



2019 **ANNUAL
MEETING**
& EXHIBIT

October 27-30
Toronto, Canada

Session 153: Beyond Physical Health: The impact of Mental Health and Social Determinants of Health

[SOA Antitrust Compliance Guidelines](#)

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Session 153: Beyond Physical Health: The Impact of Mental Health and Social Determinants of Health

David Byron, FSA, MAAA

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SOCIETY OF ACTUARIES

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The United States antitrust laws aim to protect consumers by preserving the free economy and prohibiting anti-competitive business practices; they promote competition. There are both state and federal antitrust laws, although state antitrust laws closely follow federal law. The Sherman Act, is the primary U.S. antitrust law pertaining to association activities. The Sherman Act prohibits every contract, combination or conspiracy that places an unreasonable restraint on trade. There are, however, some activities that are illegal under all circumstances, such as price fixing, market allocation and collusive bidding.

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- **Do not** discuss what you or other entities plan to do in a particular geographic or product markets or with particular customers.
- **Do not** speak on behalf of the SOA or any of its committees unless specifically authorized to do so.
- **Do** leave a meeting where any anticompetitive pricing or market allocation discussion occurs.
- **Do** alert SOA staff and/or legal counsel to any concerning discussions
- **Do** consult with legal counsel before raising any matter or making a statement that may involve competitively sensitive information.

Adherence to these guidelines involves not only avoidance of antitrust violations, but avoidance of behavior which might be so construed. These guidelines only provide an overview of prohibited activities. SOA legal counsel reviews meeting agenda and materials as deemed appropriate and any discussion that departs from the formal agenda should be scrutinized carefully. Antitrust compliance is everyone's responsibility; however, please seek legal counsel if you have any questions or concerns.

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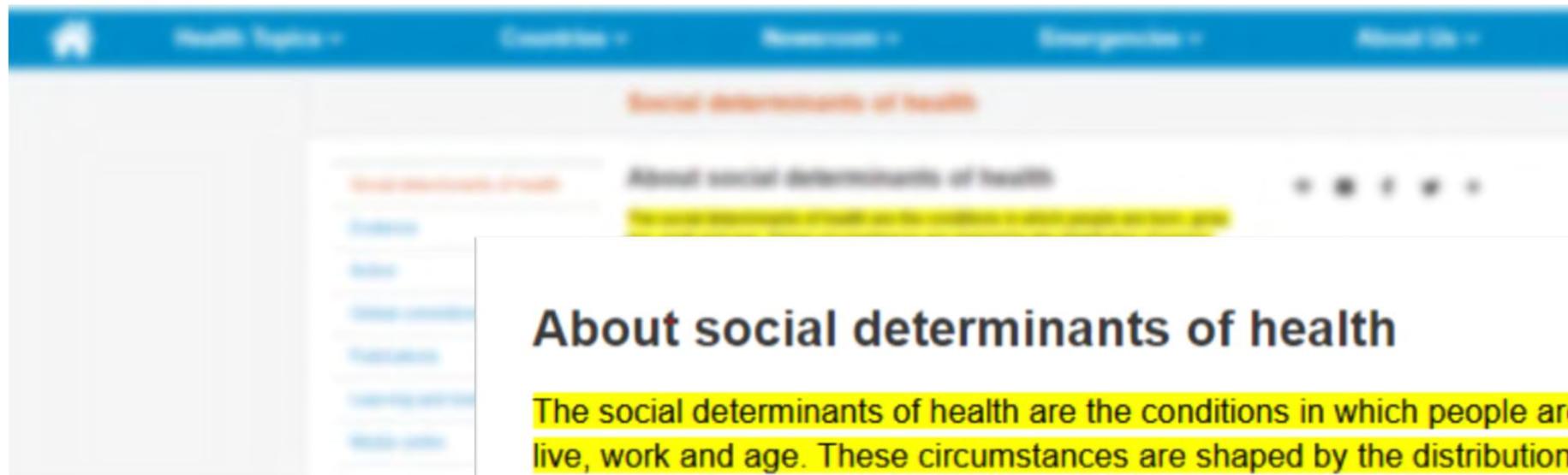
Objective

The presenters will explore the roles of mental health and social determinants of health in the management of a population's total health. We will explore how emerging sources of data and information have led to a renewed focus on managing mental health conditions and social determinants of health. Presenters will address current health care programs that utilize this data and information to manage the total care for populations using predictive models to improve the deployment of resources and initiatives to improve the cost of care and health of populations. The presenters will also look at how providers of care are approaching mental health co-morbidities to manage physical health and social determinants of health in the management of patients.

