May 16 2023

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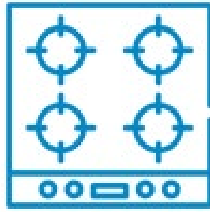
Cooktop replacement



- What's the "best" cooktop?
- What's the cost?
- Considerations & Limitations:
  - **Internal** - Home location, existing space, electrical power, etc.
  - **External** – supply chain, delivery and installation timing, etc.

You might not make the same choice as me –
the factors affecting your options are different than mine

Healthcare is not that different!

Selecting your Primary Care Provider (PCP)

- What's the "best" hospital/provider?
- What's the cost?
- Considerations & Limitations:
  - **Internal** - Home location, healthcare needs, language and culture, etc.
  - **External** – network access, insurance plan benefits, supply – accepting new patients, hours, etc.

Similar to buying a cooktop – your healthcare options and needs don't look the same as mine.

Vs a one-size fits all approach – the healthcare industry should orient around **health equity.**

Health Equity: fair and just opportunity to attain highest level of health

Agenda

- Social Determinants of Health (SDoH)
  - What it is
  - Why it matters
  - Ways to measure it
  - Considerations and limitation of methodologies
- Applications within Health Insurance
- What does the future hold
- Q&A

Feel free to jump in with questions throughout the presentation!

Caveats, Limitations, and Qualifications

- Kelly Ku is an actuary with The Cigna Group. She is member of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein. To the best of her knowledge and belief, this presentation is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices.
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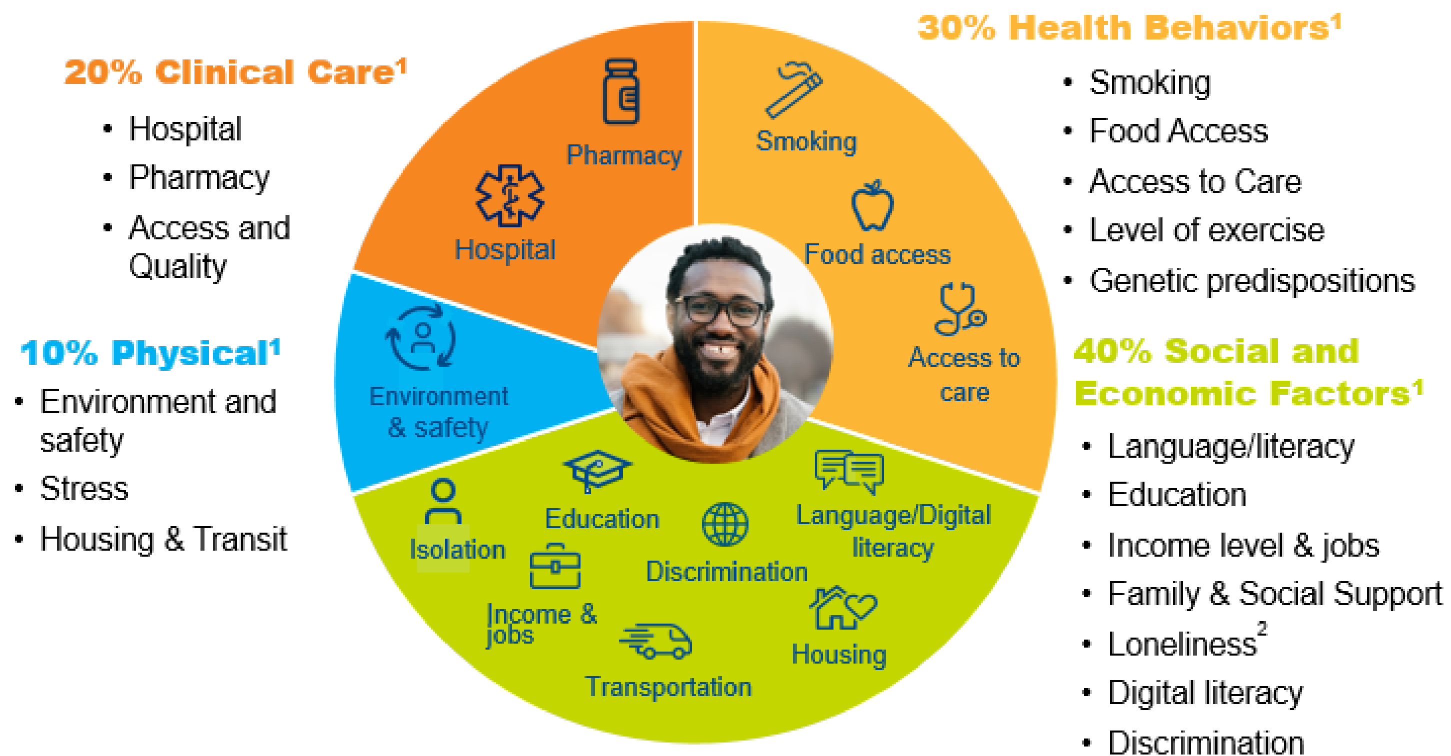
- To the best of the author's knowledge this presentation is an organized activity and qualifies for the bias topics[1] continuing education requirements of the US Qualification Standard developed by the American Academy of Actuaries.

