Social determinants of health — A population health perspective

"Whatever affects one directly, affects all indirectly. I can never be what I ought to be until you are what you ought to be. This is the interrelated structure of reality." Martin Luther King, Jr.

Human beings are social creatures deeply influenced by how we participate in society and our social and physical surroundings. As such, most definitions of the social determinants of health (SDOH) include conditions of the environment — social and physical — in which we spend our lives that affect our health, functioning and quality of life.[1]

TABLE 1: FIVE KEY SOCIAL DETERMINANTS OF HEALTH

ECONOMIC STABILITY	• Poverty • Employment • Food security • Housing stability
EDUCATION	• High school graduation • Enrollment in higher education • Language and literacy • Early childhood education and development
SOCIAL AND COMMUNITY CONTEXT	• Social cohesion • Civic participation • Discrimination • Incarceration
HEALTH AND HEALTH CARE	• Access to health care • Access to primary care • Health literacy
NEIGHBORHOOD AND BUILT ENVIRONMENT	• Access to healthy food • Quality of housing • Crime and violence • Environmental conditions

Source: HealthyPeople 2020 DPHP Campaign

The whole of one's participation and inclusion, however, cannot be understood as the mere sum of these parts. Just like a jumble of colors does not necessarily paint a work of art, our experiences and resources must fit within an organizing mental model.

Aaron Antonovsky was a Yale-trained sociologist who spent a good part of his career in Israel studying adults who had survived childhood incarceration in concentration camps during the second world war. He observed that despite common horrendous experiences, certain individuals adapted much better to life afterward. Those people found a way to comprehend, manage and find meaning in life despite what had happened around them, and this gave them resilience to persevere. Antonovsky noted that this sense of coherence was directly tied to a chronic stress response in humans.

An enormous volume of literature has catalogued the impact of the social gradient and social and psychological stressors on human health. Nearly all the determinants commonly cited in social determinants models — from job insecurity, to co-existing with violence, to inequality or isolation — have been connected to chronic stress responses and long-term worsened health care outcomes.[2,3,4] Social determinants matter because they can reset our biology, for the worse or the better. Trying to improve population health with medical interventions without addressing social determinants is like spraying greater and greater quantities of pesticides on crops growing in unsuitable soil — the plants will not thrive. Indeed, for the first time in decades we are seeing significant slowing in mortality rate improvement across the United States, and most observers believe this is the result of increasing inequality.[5]

Trying to improve population health with medical interventions without addressing social determinants is like spraying greater and greater quantities of pesticides on crops growing in unsuitable soil — the plants will not thrive.

— Alejandro Reti, MD
Chief Medical Officer, Optum Analytics

Maslow described human beings as beholden to a hierarchy of needs. The need for physical sustenance like food and sleep comes first, shelter and safety second, love and belonging third, to be esteemed fourth, and finally self-actualization. This model is helpful because it is clinically focusing. It makes little sense to try to educate a patient about the importance of taking metformin every day if she and her child are sleeping on friends' couches and struggling to find a safe environment. As clinicians we need to focus on what our patients need now, what they care about most — frameworks like this can help keep us in touch.

Which ones matter, and why?

The question of which risk factors matter more is a difficult one because the impact of social determinants is holistic and dependent on individual responses to specific obstacles. That said, it is possible to make some generalizations.

First, it is known that poor social determinants have an outsized influence on the young.[6] This is because our biology is impressionable during childhood, and because habits for a lifetime are set early. All things being equal, we do more good by improving the lives of the young. It has also been shown that certain adverse psychological experiences of childhood imprint physiologic marks that never wear away, even for those who climb their way into a satisfied middle- or upper-class life. The Dunedin Longitudinal Study of New Zealand started in 1972 and has followed a group of over 1,000 people and their families across their lifetimes. One of the thousands of studies completed on this unique group showed that individuals experiencing serious adversity in childhood suffered increased risk of heart disease and depression that was cumulative — meaning individuals with more adverse experiences had even higher risk — and was not diminished even in those who achieved higher wealth or social status in adulthood.[7]

Second, we can have outsized effect by starting first at the bottom of Maslow's hierarchy pyramid. Resolving issues with food and housing insecurity can be transformative to people's lives.[8] The world is full of stories that remind us just how overwhelming it can be to meet basic needs without a home and steady access to one's next meal.