At the conclusion of this session, attendees will be able to:

- Define non-physical health factors impacting the total cost of care
- Identify sources of information and how it can be applied to provide better healthcare outcomes for people
- Explain how information beyond claims data might be utilized to improve predictive models

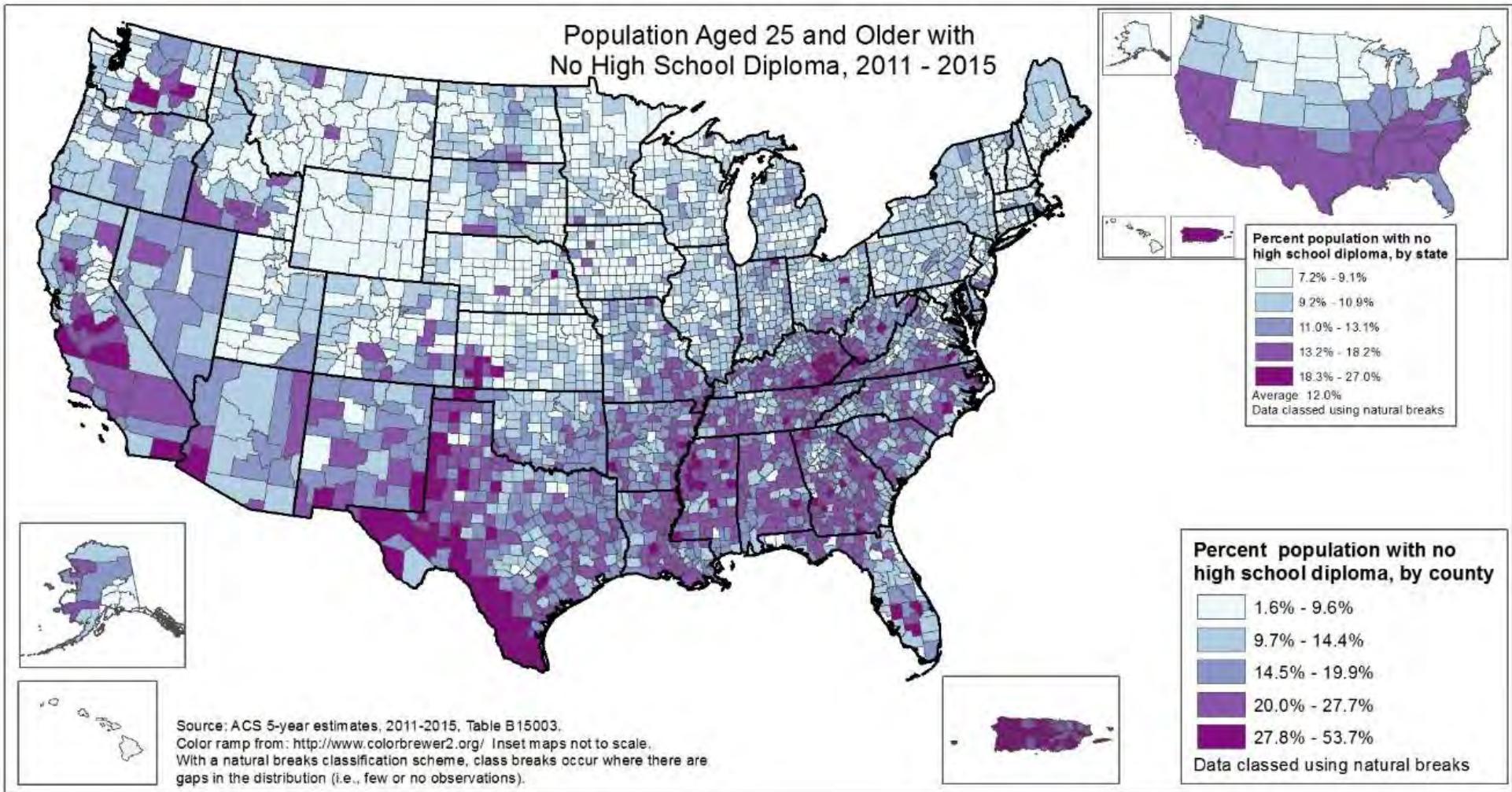
What is SDOH?