This presentation represents my own opinions, research, and addresses bias topics

[1]USQS_2021.pdf (actuary.org): Bias topics include content that provides knowledge and perspective that assist in identifying and assessing biases that may exist in data, assumptions, algorithms, and models that impact Actuarial Services. Biases may include but are not limited to statistical, cognitive, and social biases.

Factors that Impact Health and Well-Being

80% of an individuals' health is determined by health behaviors and the environment in which they live, work and play.[1]



Big picture

- Looking only at clinical care is incomplete
- Your day to day lives impact your ultimate health and medical cost than you might be aware of
- To answer the session title question – the odds are in your favor!

Social Determinants of Health (SDoH) are the nonmedical factors that influence health outcomes

1. County Health Rankings and Roadmaps: A Robert Wood Johnson Foundation Program. (2019). Country health rankings model. https://www.countyhealthrankings.org/explore-health-rankings/measures-data-sources/county-health-rankings-model
2. Schimpff, S.C. (2019, February). Loneliness is the new smoking: How payers and providers should address it. (2019). Managed Healthcare Executive. https://www.managedhealthcareexecutive.com/health-management/loneliness-new-smoking-how-payers-and-providers-should-address-it

Why does it matter?

Changing Population

It is projected that people of color will account for over half (52%) of the population in 2050.[1]

Costs

Approximately $93 billion in excess medical care costs and $42 billion in lost productivity per year as well as economic losses due to premature deaths.[2]

Affordability

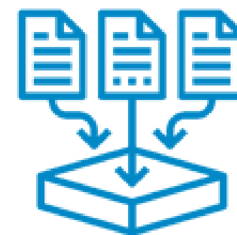
Health care trend in the US is unsustainable - We spend more per capital and are less healthy.[3]

SDoH are now widely recognized as important predictors in clinical care and positive conditions are associated with improved patient outcomes and reduced costs[4].

If we want to change course – we need to understand all drivers

1.U.S. Census Bureau, 2017 National Population Projections, Race by Hispanic Origin, 2017-2060. Available at: 2017 National Population Projections Tables: Main Series (census.gov) 2. Ani Turner, The Business Case for Racial Equity, A Strategy for Growth, W.K. Kellogg Foundation and Altarum, April 2018, https://altarum.org/publications/the-business-case-for-racial-equity-a-strategy-for-growth. 3. Looking at social determinants of health in the U.S. and comparable countries - Peterson-KFF Health System Tracker 4. Olson DP, Oldfield BJ, Navarro SM. Standardizing Social Determinants Of Health Assessments. Health Affairs Blog. doi:10.1377/hblog20190311.823116

Ways to Measure SDoH

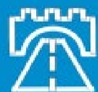


Social Determinants of Health

Economic Factors
- Employment
- Income
- Expenses
- Debt, medical bills

Health Care Access
- Health coverage
- Provider network
- Linguistic and cultural competency
- Quality of care

Infrastructure
- Housing
- Transportation
- Safety
- Playgrounds, walkability
- Urban/rural



Education
- Literacy
- Early childhood education
- Vocational training
- Higher education

Community and Social Context
- Social integration
- Support systems
- Community engagement
- Discrimination
- Stress

Food Access
- Distance to supermarkets
- Quality and cost of fresh food
- Public programs i.e. SNAP

The data associated with the measures in each domain can be sourced from public use data such as the U.S. Census and U.S. Department of Agriculture.

