Social Determinants of Health

Can predictive analytics drive results?

JANUARY 14, 2019

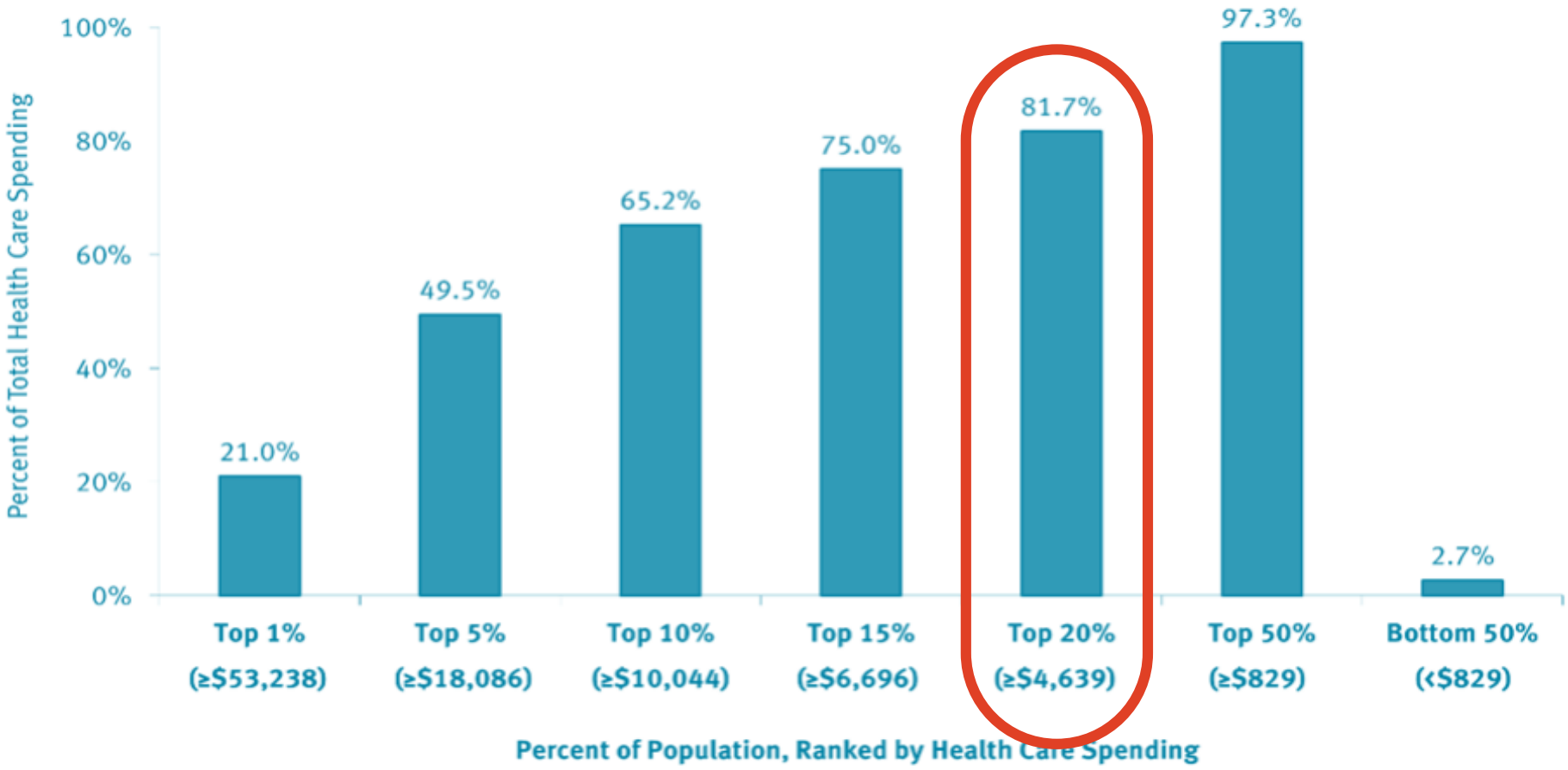
Learning objectives

- Understand SDOH use cases and application in the healthcare market
- Evaluate data correlates in the area of income, education, food, transport, and others and their relationship to medical adherence and outcomes
- Differentiate perspectives from Provider, Payer, and Employer as the patient consumers of healthcare are stratified by risk

Social determinant market factors

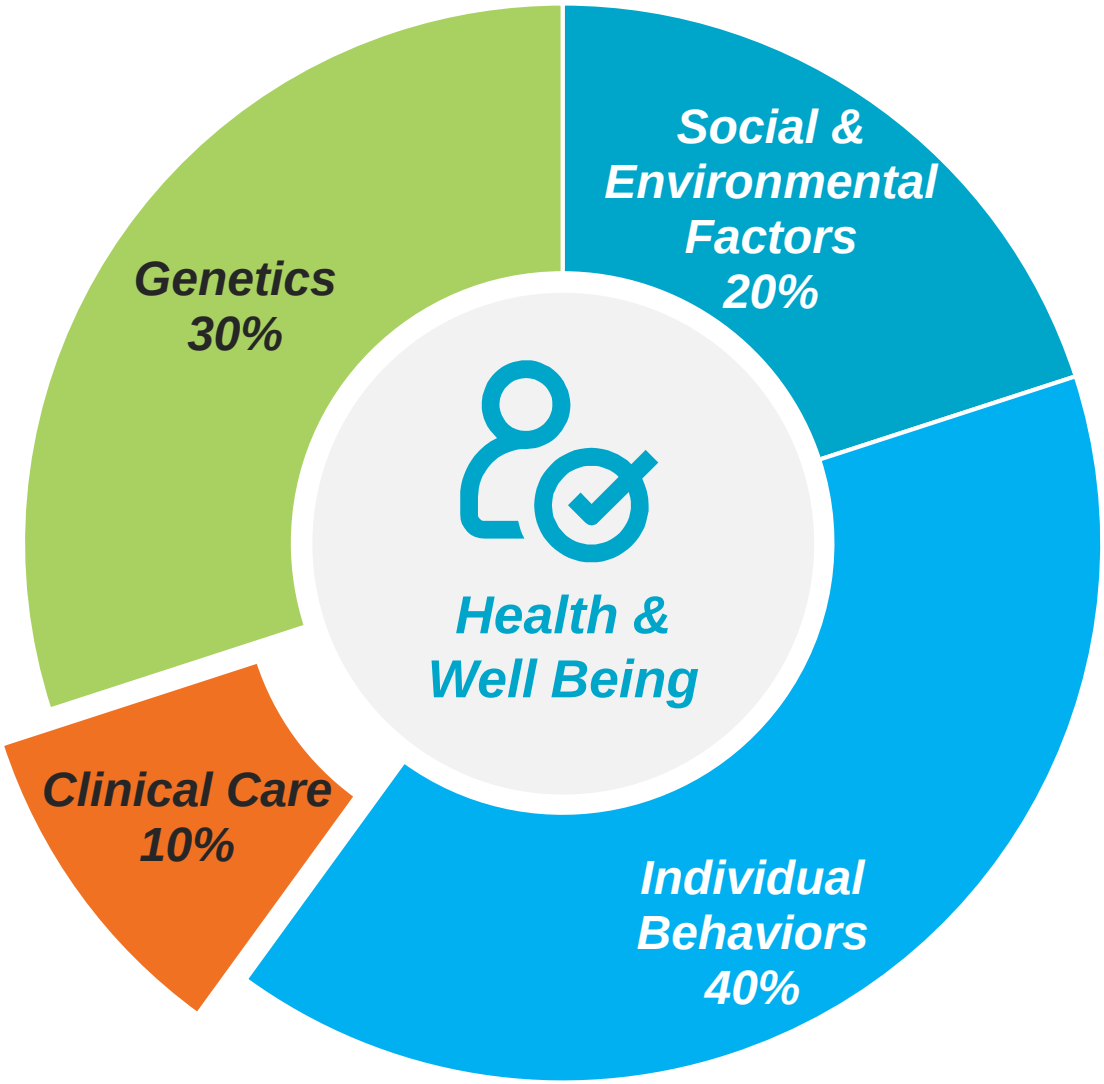
20% of the U.S. population represents 80%+ of healthcare costs

Concentration of Healthcare Spending in the U.S. Population, 2010



SOURCE: Kaiser Family Foundation / AHRQ MEPS data: https://www.healthsystemtracker.org/chart-collection/health-expenditures-vary-across-population/?_sf_s=How+Do+Health+Expenditures+Vary+Across+the+Population#item-people-age-55-account-half-total-health-spending_2015

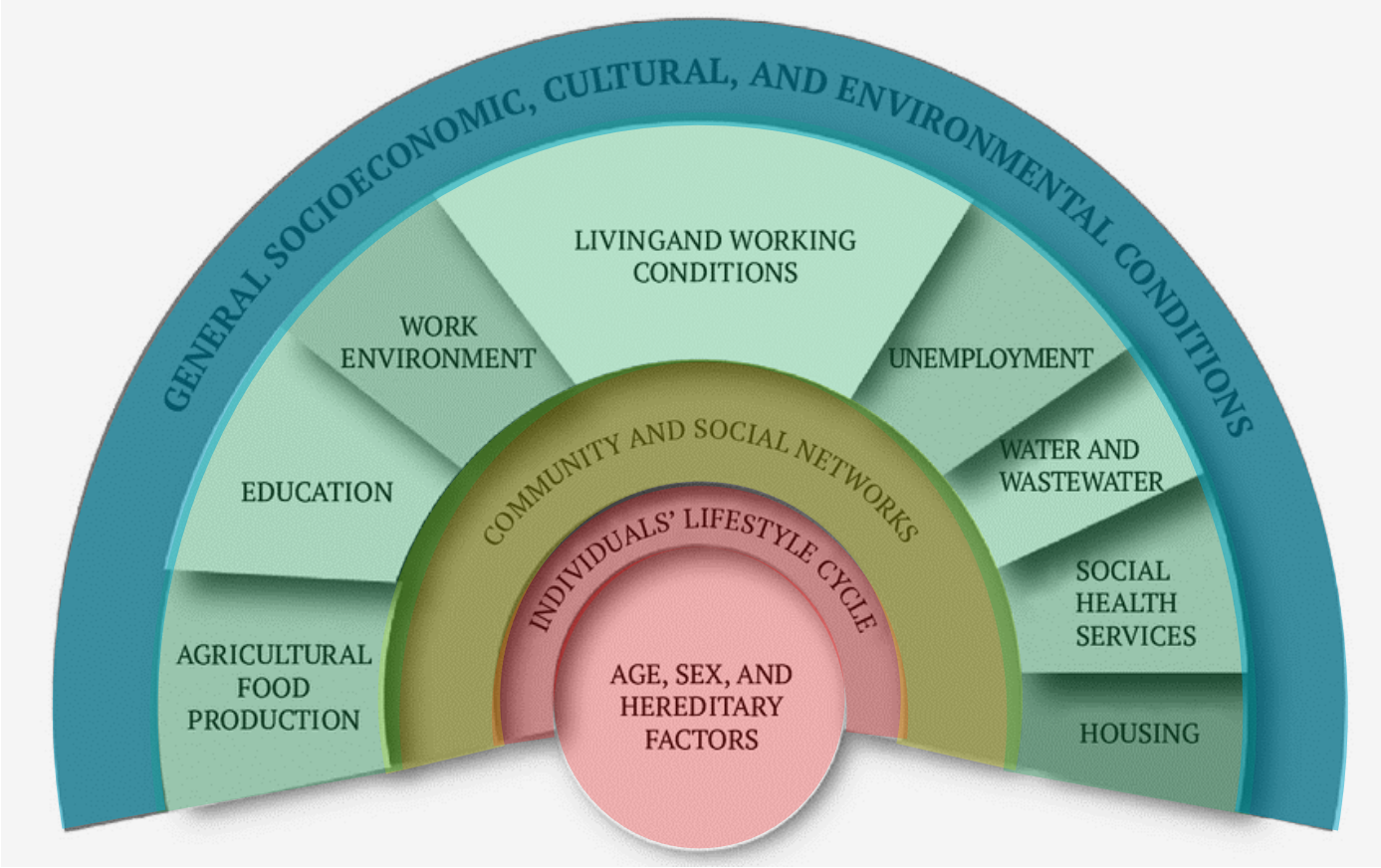
Social Determinants of Health (SDOH) have a 60%+ influence on predicting health, while clinical intervention is only 10%



Source: Schroeder, SA. (2007). We Can Do Better — Improving the Health of the American People. NEJM. 357:1221-8.