About social determinants of health

The social determinants of health are the conditions in which people are born, grow, live, work and age. These circumstances are shaped by the distribution of money, power and resources at global, national and local levels. The social determinants of health are mostly responsible for health inequities - the unfair and avoidable differences in health status seen within and between countries.

Population Aged 25 and Older with
No High School Diploma, 2011 - 2015

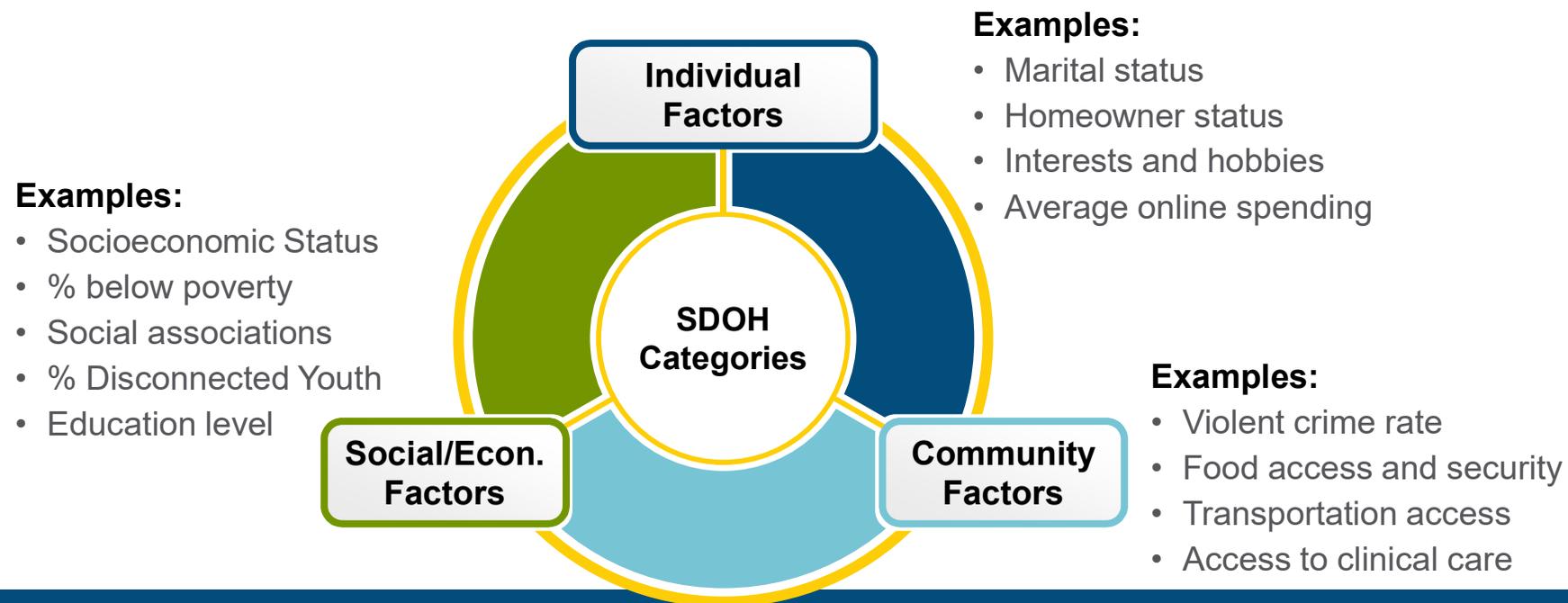


Source: ACS 5-year estimates, 2011-2015, Table B15003.
Color ramp from: <http://www.colorbrewer2.org/> Inset maps not to scale.
With a natural breaks classification scheme, class breaks occur where there are gaps in the distribution (i.e., few or no observations).

What is SDOH (to us)?