Domain	Measures
Economy	• Proportion of households below poverty line [source] • Median household income relative to county median household income [source] • Unemployment rate [source]
Education	• Proportion of total population with no high school diploma [source] • Proportion of total population that dropped out of college [source] • Health literacy ratio relative to the national average [source]
Food access	• Share of population beyond 1 mile (urban tracts) or 10 miles (rural tracts) from supermarket [source] • Share of households without vehicle that are beyond 1 mile (urban tracts) or 10 miles (rural tracts) from supermarket [source] • Share of households receiving SNAP benefits that are beyond 1 mile (urban tracts) or 10 miles (rural tracts) from supermarket [source] • Walkability score [source]
Health coverage	• Proportion of population 0-18 years of age with no health insurance [source] • Proportion of population 18-34 years of age with no health insurance [source] • Proportion of NI population 35-64 years of age with no health insurance [source] • Proportion of NI population >64 years of age with no health insurance [source]
Infrastructure	• Proportion of total population who are home owners [source] • Proportion of total housing units that are vacant [source] • Proportion of total population using sustainable means for transportation [source]
Language	• Proportion of non-English speakers in total population [source]

Many public datasets contain SDOH measures

Examples of Datasets Containing SDOH Measures

American Community Survey (ACS)
- **Geographic level of data:** state, county, place, census tract, ZCTA
- **Publisher:** U.S. Census Bureau
- ACS data profiles include the most frequently requested demographic (DP05), social (DP02), economic (DP03), and housing data (DP04).

Area Health Resources Files (AHRF)
- **Geographic level of data**: county
- **Publisher:** Health Resources & Services Administration (HRSA)
- The AHRF data files include data on health care professions, health facilities, population characteristics, economics, health professions training, hospital use, hospital expenditures, and environment.

Atlas of Rural and Small-Town America
- **Geographic level of data**: county
- **Publisher:** U.S. Department of Agriculture (USDA), Economic Research Service (ERS)
- The Atlas of Rural and Small-Town America provides statistics by broad categories of socioeconomic factors: people, jobs, county classification, income, and veterans.

Community Resilience Estimates
- **Geographic level of data:** state, county, census tract
- **Publisher:** U.S. Census Bureau
- Community resilience is the capacity of individuals and households to absorb, endure, and recover from the health, social, and economic impacts of a disaster such as a hurricane or pandemic. Estimates at the tract and county level are calculated by modeling individual and household characteristics, including poverty, crowding, and unemployment, from the 2019 ACS.

Crime Data Explorer (CDE)
- **Geographic level of data:** state, county, city
- **Publisher:** U.S. Federal Bureau of Investigation (FBI)
- The CDE provides data on violent and property crime incidents.

Environmental Dataset Gateway (EDG)
- **Geographic level of data:** county, census tract, census block group
- **Publisher:** U.S. Environmental Protection Agency (EPA)
- The EDG provides access to EPA's Open Data resources, including datasets related to air, water, temperature, precipitation, flood, and environmental justice.

Environmental Justice Index (EJI)
- **Geographic level of data**: census tract
- **Publisher:** CDC/ATSDR
- The EJI uses data from the U.S. Census Bureau, the U.S. Environmental Protection Agency, the U.S. Mine Safety and Health Administration, and the U.S. Centers for Disease Control and Prevention to rank the cumulative impacts of environmental injustice on health for every census tract. The EJI ranks each tract on 36 environmental, social, and health factors and groups them into three overarching modules and ten different domains.

Fatality Analysis Reporting System (FARS)
- **Geographic level of data**: state, county, point
- **Publisher:** U.S. Department of Transportation (DOT), National Highway Traffic Safety Administration (NHTSA)
- FARS is a nationwide census providing data regarding motor vehicle traffic crashes with fatal injuries.

Food Environment Atlas
- **Geographic level of data**: state, county
- **Publisher:** U.S. Department of Agriculture (USDA), Economic Research Service (ERS)
- The Atlas provides estimates on three broad categories of food environment factors: food choices (e.g., access and proximity to a grocery store; number of food stores and restaurants), health and well-being (e.g., food insecurity), and community characteristics (e.g., demographic composition; recreation and fitness centers).

