

As health promotion professionals, we have the opportunity, and indeed, the obligation to apply the same best practices we routinely apply to other initiatives to our efforts to address social risk factors and unmet social needs. Failing to adopt a rigorous and systematic approach could easily result in unsuccessful attempts that jeopardize the credibility of and support for interventions to level the social gradient of health.¹⁵ Drs. Osnick and Wilson share an inspiring illustration of one organization's transformational journey to turn their approach for assisting clients with obtaining social services inward to create health equity among their own team members. The issue concludes with a description of how the University of Michigan is embracing their role as an anchor institution in the community to blaze a trail to understand and address social needs for their faculty and staff.

If you have an innovative approach for addressing social risk factors, we'd love to hear about it.

References

1. DeAngelis T. Trends report: targeting social factors that undermine health. *APA Monit.* 2017; 48(10):55-57.
2. Garrett D, Hwang A, Pierce-Wrobel C. Social determinants of health: a public health concept in conflict. *Health Aff (Millwood)*. 2018. <https://www.healthaffairs.org/doi/10.1377/hblog20180530.484098/full/>. Accessed November 14, 2019.
3. KPMG, The Commonwealth Fund. *Investing in social services as a core strategy for healthcare organizations: developing the business case*. KPMG Government Institute. 2018. https://www.commonwealthfund.org/sites/default/files/documents/___media_files_publications_other_2018_investingsocialservices_pdf.pdf. Accessed November 14, 2019.
4. CMS. Accountable health communities model select link to open options for. 2019. <https://innovation.cms.gov/initiatives/ahcm>. Accessed November 14, 2019.
5. CDC. Health impact in 5 years. 2018. <https://www.cdc.gov/policy/hst/hi5/index.html>. Accessed November 14, 2019.
6. Pruitt Z, Emechebe N, Quast T, Taylor P, Bryant K. Expenditure reductions associated with a social service referral program. *Popul Health Manag.* 2018;21(6):469-476. doi: 10.1089/pop.2017.0199.
7. Kangovi S, Mitra N, Norton L, et al. Effect of community health worker support on clinical outcomes of low-income patients across primary care facilities: a randomized clinical trial. *JAMA Intern Med.* 2018;178(12):1635. doi: 10.1001/jamainternmed.2018.4630.
8. Best practices to develop a social determinants of health strategy. *Health IT Anal.* 2019. <https://healthitanalytics.com/features/best-practices-to-develop-a-social-determinants-of-health-strategy>. Accessed November 15, 2019.
9. Gottlieb LM, Wing H, Adler NE. A systematic review of interventions on patients' Social and economic needs. *Am J Prev Med.* 2017;53(5):719-729. doi: 10.1016/j.amepre.2017.05.011.
10. Tsega M, Lewis C, McCarthy D, Shah T, Coutts K. *Review of Evidence for Health-Related Social Needs Interventions.*; 2019. <https://www.commonwealthfund.org/sites/default/files/2019-07/ROI-EVIDENCE-REVIEW-FINAL-VERSION.pdf>. Accessed November 15, 2019.
11. Heath S. Family support most requested of social determinants of health. *Patient Engagem.* 2019. <https://patientengagementhit.com/news/family-support-most-requested-of-social-determinants-of-health>. Accessed November 14, 2019.
12. Frazee TK, Brewster AL, Lewis VA, Beidler LB, Murray GF, Colla CH. Prevalence of screening for food insecurity, housing instability, utility needs, transportation needs, and interpersonal violence by US physician practices and hospitals. *JAMA Netw Open.* 2019;2(9):e1911514. doi: 10.1001/jamanetworkopen.2019.11514.
13. Byhoff E, Freund KM, Garg A. Accelerating the implementation of social determinants of health interventions in internal medicine. *J Gen Intern Med.* 2018;33(2):223-225. doi: 10.1007/s11606-017-4230-8.
14. Kaissar N. The hard part of ending inequality is paying for it. *Wash Post.* 2019. https://www.washingtonpost.com/business/the-hard-part-of-ending-inequality-is-paying-for-it/2019/09/02/10d77726-cd8a-11e9-a620-0a91656d7db6_story.html. Accessed November 15, 2019.
15. Kangovi S. An effective way to tackle the social causes of poor health. *Harv Bus Rev.* 2019. <https://hbr.org/2019/05/an-effective-way-to-tackle-the-social-causes-of-poor-health>. Accessed November 14, 2019.

