



● THE EXPANDING SCOPE OF SOCIAL DETERMINANTS OF HEALTH

A DECADE OF TRENDS IN MAJOR MEDICAL JOURNALS (2016-2025)

Analysis of 1,597 articles from the BMJ, the Lancet, JAMA, the New England Journal of Medicine, and Nature Medicine

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EXECUTIVE SUMMARY

This report presents findings from an analysis of 1,597 journal articles published between 2016 and 2025 in the five most prominent medical journals: the *BMJ*, the *Lancet*, *JAMA*, the *New England Journal of Medicine*, and *Nature Medicine*. Each article was identified as containing the phrase “social determinants of health” (SDOH) or a recognized synonym and was then analyzed for the frequency of that term’s appearance and the specific examples of social determinants cited.

The analysis reveals two striking trends. First, the sheer volume of SDOH-related articles has more than tripled over the past decade, rising from 69 articles in 2016 to 216 in 2024, even as the total number of journal articles increased by only 1.7 percent. However, articles mentioning SDOH fell to 155 in 2025, possibly indicating a slowing or reversal of the trend.

Second, the composition of the SDOH conversation has shifted markedly. When race and ethnicity are considered separately from racism and other forms of discrimination, a revealing pattern emerges: References to racism, structural racism, and racial discrimination as social determinants surged from 3 percent of articles in 2019 to 21 percent in 2020, peaking at 26 percent in 2022. Mentions of race and ethnicity as demographic descriptors followed a similar but distinct trajectory, jumping from 11 percent in 2019 to 26 percent in 2020 and reaching 27 percent in 2024. References to other forms of discrimination or discrimination generally increased from 7 percent in 2016 to 14 percent in 2025, peaking at 15 percent in 2019.

Third, the scope of SDOH has expanded. While income, poverty, and socioeconomic status remain the most commonly cited determinants, the scope of SDOH has broadened to more frequently include environmental and climate-related factors, which rose from 4 percent of articles in 2016 to roughly 14 percent in 2024.

These findings suggest that the medical literature’s engagement with social determinants of health is not only growing in volume but evolving in scope and emphasis, reflecting broader social and political developments.

INTRODUCTION

The World Health Organization (WHO) **defines** “social determinants of health” as “the conditions in which people are born, grow, live, work and age,” including the health system.¹ These conditions, WHO explains, are “shaped by the distribution of money, power and resources at global, national and local levels, which are themselves influenced by policy choices.” The WHO’s Commission on Social Determinants of Health, established in 2005 and reporting in 2008, helped bring this framework into the mainstream of global health discourse.

Since then, the concept has expanded considerably. Originally centered on material deprivations such as poverty, inadequate housing, and limited education, the term has come to encompass an increasingly broad range of factors. Race, ethnicity, and “structural racism” are now widely discussed as fundamental determinants of health outcomes. Environmental exposures, climate change, and the commercial practices of industries that affect health – sometimes termed the “commercial determinants of health” – have also entered the conversation. The language used to describe these forces has also diversified: Some authors prefer “social drivers of health,” while others distinguish “structural determinants” from “social determinants,” and still others frame the issue in terms of the “conditions in which people live and work.”

This expansion of the term’s meaning raises important questions. As the concept grows more inclusive, does it risk drawing healthcare professionals into policy domains – housing, criminal justice, climate regulation, immigration – where they have little training and less expertise? When physicians and medical journals weigh in on complex social and economic problems, they may oversimplify dynamics they do not fully understand, confuse correlation with causation, or lend the authority of medicine to policy prescriptions that are neither evidence-based nor practically feasible. There is also a concern that framing health outcomes primarily through the lens of social conditions diminishes the role of personal responsibility and individual behavioral change – factors that remain central to clinical medicine and that patients can act on directly. When nearly every non-clinical factor is labeled a “social determinant of health,” the term may lose its ability to direct attention toward specific, actionable interventions.

This report examines how the use of the term “social determinants of health” and its synonyms have evolved in the major medical journals over the past decade, with the goal of illuminating both the growth of this discourse and the shifting content it conveys.

1 World Health Organization. “Taking Action on the Social Determinants of Health.” WHO Western Pacific Region, <https://www.who.int/westernpacific/activities/taking-action-on-the-social-determinants-of-health>

METHODOLOGY

Analysis involved scanning the 101,882 articles published between 2016–2025 in the top five (as measured by impact factor) medical journals: the *BMJ*, the *Lancet*, *JAMA*, the *New England Journal of Medicine*, and *Nature Medicine*.² The corpus of analyzed articles includes the 1,597 that featured the phrase “social determinants of health” or closely related terms.

Text extraction was performed programmatically using a Python-based pipeline built with Claude, Anthropic’s AI assistant. The pipeline extracted text from each PDF using multiple methods – standard text extraction, layout-aware extraction, raw-mode extraction for multi-column layouts, and optical character recognition for image-based PDFs – to ensure comprehensive coverage. The extracted text was then normalized to handle line breaks, page breaks, soft hyphens, and other formatting artifacts that could split key phrases across lines.