Local Area Transportation Characteristics for Households (LATCH)
- **Geographic level of data**: census tract
- **Publisher:** U.S. Department of Transportation (DOT)
- LATCH data provides average weekday household person-miles traveled, person trips, vehicle-miles traveled and vehicle trips at census tract level.

Local Area Unemployment Statistics (LAUS)
- **Geographic level of data**: state, county, metro area
- **Publisher:** U.S. Bureau of Labor Statistics (BLS)
- The LAUS portal provides data on unemployment rates by month and 12-month net changes.

Location Affordability Index (LAI)
- **Geographic level of data**: census tract
- **Publisher:** U.S. Department of Housing and Urban Development (HUD)
- The LAI provides estimates of household housing and transportation costs at the neighborhood-level along with constituent data on the built environment and demographic characteristics.

National Environmental Public Health Tracking Network
- **Geographic level of data:** county, census tract
- **Publisher:** CDC, National Center for Environmental Health (NCEH)
- The Tracking Network is a system of integrated health, exposure, and hazard information and data from a variety of national, state, and city sources.

Social Determinants of Health Database
- **Geographic level of data**: county, census tract, ZCTA
- **Publisher:** Agency for Healthcare Research and Quality (AHRQ)
- The beta data files include data that correspond to five key SDOH domains: social context (e.g., age, race/ethnicity, veteran status), economic context (e.g., income, unemployment rate), education, physical infrastructure (e.g., housing, crime, transportation), and health care context (e.g., health insurance).

Social Vulnerability Index (SVI)
- **Geographic level of data**: county, census tract
- **Publisher:** CDC/ATSDR
- The CDC/ATSDR SVI includes 15 U.S. census variables, including poverty, lack of vehicle access, and crowded housing, that are grouped into four related themes, including socioeconomic status; household composition and disability; minority status and language; and housing type and transportation. Each county and census tract receives a separate ranking for each of the 15 variables, the four themes, as well as an overall SVI ranking.

Availability of data is not an issue!

Source: https://www.cdc.gov/places/social-determinants-of-health-and-places-data/index.html

Existing SDoH Indices

Sampling Of SDoH And Health Equity Indices	
Adverse Outcome Index	Modified Darden-Kamel Composite Socioeconomic Index
Agency for Healthcare Research and Quality (AHRQ) Socioeconomic Status (SES) Index	Multidimensional Deprivation Index (MDI)
AHRQ Socioeconomic Status Index	NCI Census Tract–Level Socioeconomic Status Variable
Area Deprivation Index (ADI)	Neighborhood Concentrated Disadvantage Index
Average annual percent change (AAPC)	Neighborhood Deprivation Index
Baseline Resilience Indicators for Communities (BRIC)	Neighborhood Socioeconomic Disadvantage Index
Census Bureau Community Resilience Estimates	Neighborhood Socioeconomic Status (NSES)
Child Opportunity Index (COI) 2.0	Neighborhood Stress Score (NSS7)
Community Need Index	Opportunity Index
Composite Index of SES	Prevention of Quality Overall Composite (PQI 90)
Concentration Index (CIX)	Quality Indicator Disparity Scale (QIDS)
COVID-19 Vaccine Coverage Index (CVAC)	RTI Rarity™ Local Social Inequity (LSI) score
Distressed Communities Index	Slope Index of Inequality (SII)
Health Equity Summary Score (HESS)	Social Capital Index
Healthy Places Index	Social Deprivation Index (SDI)
Heath Equity Metric (HEM)	Social Determinants of a Health Index
Hispanic Health Risk Index (HHRI)	Social Vulnerability Index (SVI)
HOUSES Index	Social Vulnerability to Environmental Hazards Index (SoVI)
Material Community Deprivation Index	Townsend Deprivation Index
Minority Health SVI	Urban Health Index

There is an enormous number of SDoH and Health Equity indices, indicators, measures, and scores in the field.

Helpful checklist when comparing and contrasting indices:

- ✓ Input domains and domain definitions
- ✓ Index statistical approach and data transformation
- ✓ Geography and level of granularity
- ✓ Data sources and input variables
- ✓ Accessibility
- ✓ Output types and measures
- ✓ Index oversight and governance

There isn't a single "best" index – think about what your goals are

Source: Social Determinants of Health: A Review of Publicly Available Indices (rti.org)

Considerations and Limitations

Many SDOH index methodologies characterizes individuals at the neighborhood level.

