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California Healthy Places Index: Frames Matter

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Abstract

Introduction: We describe the California Healthy Places Index (HPI) and its performance relative to other indexes for measuring community well-being at the census-tract level. The HPI arose from a need identified by health departments and community organizations for an index rooted in the social determinants of health for place-based policy making and program targeting. The index was geographically granular, validated against life expectancy at birth, and linked to policy actions.

Materials and Methods: Guided by literature, public health experts, and a positive asset frame, we developed a composite index of community well-being for California from publicly available census-tract data on place-based factors linked to health. The 25 HPI indicators spanned 8 domains; weights were derived from their empirical association with tract-level life expectancy using weighted quantile sums methods.

Results: The HPI's domains were aligned with the social determinants of health and policy action areas of economic resources, education, housing, transportation, clean environment, neighborhood conditions, social resources, and health care access. The overall HPI score was the sum of weighted domain scores, of which economy and education were highly influential (50% of total weights). The HPI was strongly associated with life expectancy at birth ($r = 0.58$). Compared with the HPI, a pollution-oriented index did not capture one-third of the most disadvantaged quartile of census tracts (representing 3 million Californians). Overlap of the HPI's most disadvantaged quartile of census tracts was greater for indexes of economic deprivation. We visualized the HPI percentile ranking as a web-based mapping tool that presented the HPI at multiple geographies and that linked indicators to an action-oriented policy guide.

Practice Implications: The framing of indexes and specifications such as domain weighting have substantial consequences for prioritizing disadvantaged populations. The HPI provides a model for tools and new methods that help prioritize investments and identify multisectoral opportunities for policy action.

Keywords
social determinants of health, disadvantaged community, community indicators, deprivation index, opportunity index, Health in All Policies

Various tools are available for rating the well-being of the nation, states, counties, and, increasingly, communities.[1-3] These tools typically incorporate an array of indicators that are organized into common themes or domains that reflect the tool designer's interest or purpose. These purposes vary widely and include poverty and economic hardship,[4] environmental justice,[5] housing and transportation affordability,[6] climate vulnerability,[7] emergency preparedness,[8] or walkability.[9] Some tools present disaggregated indicators and leave it to users to infer cumulative effects, whereas other

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tools use statistical techniques that combine indicators or domain scores (with or without weighting) into an overall score. Ranking of scores provides policy makers and communities with an objective basis for targeting interventions to areas with the greatest needs and tracking progress. To improve the statistical properties of an index, researchers commonly identify latent variables or create subindexes.[10] These techniques tend to enhance correlation with health outcomes and create more parsimonious models than models that do not use techniques to improve statistical properties, but they are challenging to communicate to policy makers and difficult to link to specific policies or performance monitoring. Also, several established indexes were developed before enhanced data collection and geographic information systems made indicator data routinely available for US census tracts, which is a common proxy for neighborhoods.

As social determinants of health and place-based priority setting increasingly shape public health policy and practice,[11] questions arise about whether established tools and their indexes can simply be repurposed. Do the tools address the variability of the social determinants of health in counties and cities? Do they clarify the relative importance of various social determinants of health? Do they identify the same disadvantaged communities and neighborhoods as the tools that explicitly account for the social determinants of health? Do they predict health status based on empirical data from the communities they cover? Can they be linked to specific policies and actionable follow-up?

The indexes are of interest to more than academia because programs, policies, and funding streams flow to communities that receive the highest scores on indexes of disadvantage. In literature reviews, we did not find tools that affirmatively answered our questions.

The first objective of this article was to describe the development of the California Healthy Places Index (HPI),[12] a tool to rank communities at the census-tract level based on factors known to shape health outcomes. The HPI arose from a need identified by state and local health departments and community-based organizations to have an index, rooted in the social determinants of health and a positive asset-based frame, to support place-based policy making and program targeting. The index was to be scientifically rigorous, granular, easily used, and validated against a key health outcome—life expectancy at birth—as a predictive measure of community health status. Another objective was to compare the performance of the HPI with alternative indexes. This article aimed to fill this gap in comparing the performance of the HPI with alternative indexes and demonstrate how framing issues (ie, defining the purposes and interests) and technical issues (eg, weighting of index components) have a substantial and practical effect on identifying disadvantaged communities.