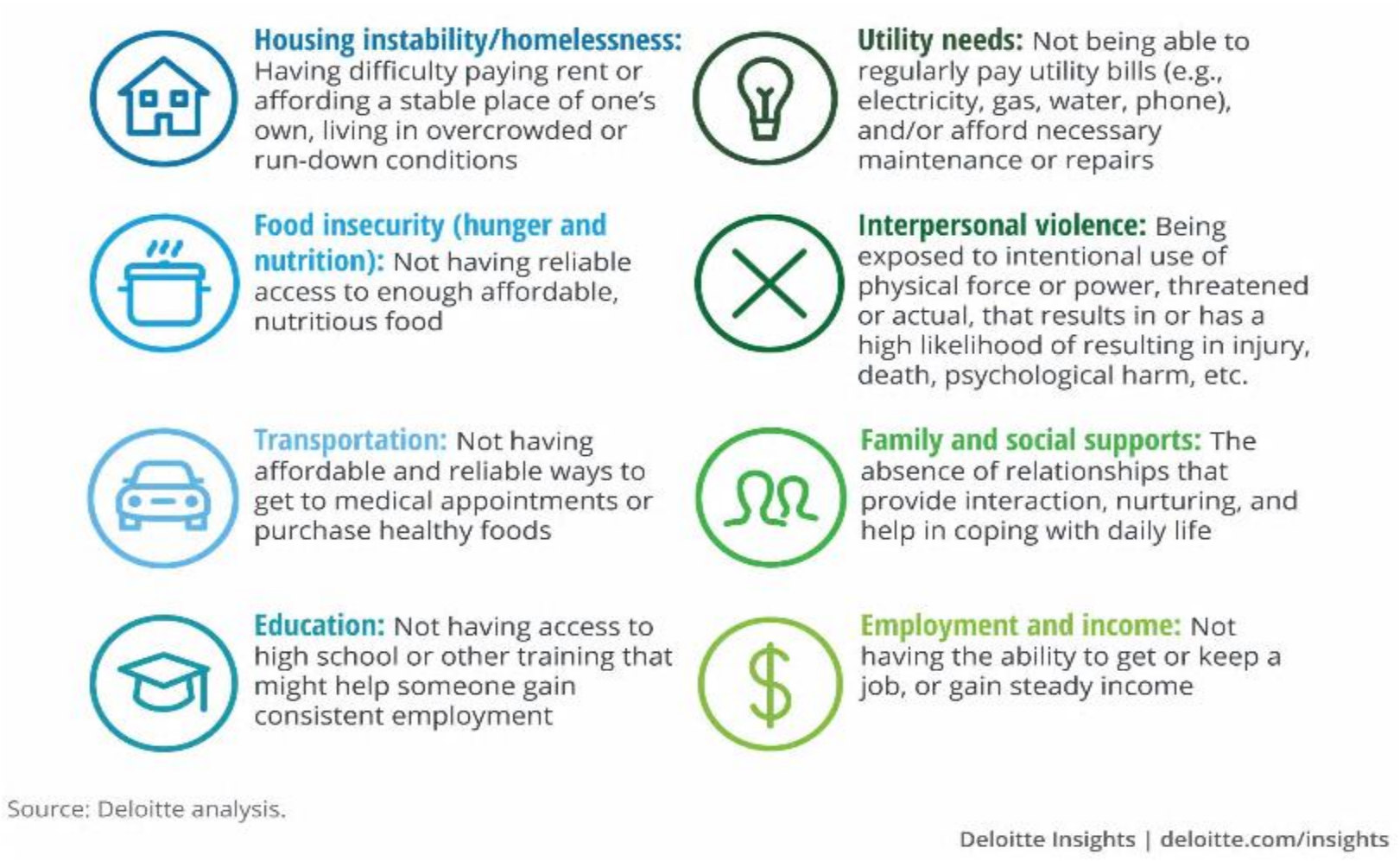
Wellness is a function of multiple individual and environmental factors

- Individual factors
- Social Networks
- Living and Working Conditions
- Socio-economic factors

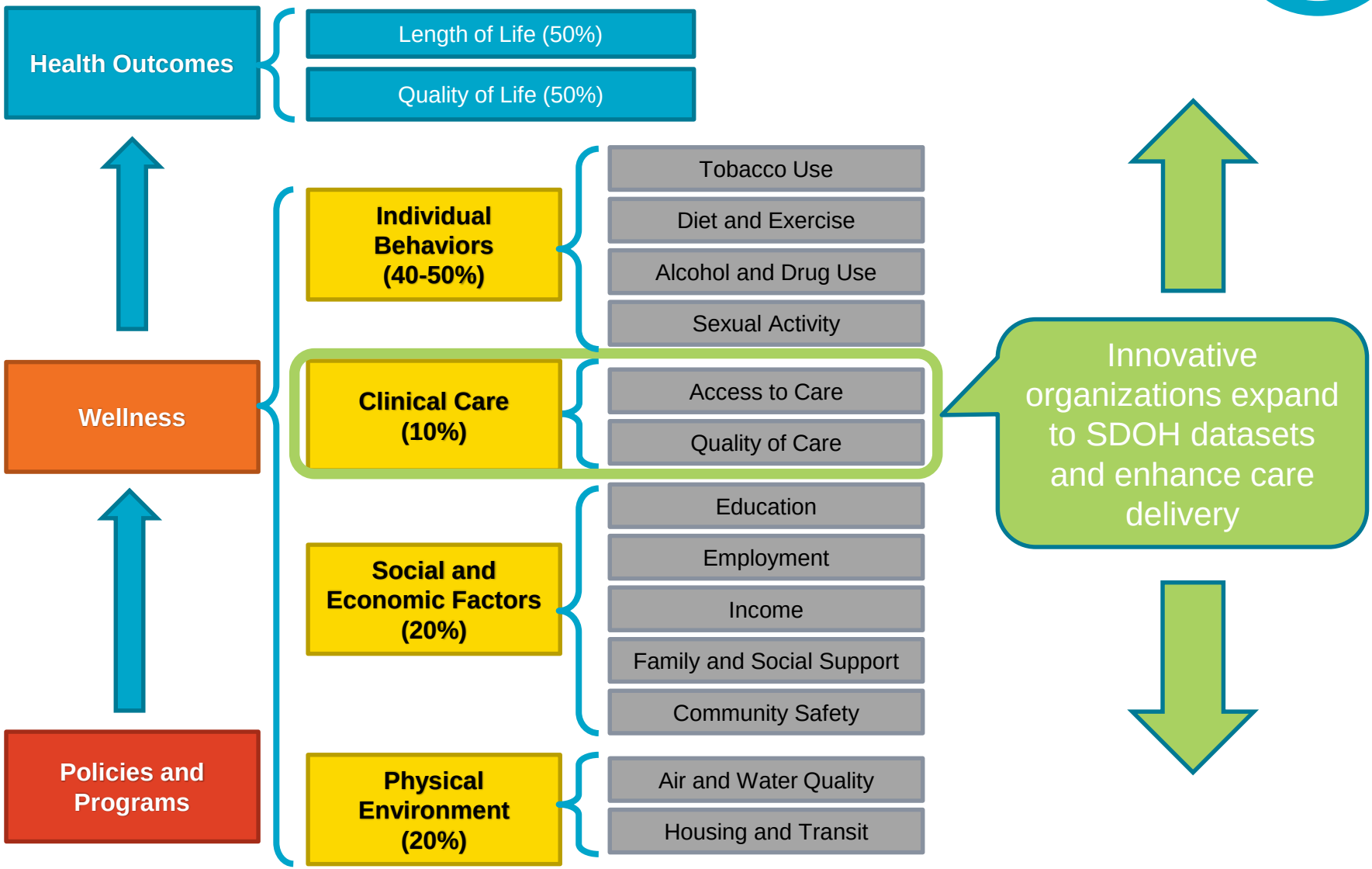


Source: Adapted from Dahlgren G, Whitehead M. Policies and strategies to promote social equity in health. Stockholm: Institute for Futures Studies; 1991; And Natalia Vincens, Lund University. 2018.
https://www.researchgate.net/publication/328772170_Income_distribution_and_health_in_Latin_America_The_interplay_between_social_determinants_of_health_for_explaining_health_inequities

Simple life necessities can become great barriers to health



SDOH are typically NOT used in traditional healthcare delivery



Source: Adapted from Robert Wood Johnson Foundation & University of Wisconsin Public Health Institute.

Predictive data models

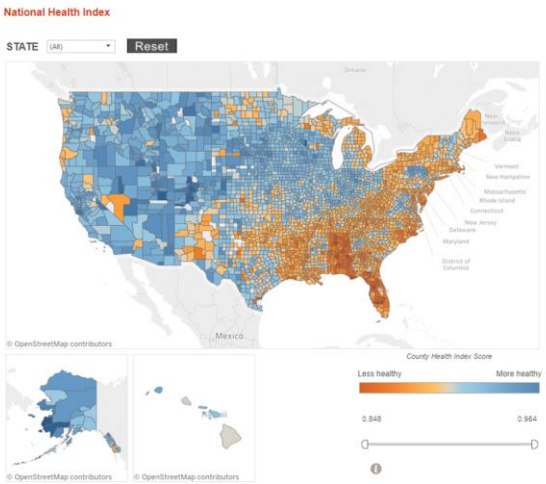
BCBS National Health Index: Patient chronic disease states that drive overall health score

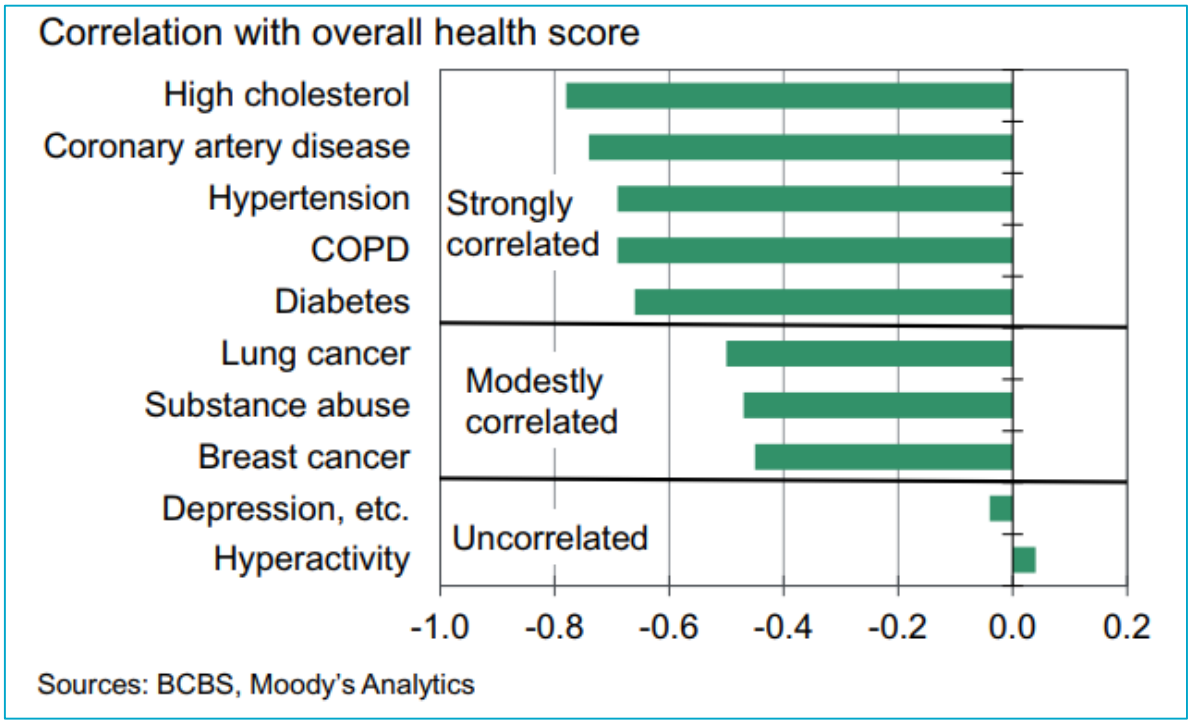
BlueCross BlueShield
THE HEALTH OF AMERICA

Data-driven insights to improve the health of all Americans.