Third, certain factors appear to have more powerful influence on health outcomes than others. A meta-analysis of 148 studies looking at social integration found that strong social relationships improve survival by 50 percent and that those with the best social integration saw survival odds improve by 90 percent compared to those experiencing the most isolation.[9] The magnitude of this effect is similar to that seen with poverty, which most observations put at causing a 50–100 percent increase in mortality risk.[10] Contrast this to the effect on mortality risk of unemployment, which, after adjustment for baseline socioeconomic status, has been estimated at 20–30 percent.[11]

The overlapping nature of these determinants cannot be underestimated. This highlights the importance of social connectedness as a vehicle to address the broad range of social and economic issues facing a community. In other words, by pursuing community-based strategies that enable community members to help one another, we tend to resolve multiple issues at once and achieve outsized outcomes.

Observations:

- First, it is known that poor social determinants have an outsized influence on the young.[6]
- Second, we can have outsized effect by starting first at the bottom of Maslow's hierarchy pyramid.
- Third, certain factors appear to have more powerful influence on health outcomes than others.

By viewing the problem not as a series of deficiencies to be resolved, but rather as an opportunity to build relationships between people capable of helping one another, we help construct community-based networks that give back to those participating across the levels of Maslow's pyramid. Not only are we solving lower-level needs like housing, food security and education, we are now also solving the need for esteem and self-actualization. It is a distinction with a difference.

As health care providers, how can we better integrate SDOH into our population health strategies?

Better integrating the social perspective involves ***incorporating data*** that capture such information, and then ***partnering with the community in the design of intervention strategies*** aimed squarely at addressing these risk factors. Health systems can play an important role in capturing data that matters and then making it accessible for understanding needs at both the patient and community levels.

Capturing data. We look to social data to tell us more about our patients' needs and the needs present in their communities. These are related but different things.

Social factors like joblessness, illiteracy and social isolation all have well-demonstrated impact on clinical outcomes. They also paint a profile of the person that can help us be better caregivers by shining a light on the holistic set of issues each patient faces. If a patient is not safe in her home or is in danger of losing that home to foreclosure, those things must be a priority.

Some social data can be purchased from third parties like Experian and resemble the data companies buy for marketing purposes. Most of these data points are survey-driven and linked to individual patients at the census tract or block level — meaning they represent a profile of the community in which the patient lives but may not reliably represent the profile of any individual person. Research has shown that such extrapolations between geography and the individual can be fraught — poverty itself has been shown to be strongly associated with an increase in risk of dying, while at the same time simply living in a high-poverty area was not.[12] Further research is necessary to fully understand how to leverage geographic-area data for the risk stratification and management of individual patients.

Providers and health systems are increasingly investing in processes and technology to systematically collect information about health status, well-being and social concerns at the identifiable patient level. A 2014 Institute of Medicine report proposed that EHRs consistently support documentation of 12 social and behavioral factors. Institutional standards can promote regular and consistent collection of these data.

Better integrating the social perspective involves incorporating data that capture such information and then partnering with the community in the design of intervention strategies aimed squarely at addressing these risk factors.

— Alejandro Reti, MD
Chief Medical Officer, Optum Analytics

TABLE 2: CORE DOMAINS AND MEASURES WITH SUGGESTED FREQUENCY OF ASSESSMENT: IOM REPORT[13]

DOMAIN/MEASURE	MEASURE	FREQUENCY
Alcohol use	3 questions	Screen and follow up
Race and ethnicity	2 questions	At entry
Residential address	1 question (geocoded)	Verify every visit
Tobacco use & exposure	2 questions	Screen and follow up
Census tract—median income	1 question (geocoded)	Update on address change
Depression	2 questions	Screen and follow up
Education	2 questions	At entry
Financial resource strain	1 question	Screen and follow up
Intimate partner violence	4 questions	Screen and follow up
Physical activity	2 questions	Screen and follow up
Social connections/isolation	4 questions	Screen and follow up
Stress	1 question	Screen and follow up

Further, it is now standard practice at an increasing number of health systems to collect PROMIS10 or equivalent health status information and PHQ-based depression screening data on primary care patients. At Optum®, we are actively experimenting with new automated methods to support the collection of vital information, since the best strategies allow a patient to share this information in the way most convenient for him or her. Table 3 identifies some additional sources and information about social needs screening.