Methods

Steering Committee

The Public Health Alliance of Southern California (Alliance) is a coalition of 8 local health departments in Southern California whose members are responsible for the public health of half of the state's population. The Alliance convened a steering committee in 2014 to guide the technical development of the HPI. The 22-member steering committee comprised epidemiologists and policy-oriented leaders of 3 California regional public health coalitions led by the Alliance. These coalitions represented 27 of California's 61 local health jurisdictions and served 78% of California's population. The steering committee also included representatives of the California Department of Public Health, regional agencies, and nongovernmental organizations. With the input of Alliance staff members and consultants, the steering committee shaped the design of the HPI, including data sources and data policy, domains of interest, criteria for selecting and scoring indicators, domain weights, and communication strategies. The Alliance also convened a communications advisory group whose 12 statewide organizations represented nonprofit health care organizations, businesses, philanthropies, public health research and policy organizations, and academia. The charge of the advisory group was to develop key messages and policy briefs on the social determinants of health, HPI methods, and results for health care professionals, state and local policy makers, businesses, investors, financial institutions, and community organizations and advocates.

Index Construction

Development of the HPI began with a literature review to summarize the international experience of measuring disadvantage and to identify methodologic approaches, data sources, and potential indicators. The HPI used a hierarchical design to capture the additive influence of place-based domains on community health. The steering committee rejected a purely statistical approach, in which domains and indicators would be selected mathematically to maximize the prediction of health outcomes. Such an approach might optimize predictive properties but produce arcane domains and indicators that are not meaningful or actionable for policy makers or communities. Instead, the steering committee used a hybrid approach in which domains were first selected based on their actionability and the evidence from the literature on their links to health outcomes. Empirical methods were then used to select indicators and to weight domains to optimize the association with health outcomes.

Domains. The steering committee identified 8 domains or policy action areas: economics, education, health care access, housing, neighborhood conditions, pollution/clean environment, social, and transportation. The steering committee also recognized race/ethnicity as an important domain because it determines access to the social determinants of health. However, under state law, California state agencies are prohibited from using race as a basis for public contracting.[13] Therefore, a ninth race/ethnicity-related domain was incorporated into an HPI version for non-California state agencies.

Indicators. We identified indicators from a literature review; recommendations from the steering committee, Alliance staff members, and university consultants; and indicator projects sponsored by the California Department of Public Health. Indicators met 7 criteria: (1) free and publicly available data, (2) statewide census tract coverage, (3) actionable (ie, linked to policy and other action on the social determinants of health), (4) timely and current data, (5) statistical association with life expectancy at birth to facilitate domain weighting and validation, (6) minimized collinearity within and between domains, and (7) compatibility with allied projects of the California Department of Public Health and other governmental agencies. This project entailed secondary analysis of publicly available aggregate data and was not research involving human subjects.

Health outcome. The steering committee selected life expectancy at birth as the health outcome for the development of domain weights and validation because of its broad recognition as a key indicator of community health status. We included no health outcomes in the HPI itself to avoid autocorrelation with life expectancy at birth. We calculated life expectancy at birth by using abridged life table methods for 13 population age groups (5-year age groups from 0-80, with ≥85 as the oldest category) from the 2010 Decennial Census[14] and California deaths (2009-2011) geocoded by residence to census tracts.[15]