Each article was searched for the exact phrase “social determinants of health,” as well as a curated set of synonyms and structural variants, including “social drivers of health,” “structural determinants of health,” “commercial determinants of health,” “political determinants of health,” “conditions in which people are born, grow, live, work, and age,” “socially determined,” “social circumstances,” “underlying determinants of health,” and several dozen additional variants. When “social” or “socioeconomic” preceded “determinants” in a comma-separated list (e.g., “clinical, socioeconomic, commercial, and political determinants of infections”), this was also counted. Collectively, these became the SDOH anchor phrases.

For each article containing an SDOH anchor phrase, the pipeline recorded the number of mentions of SDOH-related phrases; the specific examples of social determinants cited in the text (e.g., poverty, racism, housing, education); any synonym phrases used; and the publication year, journal, and article type (e.g., regular article, letter to the editor, or editorial). The SDOH examples were identified through proximity analysis – searching for related terms within paragraphs that contained an SDOH anchor phrase or outcome-determining language (e.g., “largely determines whether” or “pathways through which inequalities influence outcomes”).

The resulting data were aggregated by year, journal, and SDOH category to identify trends over the decade. SDOH examples were grouped into 11 categories for analysis: income/poverty/socioeconomic status; education; race/ethnicity (demographic descriptors such as race, ethnicity, and skin color); racism/discrimination (systemic concepts including structural racism, institutional racism, segregation, and other forms of discrimination); housing; employment; insurance/access to care; violence/trauma; gender; environment/climate; and social isolation. The separation of race/ethnicity from racism/discrimination was undertaken to distinguish between articles that reference these populations descriptively and those that identify systemic or structural forces as determinants of health.

² Note: The analysis included only the flagship journals, not associated journals covering specific fields such as cardiology or internal medicine.

TABLE 1: SUMMARY OF THE ANALYSIS DATASET.

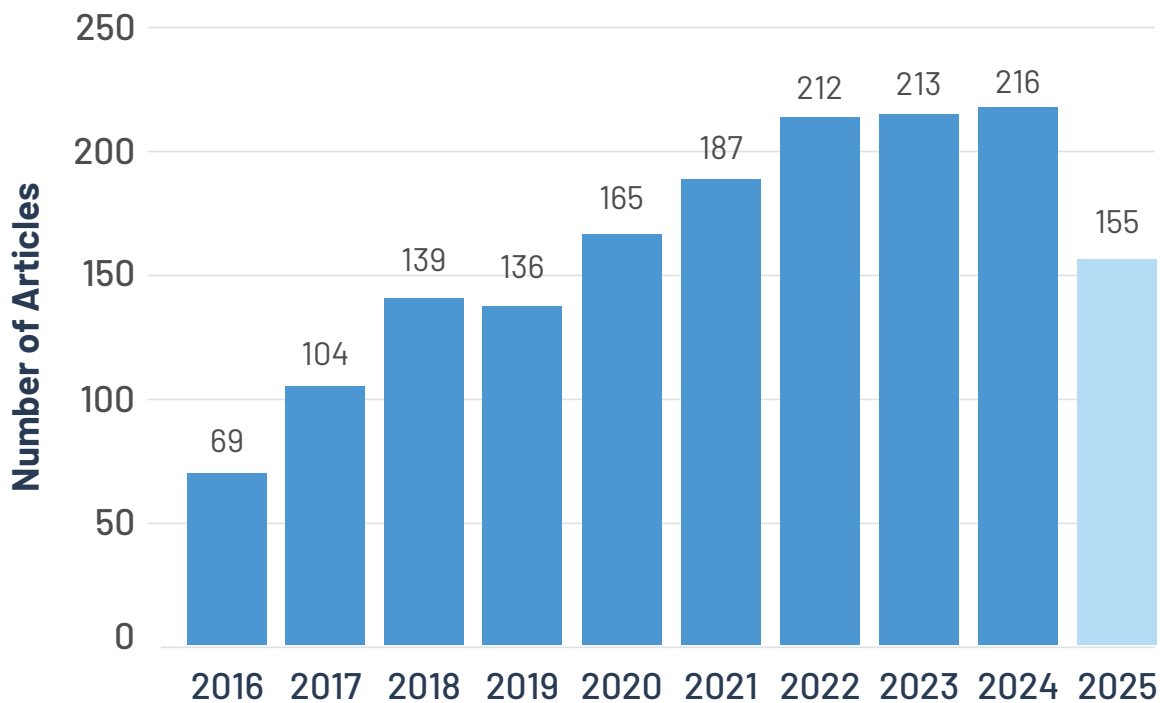
METRIC	VALUE
Total articles searched	101,882
Total articles analyzed	1,597
Journals covered	the BMJ, the Lancet, JAMA, NEJM, Nature Medicine
Time period	Jan. 1, 2016–Dec. 31, 2025

FINDINGS

SURGE IN ARTICLES MENTIONING SDOH

The total number of articles mentioning social determinants of health or similar phrases grew substantially over the past decade. From a base of 69 articles in 2016, the count rose steadily to 216 in 2024 – a more than threefold increase. Growth was particularly steep between 2019 and 2022, a period that coincided with both the COVID-19 pandemic and the heightened attention to racial issues following the death of George Floyd in 2020. The count dipped to 155 in 2025, a decline that may have reflected a slowing or reversal of the trend or natural year-to-year variation after several years of rapid growth.

FIGURE 1: TOTAL SDOH-RELATED ARTICLES PUBLISHED PER YEAR ACROSS ALL FIVE JOURNALS.