- Scores are meant to provide a portrait of the census tract – to better describe the challenges and health disadvantages faced by residents living in a defined area, relative to other areas across the U.S.
- It is **not meant to accurately depict an individual's actual situation**, as the data sourced is not at the individual level but the community level.
- Instead, the SDI provides a better understanding of the environment in which an individual lives and their risk for obstacles related to social determinants of health.

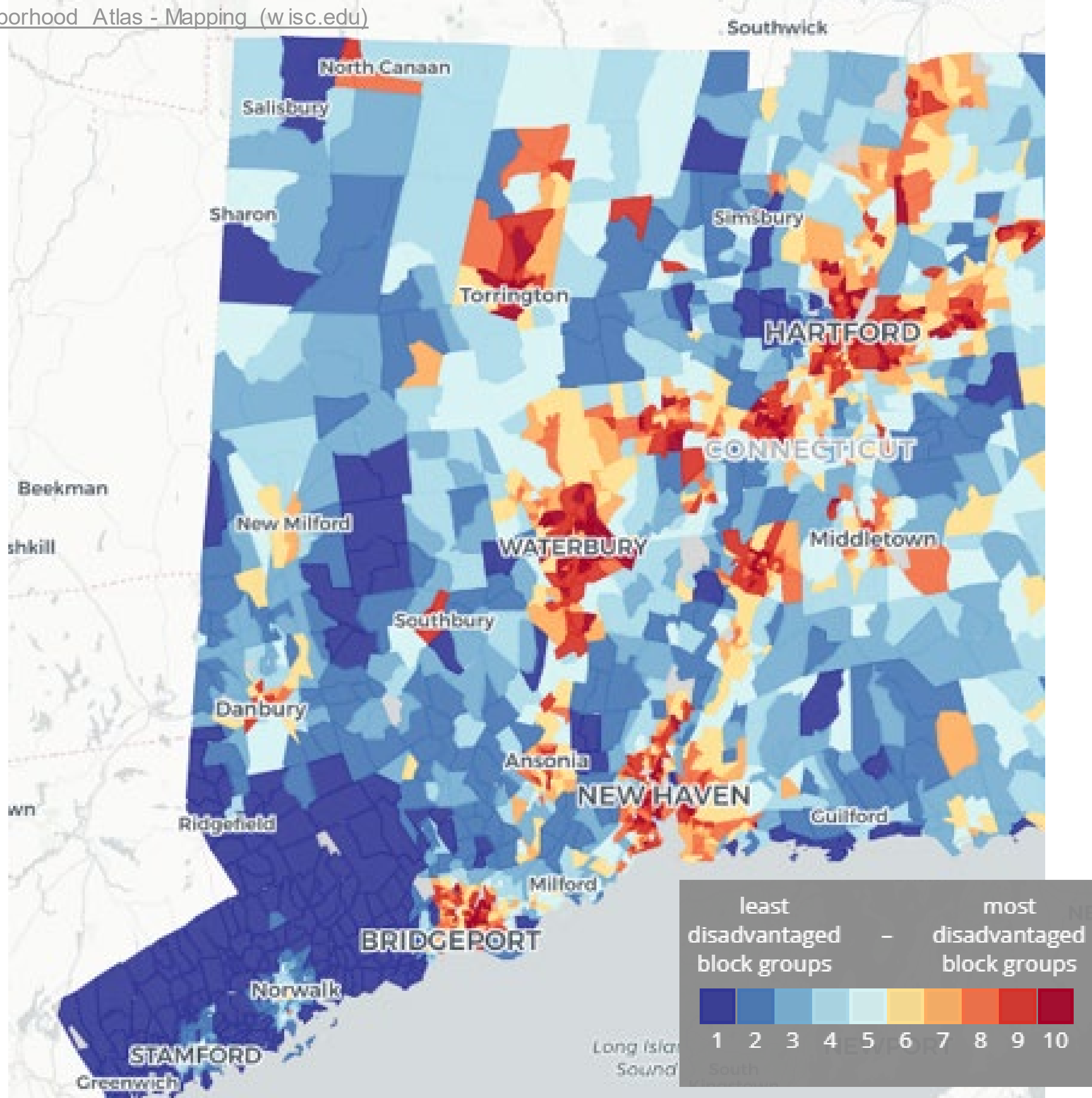
In an attempt for fairness be mindful of **unintended consequences:**

- degrading performance/experience of better performing groups.
- enforce fairness through levelling down is a cause for concern.