We assigned each indicator in an initial list of 37 indicators to a domain, and we assessed each indicator for its fidelity to the definition, geographic coverage, recency, data quality, collinearity within domains, and simple (Pearson *r*) correlation with life expectancy at birth. We considered a variance inflation factor >4 as the threshold for potentially eliminating highly correlated indicators. We excluded 5 indicators that had paradoxical associations with life expectancy at birth likely due to confounding (Gini index, traffic density, agricultural pesticide use, toxic releases from facilities, and English language proficiency). A positive association between foreign-born status and life expectancy at birth is consistent with the recognized "paradoxes" of Latinos and other immigrant populations (ie, higher life expectancy than non-Hispanic white persons despite having higher risk factors for poor health outcomes [poverty, reduced access to health care]).[16] We removed the indicator for foreign-born status because natality is not actionable and because a mortality advantage might be misused to justify disinvestment in immigrant communities.

We found few indicators for health care access or quality at the census-tract level. We excluded the physician-to-population ratio because of missing data. Only measures of health care insurance coverage were available.

Nine data sources contributed to the 25 indicators of the HPI (Table 1).[17-25] The American Community Survey 2011-2015[17] accounted for 13 indicators. We defined most indicators as the percentage of the census-tract population meeting a threshold characteristic or as an area-based environmental measurement. We defined indicators with positive, asset-oriented language that assigned higher scores to opportunity and healthier living conditions and lower scores to less healthy living conditions.

We measured the race-related domain by using a single indicator of racial residential integration, the index of dissimilarity,[26] which ranges from 0 (parity) to 1 (hypersegregation). We calculated this indicator by using the county percentage of black persons as the standard for parity, and we aggregated to census tracts from census block differences with the county standard.

We included census tracts with a 2010 population of ≥1500 persons and a group-quarters population <50% to enhance statistical reliability of estimates and to avoid spurious results in economically dependent or mobility-limited populations in prisons, universities, military bases, and nursing homes. Of California's 8057 census tracts, 7793 (96.7%) met these criteria and accounted for 98.7% of California's population.

Rural members of the steering committee requested that the correlations between life expectancy at birth and the HPI be stratified by rurality. The definition of urban and rural followed that of the American Community Survey, based on residential population density and land-use characteristics.[27]

Domain Weights and Total Score

The steering committee initially considered using published studies to assign domain weights; however, systematic reviews[28,29] revealed widely varying estimates, which reflected a lack of agreement on the nature of domains (eg, social vs biological or genetic factors), domain definitions, and methods used to derive domain weights. The steering committee preferred an empirical approach that was subject to its review of unreasonable estimates.

To compute the HPI for each census tract, we first computed *z* scores for each indicator. For some indicators, we multiplied *z* scores by –1 so that increasing positive *z* scores indicated healthier community conditions. We computed domain scores for each census tract by taking the arithmetic mean of *z* scores for each indicator. We estimated domain weights by using a weighted and constrained least-squares regression model of the 8 domain scores against life expectancy at birth for each census tract.[30] This model simultaneously estimated domain weights and the association between HPI and life expectancy at birth in a way that (1) maximized the association between HPI and life expectancy at birth and (2) assigned greater weight to domains that were more predictive of life expectancy at birth. We guaranteed all

Table 1. Social determinants of health domains, definitions of indicators, and their data sources for the California Healthy Places Index, 2010-2015