WELLNESS

National Health Index



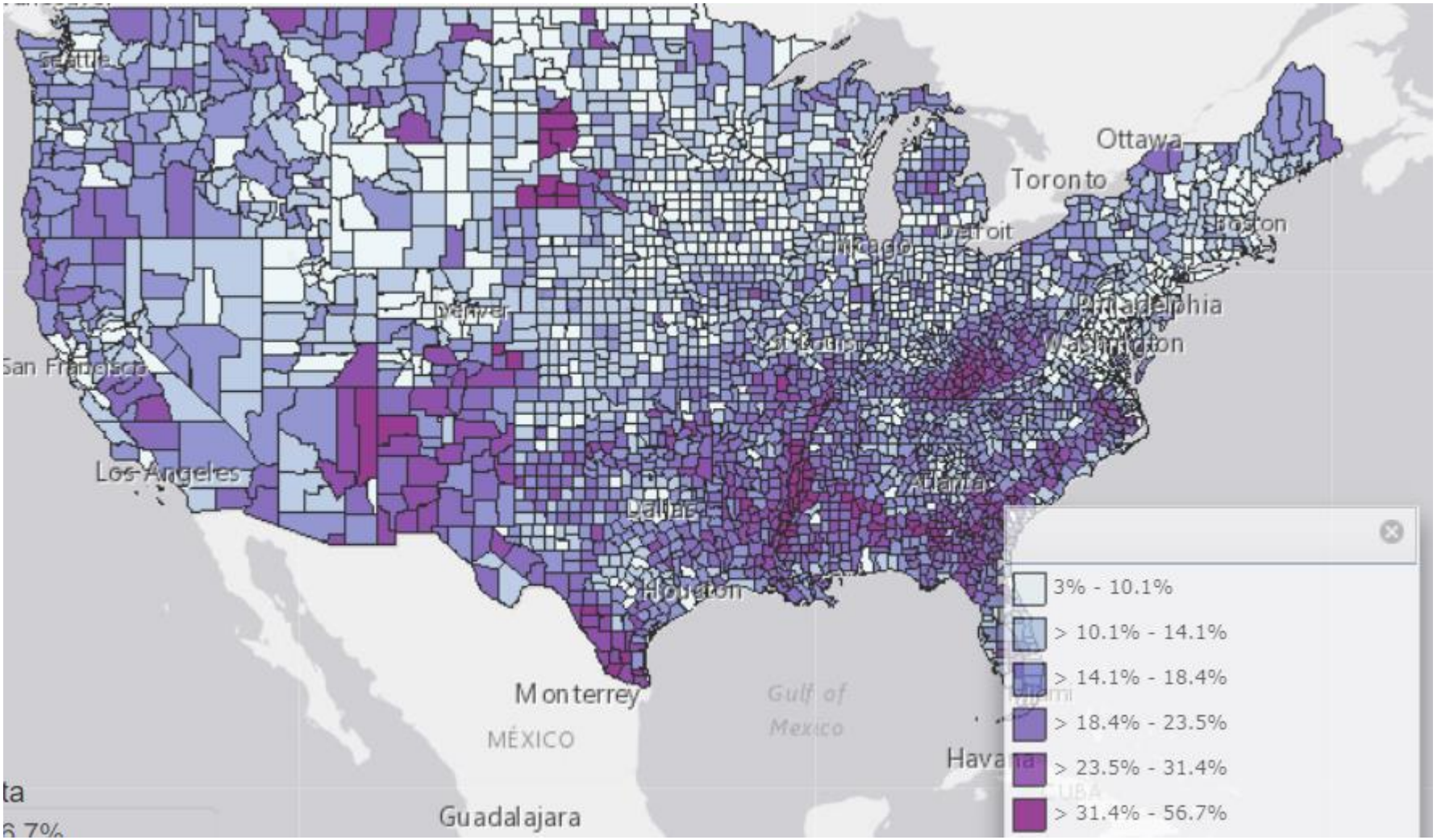


HOW THE BCBS HEALTH INDEX IS CALCULATED

The BCBS Health Index provides a comprehensive measure of health by quantifying how more than 200 health conditions affect the health and well-being of commercially insured Americans. The BCBS Health Index assigns defined populations in the United States a health index score between 0 and 1, where 1 represents optimal health and anything less than 1 represents the adverse impact of illness or disease on longevity and quality of life. For example, a health index score of 0.9 indicates that, on average, that population is living at 90% of its optimal health. In other words, the population could gain up to 10% in healthy lifespan by addressing the top health conditions impacting their area.

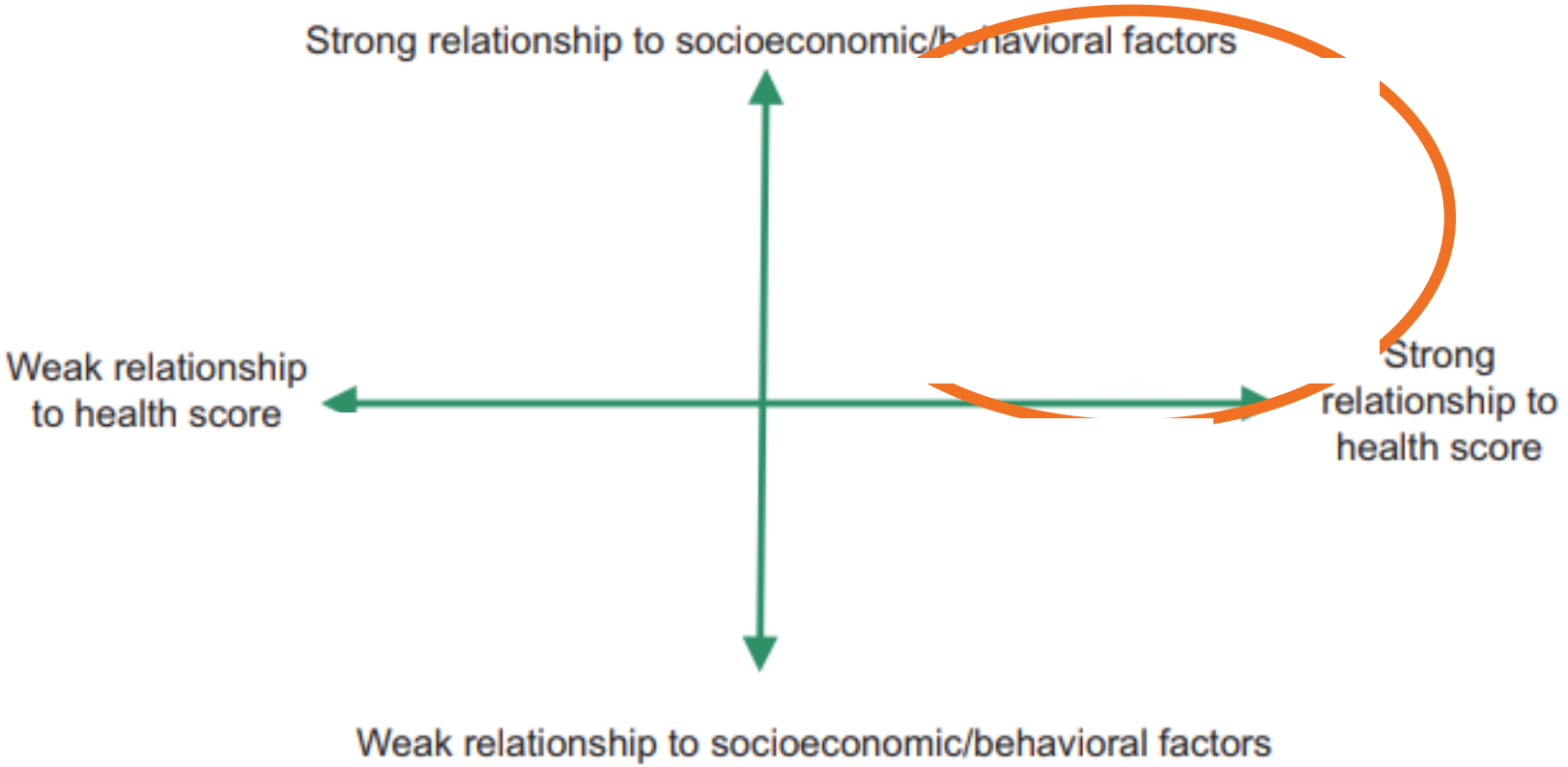
Source: https://www.bcbs.com/sites/default/files/file-attachments/health-of-america-report/BCBS.HealthOfAmericaReport.Moodys_02.pdf

Socio-Economic Status (SES) varies considerably at the county level



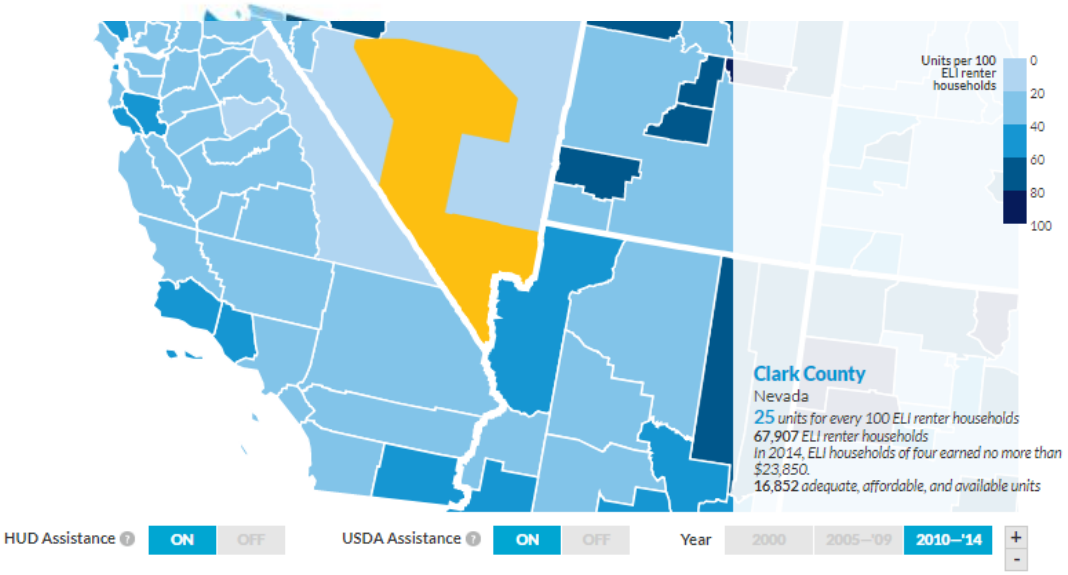
Source: CDC: https://www.census.gov/data-tools/demo/saipe/saipe.html?s_appName=saipe&map_yearSelector=2017&map_geoSelector=aa_c

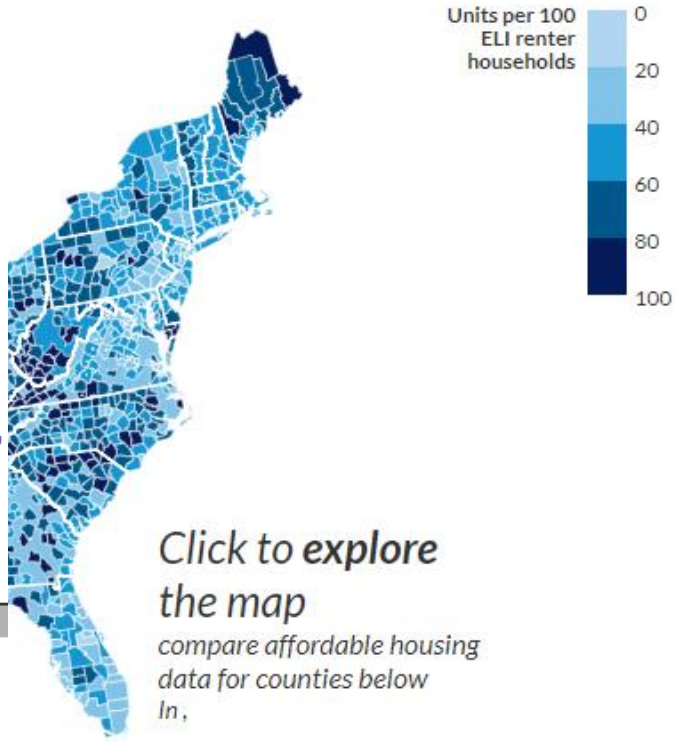
Certain chronic diseases are also highly correlated with the SES factors and health score



Source: https://www.bcbs.com/sites/default/files/file-attachments/health-of-america-report/BCBS.HealthOfAmericaReport.Moodys_02.pdf

Housing Insufficiency





LOCATION	ELI RENTER HOUSEHOLDS	UNITS PER 100	TOTAL UNITS
United States 2010 – '14	11,775,631	46	5,374,785
Clark County, NV 2010 – '14 expand years	67,907	25	16,852
Nye County, NV 2010 – '14 expand years	1,786	62	1,116