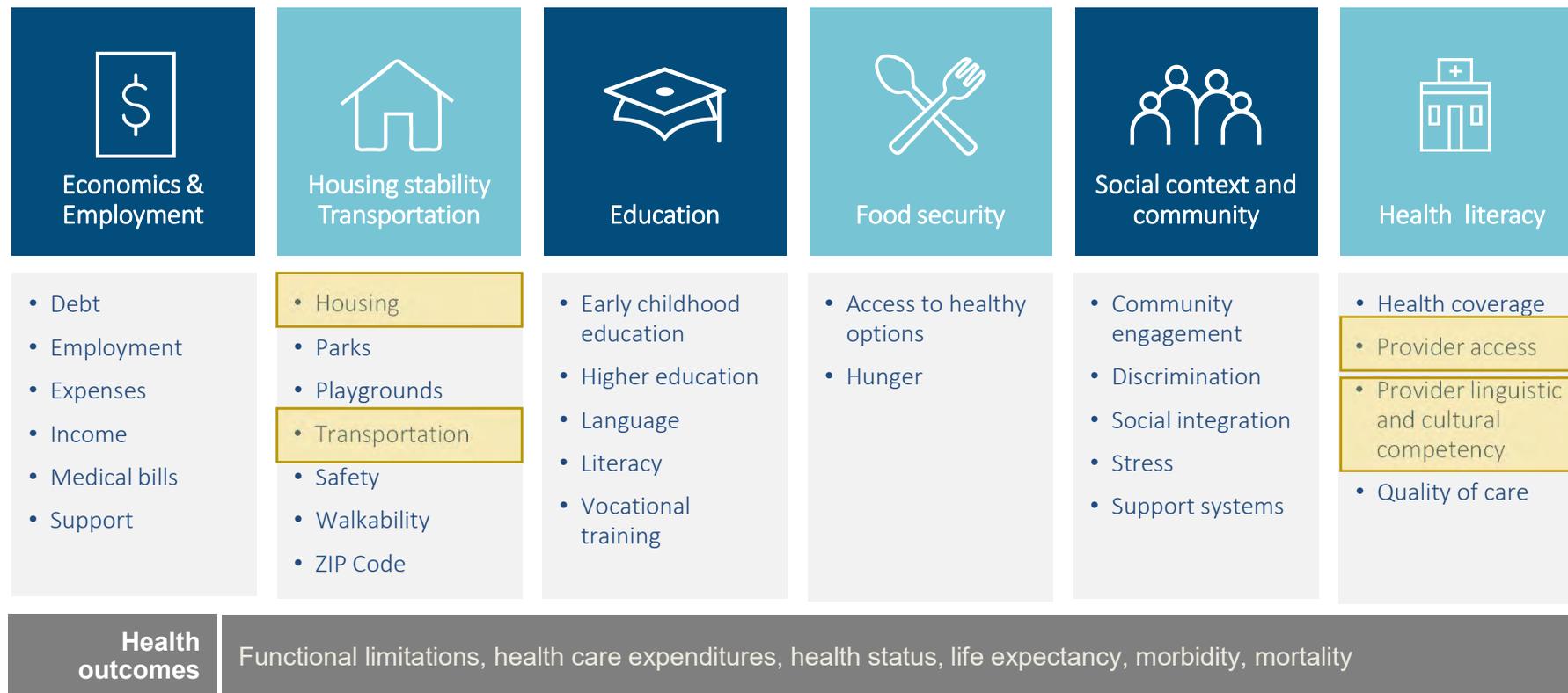
Three categories of data are typically used in analyzing and understanding social determinants of health

- **Individual factors:** Include consumer and health behavior measures
- **Community factors:** Include clinical access, housing, transportation, safety and food security measures
- **Socioeconomic factors:** Include education, income, poverty, family and social support