Domain	Definition of Indicator	Data Source (Year)
Economics	Percentage of population with household income >200% of the federal poverty level	American Community Survey[17] (2011-2015)
	Percentage of population aged 25-64 employed	
	Median household income	
Education	Percentage of population aged >25 with a bachelor's degree or higher	American Community Survey[17] (2011-2015)
	Percentage of teenagers aged 15-17 enrolled in school	
	Percentage of children aged 3 or 4 enrolled in preschool	
Health care access	Percentage of adults aged 18-64 currently insured	American Community Survey[17] (2011-2015)
Housing	Percentage of housing units occupied by property owners	American Community Survey[17] (2011-2015)
	Percentage of households with complete kitchen facilities and plumbing	Comprehensive Housing Assessment System[18] (2010-2014)
	Percentage of low-income homeowners paying >50% of income on housing costs	
	Percentage of low-income renter households paying >50% of income on housing costs	
	Percentage of households with $\leq$1 occupant per room	American Community Survey[17] (2011-2015)
Neighborhood conditions	Percentage of population living within a half-mile of a park, beach, or open space >1 acre	GreenInfo Network[19] (2012)
	Population-weighted percentage of the census tract area with tree canopy	National Land Cover Database[20] (2011)
	Percentage of urban and small-town population residing <1 half-mile from a supermarket or large grocery store and percentage of rural population living <1 mile from a supermarket or large grocery store	US Department of Agriculture[21] (2015)
	Percentage of population residing within 1-quarter mile of an off-site sales alcohol outlet	California Department of Alcoholic Beverage Control[22] (2014)
	Combined employment density for retail, entertainment, and educational uses (jobs per acre)	Smart Location Database[23] (2010)
Pollution/clean environment	Spatial distribution of gridded diesel particulate-matter emissions from on-road and nonroad sources for a summer day in July 2012 (kg/d); census tracts were ordered by diesel particulate-matter concentration values and assigned a percentile based on the statewide distribution of values	CalEnviroScreen 3.0[24] (2012)
	Cal EnviroScreen 3.0 drinking water contaminant index for selected contaminants	CalEnviroScreen[24] (2005-2013)
	Mean of summer months (May-October) of the daily maximum 8-h ozone concentration (parts per million), averaged over 3 y (2012-2014); census tracts were ordered by ozone concentration values and assigned a percentile based on the statewide distribution of values	CalEnviroscreen[24] (2012-2014)
	Annual mean concentration of particulate matter $\leq$2.5 μm across ($PM_{2.5}$; average of quarterly means, $\mu g/m^3$) over 3 y (2012-2014); census tracts were ordered by $PM_{2.5}$ concentration values and assigned a percentile based on the statewide distribution of values	
Social	Percentage of registered voters who voted in the 2012 general election	Statewide Database, University of California, Berkeley[25] (2012)
	Percentage of family households with children aged <18 with 2 parents	American Community Survey[17] (2011-2015)
Transportation	Percentage of households with access to an automobile	American Community Survey[17] (2011-2015)
	Percentage of workers (aged $\geq$16) commuting by walking, cycling, or transit (excluding working from home)	
Racial residential integration	Index of dissimilarity using county percentage of black persons as a parity reference and aggregating census block differences to census tracts	Decennial Census[14] (2010)

domains a minimum 5% weight to ensure that each domain was incorporated; the minimum weight of 5% left 60% of weighting to the modeling process.

We computed the final HPI score for each census tract by averaging *z* scores for each domain, multiplying the average domain score by its domain weight, and summing the weighted domain scores. We also computed the HPI score's percentile so that census tracts could be ranked and displayed in a mapping application (http://healthyplacesindex.org/map).[12]

Alternative Indexes

We compared the HPI with several indexes and indicators used by California government agencies and local health departments to define disadvantaged persons or communities. These included (1) CalEnviroScreen version 3.0,[24] (2) household income <200% of the federal poverty level,[31] (3) 80% of California's median household income in 2015 ($49 454), (4) the Intercity Hardship Index,[4,32] and (5) the American Human Development Index.[33]

CalEnviroScreen organizes 19 indicators into 2 domains, pollution burden and population characteristics, the second of which includes sensitive populations (ie, sensitive to the effects of pollution) and socioeconomic factors. CalEnviroScreen incorporates a design that recognizes that population characteristics can amplify the health effects of certain environmental pollutants. Seven CalEnviroScreen indicators, including 4 pollution indicators, were also in the HPI.