Social Determinants of Health—an Employer Priority

**Alexandria Blacker, MPH¹, Stephen Dion, MBA²,
Jessica Grossmeier, PhD, MPH³, Rick Hecht, MFT, MBA⁴, Elizabeth Markle⁵,
Les Meyer, MBA⁶, Sarah Monley, MPH⁷, Bruce Sherman, MD⁸,
Nicole VanderHorst⁹, and Emily Wolfe, MSW, LCSW¹⁰**

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This report is a product of the HERO HWHC Study Committee on SDOH. Development of this report and content was led by HERO staff and members of the HWHC Study Committee. Contributors to the report are listed alphabetically below.

¹ Stanford University, Stanford, CA, USA

² Optum, Boston, MA, USA

³ Health Enhancement Research Organization, Waconia, MN, USA

⁴ Willis Towers Watson, Los Angeles, CA, USA

⁵ Open Source Wellness, Oakland, CA, USA

⁶ Senior Advisor, Tiatros, San Francisco, CA, USA

⁷ Cardinal Health, Sacramento, CA, USA

⁸ Case Western Reserve University, Cleveland, OH, USA

⁹ Kaiser Permanente, Pasadena, CA, USA

¹⁰ Health Enhancement Research Organization, Waconia, MA, USA

For more than 30 years, employers have tried to improve employee health through the development of worksite wellness initiatives, most notably interventions focused on physical health. While physical well-being is important, the results of employers' efforts have been underwhelming. American employees continue to struggle to maintain positive health status as evidenced by the growing obesity and chronic condition epidemics. These epidemics continue to impact American businesses in a variety of ways including productivity losses driven by absenteeism, presenteeism, turnover, health care, workers' compensation, and disability costs.¹

The construct of well-being is complex and multifaceted. While there are several definitions, the holistic Gallup model goes beyond physical well-being and includes career well-being, social well-being, financial well-being, and community well-being. The elements are interdependent, and people can be thriving, suffering, or struggling in each element.²

Well-being influences business through employee engagement² because business is based on human potential. To improve employee well-being and thereby sustain high-value business performance, employers must expand their focus to much more than individual behavior change in the physical well-being dimension. Well-being is generated, sustained, and diminished in the communities where people live and by their relationships. Despite a shared interest in health between business and governmental public health agencies, there are relatively few examples of local partnership between these 2 entities today.³

Social determinants of health, also referred to as vital conditions,⁴ are the conditions—both good and bad—that at shape and influence employee experiences: where they are born, grow, play, learn, work, and pray. They are the conditions that influence health and illness, and they have a profound impact on morbidity, mortality, and quality of life, which in turn have implications for productivity and performance. Examples of SDOH include cultural norms; social support; education level; economic stability; the physical attributes of a community including air quality and access to clean drinking water; access to supermarkets and healthy food; reliable transportation; affordable, adequate, and stable housing; and good jobs that pay a livable wage.⁵

Relationship Between SDOH and Well-Being

While all social determinants may impact employee well-being, this article highlights the following SDOH: location, financial instability, access and availability of healthy food, and social isolation.

Location

Where individuals spend their time matters. Location influences access to food and transportation, safety and housing, employment, and health care. One's ZIP code has been shown to have a greater impact on health and happiness than one's genetic code, including the length and quality of life.⁶ People living in impoverished neighborhoods, particularly racial minorities, experience increased exposure to environmental risks and are at a greater risk of illness. In America, adjacent communities can have life expectancies that vary by 20 to 30 years.⁷

Financial Instability

Poverty has been linked to increased morbidity and mortality and has been shown to have significant health implications throughout the life span. Adults living in poverty have a higher incidence of diabetes, heart disease, stroke, obesity, depression, and premature death. They are more sedentary, smoke more, and are more likely to have

unhealthy diets.⁸ Poverty not only has a negative impact on quality of life, it has been shown to reduce life expectancy by almost 5 years.⁹ A 2018 Gallup study found that 29% of Americans skip medical care because of finances, and half of those people report that it was for a serious condition.¹⁰ While smoking rates nationally have continued to decline, they remain high among the poor. The rate of lung cancer is 18% to 20% higher for people who live in under-resourced rural areas.