TABLE 3: RESOURCES RELEVANT TO MEASURING SOCIAL DETERMINANTS OF HEALTH AT THE INDIVIDUAL AND COMMUNITY LEVELS

RESOURCE	ORGANIZATION	DETAIL
PRAPARE (Protocol for Responding to and Assessing Patients' Assets, Risks and Experiences)	National Association of Community Health Centers	Patient risk assessment tool for measuring social determinants of health; includes EHR-specific templates
THRIVE (Tool for Health and Resilience in Vulnerable Environments)	Prevention Institute	Tool for assessing status of, and prioritizing, community determinants
Medical Advocacy Screening Questionnaire	Family Advocates of Central Massachusetts	Widely used patient-focused tool for SDOH, on topics like child care, immigration, school safety, housing safety, stability and affordability
Sinai Community Health Survey	Sinai Urban Health Institute	Documents health status, social factors and health-related behaviors at the community level

Understanding needs at the patient level

The most useful patient-level social data helps redirect caregiver focus when serious non-medical problems represent potential barriers to care. Issues like homelessness, poverty, illiteracy, social isolation or ongoing abuse all fall into this category.

These indicators can also meaningfully improve risk methodologies, although research is needed to fully understand how best to deploy these indicators alongside more traditional indicators of risk. Social risks have been incorporated into instruments for calculating cardiovascular risks and assessing mental status, and shown to improve accuracy.[14,15] Anecdotally, clinicians experienced with managing high-risk patients recognize that a sizeable fraction of these patients have issue sets that are substantially or entirely driven by social issues. Many high-risk patient management programs — including those at Mercy Health East in St. Louis and Banner Health in Phoenix — in some settings now partner RN or APRN case managers with social workers to help formally address the social components of these patients' care plans. At Optum, we are exploring the development of a social frailty index to help caregivers distinguish where social factors play an outsized role in a patient's risk profile.

Understanding needs at the community level

Social issues rarely resolve from interventions targeted only at the patient level. They spring from the state of unique communities and are thus usually best addressed at the community level. Geospatial techniques help planners visualize these communities, quantify their needs and start a conversation about partnership.

Duke University and Michigan's National Center for Geospatial Medicine (MNCGM) aimed to show just how this can be done through a $9.7M federal grant to use community-level analytics to guide the engagement strategy of a workforce of community-based health care providers.[16] This arrangement was planned to "allow researchers to visualize complex relationships among locations of diabetes patients, patterns of healthcare, and available social resources. The information will serve as the basis for intervention design, decision support, and real-time monitoring of interventions," according to Marie Lynn Miranda, director of the MNCGM.

On a smaller scale, population health programs across the country are using census tract and even block-level geospatial analyses to localize problems and identify groups to work with. Carolinas HealthCare has pursued this strategy to target accident avoidance in areas with high accident injury rates, as well as to better understand the impact of ambient air quality, often affected by industry or nearby highways, on management of severe asthma and COPD.[17] Clinicians at Children's National Medical Center in Washington, DC, have used geospatial analysis to understand potential patterns in childhood burn injuries.[18] This analysis found that nearly half of all such injuries across the district came from just six neighborhoods disproportionately occurring in Spanish-speaking families. The analysis led to an outreach and education partnership with the Mayor's Office on Latino Affairs.

Process:

- Understanding needs at the patient level
- Understanding needs at the community level
- Delivering community-based intervention

Delivering community-based intervention

Data can provide insight into a community's needs and circumstances, but the most effective community-based interventions have begun with an assessment of community priorities conducted by the communities themselves.

Decades of research into the topic by people such as those running the Sinai Urban Health Institute in Chicago has shown community-based interventions to be some of the most effective, sustainable approaches to mitigating the negative effects of social factors.