The surge in articles mentioning SDOH was not driven by an overall increase in the number of articles published in the five journals. As shown in Tables 2–4 below, the total number of articles published annually across the five journals increased only 1.7 percent, from 10,925 in 2016 to 11,111 in 2025. Indeed, three of the five journals – the *BMJ*, the *Lancet*, and *NEJM* – published fewer articles in 2025 than they did in 2016 even as the total number of articles mentioning SDOH in those journals rose. In the remaining two journals – *JAMA* and *Nature Medicine* – the increase in the number of articles mentioning SDOH from 2016 to 2025 still outpaced the increase in the total number of articles over that period.

Overall, the percentage of articles mentioning SDOH or related terms increased from 0.6 percent of the total in 2016 to 2.2 percent in 2022, after which it held steady before dropping slightly to 1.4 percent in 2025.

SDOH TRENDS BY JOURNAL

The *BMJ* and the *Lancet* account for the largest share of articles mentioning SDOH among the five journals in the study, together accounting for roughly two-thirds of all articles. However, the distribution has shifted over time. The *BMJ*'s contribution grew from just seven articles in 2016 to 91 in 2024, making it the single largest source by the end of the study period. *JAMA*'s output nearly tripled, from 14 articles in 2016 to a high of 50 in 2022. *NEJM* showed a notable spike during the pandemic years (29 articles each in 2020 and 2021, up from 10 in 2019) but subsequently declined to 13 by 2024. *Nature Medicine* did not publish any SDOH-related articles in the dataset before 2020 but grew rapidly to a high of 19 articles by 2024.

In percentage terms, the *BMJ* had the largest increase, surging from 0.2 percent of all articles mentioning SDOH in 2016 to 4.1 percent in 2024 before dropping to 2.1 percent in 2025. The *Lancet* had the overall largest percentage of articles mentioning SDOH, as well as the highest percentage in any given year (5.0 percent in 2022). *NEJM* quadrupled the percentage of articles mentioning SDOH, from 0.5 percent in 2016 to 2.0 percent in 2021, before dropping to 0.9 percent in 2025. *JAMA* had a similar trajectory, tripling the percentage of articles mentioning SDOH from 1.1 percent in 2016 to 3.3 percent in 2022 before dropping to 1.7 percent in 2025.

Notably, both the *BMJ* and the *Lancet* are published in the United Kingdom, though American researchers make regular contributions. The heightened focus on social determinants of health in major British medical journals compared to American ones might indicate that focus on social determinants of

health is even more acute in England’s National Health Service compared to the American healthcare landscape. Still, the trends mirror each other even if the volume does not. Overall, scholarly focus on SDOH has clearly accelerated rapidly over the past decade.

FIGURE 2: ARTICLES MENTIONING SDOH BY JOURNAL, STACKED BY YEAR.

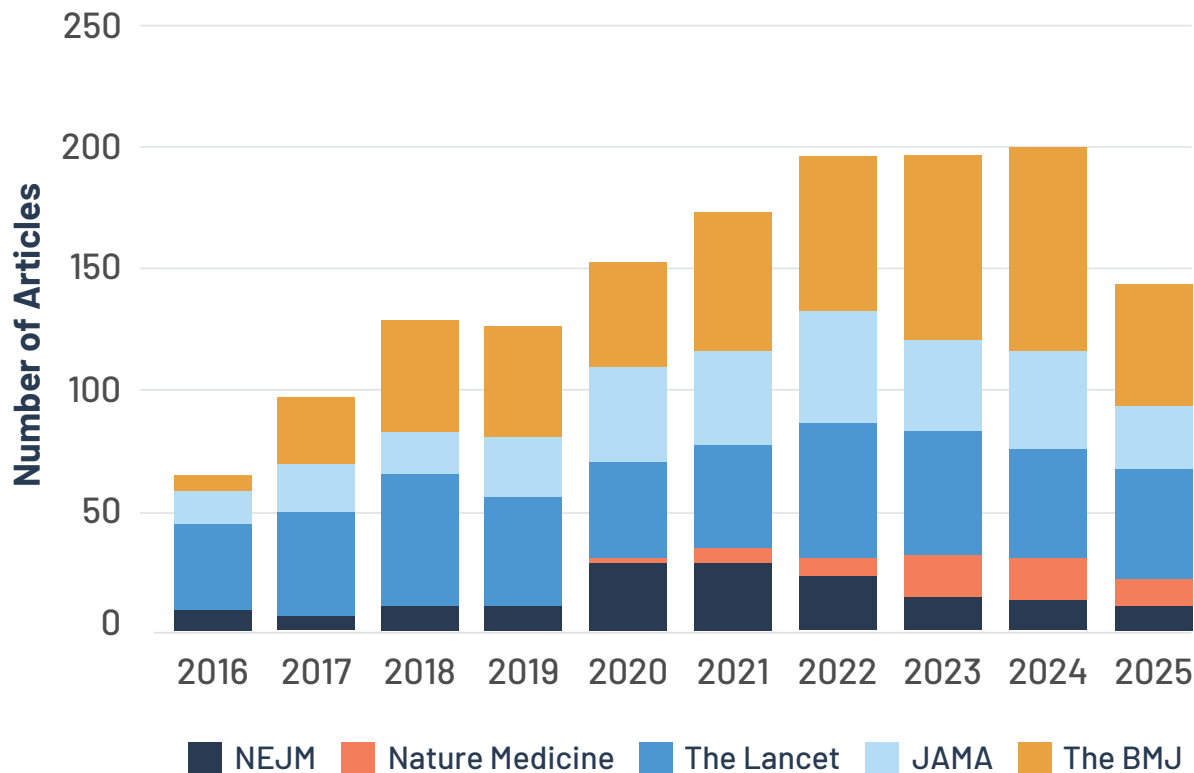


TABLE 2: SDOH ARTICLE COUNTS BY JOURNAL AND YEAR.