Access and Availability of Healthy Food

Research shows that good nutrition is critical to long-term health, yet finding food at all is a challenge for millions of people in the United States. According to the US Department of Agriculture Economic Research Service, food-insecure households are uncertain of having, or are unable to acquire, at some point during the year, enough food to meet the needs of all their members because they had insufficient money or other resources for food. Full-time employment does not ensure food security, more than half of those Americans who were food insecure had full time jobs.¹¹

Social Isolation

Loneliness has a significant impact on morbidity and mortality.¹² Loneliness impacts health outcomes in ways comparable to smoking, alcohol consumption, obesity, high blood pressure, and sedentary behavior.¹³ People who are lonely are at a greater risk of catching a cold, having a stroke, or developing heart disease.¹⁴ A recent 10-year study found that loneliness increases the risk of dementia by 40%.¹⁵ It reduces life expectancy comparable to smoking¹⁵ cigarettes per day and has been found to impact work productivity, creativity, reasoning, and decision-making.¹⁶

Clarifying Definitions for Employer Action

“SDOH shape health for better or worse.”¹⁷ There is an important distinction, however, between SDOH, social risk factors, and social needs that employers must understand.

According to the Health Care Transformation Task Force, “SDOH impact everyone, they are not something an individual can have or not have, and they are not positive or negative.”¹⁸ In contrast, social risk factors are “specific adverse social conditions that are associated with poor health, like social isolation or housing instability. These social risks have very real impacts on health and health care.”¹⁷ Finally, social needs are defined as the needs of a specific individual at a point in time. “A person may have many social risk factors but fewer immediate social needs.”¹⁸ In short, a way to distinguish between SDOH and social risk factors/needs is whether or not the circumstance is individual or population based. “[An] individual-level adverse social determinant of health, such as low education level or housing instability, [should] be referred to as a social risk factor.”¹⁷

Impact of Social Risk Factors on Employees and Their Communities

Social risk factors influence employee behavior, and the workplace can influence an employee's social risk factors.¹⁹

For many years, employers have worked to mitigate employees' behavioral risk factors. Workplace wellness programs have offered online and in-person resources to encourage nutritious eating, exercise, and stress management. Today, however, employers must recognize that behavioral risk factors may be a result of social risk factors

employees are experiencing in their communities. Furthermore, employer efforts to reduce behavioral risk factors may be hampered by workplace circumstances influencing employees' social risk factors.

Employment impact social risk factors, and social risk factors can impact opportunities for employment. The Centers for Disease Control and Prevention (CDC) notes that work is "a central part of people's lives that affects the physical, psychological, and social well-being of workers and their families." A person's career can influence where they live, the type of housing, childcare and education they can afford, as well as the amount of time they can spend with family and accessing other needed resources.²⁰ A person's income is primarily determined by work, as well as one's social prestige and opportunities for social connectedness, all of which relate to power. In fact, "work is the underlying measure of inequality in any definition of socioeconomic health inequalities."¹⁹

Many aspects of the workplace such as the work environment, compensation, job security, and demands may affect the health of employees.²¹ Additionally, socioeconomic status (SES) variables such as education, gender, and racial and ethnic disparities contribute to the type of work people do, workplace conditions, and earnings.

Work Environment

Particular benefits offered to employees have the potential to positively impact the health of employees. According to the US Department of Labor, Bureau of Labor Statistics in 2017, 70% of civilian workers and 67% of private industry workers had access to health insurance, while 89% of state and local government employees had access.²² Furthermore, additional benefits such as paid sick leave and maternity leave have been associated with a number of positive outcomes, such as protection from unexpected medical costs and enhanced maternal and child health.^{23,24}

Reported workplace injuries can be an indicator of the conditions of the workplace.²⁵ Findings from the Robert Wood Johnson Foundation indicate that workers are "more prone to injuries and illness if their job includes repetitive lifting, pulling or pushing heavy loads, poor quality office equipment, long-term exposure to harmful chemicals such as lead, pesticides, aerosols, and asbestos, or a noisy work environment." Additionally, the job demands, lack of autonomy, workplace interpersonal conflict, evening shift work, and working multiple jobs are reported sources of psychosocial stress.²⁶⁻³³