USDA assisted units
HUD assisted units
Units without assistance

HU

Source: HUD: https://www.huduser.gov/portal/tmaps/LI-household/chas.html

Housing resources dramatically reduces healthcare spend

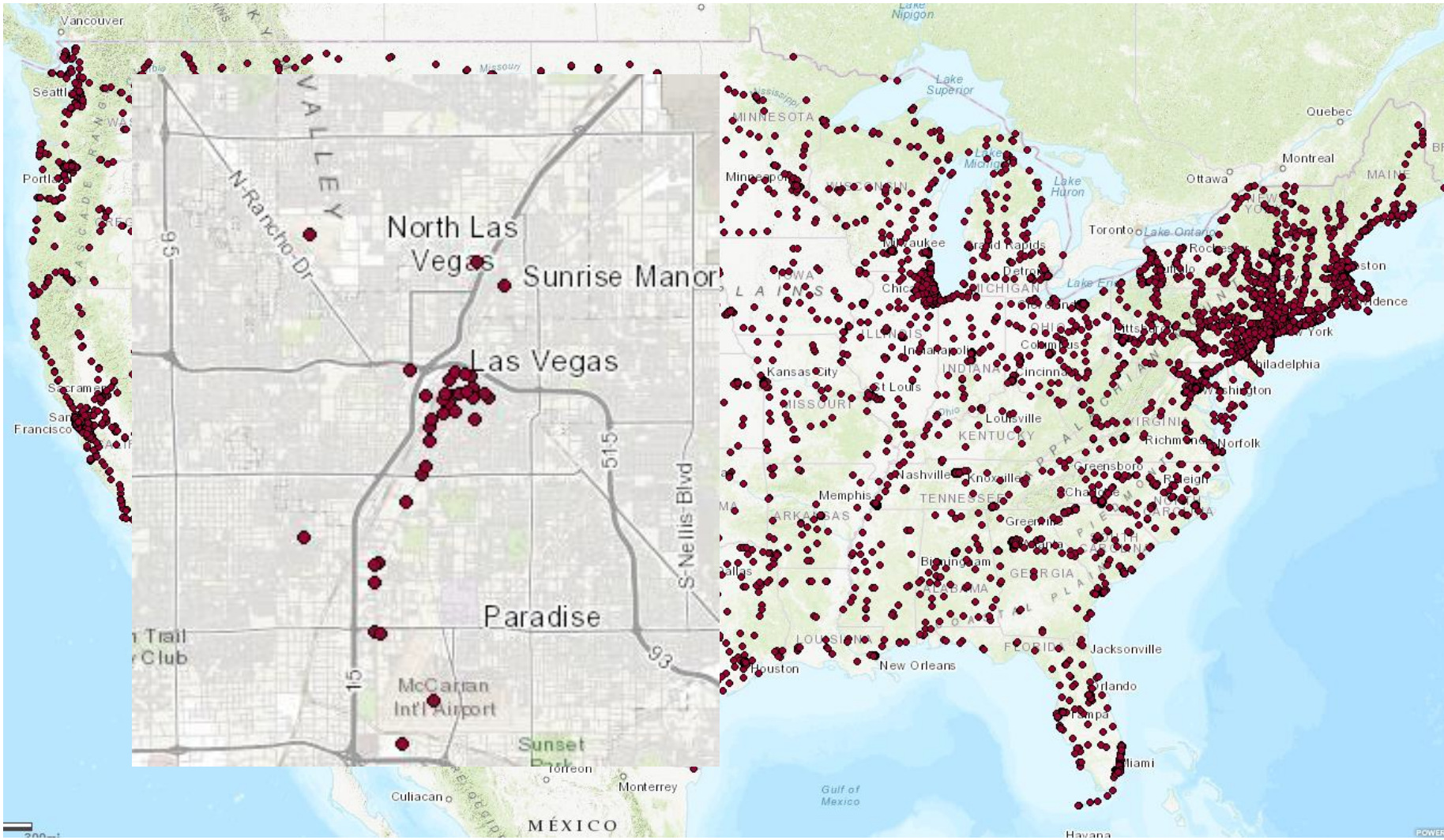
- **Montefiore Medical Center[1]:**
  - Started a respite program with housing shelters
  - Flagged patients for homelessness ~ 1000 patients per year identified
  - Partnered with 100+ shelters in Bronx area; Reduced readmission 15%
  - 10,000 participants = $100K investment → **$2.6M reduction in medical costs**

- **Housing First[2]:**
  - Pilot in Seattle, WA and Boston, MA (n=191)
  - Participants are identified through data and screening and provided supportive housing
  - Hospitals assigned patients at discharge and reduced ED utilization
  - 196 participants = $480K investment → **$3.6 M reduction in medical costs**

- **University of Illinois Hospital[3]:**
  - Partnered with Center for Housing and Health
  - Identified chronically homeless patients in ED and then qualified for housing
  - ED had a 35% reduction and costs were reduced 42%
  - 177 participants = $85K investment → **$855K reduction in medical costs**

1.HFN:https://www.healthcarefinancenews.com/news/what-montefiores-300-roi-social-determinants-investments-means-future-other-hospitals; https://innovations.ahrq.gov/events/2013/01/innovative-policies-using-aco-principles-and-financial-incentives-improve-health
2.BCBSF:https://bluecrossmafoundation.org/sites/default/files/download/publication/Social_Equity_Report_Final.pdf
3.RCI: https://revcycleintelligence.com/news/how-addressing-social-determinants-of-health-cuts-healthcare-costs

Transportation Insufficiency



http://osav-usdot.opendata.arcgis.com/datasets/1d58e1212068450aa3e49fde1aff8d9d_0?geometry=105.293%2C11.903%2C79.805%2C54.184

If the patients cannot get to care, it's ED via ambulance – Transportation insecurities are a major cost driver

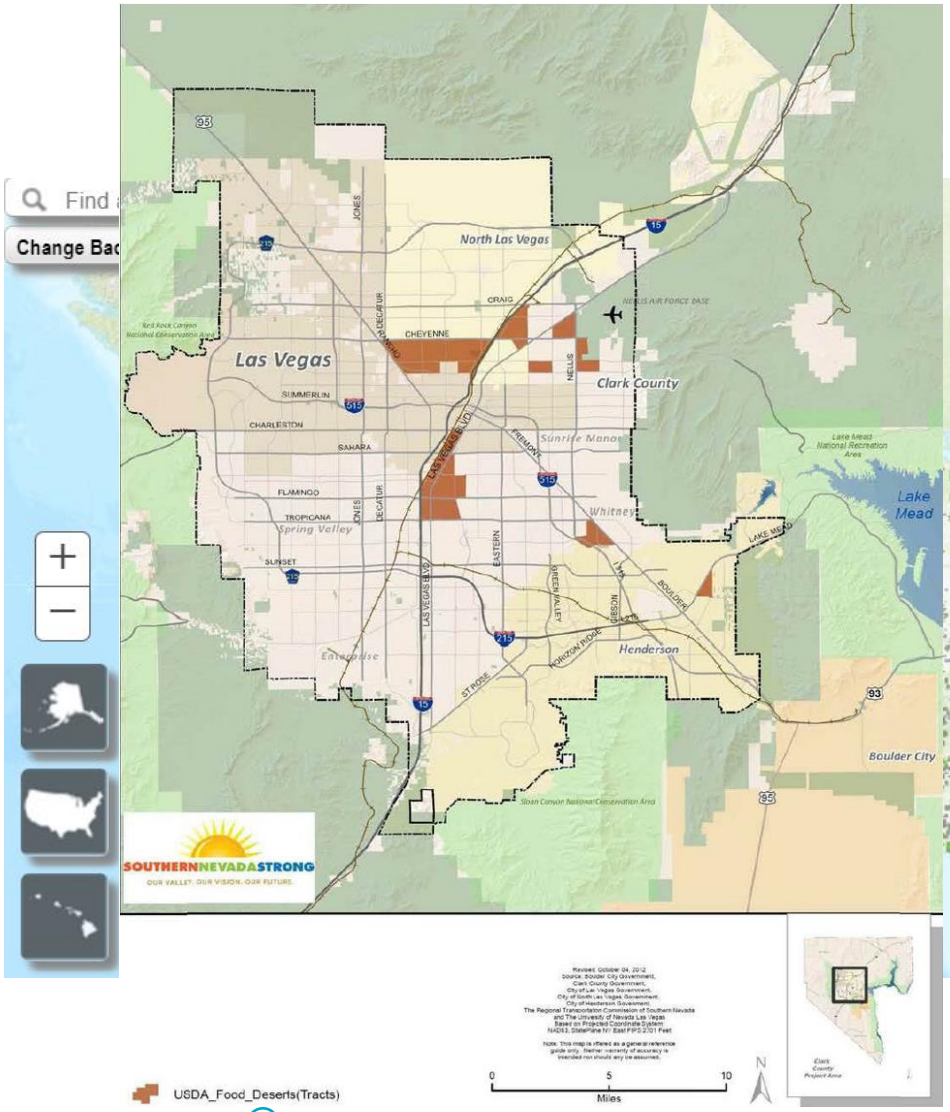
- **CalvertHealth[1]:**
  - Used data and assessments to identify patients with transportation barriers
  - Deployed the Calverthealth Mobile Health Center to those areas
  - 9% reduction in readmissions
  - 1721 participants = $107K investment → **$2.8M reduction in medical costs**

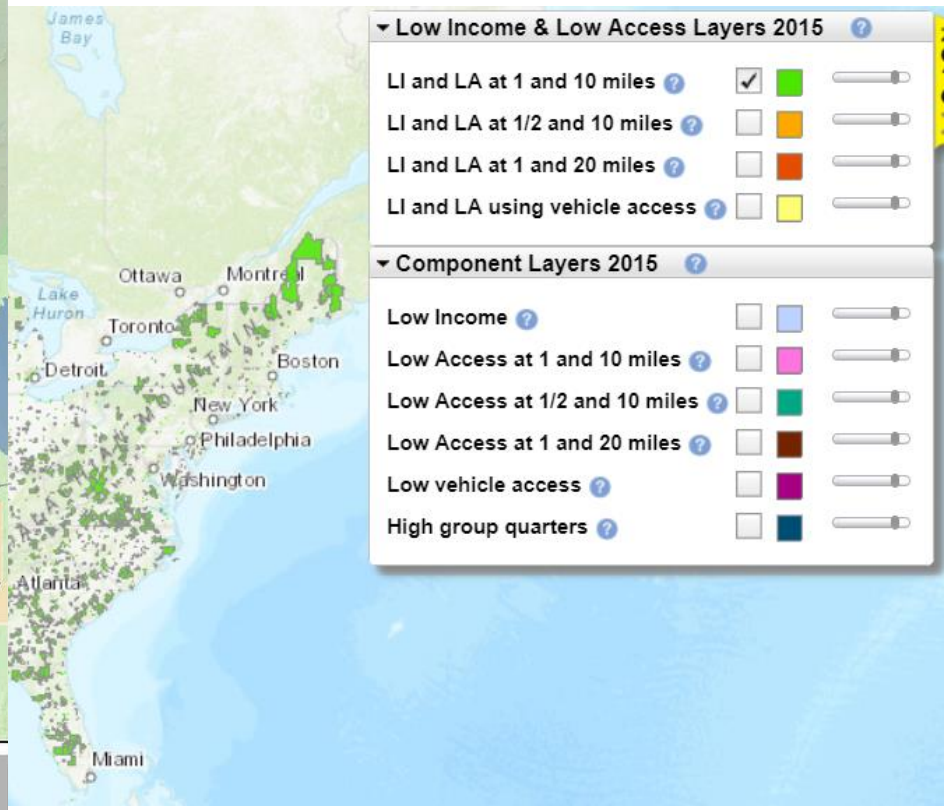
- **WellCare Health Plan[2]:**
  - Performed outbound calls based on data analytics leveraging MCO social service referral program
  - Program matched participant needs to available social services, including transportation
  - Medical transport barriers (16.7%), was largest issue identified
  - 2718 participants = $150k investment → **$1.2M reduction in medical costs**

- **Tallahasee Memorial Hospital[3]:**
  - Implemented remote medical services primarily focused on transitional care
  - Lowered readmission rates and reduced ED and outpatient usage
  - Reduced ED visits 83% with tele monitoring program
  - 23 participants = $25K investment → **$1M+ reduction in medical costs**

1.AHA:https://www.aha.org/news/headline/2018-01-05-case-study-calverthealth-medical-centers-efforts-address-transportation
2.PHM: https://www.liebertpub.com/doi/10.1089/pop.2017.0199
3.HITN:https://www.healthcareitnews.com/news/telemedicine-racks-1-million-cost-avoidance-savings-tallahassee-memorial