YEAR	BMJ	LANCET	JAMA	NEJM	NAT MED	TOTAL
2016	7	39	15	8	0	69
2017	30	47	22	5	0	104
2018	51	60	18	10	0	139
2019	50	50	26	10	0	136
2020	48	43	42	29	3	165
2021	62	46	43	29	7	187
2022	69	61	50	24	8	212
2023	83	56	41	15	18	213
2024	91	49	44	13	19	216
2025	55	49	28	11	12	155

TABLE 3: TOTAL ARTICLE COUNTS BY JOURNAL AND YEAR.

YEAR	BMJ	LANCET	JAMA	NEJM	NAT MED	TOTAL
2016	3,107	1,718	1,322	1,677	3,101	10,925
2017	3,003	1,480	1,588	1,474	3,051	10,596
2018	2,631	1,535	1,613	1,388	2,974	10,141
2019	2,853	1,574	1,587	1,447	2,513	9,974
2020	2,916	1,470	1,685	1,673	2,178	9,922
2021	2,680	1,353	1,541	1,450	2,149	9,173
2022	2,928	1,217	1,526	1,413	2,674	9,758
2023	2,841	1,391	1,610	1,390	2,789	10,021
2024	2,209	1,504	1,542	1,285	3,721	10,261
2025	2,579	1,292	1,636	1,292	4,312	11,111

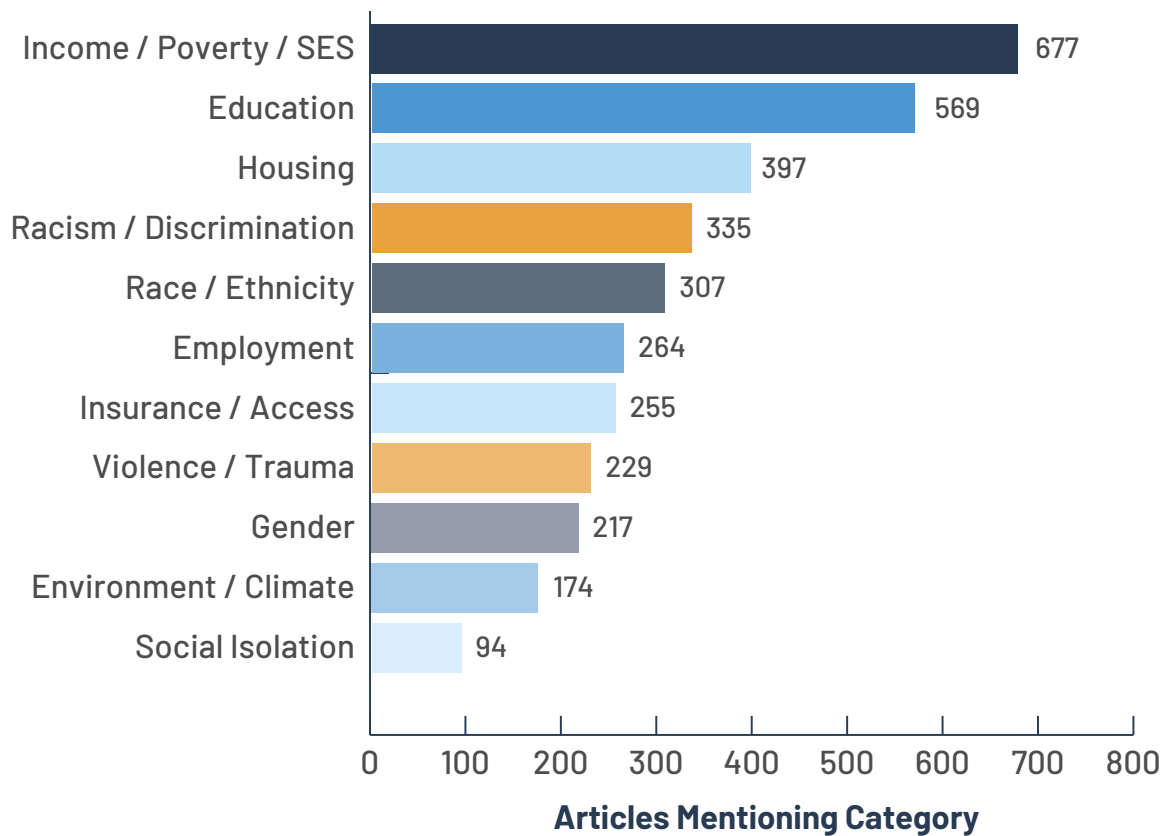
TABLE 4: PERCENTAGE OF TOTAL ARTICLES MENTIONING SDOH BY JOURNAL AND YEAR.