Education

According to the Pew Research Center, among adults aged 25 and older, 23% of African American and 15% of Hispanic individuals have a bachelor's degree or more education in comparison to 36% of white adults and 53% of Asians.³⁴ Research has shown that those with less education tend to have "fewer employment choices" leading to positions "with low levels of control, job insecurity, and low wages." This type of work is also far more likely to include roles that expose individuals to environmental toxins and that are physically strenuous.³⁵

Gender

Sexism in the workplace highlights several disparities. Namely, "women are underrepresented at every level, and women of color are the most underrepresented group of all," notes the 2018 LeanIn.Org and McKinsey Women in the Workplace study. The survey noted that "for every 100 men promoted to [a] manager [role], 79 women are"

promoted, and due to this gender gap, men hold "62% of manager positions, while women hold only 38%."³⁶ Other studies looking at Fortune 500 companies note that this percentage is even lower with women holding only 26% of executive or senior-level positions, only 21% of board seats and only 5% of chief executive officer (CEO) positions.³⁷ This gap grows larger when looking at women of color who hold only 3.9% of executive or senior level roles and only 0.4% of CEO positions in 2015.³⁸ The McKinsey report goes on to say that key factors, including microaggressions and sexual harassment, lead to an uneven playing field and less opportunities for women.³⁶

Additionally, the 2017 US Census reported that the income for women was 80.5% of their male counterparts.³⁹ Although women tend to be overrepresented in lower-paying occupations such as health care, education, and social services,⁴⁰ regardless of industry, women earn less than men in their industry.⁴¹ When considering racial differences, this gap widens even further with African American women earning 67% and Hispanic women earning 62% of what their white male counterparts earn.⁴² Much of this disparity is due to lower earnings in occupations that are comprised mainly of women, offer limited or no paid family leave or childcare, and use discriminatory compensation and hiring processes.⁴³

Research is still needed to understand and address the specific disparities of the lesbian, gay, bisexual, transgender (LGBT) and gender nonconforming communities in the workplace. A 2014 research study from the Human Rights Campaign Foundation indicated that 53% of LGBT workers nationwide have to hide who they are in the workplace due to an unwelcoming work environment. This has impacts on broader employee engagement, retention, and productivity. Positively, the study found that organizations with an inclusive environment for LGBT employees reported that 1 in 4 employees stayed with the organization specifically due to the workplace environment.⁴⁴

Race and Ethnicity

Racism and ethnic disparities are common in the American workplace. As previously noted, there are salary differences between men and women, but when considering racial and ethnic differences, there are a variety of gaps. According to the Pew Research Center, although large gaps between the incomes of blacks and whites have narrowed, income gaps across racial and ethnic groups exist and, in some cases, are wider than in 1970.⁴⁵ It is worth noting that the life experiences across racial and ethnic groups could reflect differences in the characteristics of workers, the legacy, and current impact of discrimination.⁴⁵

In addition, according to the CDC, African Americans are more likely to be employed in jobs where they are at a higher risk for injury or illness.⁴⁶ Furthermore, a study assessing occupational health disparities concluded that ethnic and racial minority groups are more likely to face workplace inequalities, which can lead to poor mental and physical health.⁴⁷

Relevance to Employers

Social determinants of health, social risk factors, and employees' individual social needs can impact employer business performance and profitability.⁴⁸ Furthermore, employee performance and productivity may be impacted by chronic conditions caused by SDOH. Workforce social risk factors can also be evaluated in relation to business performance, including work quality, safety, efficiency, and customer satisfaction.