The Intercity Hardship Index is a composite of 6 indicators: unemployment rate, dependency (population aged ≥65 or <18), low educational attainment (percentage of adults aged >25 with <high school education), per-capita income, housing overcrowding (>1 occupant per room), and income <100% of the federal poverty level. Five indicators in the Hardship Index were in the HPI.

The American Human Development Index[34] comprises 3 subindexes calculated from life expectancy at birth, educational attainment and school enrollment, and median household income, all of which were included in the HPI.

To measure concordance, we computed sensitivity, specificity, and positive predictive value for dichotomous variables in 2-by-2 tables of census tracts, using the quartile of greatest disadvantage as the cut point. This cut point (≥25%) is a statutory threshold used by several California state agencies to earmark funding to disadvantaged communities.

Results

Economic resources and education accounted for 50% of the domain weights (Table 2). Health care access, housing, and pollution/clean air environment correlated weakly with life expectancy at birth and received the 5% minimum weight. The racial residential integration domain had a weight of 0.13 when treated as a separate domain (slightly diminishing weights for the domains of economic, education, neighborhood, social, and transportation).

HPI census-tract scores were normally distributed, with a mean of 0 (range: –1.9 to 1.6). The total HPI score was strongly associated with life expectancy at birth ($r = 0.53$) and had an R^2 of 0.31 in simple linear regression. Incorporating racial residential integration produced a small increase in the correlation with life expectancy at birth ($r = 0.58$; $R^2 = 0.33$). The correlation between HPI and life expectancy at birth decreased with greater rurality: 0.56 (n = 7051) in urban census tracts, 0.46 (n = 384) in urban clusters in rural areas, and 0.42 (n = 358) in rural census tracts. The HPI varied regionally; the San Joaquin Valley accounted for 53% of census tracts in the most disadvantaged quartile, and the San Francisco Bay Area accounted for 6% of census tracts in this quartile. Detailed maps and policy guides are provided at http://healthyplacesindex.org.

Table 2. Domain weights for the Healthy Places Index, including and excluding the racial residential integration domain, California, 2010-2015

	Racial Residential Integration Domain	
Domain	**Excluded[a,b]**	**Included[a,b]**
Economics	0.32	0.26
Education	0.19	0.16
Health care access	0.05	0.05
Housing	0.05	0.05
Neighborhood conditions	0.08	0.07
Pollution/clean air environment	0.05	0.05
Racial residential integration	—	0.13
Social	0.10	0.09
Transportation	0.16	0.13

[a]Under state law, California state agencies are prohibited from using race as a basis for public contracting.[34]

[b]The numbers in the columns are fractions that total to 1. Domain scores are multiplied by these fractions (weights), and the sum of the weighted domain scores make up the overall Healthy Places Index score.

The HPI and CalEnviroScreen had the greatest discordance in identifying census tracts in the most disadvantaged quartile (Table 3). Of census tracts in the most disadvantaged quartile based on the HPI, 649 tracts (representing 3 million people) fell outside of the most disadvantaged quartile as determined by the CalEnviroScreen. Assuming HPI as the standard, the CalEnviroScreen had a sensitivity of 66.7% and a specificity of 88.8%. The Intercity Hardship Index and federal poverty level were less discordant with the HPI; they had higher sensitivity (80.5% and 84.2%, respectively) and specificity (93.4% and 94.7%, respectively) and misclassified a smaller number of census tracts. Median household income also had high sensitivity (91.9%) but low specificity (86.0%). The American Human Development Index had intermediate discordance with the HPI (sensitivity = 74.9%, specificity = 91.5%). Inclusion of the racial residential integration domain shifted 245 (13%) census tracts (1.2 million persons) into the most disadvantaged quartile.