YEAR	BMJ	LANCET	JAMA	NEJM	NAT MED	TOTAL
2016	0.2%	2.3%	1.1%	0.5%	0.0%	0.6%
2017	1.0%	3.2%	1.4%	0.3%	0.0%	1.0%
2018	1.9%	3.9%	1.1%	0.7%	0.0%	1.4%
2019	1.8%	3.2%	1.6%	0.7%	0.0%	1.4%
2020	1.6%	2.9%	2.5%	1.7%	0.1%	1.7%
2021	2.3%	3.4%	2.8%	2.0%	0.3%	2.0%
2022	2.4%	5.0%	3.3%	1.7%	0.3%	2.2%
2023	2.9%	4.0%	2.5%	1.1%	0.6%	2.1%
2024	4.1%	3.3%	2.9%	1.0%	0.5%	2.1%
2025	2.1%	3.8%	1.7%	0.9%	0.3%	1.4%

WHAT COUNTS AS A SOCIAL DETERMINANT?

Across the full dataset, income, poverty, and socioeconomic status form the most frequently cited category of social determinants, appearing in 677 articles (42 percent of the total). Education follows at 569 articles (36 percent) and housing at 397 (25 percent).³ References to racism and/or other forms of discrimination appear in 335 articles (21 percent), while race and ethnicity as demographic descriptors appear in 307 (19 percent). Employment, insurance/access to care, violence/trauma, gender, environment/climate, and social isolation round out the remaining top categories.

FIGURE 3: NUMBER OF ARTICLES CITING EACH SDOH CATEGORY (2016–2025).

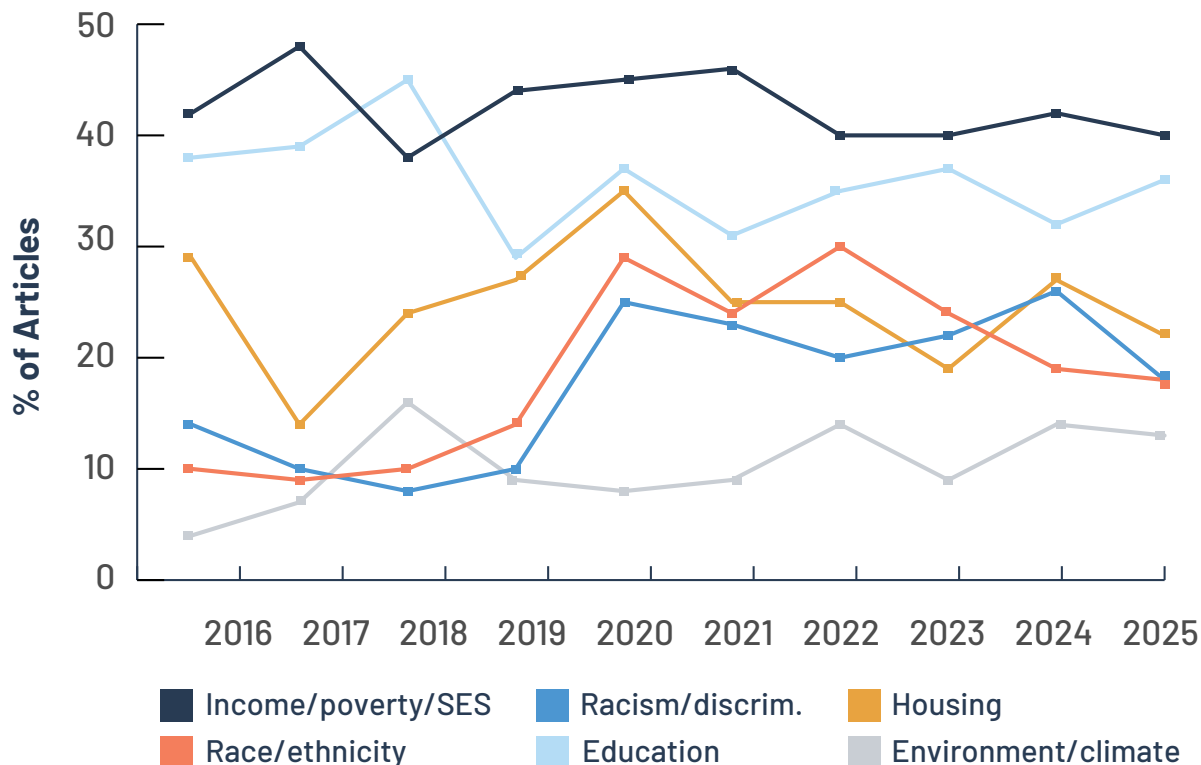


The relative prominence of these categories has shifted over time. Income/poverty/socioeconomic status has remained the most commonly cited category throughout, appearing in roughly 38–48 percent of articles in any given year. Education has been similarly stable at around 31–45 percent. The race/ethnicity and racism/discrimination trajectories, as discussed below, increased significantly after 2019.

Among the remaining categories, only environment and climate showed a significant increase, rising from just 4 percent of articles in 2016 to approximately 14 percent by 2024. By contrast, mentions of employment declined from 22 percent in 2016 to 13–15 percent in recent years. Housing has fluctuated between roughly 14 percent and 35 percent, and gender has fluctuated between 7 percent and 19 percent without a clear directional trend.