Today, employers are leaning toward value-based benefit design offerings that encompass social needs. Emerging strategies focus on high-value services which decrease cost-related nonadherence, reduce health-care disparities, and improve the efficiency of health care spending without compromising quality.⁴⁹ Value-based benefit design requires a unified definition of value that includes elements of clinical effectiveness, patient personalization, and patient perspective.⁵⁰

At the highest level, when the health-care system partners with employers; providers; well-being vendors; consumers; local, regional, and federal governments and community organizations, the community conditions in which people live can improve. The Population Health Alliance (PHA) is leading work to identify best practices and problem solve with members and the health-care community to create and sustain cross-sector partnerships for health.⁵¹

In addition to community, government and business coalitions, social risk factors, and social needs are being addressed by health systems. Geisinger Health System's Springboard Healthy Scranton program illustrates the power of partnership in addressing food insecurity, for example. The program empowers employees and patients to eat better and get healthier. Its innovative food prescription program, the Fresh Food Farmacy, helps patients sustain lifestyle changes by improving access to healthy foods and brings together community organizations including a hospital and local food bank.⁵²

Employers, too, are addressing social needs of employees through value-based benefit design and by building workplaces that foster fulfilling employee experiences.⁵³ Employers are considering how employees' functional well-being and emotional intelligence are influenced by social needs by considering employee behavioral health support services.⁵⁴

Implications for Well-Being Programming

Beyond Benefit Offerings

Historically, employers have tried to improve employee health and well-being by focusing on the health-care delivery system. Public health researchers have shown that comparatively small expenditures to address community based SDOH priorities can lead to significant reductions in overall health-care costs.⁵⁵ Similar to employee well-being, public health seeks to assure conditions in which people can be healthy.

Employers have traditionally focused on the workplace while public health practitioners focus on community efforts to prevent disease and promote health.³ A recent report published by the Bipartisan Policy Center and de Beaumont Foundation asks employers to consider the question: "Is our community thriving, healthy, inspiring, and attractive to blossoming talent, or is it perceived as deteriorating, sick, and unsafe?"³ How an organization answers that question will shape the approach taken towards public health promotion and SDOH interventions.

Several health systems have begun to address patient social risk factors and needs in partnership with the public health sector. For example, the Centers for Medicare and Medicaid Services has initiatives that require health plans to screen for social needs and provide referrals.⁵⁶ Private health plans are approaching social needs by providing screening and referrals to social services, including housing support, nutritional assistance, and integrated case management. Examples include:

- Anthem's Healthy Generations initiative uses social mapping technology and analyzes public health data to provide a

snapshot of the major health issues in each state, allowing the organization to target initiatives at the ZIP code level.⁵⁷

- Humana's Bold Goal initiative creates physician, nonprofit, business and government partnerships to address social needs like food insecurity, loneliness, and social isolation.⁵⁸
- Kaiser Permanente has donated 200 million dollars to fight homelessness. The organization's Total Health initiative focuses on health promotion policies and environmental changes to address the social risk factors in neighborhoods and school settings, as well as screens patients for unmet social needs.⁵⁹
- L.A. Care Health Plan provides permanent housing for the homeless.⁶⁰
- United Healthcare and the American Medical Association's nearly 2 dozen *International Statistical Classification of Diseases and Related Health Problems, 10th revision (ICD-10)* codes trigger referrals to social and government services that connect patients directly to local and national resources in their communities.⁶¹

Employer Examples

In order to improve health and reduce health disparities, employers will need to follow the health systems' lead by collaborating with community organizations and businesses to address employee social risk factors. Examples include:

- Financial well-being: Tom's of Maine pays the lowest-paid workers more than 25% above a living wage.⁶²
- Housing: Housing Trust Silicon Valley, a nonprofit community development financial institution including Cisco, LinkedIn, and Pure Storage, has committed millions in support of affordable housing initiatives in the region.⁶³
- Food insecurity: Campbell Soup Company's Healthy Communities campaign works to improve food security through a collective impact model by bringing together the disparate work of government, nonprofits, and businesses to make the community healthier.⁶⁴

Relationship to Corporate Social Responsibility

Investment in coalitions and policy advocacy to address SDOH and programs to screen for and address social risk factors/needs is now both a responsibility of good corporate citizenship and a key element of an enterprise talent strategy. Society expects organizations to play an increasing role in strengthening population health and well-being. Organizations are responding to these evolving expectations, focusing primarily on employees and, in some industries, on customers and supply chains. Levi Strauss and Target,⁶⁵ Walmart,⁶⁶ and PepsiCo⁶⁷ have extended health initiatives across their entire value chains to include suppliers, local communities, and the general public.