Discussion

This study found that various indexes produce discordant results and should not be used interchangeably for various policy questions. The appropriateness of a metric for rating communities depends on whether the domains of interest, indicators, and weighting are suited to the topic. Some composite indexes assign weights to component domains, whereas others either ignore domain weighting or include a disclaimer about its importance and then use equal

Table 3. Census-tract agreement between the Healthy Places Index and alternative indexes, California, 2010-2015

Index		Census Tract, No.			Population, No.		
		25% Most Disadvantaged			25% Most Disadvantaged		
		Yes	No	Sum	Yes	No	Sum
CalEnviroScreen version 3.0[24]							
California Healthy Places Index	Yes	1299	649	1948	6 077 925	3 043 761	9 121 686
25% most disadvantaged	No	651	5192	5843	3 170 155	24 461 622	27 631 777
	Sum	1950	5841	7791	9 248 080	27 505 383	36 753 463
Intercity Hardship Index[4,32]							
California Healthy Places Index	Yes	1569	379	1948	7 468 805	1 652 881	9 121 686
25% most disadvantaged	No	380	5465	5845	1 885 044	25 750 245	27 635 289
	Sum	1949	5844	7793	9 353 849	27 403 126	36 756 975
Household income <200% of federal poverty level[31]							
California Healthy Places Index	Yes	1641	307	1948	7 723 774	1 397 912	9 121 686
25% most disadvantaged	No	308	5537	5845	1 463 802	26 171 487	27 635 289
	Sum	1949	5844	7793	9 187 576	27 569 399	36 756 975
American Human Development Index[33]							
California Healthy Places Index	Yes	1402	471	1873	6 761 326	2 097 079	8 858 405
25% most disadvantaged	No	484	5185	5669	2 282 522	24 748 851	27 031 373
	Sum	1886	5656	7542	9 043 848	26 845 930	35 889 778
California Healthy Places Index (with racial residential integration domain)[a]							
California Healthy Places Index	Yes	1703	245	1948	7 968 289	1 153 397	9 121 686
25% most disadvantaged	No	245	5600	5845	1 239 108	26 396 181	27 635 289
	Sum	1948	5845	7793	9 207 397	27 549 578	36 756 975
California Healthy Places Index (unweighted domains)							
Healthy Places Index	Yes	1703	245	1948	7 967 491	1 154 195	9 121 686
25% most disadvantaged	No	245	5600	5845	1 149 756	2 648 553	3 798 309
	Sum	1948	5845	7793	9 117 247	3 802 748	12 919 995
80% ($49 454) of California's median household income in 2015							
California Healthy Places Index	Yes	1790	158	1948	8 325 959	795 727	9 121 686
25% most disadvantaged	No	843	5002	5845	3 729 531	23 905 758	27 635 289
	Sum	2633	5160	7793	12 055 490	24 701 485	36 756 975

[a] The overall Healthy Places Index score includes the *z* score of the indicator for racial residential integration.

weighting. These differences in approach have substantial consequences for millions of persons, neighborhoods, and communities that are either selected or passed over for potential investments. This study shows that an index intended for rating environmental conditions (CalEnviroScreen) failed to detect one-third of census tracts with the worst conditions for population health. This discordance occurred despite substantial overlap in indicators and domains.

The development of the HPI is important for several reasons. First, it illustrates how community engagement can help customize such tools for local needs by engaging stakeholders in selecting actionable domains and meaningful indicators and ensuring that results are communicated in formats that are easily understood and useful to policy makers and practitioners. We beta-tested the HPI and its communication with advocates and community-based organizations and made substantial adjustments in functionality based on this input. The communication imperative is serious: this study produced an interactive online mapping application (http://healthyplacesindex.org/map) to enable the public to access data for their communities and to link the HPI score and individual indicators with general information and detailed policy briefs (http://healthyplacesindex.org/policy-actions). The HPI has already been used by more than 40 California agencies that have endorsed its use in their grant-making programs,[35-37] which has begun a process redirecting opportunity for millions of dollars in investments.[38]

Second, this study introduces new methods for weighting the relative importance of factors that shape health. Widely cited weightings by the County Health Rankings[39] project—which estimate that health outcomes can be attributed to health behaviors (30%), clinical care (20%), social and economic factors (40%), and the physical environment (10%)—are derived from relatively simple linear regression equations. In 2016, experts convened by the National Academy of Sciences called for more precise methods in measuring what shapes health.[40] Our study introduced a new method for deriving more precise weights by combining weighted and constrained least-squares regression.