³ Note: These categories are not mutually exclusive, as articles may have discussed multiple social determinants of health.

FIGURE 4: SDOH CATEGORY TRENDS OVER TIME (% OF ARTICLES PER YEAR CITING EACH CATEGORY).



Other examples given of social determinants of health, though not placed in any specific category, included caste systems, colonialism, immigration status, language barriers, bullying, zip codes, rural residence, policing, criminal justice, food insecurity, transportation, internet access, human trafficking, modern slavery, child labor, military conscription, and gang membership.

INCREASED FOCUS ON RACE, RACISM, AND DISCRIMINATION

Perhaps the most striking finding is the surge in discussion of race/ethnicity, racism/racial discrimination, and discrimination more broadly beginning in 2019–2020.

Although interrelated, the concepts of race/ethnicity and racism should be considered separately. Race and ethnicity are demographic characteristics – descriptors of identity and population membership. Racism, structural racism, and racial discrimination, by contrast, refer to the policies, institutional practices, and social arrangements that treat people differently on the basis of race. An article that notes racial disparities in the incidence of a particular disease is making a demographic observation. In the context of social determinants of health, these disparities could stem from differences in factors, such as cultural practices, that are not necessarily the result of discriminatory policies or practices, although they could be. However, an article that identifies redlining or segregation as a driver of those disparities is naming a structural mechanism. Likewise, the generic term “discrimination” can refer to policies or practices that treat people differently on the basis of a variety of factors, including race, sex, age, disability, religion, immigration status, and so on. Each points toward different kinds of analysis

and different kinds of intervention. Disaggregating the three reveals patterns that a combined category would obscure. Hereafter, three distinct categories are examined: race/ethnicity, racism (including structural racism and racial discrimination), and generic discrimination.

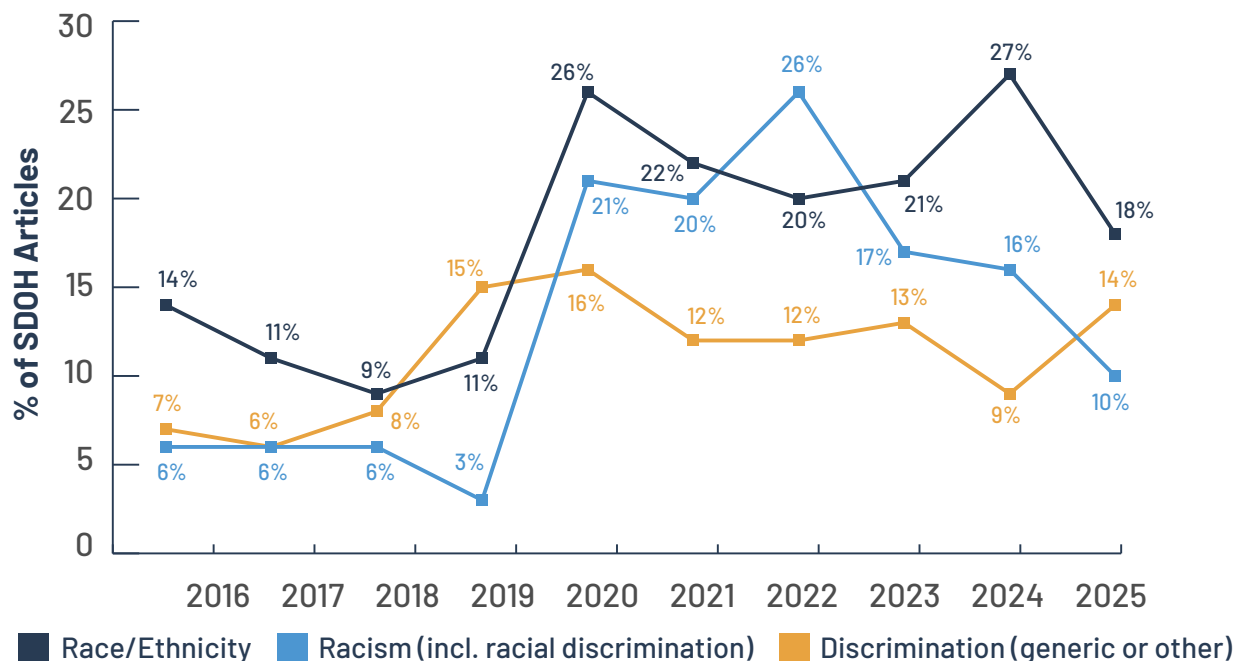
The race/ethnicity and racism categories both surged in 2020, but they tell different stories.

References to race and ethnicity as demographic descriptors rose from 11 percent in 2019 to 26 percent in 2020 and have remained elevated, reaching 27 percent in 2024 before settling at 18 percent in 2025. Unlike racism, discussion of race and ethnicity did not recede after 2022, pointing to a more durable shift in how these journals describe population-level health differences.

References to racism – including structural, systemic, and institutional racism, as well as explicitly racial or ethnic discrimination – jumped from just 3 percent of articles in 2019 to 21 percent in 2020 and peaked at 26 percent in 2022 before receding to roughly 10 percent in 2025. This trajectory suggests an intense but partially receding engagement with systemic and structural concepts. This may reflect a gradual shift from the structural framing that dominated the immediate post-2020 discourse toward a less politically charged approach – perhaps in response to backlash against “diversity, equity, and inclusion” frameworks – or it may simply reflect the rhythms of different research agendas.