Employers should consider community partnerships to address social risk factors. Anchor institutions are rooted in their communities, making them invaluable to local economies with the potential to lead community wealth building. The largest and most numerous of such anchors are universities and health-care systems. Over the past 2 decades, useful lessons have been learned about how to leverage the economic power of universities as they relate to targeted community benefits. The University of Southern California (USC), for example, has instituted a program to increase employment from neighborhoods

immediately surrounding its campus. This is an impactful investment as recent reports have shown that “one out of every seven applicants for staff positions at USC was hired from the seven ZIP codes nearest the campus.”⁶⁸

Complex health challenges require cross-sector partnerships.³ System-level solutions to address SDOH will require partnership and “breaking down silos among health care, public health, and social services, as no single entity is able to tackle the upstream social conditions on its own.”¹⁸ It is imperative for leaders from business and public health to address SDOH in a manner that will benefit both, in addition to the community.

Action Steps for Employers

For businesses, a compelling goal should be to optimize the value of workforce human capital. The impact of existing company practices on workforce health in all aspects of business operations must be considered, even in areas not traditionally viewed as affecting employee health. Once successfully implemented, “health in all policies and practices” can become a new organizational mantra, with measurable quantitative benefit.

Below is a representative list of areas in which business leaders can begin to explore the extent to which their company aligns with promoting a healthy, high-performing workforce as it relates to addressing social risk factors and needs.

This list is not meant to be exhaustive; rather, the intent is to prompt further internal analysis to identify other opportunities to better align workforce health and well-being with enhanced business performance objectives. First and foremost, among an employer's role in addressing social risk factors is to evaluate the extent to which they are providing a livable wage.

Organizational Philosophy

With the foundation of ensuring that the organization's mission supports employee health and well-being, there are several ways to socialize SDOH and address social needs internally. These strategies can include educating business partners on SDOH in their communities, on the social risk factors their employees face, and developing approaches to improve community health. There is value in teaching empathy to managers and encouraging them to connect with their employees. Worline and Dutton⁶⁹ instruct managers to utilize appreciative inquiry to probe for life circumstances that may be contributing to performance issues. Notably, Gallup reports that 70% of the variability in employee engagement is driven by the manager.⁷⁰

Some important questions to reflect on are:

- To what extent does the organization include its beliefs about the importance of its workforce human capital in its mission and/or vision statements?
- To what extent are the mission and/or vision statements operationalized in daily practice?
- Is employee engagement in work considered an important organizational priority? If so, how broad, rigorous and data-driven is the process to improve job satisfaction, engagement, and retention levels?
- Are employees paid a fair living wage, particularly in geographic regions where the cost of living may be higher than national norms?
- Do supervisors receive formal management training to foster constructive working relationships with their direct reports? If so, is there a formal process for evaluating the effectiveness of these programs?
- Does supervisor training include raising awareness of social risk factors and resources they can refer employees to?
- Does supervisor training include strategies for addressing performance issues that open the door to the ways SDOH and social risk factors may be influencing employee behavior?

Work Cultural Environment

Create policies and practices to support health including leave policies that support employees in taking care of themselves and caring for others, including paid time off to go to doctors' appointments, subsidized public transportation, and childcare. Important considerations include:

- What workplace factors do employees identify that interfere with their ability to do their jobs well (eg, high demand-low control environment, inadequate staffing, hostile peer environment)?
- How do employees describe their sense of job security? Do they feel they could be fired at any time?
- Is there a formal process by which workforce health and well-being are considered when implementing new corporate policies or practices?
- Do all employees have an opportunity for career advancement?

Health and Well-Being Benefits

Learn about employees and their struggles. Employers can ask employees directly which social services and programs would be most valuable to them. This may be done through focus group conversations or through formal employee surveying. Kaiser Permanente, for example, deployed an anonymous survey to measure employees' subjective well-being that included SDOH metrics.⁷¹

Leverage existing vendor partners including employee assistance providers, onsite social workers, financial partners (ie, 401 k, insurance), and health plans to understand employee data with an SDOH perspective.

Explore new vendor partners that may be able to provide social risk factor data for program planning purposes. Internally, there may be human resources data such as ZIP codes and income levels that help identify target locations for intervention. Externally, public health records, area depravity indexes, medical carrier *ICD-10* codes, and data aggregation services can help employers make informed decisions.