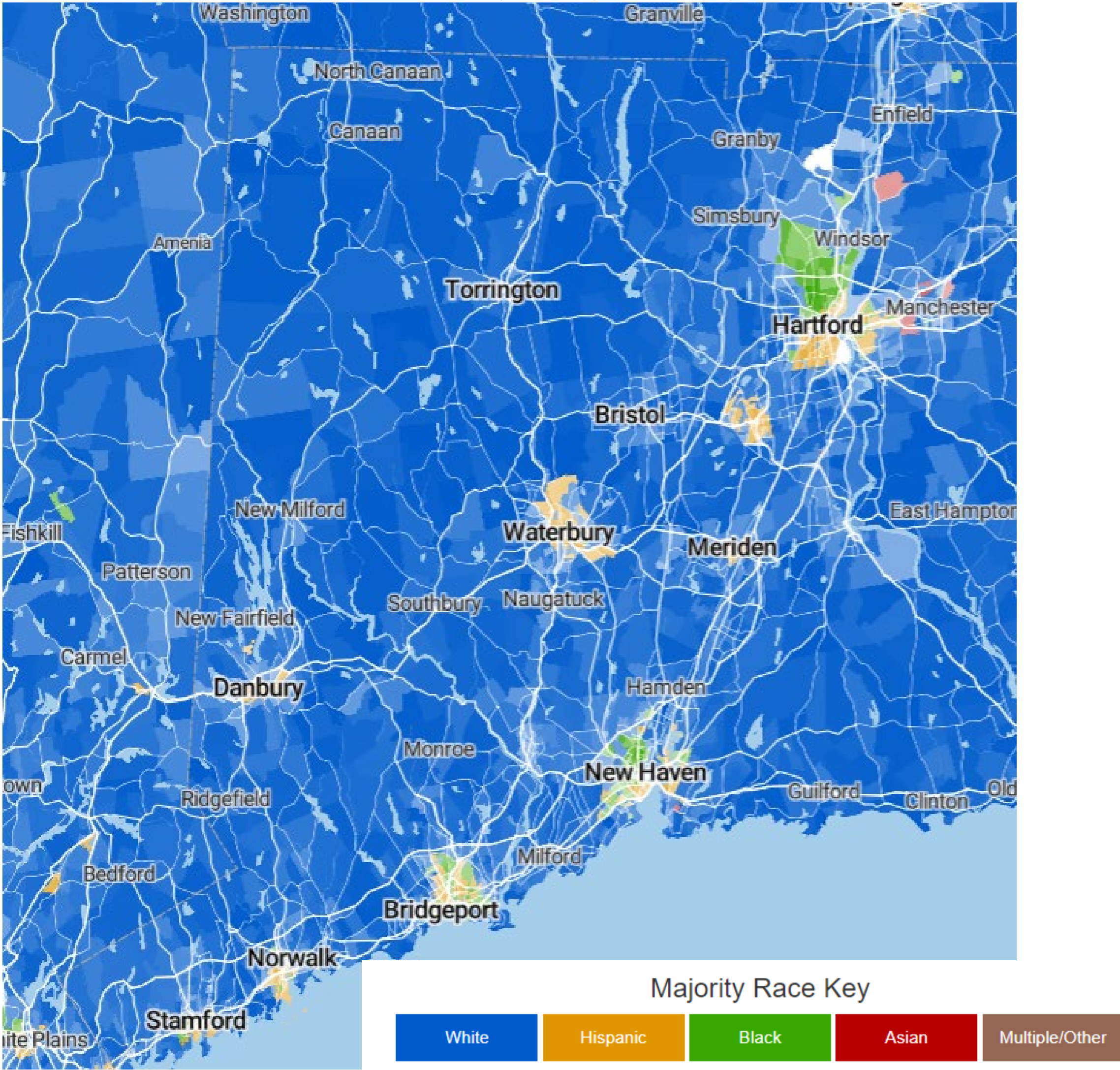
Watch out for biases - In the data or in your interpretation of it!