Discrimination that is generic or of another kind – mentions not tied to race or ethnicity – shows a different pattern entirely, surging from 8 percent in 2018 to 15 percent in 2019 and then holding at a fairly steady 12–16-percent band since. Among articles whose discrimination language is explicitly qualified by something other than race, sex and gender discrimination are the most common (roughly 16 articles across the dataset), followed distantly by discrimination on the basis of religion, caste, weight, age, sexual orientation, class, immigration, and disability.

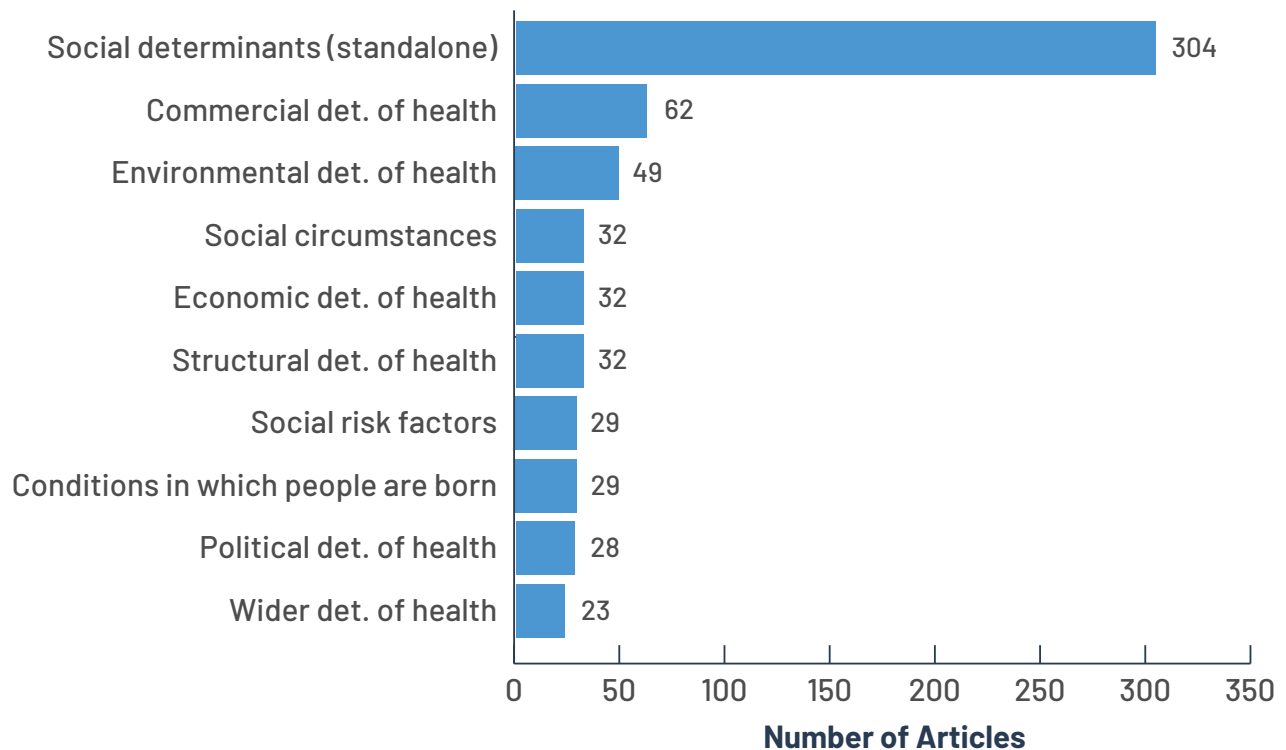
FIGURE 5: RACE/ETHNICITY, RACISM, AND DISCRIMINATION AS SDOH, BY YEAR.



ALTERNATIVE PHRASINGS AND RELATED CONCEPTS

The analysis also tracked the use of alternative phrasings for the social determinants concept. The most common variant was the standalone phrase “social determinants” without “of health,” found in 304 articles. The most prominent alternative framings were “commercial determinants of health” (62 articles), “environmental determinants of health” (49), “social circumstances” (32), “economic determinants of health” (32), and “structural determinants of health” (32).

FIGURE 6: MOST COMMON ALTERNATIVE PHRASINGS FOR “SOCIAL DETERMINANTS OF HEALTH.”



The proliferation of these alternative phrases reflects both the expanding scope of the SDOH concept and the emergence of distinct sub-fields within the broader determinants framework. The second most popular phrase, “commercial determinants of health,” is defined by the World Health Organization as “the conditions, actions and omissions by commercial actors that affect health.”⁴ In 2023, the *Lancet* published an entire series on the commercial determinants of health, claiming that “a substantial group of commercial actors are escalating avoidable levels of ill health, planetary damage, and inequity.”⁵ The series purported to offer “recommendations and frameworks to foster a better understanding of the diversity of the commercial world, potential pathways to health harms or benefits, and the need for regulatory action and investment in enterprises that advance health, wellbeing, equity, and society.”