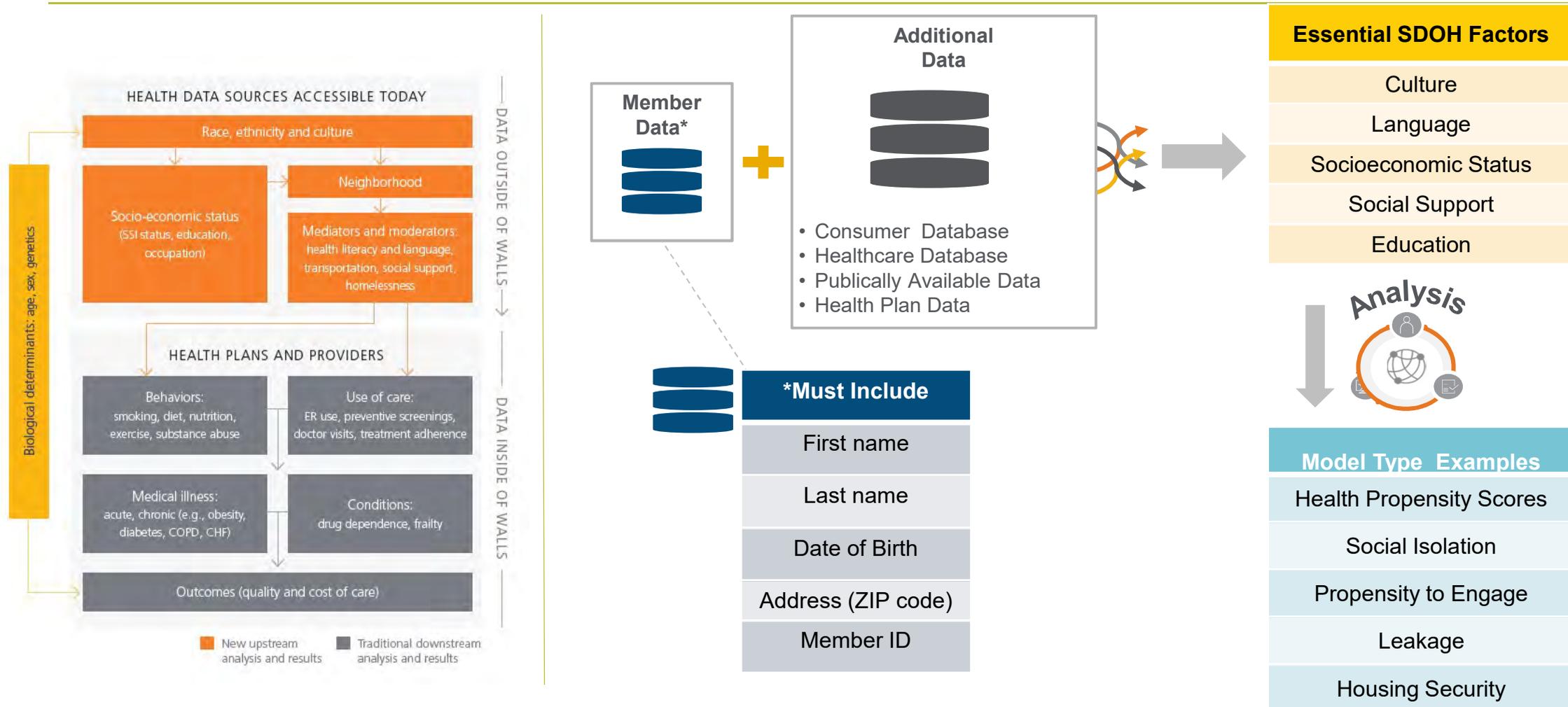
What is SDOH (to us)?

These characteristics impact every aspect of life from when we are born, grow, live, work, and age within our communities



Source: Kaiser Family Foundation. "Beyond Health Care: the role of social determinants of health," May 10, 2018. <https://www.kff.org/disparities-policy/issue-brief/beyond-health-care-the-role-of-social-determinants-in-promoting-health-and-health-equity/> Accessed June 2018.

Data Elements



How is SDOH Used Today?

Though organizations are constantly evaluating ways to employ SDOH, they are still figuring it out

POPULATION ID/STRAT	MEMBER/ PROFILING	POPULATION RISK	FINANCE
<ul style="list-style-type: none">• Finding patients who are at high financial risk, or likely to be admitted to the hospital• Finding patients who have multiple comorbid conditions• Understanding patient gaps in care• Creating disease registries• Matching patients to specific program opportunities	<ul style="list-style-type: none">• Holistic view of member's care history as well as drivers and gaps in care• Insight into the member's likelihood of near-term hospitalization or emergency room usage• Identification of frequent flyers	<ul style="list-style-type: none">• Population trends in overall risk• Understanding difference between populations (dual-eligible, CHIPs, traditional)• Identifying emerging drivers of cost• Identifying shifts in place of service• Assessing improvements in gap closure	<ul style="list-style-type: none">• Honing financial forecasts• Determining resource requirements• Assessing the effectiveness of various programs• Key metrics and leading indicators for performance management dashboards• Refine underwriting practices to incorporate clinical data

