based on the HP 2030 objectives specified for each key domain.

[a] Includes health equity frameworks found in Table 1.

[b] Individual factors (e.g., biology, age) can also impact health inequities. For example, although race and ethnicity are not considered SDOHs according to the HHS definition, the way society perceives those of different races and ethnicities can influence social opportunities and disadvantages.

[c] Definitions for select terms:

Agriculture/food production and access addresses “supply side” of food security at the national or international level and is determined by economic and physical access factors such as the level of food production, stock levels, and net trade (this includes food access, which refers to household level food security and whether individuals can obtain food, food stability, food availability, food deserts, rurality, agriculture and food production).

Community resilience refers to the ability of individuals, households, and communities to use available resources and adapt to changing conditions to recover from the health, social, and economic impacts of an adverse event such as a hurricane or pandemic.

Genetic predictors refer to genetic predispositions which may influence the development of certain health conditions or diseases.

Healthcare availability refers to healthcare infrastructure and provision, specifically the presence of health professionals, services, and supplies; existence and physical location of healthcare facilities and other infrastructure (e.g., ambulances); and the organizational characteristics of a health system (e.g., wait times and hours of operation).

Healthcare system factors/characteristics refers to access to quality, affordable, and timely preventive and curative health care that recognizes individual patient needs, including their health history and personal preferences.

Healthcare system accountability is the responsibility of the healthcare system to provide equitable and quality care that is responsive to individual health needs, personal situations, and broader socioeconomic contexts.

Healthcare system capacity building is defined as the development and strengthening of knowledge, skills, systems, and leadership in healthcare settings which focus on reducing health disparities and connecting high-risk individuals to care.

Power/prestige refers to an imbalance in status and opportunities between populations based on factors such as race and ethnicity, gender, income, or sexual orientation.

Safety includes injury deaths, juvenile arrests, and the general state of feeling "safe".

Social support/relationships includes family and social support.

Social context/environment are factors and circumstances in the broader social setting (such as exposure to community stressors or personal/life experiences) that shape behaviors, beliefs, and/or perceptions of individuals and groups of people.

Table 4

Social determinants of health and individual factors identified in health equity frameworks[a] Cateogorized by the healthy people 2030 key domains limited to injury topic areas.[b,c]

HP 2030 Key Domain	Social Determinants of Health (SDOHs) and Individual Factors[d] (n =29)	Drowning	Motor vehicle crashes	Older adult falls	Suicide	Traumatic brain injury
Economic Stability	Occupation/employment				X	
	Economic security					X
	Employment status					X
	Employment class					X
	Housing					X
	Income					X
	Income inequality					X
	Socioeconomic status					X
Health Care Access and Quality	Disability status				X	
	Health insurance status					X
Neighborhood and Built Environment	Geography	X	X	X	X	X
	Residential location/neighborhood		X	X	X	X
	Drug/alcohol misuse	X	X			
	Safety[e]					X
	Transportation (including traffic)		X			
	Violence					X
Social and Community Context	Age	X	X	X	X	X
	Minority status	X	X	X	X	X
	Nativity/country of origin	X	X	X	X	X
	Power/prestige[e]	X	X	X	X	X
	Race/ethnicity	X	X	X	X	X
	Racism/ discrimination	X	X	X	X	X
	Segregation	X	X	X	X	X
	Immigration/refugee status	X	X	X		X
	Sex	X	X	X		
	Veteran status				X	X

HP 2030 Key Domain	Social Determinants of Health (SDOHs) and Individual Factors[d] (n =29)	Drowning	Motor vehicle crashes	Older adult falls	Suicide	Traumatic brain injury
	Sexual orientation				X	
	Crime					X
	Social context/environment[e]					X
TOTAL (%) (N = 59)		**11 (18.6)**	**13 (22.0)**	**11 (18.6)**	**13 (22.0)**	**23 (39.0)**

[a] Includes health equity frameworks found in Table 1.

[b] SDOHs and individual factors included in the table above contribute to health disparities in the following injury topic areas: drowning, motor vehicle crashes, older adult falls, suicide, and traumatic brain injury (TBI). This does not mean that other SDOHs and individual risk factors do not contribute to health disparities in these injury topic areas; however, the SDOHs and individual factors above are the factors highlighted as influencing injury outcomes in the United States, according to CDC webpages:

Drowning: https://www.cdc.gov/drowning/facts/index.html.

Motor vehicle crashes: https://www.cdc.gov/transportationsafety/.

Older adult falls: https://www.cdc.gov/falls/facts.html.

Suicide: https://www.cdc.gov/suicide/facts/disparities-in-suicide.html.

TBI: https://www.cdc.gov/traumaticbraininjury/health-disparities-tbi.html.

[c] None of the factors listed in the CDC websites for the injury topics fit under the Education Access and Quality domain; therefore, this domain is not included in the table.

[d] Social determinants of health (SDOHs) and individual factors include the individual, social, economic, and environmental factors that influence the health and well-being of individuals and communities.

[e] Definitions for select terms:

Power/prestige refers to an imbalance in status and opportunities between populations based on factors such as race and ethnicity, gender, income, or sexual orientation.

Safety includes injury deaths, juvenile arrests, and the general state of feeling “safe”.

Social context/environment are factors and circumstances in the broader social setting (such as exposure to community stressors or personal/life experiences) that shape behaviors, beliefs, and/or perceptions of individuals and groups of people.