4 World Health Organization. “Commercial Determinants of Health.” WHO, 21 Mar. 2023. <https://www.who.int/news-room/fact-sheets/detail/commercial-determinants-of-health>

5 The Lancet. “Commercial Determinants of Health.” The Lancet, 2023. <https://www.thelancet.com/series-do/commercial-determinants-health>

Similarly, the framing of “political determinants of health” (28 articles) suggests an emerging focus on the effects of governance structures and political decisions on health outcomes. A 2022 article in the *Oxford Research Encyclopedia of Global Public Health* defines political determinants of health as “the structural conditions and the social drivers – including poor environmental conditions, inadequate transportation, unsafe neighborhoods, poor and unstable housing, and lack of healthy food options – that affect all dynamics involved in health.”⁶ Studying the political determinants of health, the authors explain, entails “analyzing how different power constellations, institutions, processes, interests, and ideological positions affect health within different political systems and cultures and at different levels of governance.” Although there is certainly validity to the claim that government policies affect health outcomes, as the political determinants lens expands into the domain of political science and governance, medical researchers may find themselves making causal claims about systems they are not trained to analyze and proposing structural reforms whose feasibility and effectiveness lie well beyond the reach of clinical evidence.

6 Dawes, Daniel E, Christian M Amador, and Nelson J Dunlap, ‘The Political Determinants of Health: A Global Panacea for Health Inequities’ (19 Oct. 2022), in David V McQueen (ed.), *Oxford Research Encyclopedia of Global Public Health* (New York, NY, online edn, Oxford Academic, 20 Nov. 2017 -), <https://doi.org/10.1093/acrefore/9780190632366.013.466>



CONCLUSION

This analysis documents a dramatic expansion in the medical literature's engagement with social determinants of health over the past decade. The number of SDOH-related articles in the top five medical journals more than tripled from 2016 to 2024 before receding somewhat, and the range of factors discussed under this umbrella grew considerably. References to racism and other forms of discrimination surged after 2020 and have partially receded, while race and ethnicity as demographic descriptors have remained elevated. The concept has also expanded into territory far removed from traditional medicine, with articles now listing as "social determinants" everything from political governance and commercial regulation to internet access, gang membership, and colonialism.

These trends reflect a growing recognition that health is shaped by forces beyond the clinic. But growth in discourse is not the same as growth in understanding, and the rapid expansion of the SDOH framework raises concerns that deserve serious attention. Medical journals are devoting increasing space to poverty, racism, policing, climate policy, housing markets, and governance structures, thereby venturing into domains where clinical training offers little analytical advantage. Numerous prominent government agencies and medical organizations appear to be on a similarly perilous trajectory, including the **Centers for Disease Control and Prevention**⁷, the **National Institutes of Health**⁸, the **Department of Health and Human Services**⁹, the **Association of American Medical Colleges**¹⁰, and the **American Medical Association**¹¹. In short, influential policymakers are framing **an extraordinarily wide swath of issues as matters of healthcare**, far beyond their medical expertise.¹²

7 Centers for Disease Control and Prevention. "Social Determinants of Health (SDOH)." CDC, 17 Jan. 2024, www.cdc.gov/about/priorities/why-is-addressing-sdoh-important.html

8 National Institute of Nursing Research. "Advancing Social Determinants of Health Research at NIH Through Cross-Cutting Collaboration." NINR, 17 July 2023, www.ninr.nih.gov/newsandevents/news/advancing-social-determinants-health-research-nih-through-cross-cutting

9 Office of Disease Prevention and Health Promotion. "Social Determinants of Health." Healthy People 2030, U.S. Department of Health and Human Services, n.d., odphp.health.gov/healthypeople/priority-areas/social-determinants-health

10 Association of American Medical Colleges. "Teaching Hospitals' Commitment to Addressing the Social Determinants of Health." AAMC, May 2017, www.aamc.org/media/19686/download

11 American Medical Association. "Social Determinants of Health." AMA, n.d., www.ama-assn.org/topics/social-determinants-health

12 Pope, Chris. "Is Everything Health Care? The Overblown Social Determinants of Health." Manhattan Institute, 11 July 2024, manhattan.institute/article/the-overblown-social-determinants-of-health

The risk is not merely imprecision but overreach – physicians and researchers making causal claims about complex social systems they are not equipped to evaluate and lending the authority of medical science to policy prescriptions whose effectiveness and feasibility have not been established. Correlation must not be conflated with causation. That a health disparity tracks along racial, economic, or geographic lines does not, by itself, identify the mechanism or point toward an effective intervention. When the SDOH framework treats the mere existence of a disparity as evidence of a structural cause, it may foreclose the kind of rigorous causal analysis that good policy requires. It may also marginalize the role of individual behavior and personal responsibility – factors that remain central to clinical medicine and that patients can act on directly – in favor of structural explanations that are harder to test and harder to change.

None of this is to suggest that social conditions are irrelevant to health. It is clear that various social conditions and government policies affect health outcomes to varying degrees. But the value of the SDOH framework depends on its ability to generate specific, evidence-based, and actionable insights – not on the breadth of its reach. Greater care in how the term is used could strengthen rather than weaken its impact. Researchers and editors might consider specifying which domain of social determinants they are addressing, distinguishing between factors they can measure with clinical rigor and those they are borrowing from other disciplines. The challenge ahead is for medical researchers to exercise honesty and humility about the limits of their knowledge – recognizing that the further they venture from clinical evidence into the complexities of social, economic, and political systems, the less certainty they can claim about either diagnosis or cure.





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