Statistics 101 – Correlation does not mean causation

Neighborhood Atlas - Mapping (wisc.edu)



Race, Diversity, and Ethnicity in Connecticut | BestNeighborhood.org



Race is correlated and can inappropriately be seen as a proxy for high SDH inequities – this does not mean that race inputs in algorithms are justified!

Application of SDOH Index

Cigna is currently using the SDI in two ways:

- To **identify under-resourced communities** within Cigna markets where overall health status and utilization are impacted by SDoH, and additional resources may need to be deployed in the community
- To **improve identification of customers** who are at increased risk for poor health status and utilization based on their residence, and **increase engagement** in programs to support customers with the resources they need to obtain optimal health.

SDI

For every 5 unit increase in the SDI score (more social obstacles)

customers are 4% less likely to engage in a Cigna case management program

Once engaged, customers show $663 PMPM savings and 0.80 fewer ER visits*

*Cost savings is an average within first 5 months post engagement and emergency room (ER) reduction is an average within first 6 months post engagement

Higher SDI score → greater risk of avoidable utilization, greater risk of chronic medical conditions, under-diagnosis of behavioral conditions

A book of business profile indicated customers living in **very high SDI areas** are...

1.9x as likely to have **avoidable ER utilization**

1.4x as likely to be **ER super utilizers**

1.6x as likely to have an **avoidable inpatient visit**

1.8x as likely to be diagnosed with **diabetes**

1.4x as likely to be diagnosed with **hypertension**

1.3x as likely to be diagnosed with **substance use disorder**

0.7x as likely to be diagnosed with **depression, anxiety, and bipolar**

1.4x – 1.7x **less likely to be adherent to their medications**

…compared to customers living in low SDI areas.

- Combining data related to SDOH measures with community-level chronic disease measures (e.g. PLACES - https://www.cdc.gov/places/) can broaden the usefulness of each of these types of data in understanding community health.

SODH Indices help “zone in” on highest risk populations, maximizing “Bang for the Buck”

Inside Cigna's Data-Driven Approach to Health Equity | Cigna Newsroom (thecignagroup.com)

Other Applications

3 Real-world examples:

- CMS incorporated SRF into Medicare payments to providers.
  - proposed increased payments to new ACOs that care for dually eligible beneficiaries who live in areas with high deprivation by utilizing the Area Deprivation Index (ADI).
- The Healthy Places Index (HPI) was used in California during the COVID-19 pandemic
  - directed $272 million in federal COVID funding to disproportionately impacted communities.
- Ohio Medicaid piloted the (Research Triangle Institute) RTI Rarity™ score to identify the 5 most important predictors of shorter life expectancy by utilizing more than 140 publicly available variables specific to the state.
  - With this index, the organization uncovered 10-20% more variability in life expectancy.

Health Insurance carrier possible applications:

- Book of business analysis/Client reporting
  - Tailor programs to fit the needs of a specific cohorts
- Targeted pilot/community programs
- Marketing material
  - simple plain English and other language options
- Pricing and underwriting (?)
  - You might want to be carful here!
- SDOH screening requirements for Healthcare teams – FFV measurements
  - CMS ICD-10 Z codes: SDOH-related Z codes ranging from Z55-Z65 are the ICD-10-CM encounter reason codes used to document SDOH data
- Case management engagement
  - Understanding barriers to care

Just a few examples – Let's hear from you!

What does the future hold?

Reactive → Proactive

- Focus on not just on unit cost but holistic drivers of medical cost
- Preventative screening campaigns
- Healthy lifestyle incentives

Acute Intervention, Crisis-based → Primary-care-based

- Arms race for VBC:
  - CVS/Aetna + Signify + Oakstreet Health
  - UHC + Walmart
  - Walgreens + VillageMD + Cigna
- Fragmented care → Coordinated care

Hospital/Provider-based → Population based

- Access – Telehealth and Expansion to retail – CVS, Walgreens, MDLive, Teledoc
- At home care and tests
- Transportation – Uber and Lyft partnerships
- Uber Health – Patient transportation and Rx delivery

Medical Models → More Inclusive SDOH models

- Care coordinators closing the loop
- Language – Generative AI
- Not just physical health but mental as well
- Food access
- Social support

Awareness → Informed decisions → Action

Recap + Q&A

“

DO THE BEST YOU CAN UNTIL YOU KNOW BETTER. THEN WHEN YOU KNOW BETTER, DO BETTER

MAYA ANGELOU

”