Providers must engage here, but they don't need to carry the entire burden themselves. Community-based groups interested in food security, housing, education, crime reduction, addressing racism and social isolation, to name a few, all exist in nearly every region. They are often functioning in a vacuum and greatly underfunded. Provider organizations with a population health mission are in a unique position to coordinate among these groups and bring focus to issues that have particularly deleterious effects on health outcomes. By creatively supporting referrals to community partners and co-locating social services where appropriate, providers can be a meaningful bridge for patients.[19]

The efforts of the National Health Services of Scotland are perhaps farther along in leveraging community partnerships than any system or municipality in the United States. By using a process of "Co-production," they partner and share in the delivery of health and resilience-building activities with communities. A profound example can be found in its Early Years program, aimed at improving the lives of young people and mitigating the worst effects of social disadvantage early in life.[20] This program operates with relatively modest funding, yet through partnerships with community and other state agencies manages to maintain a robust repertoire of programs in every city and hamlet across the country. Public schools make available meeting spaces in the afternoons and early evenings, and most program leaders are community volunteers. Tight integration with authorities such as those in housing and public safety ensures programs exist to address related issues in communities where these matter.

It is worth emphasizing that this approach builds links and relationships between community members that persist beyond the lifetime of the program. By tightening social bonds and building resilience within the community in this way, they build assets that the communities own as their own and reinvest in. It is the asset-based nature of the co-production concept that is so powerful.

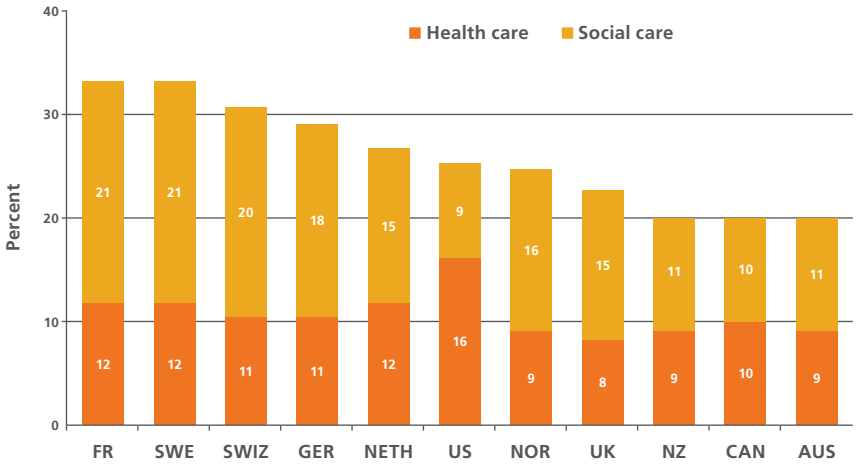
A worthy stateside example can be found in West Baltimore at the hospitals of Bon Secours Health System. Administrators noticed for years that some of their most frequent emergency department visitors were homeless. They tasked a social services group to investigate local low-income housing authority partnerships to fast-track housing support for the most troubled of these individuals — particularly those with long-standing chronic disease. They ultimately determined that directly operating a housing support service was necessary to properly address the problem. To date, Bon Secours has developed and maintains over 720 low-income housing units in West Baltimore, and the organization sees a positive return on this investment as measured in reduced uncompensated health care expenditures from this population.[21] In part influenced by this experience, in 2015 CMS made clear that Medicaid can reimburse for housing referral, support and case management services.[22]

It is worth emphasizing that this approach builds links and relationships between community members that persist beyond the lifetime of the program.

— Alejandro Reti, MD
Chief Medical Officer, Optum Analytics

These approaches also represent a shift in resource allocation from medical to social services, which in some cases has a very short time horizon for investment return. Of course, the concept is not novel. Nearly every developed health care system in the world, excluding the United States, consciously allocates a relatively larger proportion of wealth to social services.[23]

TABLE 4: SOCIAL CARE SPENDING AS A PROPORTION OF GDP



Source: E. H. Bradley and L.A. Taylor. The American Health Care Paradox: Why Spending More Is Getting Us Less. Public Affairs, 2013.

By acknowledging the need to redirect resources into the social sphere, we take the first step in changing the trajectory of health outcomes and costs for the people in the communities we serve. By pursuing a community-centric and asset-based approach to addressing the problems we find, we help catalyze a virtuous cycle, leaving human relationships and capacity behind that will continue to work long after we have moved on.

Contributing Author

Alejandro Reti, MD
Chief Medical Officer, Optum Analytics

Sources

[1] Office of Disease Prevention and Health Promotion. Social determinants of health. https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-of-health. Accessed November 30, 2016.

[2] Brunner EJ. Stress and the biology of inequality. *BMJ.* 1997; 314:1472–1476.

[3] Marmot MG, et al. Contribution of job control and other risk factors to social variations in coronary heart disease incidence. *Lancet.* 1997; 350:235–239.