Finally, teach employees how to use their benefits and locate providers in their communities. Research and promote local resources that address various social needs that are relevant to the employee population, including 211 assistance. Identify and communicate local transportation resources and aid to those who struggle to get to and from work and appointments.

- Have employers heard directly from employees and their family members as to what they value in available and desirable offerings to promote their health and well-being?
- Do all employees have equitable access to affordable benefits with some type of wage-based subsidy for lower income earners?
- Do all employees have the ability to leave work without penalty to obtain recommended preventive care services, including cancer screenings?

- Are programs available to support the financial well-being of all employees?
- Are programs available to support the mental well-being of all employees?
- Do employees receive employer support to promote their financial well-being, either through retirement fund contributions or performance-based incentives or both?
- Are health plan partners addressing social risk factors within their delivery system and in the community?
- Is the health plan offering social risk factor screening and social needs referral services for members, especially for food insecurity and adverse childhood experiences?
- Does the health plan support the local community where employees live, such as reinvesting funds to support the overall health and well-being of the community?

Work Scheduling and Pay

Review recruiting and hiring practices to incorporate new skills and perspectives, especially those of underserved populations including the formerly incarcerated.⁷² Employers such as King's Kitchen⁷³ in Charlotte, North Carolina, and Greyston Bakery⁷⁴ in New York employ previously incarcerated individuals with a goal to educate, train, and ultimately end the cycles of poverty that impact health status. Promote ongoing training to incorporate cultural competency and health equity into the culture.⁷⁵

- Do employers understand what employees desire in terms of equitable work scheduling and pay?
- Do all employees have predictable work schedules to ensure a steady source of income?
- Do all employees have access to regular pay—and do opportunities exist to facilitate access to emergency funds/advance pay in the event of a financial crisis?
- Are work schedules involving shift work designed to promote/facilitate favorable health outcomes?
- Is paid sick leave available for all employees? Paid maternity/paternity leave?
- Is employee sleep disruption considered in travel planning for high-frequency travelers?
- Are there programs to support diversity and inclusion in hiring and promotion processes?

Work-Life Integration

Integrating work and life includes focusing on employees' behavioral health issues, especially stress and depression, as well as the workplace culture. Employers should not only reduce the stigma associated with mental health, they must establish a confidential, safe setting where employees can meet with human resources, an onsite employee assistance professional, or an onsite social worker to help target local referrals. In addition to providing psychological safety, it is necessary to foster social connection among teams in the workplace. Social connection can help to address loneliness and isolation. Creating a culture where people feel valued and cared about, and one that supports kindness, can help foster connections. For some employees, the kind word they receive from colleagues may be the only positive thing they hear all day, particularly if they are returning home to a dysfunctional environment.⁷⁶

- Do employers understand employee issues/concerns regarding work-life balance?
- Are employees given opportunities to propose flexible work arrangements within their teams or to their managers?
- What are employer expectations for the duration of the work-week in terms of hours per day and days per week?
- Are employees able to disconnect from all business communications without penalty during their "off" time?
- Does the employer provide adequate resource support for employee lives outside of work, for example, to address caregiving concerns?

Work Physical Environment

Build a work environment that makes the healthy choice the easy choice. To the extent possible, create easy access to subsidized or free healthy food options, filtered water, a quiet room, a locker room with showers, and walking paths. Work may be the only time that employees have access to such things.

- Are stairwells well-lit and easy to use?
- Is physical activity or periods of rest for active jobs during paid work time (eg, walking meetings or breaks) encouraged?
- Are potential workplace ergonomic issues being proactively addressed?

Conclusion

Health is a personal and national resource. It is what allows people to engage with life. Without mind-body-health-well-being, people cannot share in loving, enduring relationships with family and friends; contribute to their communities; or fully participate in work.⁷⁷ When people can maximize positive emotion, engagement, relationships, meaning, and accomplishment they flourish.⁷⁸ Yet, as Dr Sandro Galea explains, "Each of us is shaped by the conditions around us—the combination of place, time, power, money and connections, by what we know, and by the compassion of the people we encounter. And, importantly, our health depends on these things, too."⁷⁹ Therefore, work to address employee social risk factors and needs throughout the workforce.