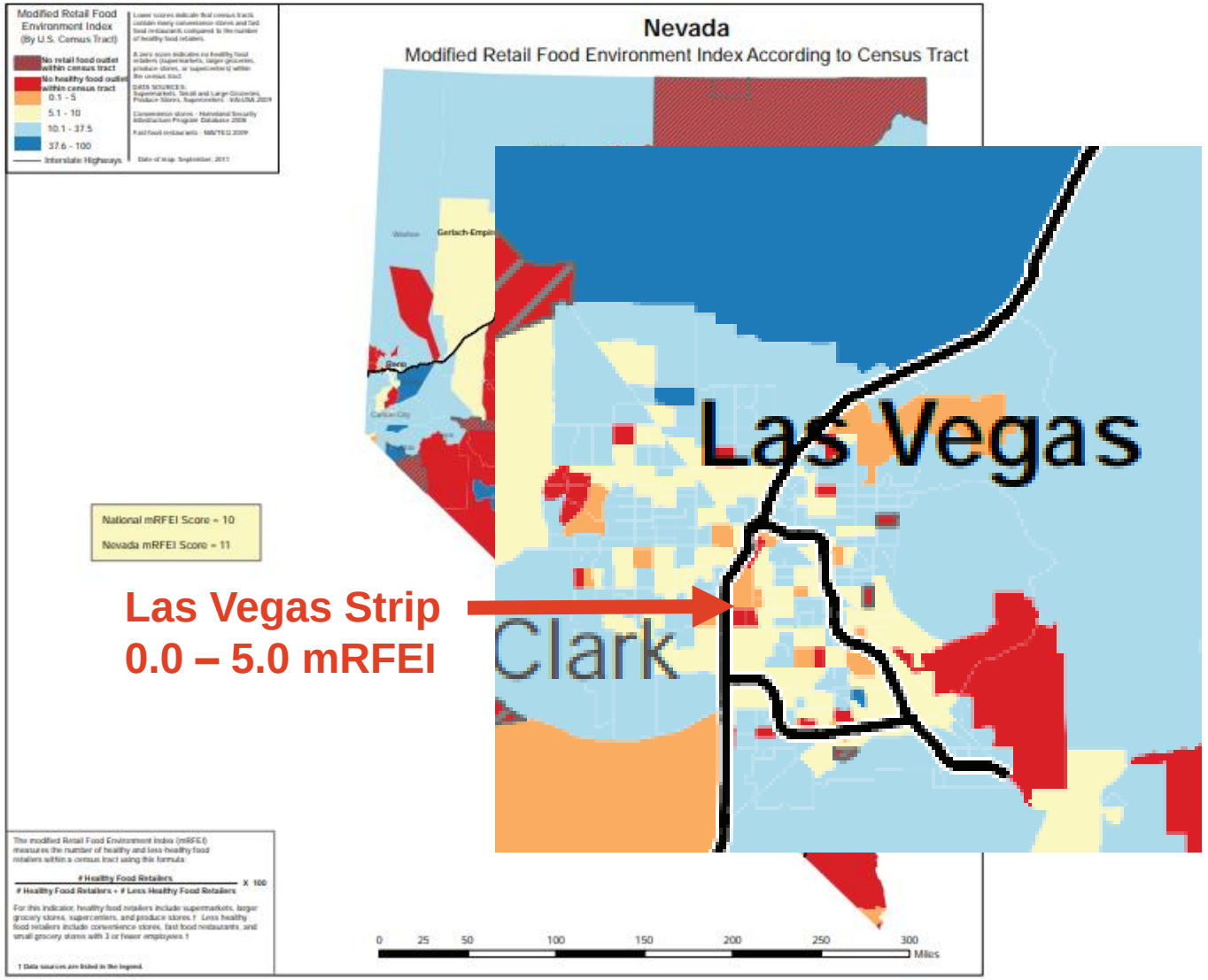
Food deserts: Low access and low income.





USDA: https://www.ers.usda.gov/data/fooddesert/

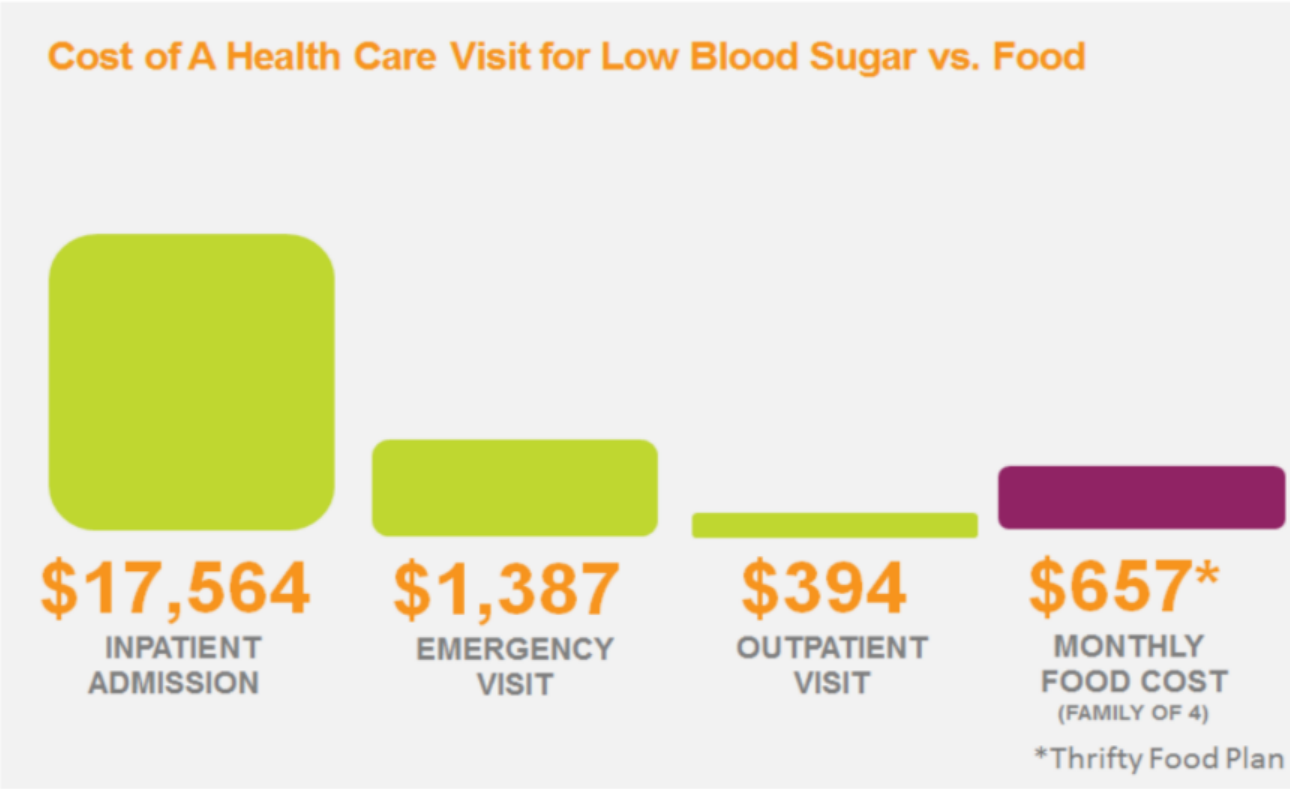
Food swamps: Modified Retail Food Environment (mRFEI)



https://ftp.cdc.gov/pub/publications/dnpao/census-tract-level-state-maps-mrfei_TAG508.pdf

Food insecurity ROI: Readmission and ED costs far outweigh food pharmacy investment

THE OHIO STATE UNIVERSITY



Seligman H.S, Food Insecurity, Health, and Health Care,(2016)

Food pharmacies driving ROI

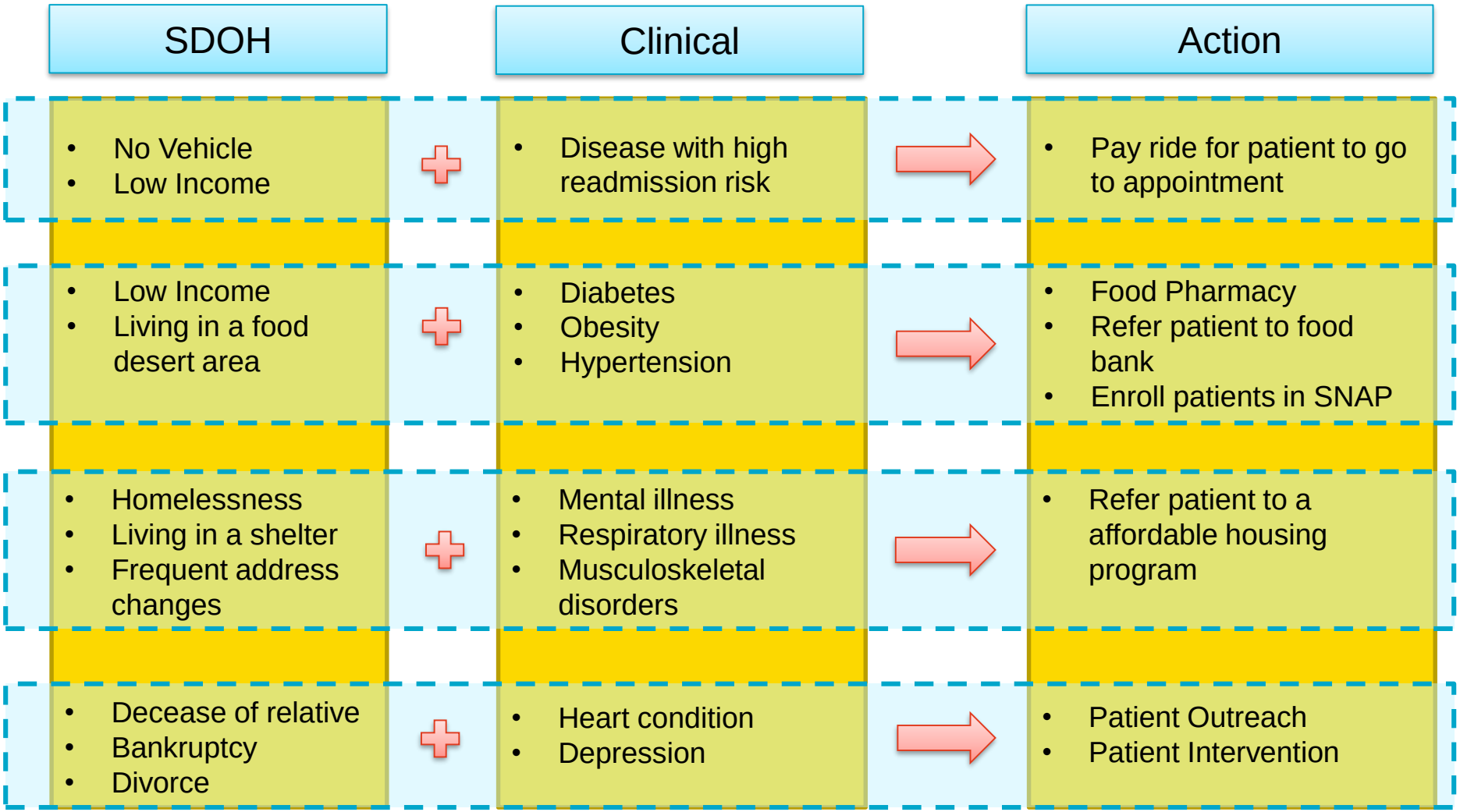
- **Geisinger[1]:**
  - Diabetes program reduced HbA1C levels 20%.
  - Each % reduction results in $8,000 medical savings
  - Invest $1,000 in fresh food pharmacy
  - 250 participants = $250K investment → **$2M reduction in medical costs**

- **Promedica[2]:**
  - Food insecurity program reduced ED utilization 3% and IP Readmissions dropped 53%
  - 57,000 screened for food insecurity in 2016
  - 4,000 participants = $500K investment → **$3.8M reduction in medical costs**

- **Advocate Health[3]:**
  - ACO in Chicago, IL
  - Screened all patients at admission for malnutrition risk; supplements and food education
  - Reduced healthcare costs by $3,800 per patient → **$4.8M reduction in medical costs**

Sources:
1.CWF/KPMG: https://www.commonwealthfund.org/sites/default/files/documents/___media_files_publications_other_2018_investingsocialservices_pdf.pdf
2.HHN: https://www.hhnmag.com/articles/8657-social-determinants-of-health-the-promedica-story
3. Revcyle intelligence: https://revcycleintelligence.com/news/accountable-care-organization-saves-4.8m-with-nutrition-aid

Typical use cases

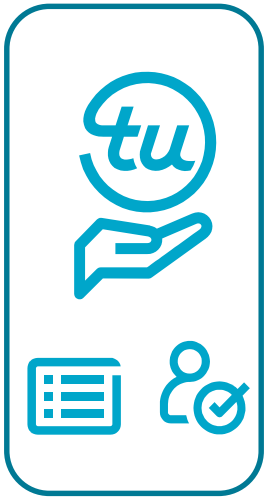


SDOH application in today’s market

SDOH for **providers**: Healthcare delivery paradigm

Traditional healthcare delivery only impacts 10% of a patients' well being, resulting in high ER utilization and IP readmissions