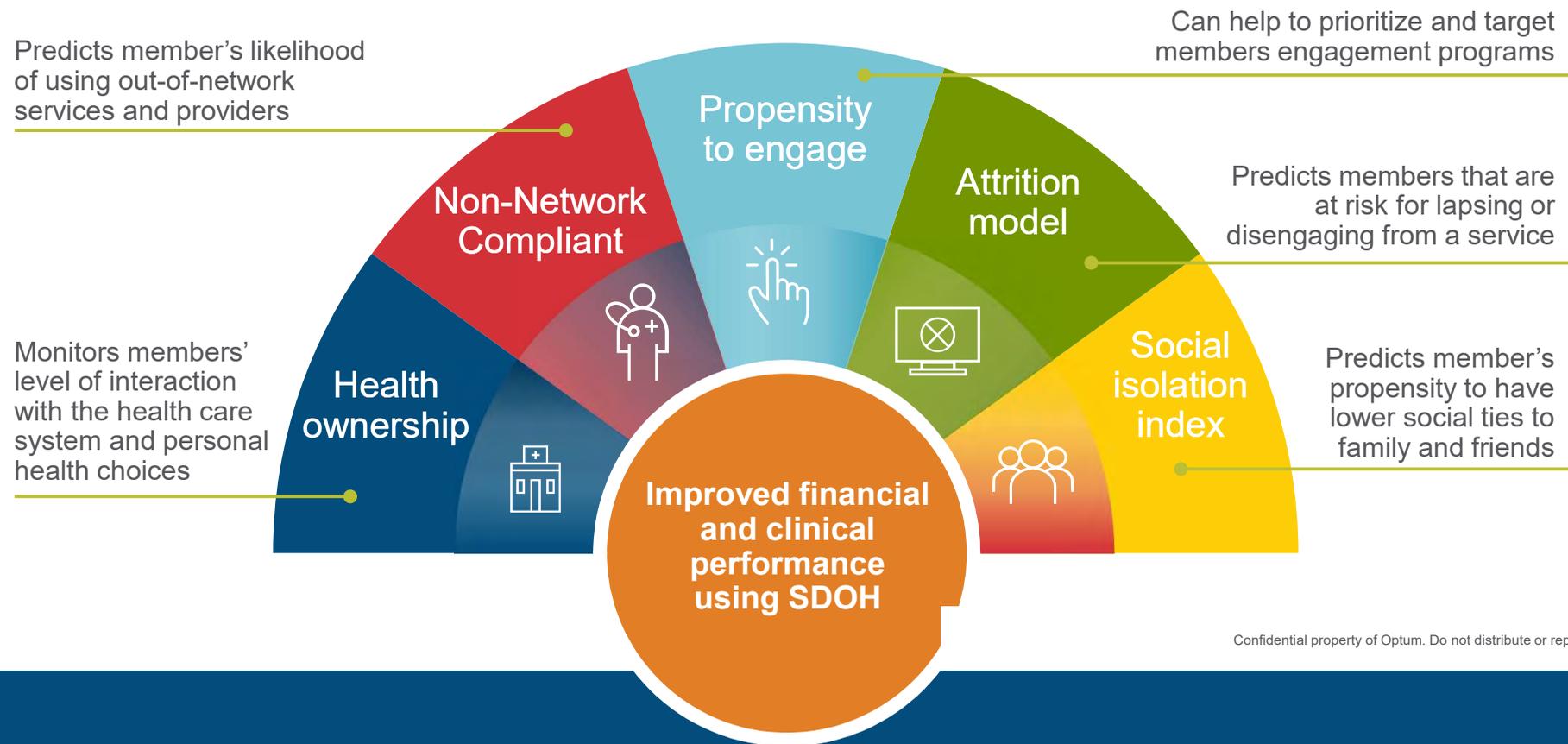
How is SDOH Used Today?

The results of analytics can be used across actuarial, underwriting, account management, clinical, population health management and quality programs



How is SDOH Used Today?

PROPENSITY MODELS



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What are Advantages of SDOH?

- **Supplements/enhances data** sets otherwise with limited data (e.g. Medicaid)
- **Fills in data gaps that exist today** - Data gaps make it difficult to develop accurate member risk profiles, anticipate members' needs, promote preventive care and personalize care experiences.
- **Works with disparate data groups** - Most actuarial and predictive models work best with 12 months of data from both a financial and operational perspective. The average duration of Medicaid members, however, is approximately nine months.
- **Works with Turnover** - Often commercial health plans experience member and employer turnover of more than 40 percent, on average, within a 12-month period.¹
- **Does not rely on past experience** - Predictive clinical analytics and traditional actuarial and underwriting models typically support projections based on what has happened in the past across member populations. This is not always an indication of what will happen again in the future for a single patient.
 - For example, a patient having knee surgery is not considered a recurring pattern. Therefore, it is unlikely the patient will require knee surgery on that knee again in the near future.