[4] Morris JN, et al. A minimum income for healthy living. *Journal of Epidemiology and Community Health.* 2000; 54:885–889.

[5] Fenton J, Kelley C, Steiner K. New mortality data show declining longevity improvements — How should life insurers prepare? Willis Towers Watson Insights. https://www.willistowerswatson.com/en/insights/2016/06/new-mortality-data-show-declining-longevity-improvements. Accessed December 8, 2016.

[6] Claussen B, Davey Smith G, Thelle D. Impact of childhood and adulthood socioeconomic position on cause specific mortality: The Oslo Mortality Study. *Journal of Epidemiology and Community Health.* 2003; 57:40–45.

[7] Danese A, Moffitt TE, Harrington HL, et al. Adverse childhood experiences and adult risk factors for age-related disease: Depression, inflammation and clustering of metabolic risk markers. *Archives of Pediatrics and Adolescent Medicine.* 2009; 163(163), 1135–1143.

[8] Kushel MB, Gupta R, Gee L, et al. Housing instability and food insecurity as barriers to health care among low-income Americans. *J Gen Intern Med.* 2006 Jan; 21(1): 71–77.

[9] Holt-Lunstad J, Smith TB, Layton JB. Social relationships and mortality risk: A meta-analytic review. *PLOS Medicine.* July 27, 2010.

[10] Zonderman AB, Mode NA, Ejiogu N. Race and poverty status as a risk for overall mortality in community-dwelling middle-aged adults. *JAMA Internal Medicine.* 2016; 176(9):1394–1395.

[11] Moser KA, Fox AJ, Jones DR. Unemployment and mortality in the OPCS Longitudinal Study. *Lancet.* 1984 Dec 8; (8415):1324–9.

[12] Holt-Lunstad J, Smith TB, Layton JB. Social relationships and mortality risk: A meta-analytic review. *PLOS Medicine.* July 27, 2010.

[13] Institute of Medicine, 2014. Capturing Social and Behavioral Domains and Measures in Electronic Health Records: Phase 2.

[14] Fiscella K, Tancredi D, Franks P. Adding socioeconomic status to Framingham scoring to reduce disparities in coronary risk assessment. *Am Heart Journal.* 2009; 157(6):988–994.

[15] Crum RM, Anthony JC, Bassett SS, et al. Population-based norms for the Mini-Mental State Examination by age and educational level. *JAMA.* 1993; 269(18):2386–2391.

[16] Centers for Medicare and Medicaid Services. Health Care Innovation Awards: North Carolina. https://innovation.cms.gov/initiatives/health-care-innovation-awards/north-carolina.html. Accessed November 17, 2016.

[17] Carolinas HealthCare System. Research highlights 2014. https://www.carolinashealthcare.org/documents/carolinashcsystem/cmc-research-highlights-2014.pdf. Accessed November 19, 2016.

[18] Jacobs BR. Geospatial mapping and analysis of health care conditions in children. http://www.himss.org/sites/himssorg/files/HIMSSorg/Content/HIMSS12PhysPosters/BrianJacobs.pdf. Accessed November 30, 2016.

[19] Gottlieb L, Sandel M, Adler NE. Collecting and applying data on social determinants of health in health care settings. *JAMA Internal Medicine.* 2013; 173(11): 1017–1020.

[20] Scottish Government Riaghaltas na h-Alba. Children and young people improvement collaborative. http://www.gov.scot/Topics/People/Young-People/early-years/early-years-collaborative. Accessed November 19, 2016.

[21] Bon Secours. Bon Secours housing. https://bonsecours.com/baltimore/community-commitment/housing. Accessed November 12, 2016. Also, verbal communication with Richard Statuto, president and CEO of Bon Secours.

[22] Wachino V. CMCS Informational Bulletin: Coverage of housing-related activities and services for individuals with disabilities. (Washington, DC: Center for Medicaid and CHIP Services, Center for Medicare and Medicaid Services. June 26, 2015.)

[23] Bradley EH, Taylor LA. The American health care paradox: Why spending more is getting us less. Public Affairs. 2013.

Contact us:

Call: 1-800-765-6619
Email: discover@optum.com
Visit: www.optum.com

optum.com

11000 Optum Circle, Eden Prairie, MN 55344