Third, more precise information on weighting provides new insights about the relative importance of factors that determine health. Our study estimated that education and economic well-being accounted for 51% of domain weights. The HPI also quantifies the influence of infrastructure conditions (eg, transportation and places for physical activity and access to foods) and social factors (eg, household composition and civic engagement through voting). Individual indicators' association with life expectancy at birth confirmed what was already reported in the literature and was incorporated into our methodology to optimize the association between the overall HPI score and life expectancy, rather than to reveal new relationships.

Our results suggest that health care is not the dominant determinant of life expectancy at birth. However, the minimum weight (5%) assigned in this study to health care access should be interpreted with caution, because insurance coverage has endogenous relationships with income, and no other indicator of access or quality was available at the census-tract level. Policies to ensure access to health insurance and quality health care remain important.

Similarly, the minimum weights given to housing and the environment should be interpreted with caution. Housing in California is unique and complex; it is a convergence of housing shortages, inflated costs, an economic boom, homelessness, gentrification, tax policy, and other factors. The minimum weight given to the environment underscores why measures of environmental well-being, like CalEnviroScreen, do not measure the broader range of socioecological factors that determine health and longevity.

Limitations

This study had several limitations. HPI used one-time, area-based measures rather than longitudinal, person-level measurements.[41] As such, it was subject to the limitations of an ecologic design. In the screening of indicators, a few indicators with strong evidence of health effects showed contrary associations with life expectancy at birth in California census tracts. These associations may reflect confounding, indicators with inadequate measurement properties, or uncertainty of evidence. We recognize that individual characteristics (eg, age, sex) and place-based determinants of health (eg, violent crime and incarceration, adverse childhood events, social capital) that contribute to community health were omitted, largely because data were not available that met our inclusion criteria. The HPI may not be accurate for census tracts undergoing dynamic population change from immigration, rapid gentrification, and other causes of neighborhood succession.

The variance in life expectancy at birth explained by the model was modest, suggesting that other factors beyond those measured by the HPI contribute to longevity. The tool relies heavily on place-based characteristics and lacks data on personal health behaviors, clinical history, or other person-level factors that shape health.

Our study created versions of the HPI with and without a domain related to race/ethnicity in response to regulatory obstacles (related to Proposition 209)[13] for users in California state agencies. However, neither race nor ethnicity is truly independent of the other domains in the HPI. For generations, race/ethnicity and immigrant status have determined access to education, economic opportunity, food security, affordable housing and transportation, and healthy, safe environments. Race and ethnicity also influence health through the harmful effects of discrimination, racism, exclusionary policies, and segregation. These influences likely contributed to the domain weight of 13.2% in the HPI version that included the racial residential integration domain. Although our tool was not designed to assess the effects of Proposition 209,[42,43] it does provide information to delineate census tracts of comparable disadvantage that differ on racial residential integration. How these communities fare on social determinants of health before and after state investments in disadvantaged communities may be of interest to policy makers.

Although we developed the HPI in the California policy environment, HPI draws largely from public and national data sources. This can facilitate similar state and national efforts.

Practice Implications

Social determinants of health and Health in All Policies[44] (ie, strategies to include health considerations in policy making across multiple sectors that play a major role in determining the health of populations) are increasingly viewed as the primary causes of widespread health inequities and a holistic response, respectively. Policy makers and practitioners are often faced with the crucial question of which communities and conditions to prioritize, given limited resources. The California HPI is a useful data-driven tool to help inform those decisions and one that others can adapt for use throughout the United States. Areas of future research include development of longitudinal data.

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