1. Sara Collins and Cathy Schoen. The Big Five Health Insurers' Membership and Revenue Trends: Implications for Public Policy. The Commonwealth Fund, 2017. [commonwealthfund.org/publications/journal-article/2017/dec/big-five-health-insurers-membership-and-revenue-trends](https://www.commonwealthfund.org/publications/journal-article/2017/dec/big-five-health-insurers-membership-and-revenue-trends). Accessed August 2018.

What are Disadvantages of SDOH?

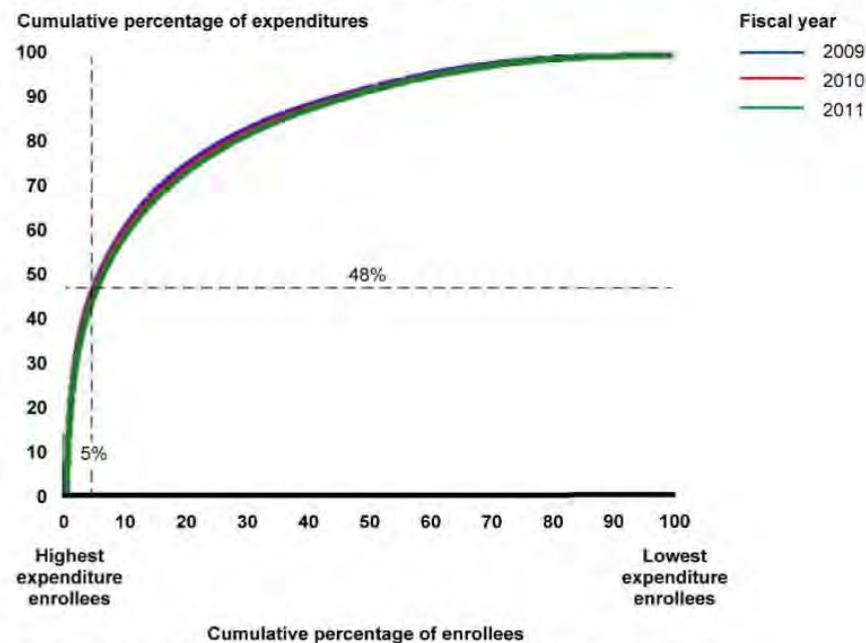
- Requires robust and quality **data**, mature **data infrastructure**, and user **expertise**
- Still **new and emerging**
 - Testing the boundaries – regulatory, social, etc.
- **Ethical/Legal risks and challenges** may arise
- **Data Security**
 - Member information stored in their databases and member privacy and security safeguards must be a top priority
- **Consumer Optics**
 - While society as whole is becoming increasingly used to ‘sharing of data’, this specific application may be more sensitive and personal/emotional

Case Study #1 – GAO & Medicaid

Problem:

- Government accountability Office (GAO) identified 5% drove 50% of expenditures

Figure 1: Distribution of Medicaid Expenditures Among Beneficiaries Only Enrolled in Medicaid, Fiscal Years 2009 through 2011



Source: GAO analysis of data from the Centers for Medicare & Medicaid Services. | GAO-19-569

Approach:

- CMMI+CHIP collaborated to launch Medicaid Innovation Accelerator Program (July 2014) – program to promote states building analytic capabilities
- Goal to be used in identifying and stratifying beneficiaries with complex care needs and high costs, designing effective care management strategies, and incorporating social determinants of health into the program design activities

Why SDOH?

- Extremely diverse population
- Inability to communicate with
- Lack of Social Support

Outcome:

- Programs improved state's efforts to manage care for their high-expenditure beneficiaries.

Case Study #2 – Medicaid (Massachusetts)

Problem:

- Can social determinants of health (SDH) enable Medicaid payment formulas to pay more equitably for the care of **socially vulnerable individuals**?
- Payment formulas commonly allocate more money for medically complex populations, but **ignore most social determinants of health**
- Inadequate risk adjustment **takes money from vulnerable** patients and their clinicians, and **generates unearned profits for plans** that shun needier patients

Approach:

- SDOH Data of more than 350,000 Massachusetts 2013 Medicaid beneficiaries enhanced traditional data points
 - **Traditional:** diagnosis-based model are age, sex, and diagnoses from claims
- A key innovation was using enrollee addresses to calculate a “neighborhood stress score” (NSS)
 - **SDOH:** persons with 3 or more addresses during the year, and those living in distressed neighborhoods.