Socio-demographic attributes correlate to SDOH elements that can identify barriers to care

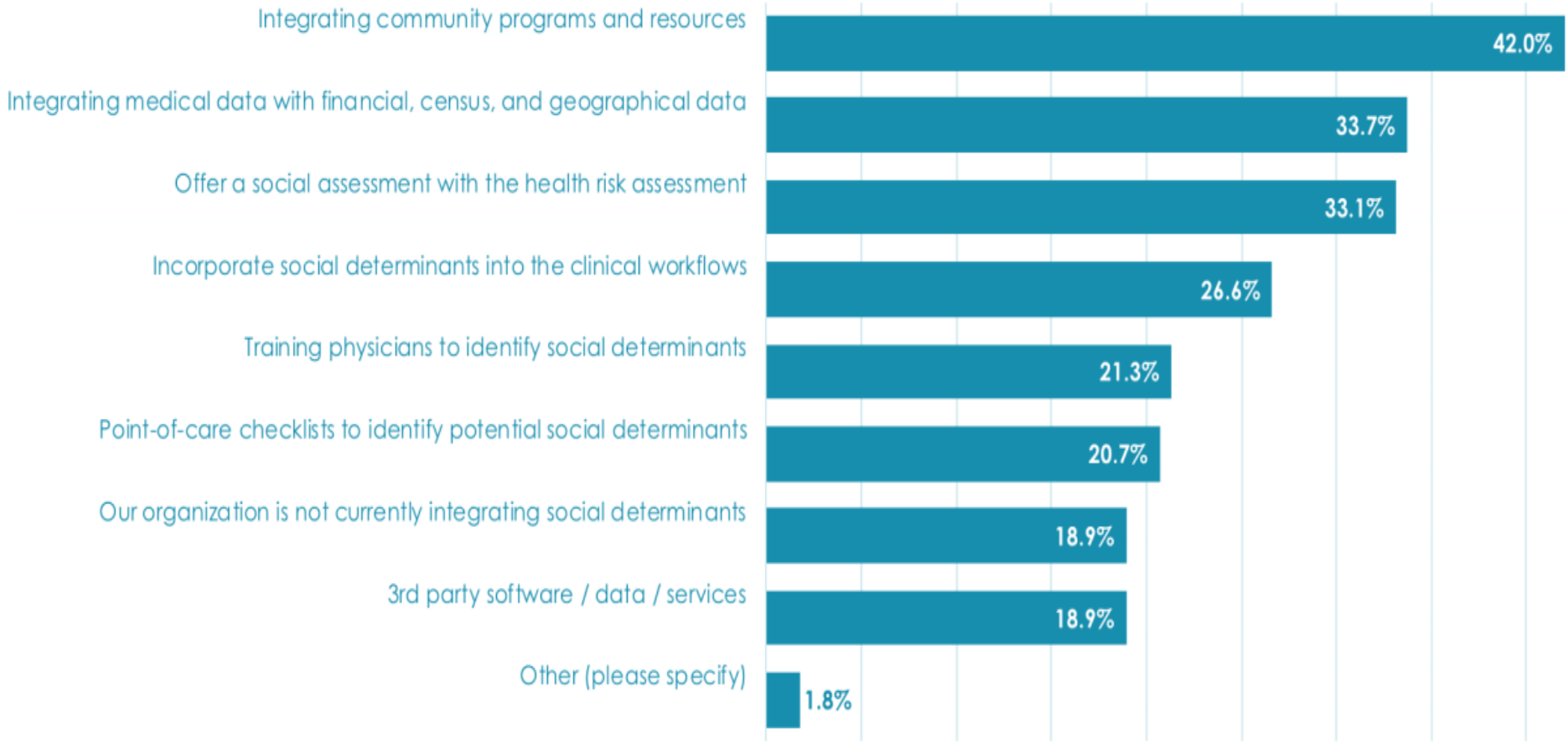


Providing a reliable, timely, and actionable SDOH dataset can drive better decisions and interventions

A targeted strategy through identifying needs in nutrition, transport, housing, and others can result in positive outcomes for community, provider, and bottom line

SDOH for **payers**: **80%** of payers believe that using SDOH data will **improve their population health programs**

Current strategies for integrating SDOH into population health programs



Source: CHANGE Healthcare

SDOH for **Payers**: **Incentives** from SDOH-derived insights drive behavior, **NOT HDHPs**

> Payers believe that high-deductible health plans **(HDHPs) are less likely than incentives** to improve healthcare utilization…
>
> …**incentives reward them** for demonstrating they are making progress toward improving their health…
>
> Incentives can take many forms, including **lower premiums** or other **bonuses for behaviors** such as participating in an exercise program.

Source: CHANGE Healthcare

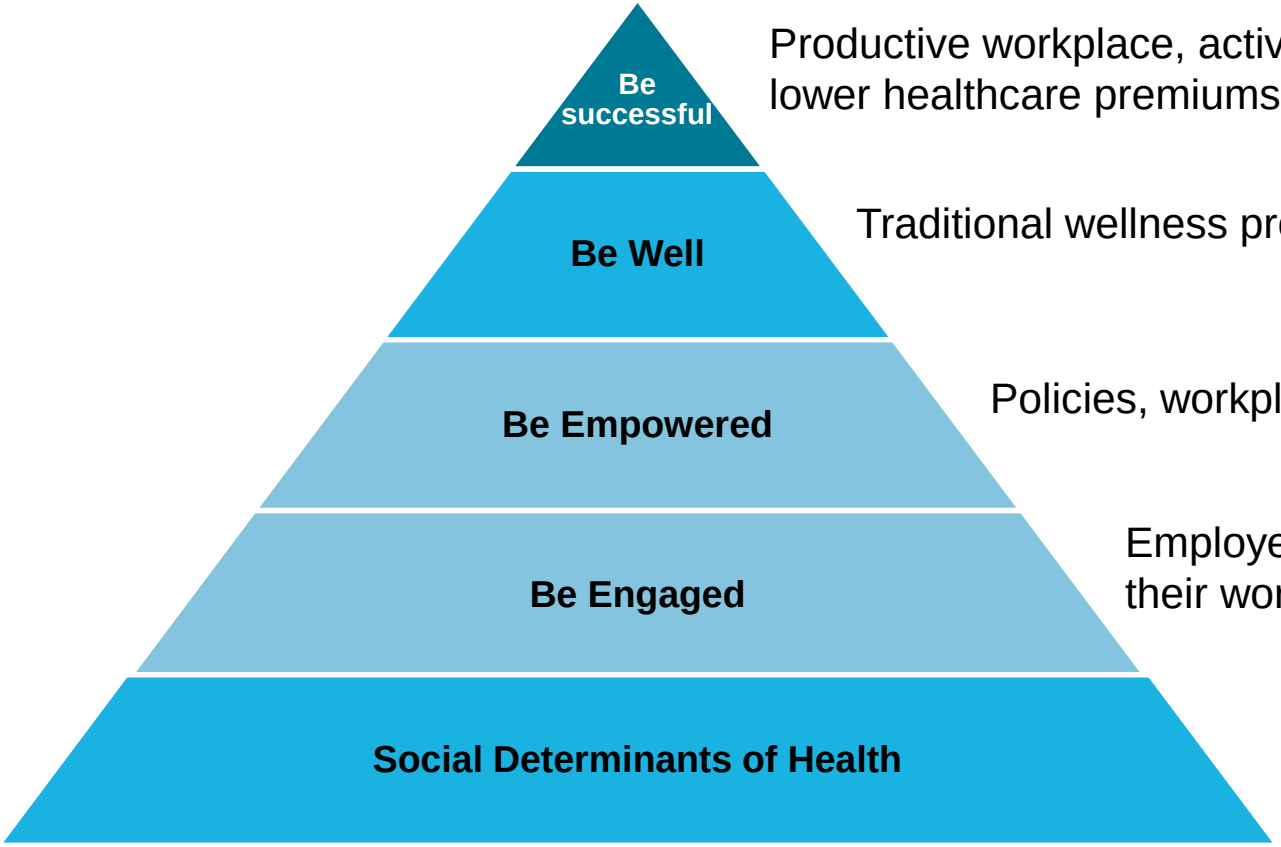
CMS is moving with SDOH

*We are eager to think about **social determinants of health throughout the Medicare program**, and one of the best ways we can do that is through the flexible, accountable, individual-driven system we already have…We want patients to be empowered and informed, not just to seek out the health services they need, but any **necessary social supports, too**. **We need providers to act as accountable navigators of the health system**, but we need to supplement that with navigators of the social services system.*

- HHS Secretary Azar November 11, 2018

Source: https://www.hhs.gov/about/leadership/secretary/speeches/2018-speeches/the-root-of-the-problem-americas-social-determinants-of-health.html

SDOH for Employers: Be well, and we'll reward you



Productive workplace, actively at work, lower healthcare premiums

Traditional wellness programs

Policies, workplace and benefit design

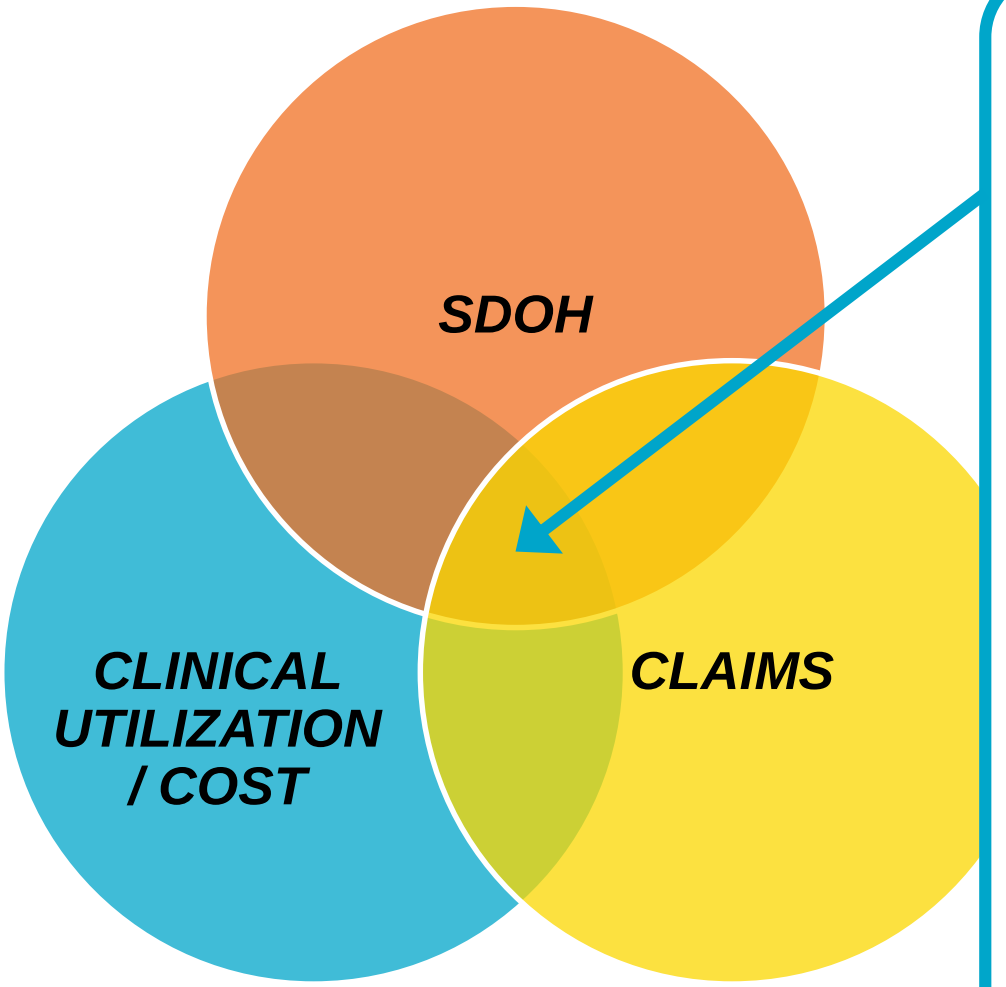
Employee control and influence on their workday, forums

Income, education, employment, social support, transportation, environment

Source: Adapted from: http://goodandhealthysd.org/wp-content/uploads/2014/02/Healthy_EmployeesProductive_Employees_Slides.pdf

Source: CHANGE Healthcare

In all these cases, it's important to marry SDOH datasets to clinical and cost data to drive outcomes



SDOH Innovations:

1. ***Rich Dataset:***
   Capture early and often
2. ***Risk:***
   Link predicted risk to an individual or group
3. ***Empowered:***
   Evangelize the risk factors – displayed and leveraged
4. ***Change Behavior:***
   Care, coverage or payment
5. ***Focus:***
   Right person, right data, right time – actionable intelligence

Where can I find “good” SDOH data? How can I use it to drive results?