Social Determinants of Health in Managed Care Payment Formulas by Arlene S. Ash, PhD, Eric O. Mick, ScD, Randall P. Ellis, PhD, Catarina I. Kiefe, PhD, MD Jeroan J. Allison, MD, MS, and Melissa A. Clark, PhD
[JAMA Intern Med.](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5710209/) 2017 Oct; 177(10): 1424–1430. Published online 2017 Oct 2
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5710209/> accessed 10/2019

Case Study #2 – Medicaid MA (Cont'd)

Why SDOH?

- Rejected race since nearly 40% of values for race were missing
- Potentially removing money from patient populations whose use of additional resources (eg, translation services for people with limited English) is not captured in claims or encounter records.

Outcome:

- Overall, the SDH model performed well, but only slightly better than the diagnosis-based model
 - Diagnosis-based model underpredicts costs for the most stressed quintile by about 2.1% (\$130 per member per year).
- Successfully reduced underpayments for several vulnerable populations
 - Expanded model eliminates the neighborhood-based underpayment, as well as underpayments of 72% for clients of the Department of Mental Health (observed costs of about \$30 000 per year) and of 7% for those with serious mental illness (observed costs of about \$16 000 per year)

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Case Study #2 – Medicaid MA (Cont'd)

Measuring the predictive ability among capitated payment, traditional risk method, and SDH

Predictive ratio:

- >1.0 indicates underpayment;
- <1.0 indicates overpayment;
- ~1.0 represents good fit

Table 4.
Prevalence, Costs, and Predictive Ratios for Policy-Relevant Subgroups of FFS Members in 2013

Characteristic	No. (%)	Mean Cost, \$	Model Predictive Ratio ^a		
			Constant ^b	RRS ^c	SDH ^d
Subgroups Identified by SDH Model Predictors					
Sex and age, y					
Female, age 0-17	73 899 (20.7)	3044	0.51	1.26	1.00
Female, age 18-44	67 784 (18.7)	6951	1.16	0.97	1.00
Female, age >45	38 023 (10.9)	11 030	1.84	0.93	1.00
Male, age 0-17	79 157 (22.3)	3764	0.63	1.28	1.00
Male, age 18-44	60 064 (16.4)	5747	0.96	0.97	1.00
Male, age >45	38 733 (11.0)	9858	1.64	0.87	1.01
Disability status					
DMH client	5036 (1.5)	30 216	5.04	1.72	1.00
Developmental services (but not DMH) client	8298 (2.5)	12 502	2.08	1.01	1.00
All other disabled	61 556 (18.0)	13 421	2.24	0.93	1.00
Behavioral health					
Serious mental illness	50 041 (14.4)	16 713	2.79	1.07	1.01
Substance use disorder	34 160 (9.6)	17 698	2.95	0.99	1.02

Characteristic	No. (%)	Mean Cost, \$	Model Predictive Ratio ^a		
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Substance use disorder	34 160 (9.6)	17 698	2.95	0.99	1.02
Housing					
Homeless by diagnostic code	2396 (0.7)	35 044	5.84	1.11	1.24
≥3 Addresses in a year	42 938 (11.5)	9061	1.51	1.06	1.01
Least stressed neighborhood quintile	74 251 (20.8)	5325	0.89	0.97	1.00
Most stressed neighborhood quintile	67 195 (18.8)	6577	1.10	1.02	1.00
Selected Other (Nonmodeled) Subgroups					
Race/ethnicity					
White/non-Hispanic	133 142 (37.7)	7471	1.25	0.99	1.01
Black/non-Hispanic	37 308 (10.3)	5952	0.99	0.99	0.98
Hispanic	35 163 (9.8)	5787	0.96	1.00	0.98
Other/non-Hispanic	21 873 (6.2)	3416	0.57	1.06	1.00
Missing/unknown	130 174 (36.0)	4979	0.83	1.01	1.00
LTSS ^c					
Persistent LTSS use	11 426 (3.4)	28 921	4.82	1.27	1.36
Some LTSS use, not persistent	26 907 (7.7)	13 822	2.30	0.95	1.08
Medical conditions					
Any behavioral health use	88 747 (25.5)	13 263	2.21	1.11	1.08
Schizop					

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Thank you