- **Survey data**
  - PRO: Easy to develop and deploy
  - CON: Data is a one off, inconsistent and difficult to trend or predict

- **EMR-Driven Database**
  - PRO: Within existing workflow, enables change
  - CON: Limited scope and predictability to patients not yet seen

- **Census Data**
  - PRO: Large, accessible datasets
  - CON: Not matched or correlated across multiple sources

- **Individually-matched SDOH Data and Analytics**
  - PRO: Predictive analytics for current and future patients to meet CHNA, and drive down costs
  - CON: Third party integration and data integrity

EHR tools face challenges collecting SDOH

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Adoption of Social Determinants of Health EHR Tools by Community Health Centers

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Abstract

PURPOSE This pilot study assessed the feasibility of implementing electronic health record (EHR) tools for collecting, reviewing, and acting on patient-reported social determinants of health (SDH) data in community health centers (CHCs). We believe it is the first such US study.

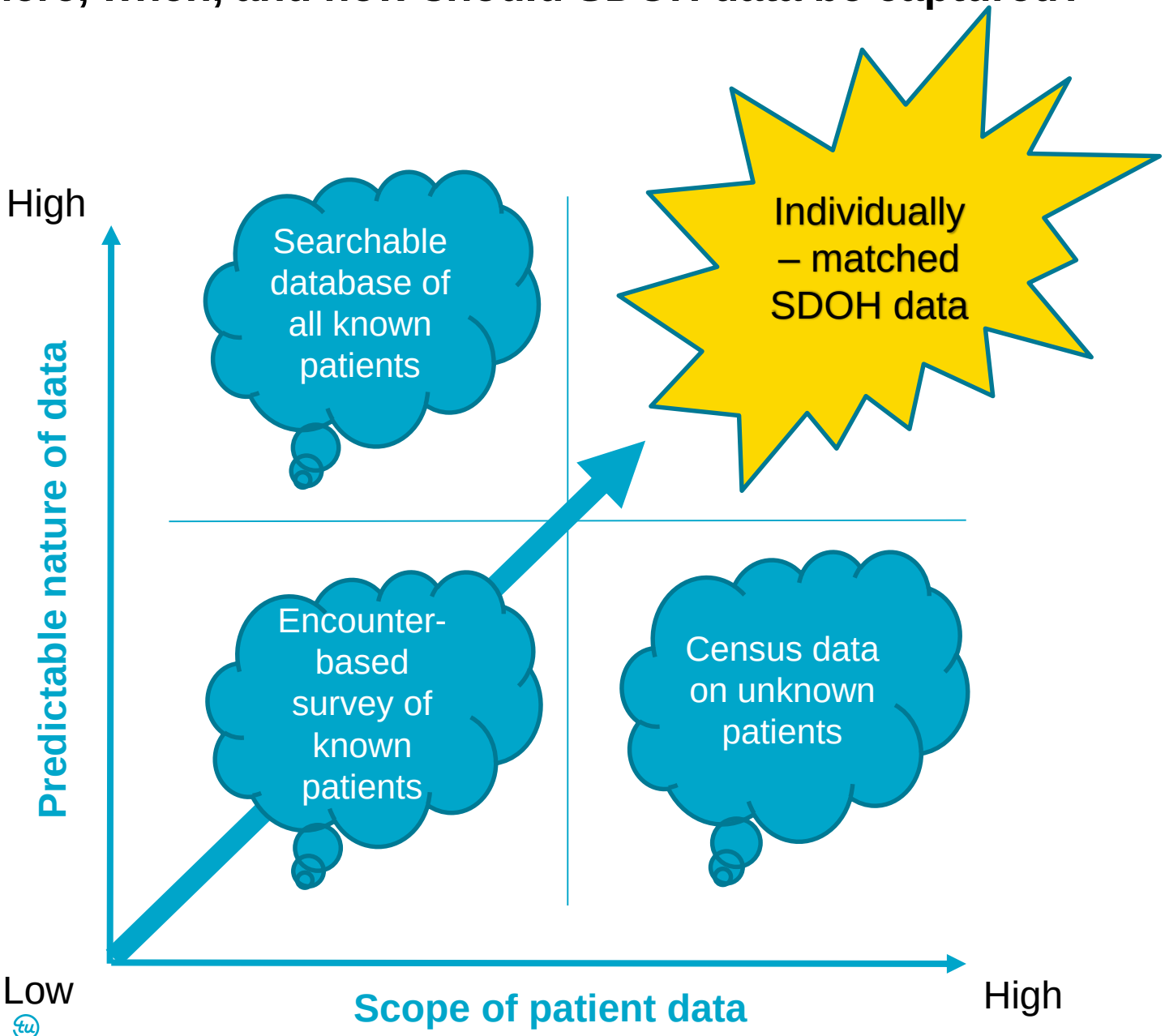
METHODS We implemented a suite of SDH data tools in 3 Pacific Northwest CHCs in June 2016, and used mixed methods to assess their adoption through July 2017. We modified the tools at clinic request; for example, we added questions that ask if the patient wanted assistance with SDH needs.

RESULTS Social determinants of health data were collected on 1,130 patients during the study period; 97% to 99% of screened patients (n = 1,098) had ≥1 SDH need documented in the EHR, of whom 211 (19%) had an EHR-documented SDH referral. Only 15% to 21% of patients with a documented SDH need indicated wanting help. Examples of lessons learned on adoption of EHR SDH tools indicate that clinics should: consider how to best integrate tools into existing workflow processes; ensure that staff tasked with SDH efforts receive adequate tool training and access; and consider that timing of data entry impacts how and when SDH data can be used.

CONCLUSIONS Our results indicate that adoption of systematic EHR-based SDH documentation may be feasible, but substantial barriers to adoption exist. Lessons from this study may inform primary care providers seeking to implement SDH-related efforts, and related health policies. Far more research is needed to address implementation barriers related to SDH documentation in EHRs.

http://www.annfammed.org/content/16/5/399.full?sid=a950ec72-4a3f-4e52-b9a5-404bf11ca95e

What, where, when, and how should SDOH data be captured?



What approach?

1

SEGMENT INTO KEY PATIENT GROUPS

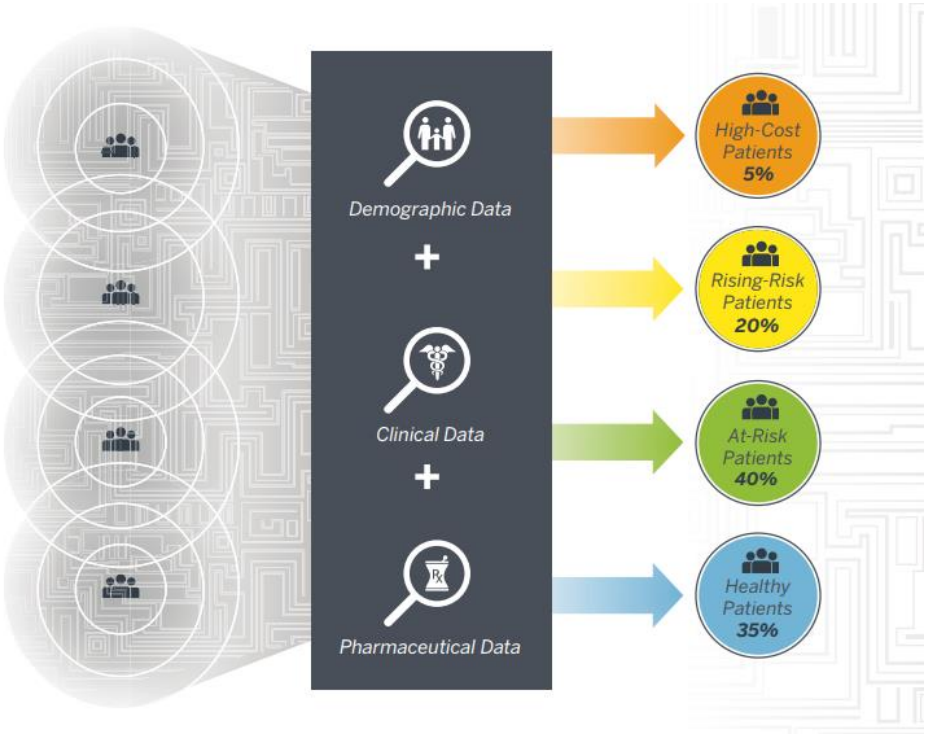
Utilize clinical and claims data to begin segmentation

Every provider has clinical data, from electronic medical records to laboratory and e-prescribing systems. Even clinical data from a simple disease registry can prove useful.

FILL IN GAPS

Focus data collection to refine patient populations

After you start segmenting your population, you might notice a few gaps. Even with an abundance of clinical and claims data, population health managers will still be missing important information about at-risk patients. Providers have used a range of approaches from mining demographic data to collecting new clinical data to close gaps and further segment the population.



2

ASSESS ROOT CAUSE

Determine the root causes of risk to gain a better understanding of which interventions will actually make a difference

Population health managers should consider a broader set of risks, including social risk, geographic risk, and behavioral risk. In addition, the degree of patient engagement can make a big difference in which interventions are most appropriate and most effective.

Source: Advisory Board Company https://www.advisory.com/-/media/Advisory-com/Research/HCAB/Resources/2014/28727_HCAB_Prioritize_Interventions_IG.pdf

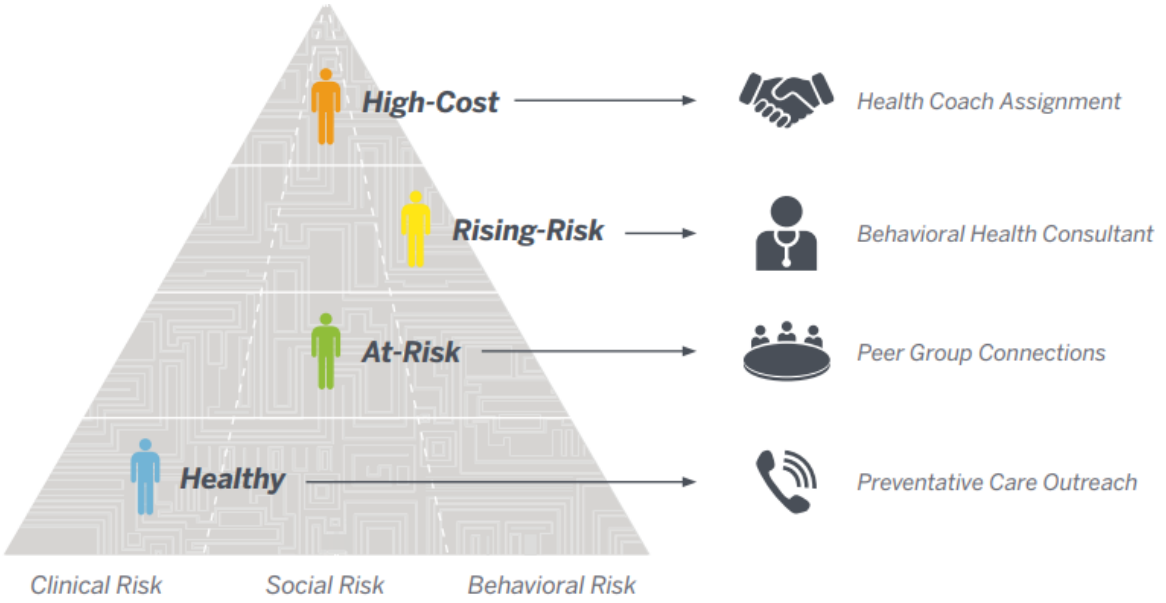
What approach?

3

TAKE **ACTION**

A properly segmented population allows the population health manager to target finite resources where they'll do the most good

Each population segment has an intervention strategy appropriate for its level of risk.



Source: Advisory Board Company https://www.advisory.com/-/media/Advisory-com/Research/HCAB/Resources/2014/28727_HCAB_Prioritize_Interventions_IG.pdf

Accessing comprehensive and reliable data sources is critical for an effective SDOH strategy

Social Determinants of Health

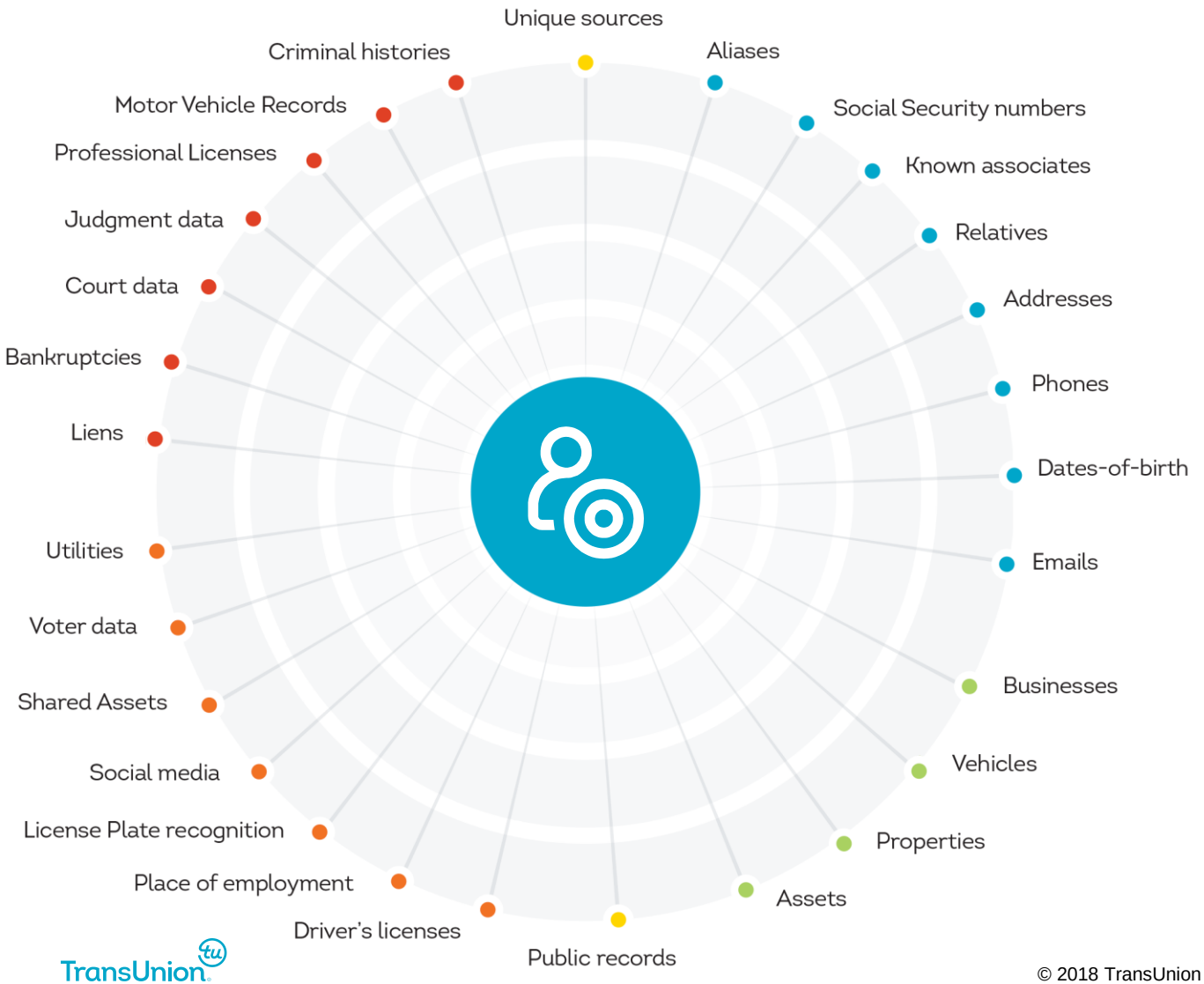
Economic Stability	*Neighborhood & Physical Environment*	*Education*	*Food*	*Community & Social Context*	*Health Care System*
▪ Employment ▪ Income ▪ Expenses ▪ Debt ▪ Medical bills ▪ Support	▪ Housing ▪ Transportation ▪ Safety ▪ Parks ▪ Playgrounds ▪ Walkability	▪ Literacy ▪ Language ▪ Early childhood education ▪ Vocational training ▪ Higher education	▪ Hunger ▪ Access to healthy options	▪ Social integration ▪ Support systems ▪ Community engagement ▪ Discrimination	▪ Health coverage ▪ Provider availability ▪ Provider linguistic & cultural competency ▪ Quality of care

Health Outcomes

Mortality, Morbidity, Life Expectancy, Health Care Expenditures, Health Status, Functional Limitations

Source: Kaiser Family Foundation

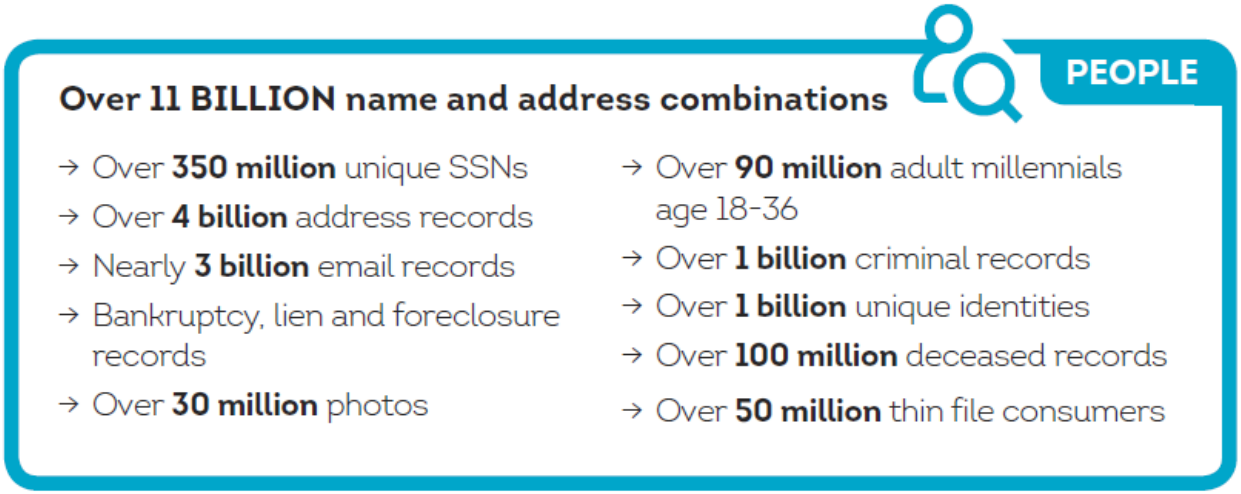
Important to leverage unique alternative data, updated daily with proprietary sources

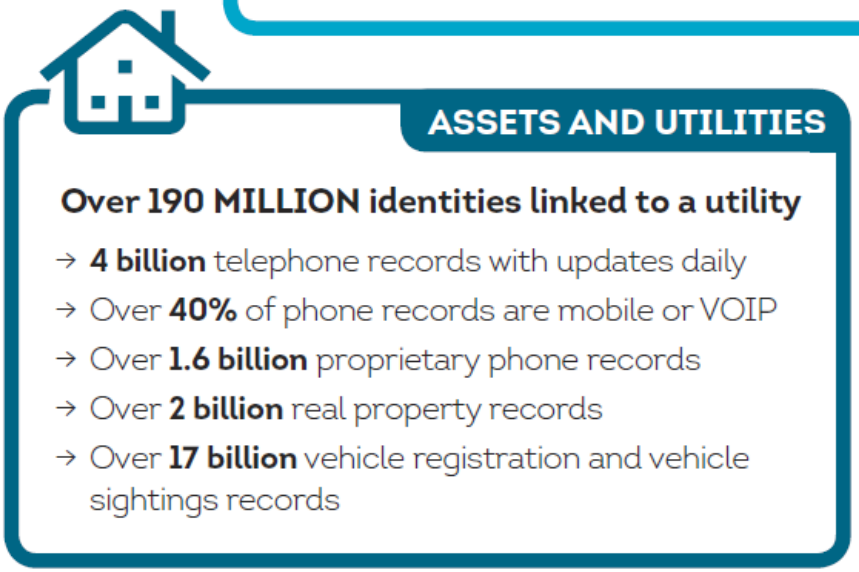


- ✓ ***Personal Finances / Income***
- ✓ ***Patient Demographics***
- ✓ ***Education Level***
- ✓ ***Voter Registration***
- ✓ ***Law Enforcement***
- ✓ ***Driving Records***

TransUnion

Ensure significant breadth and depth of coverage exists for SDOH data





Social determinants of health have **a far greater impact** on outcomes than the actual delivery of health services

> The definitive factors in determining whether someone is in good health extend significantly beyond access to care and include the conditions in their life and the conditions of their neighborhoods and communities.

- John Auerbach, CDC

Source: Beckers https://www.beckershospitalreview.com/healthcare-information-technology/leveraging-social-determinants-of-health-data-for-value-based-care-success.html ; CDC https://www.buildhealthyplaces.org/whats-new/11-quotes-about-health-and-community-overheard-in-2015/

QUESTIONS?

THANK YOU!

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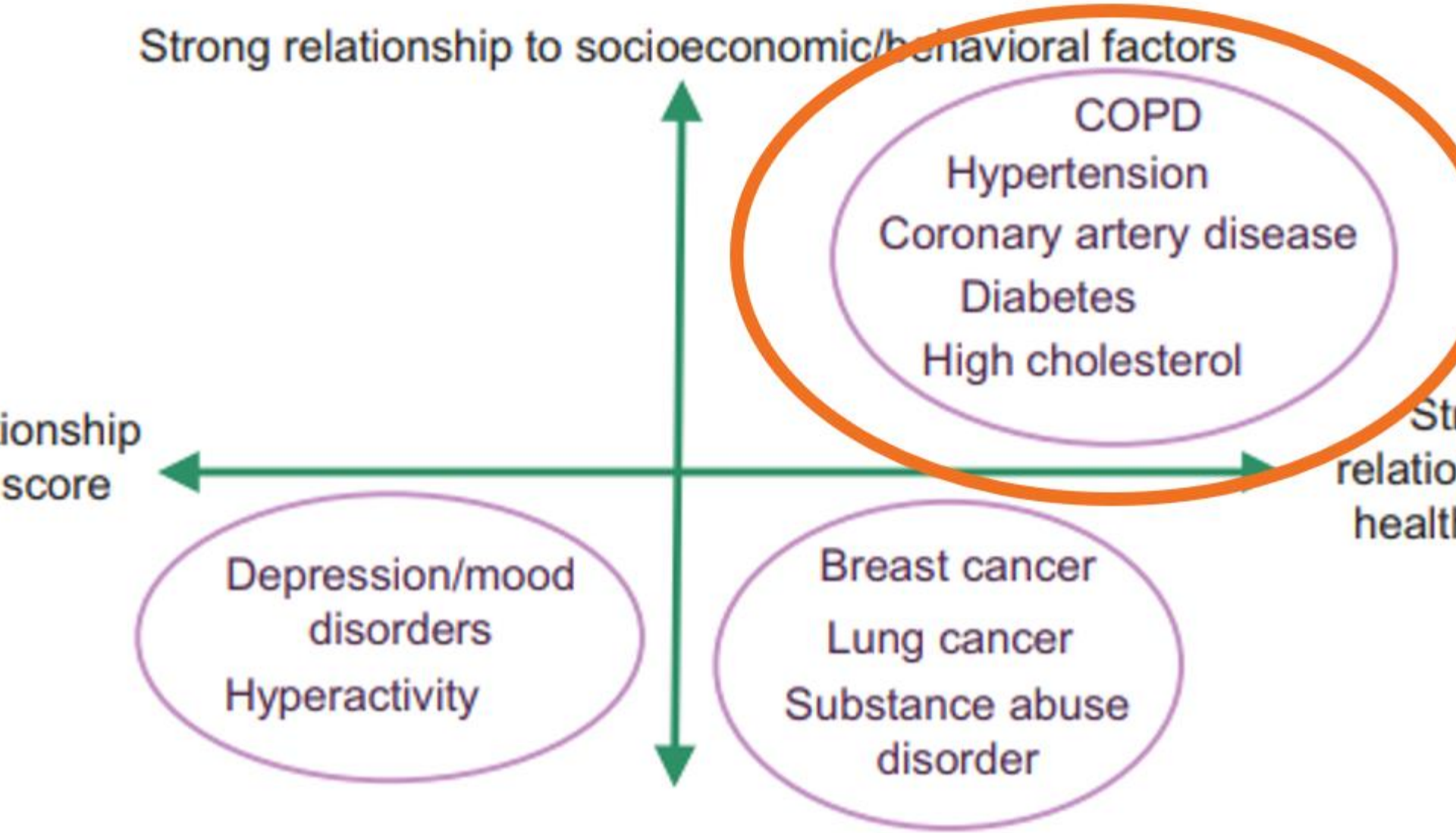
Strong relationship to socioeconomic/behavioral factors
COPD
Hypertension
Coronary artery disease
Diabetes
High cholesterol
ionship
score
Depression/mood disorders
Hyperactivity
Breast cancer
Lung cancer
Substance abuse disorder
Weak relationship to socioeconomic/behavioral factors