The HERO calls business leaders across the country to identify at least one action your organization can take in the next 12 months to address the social determinants impacting your employee population. In time, draft and contribute a case study to HERO for publication on the HERO and get-hwhc.org websites.

Your ability to demonstrate how your organization is working to address SDOH for your employees can inspire other business leaders and motivate change throughout the country.

References

1. Worker Productivity Measures | Model | Workplace Health Promotion | CDC. Cdc.gov. 2019. <https://www.cdc.gov/workplacehealthpromotion/model/evaluation/productivity.html>. Accessed May 29, 2019.
2. Rath T, Harter J. The Five Essential Elements of Well-Being. Gallup.com. 2010. <https://www.gallup.com/workplace/237020/five-essential-elements.aspx>. Accessed May 29, 2019.
3. Bipartisan Policy Center, de Beaumont. Good Health Is Good Business: The Value Proposition of Partnerships between Business and Governmental Public Health Agencies to Improve

- Community Health. 2019. <https://www.debeaumont.org/news/2019/report-good-health-is-good-business/>. Accessed July 8, 2019.
4. Well Being Legacy | Conditions. The Vital Conditions. 2018. <https://www.wellbeinglegacy.org/vital-conditions>. Accessed June 21, 2019.
 5. Determinants of Health | Healthy People 2020. Healthypeople.gov. 2019. <https://www.healthypeople.gov/2020/about/foundation-health-measures/Determinants-of-Health>. Accessed May 29, 2019.
 6. Graham GN. Why your ZIP code matters more than your genetic code: promoting healthy outcomes from mother to child. *Breastfeeding Medicine*. 2016. <https://www.liebertpub.com/doi/10.1089/bfm.2016.0113>. Accessed May 29, 2019.
 7. Evans G, Kantrowitz E. Socioeconomic status and health: The potential role of environmental risk exposure. *Annu Rev Public Health*. 2002;23:303-331.
 8. Khullar D, Chokshi DA. Health, Income, & Poverty: Where We Are & What Could Help. Health, Income, & Poverty: Where We Are & What Could Help | Health Affairs. 2018. <https://www.healthaffairs.org/doi/10.1377/hpb20180817.901935/full/>. Accessed May 30, 2019.
 9. Hunger and Health: The Impact of Poverty, Food Insecurity, and Poor Nutrition on Health and Well-Being. Food Research & Action Center. 2017. <http://frac.org/wp-content/uploads/hunger-health-impact-poverty-food-insecurity-health-well-being.pdf>. Accessed May 30, 2019.
 10. Saad L. Delaying Care a Healthcare Strategy for Three in 10 Americans. Gallup. 2018. <https://news.gallup.com/poll/245486/delaying-care-healthcare-strategy-three-americans.aspx>. Accessed May 30, 2019.
 11. USDA ERS. Interactive Charts and Highlights. Interactive Charts and Highlights. 2018. <https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/interactive-charts-and-highlights/>. Accessed May 30, 2019.
 12. Threnhauser SC. Is Loneliness The Overlooked Social Determinant? OPEN MINDS. 2018. <https://www.openminds.com/market-intelligence/executive-briefings/loneliness-overlooked-social-determinant/>. Accessed May 30, 2019.
 13. Holt-Lunstad J, Smith T. Social relationships and mortality risk: a meta-analytic review. *SciVee*. 2010. doi: 10.4016/19911.01.
 14. Killam K. To Combat Loneliness, Promote Social Health. *Scientific American*. 2018. https://www.scientificamerican.com/article/to-combat-loneliness-promote-social-health1/?utm_source=newsletter&utm_medium=email&utm_campaign=daily-digest&utm_content=link&utm_term=2018-01-24_top-stories. Accessed May 30, 2019.
 15. Sutin A, Stephan Y, Luchetti M, Terracciano A. Loneliness and risk of dementia. *In-novat Aging*. 2018;2(suppl 1):966-967. doi: 10.1093/geroni/igy031.3581.
 16. Murthy V. Work and the Loneliness Epidemic. *Harvard Business Review*. 2018. <https://hbr.org/cover-story/2017/09/work-and-the-loneliness-epidemic>. Accessed June 1, 2019.
 17. Alderwick H, Gottlieb LM. Meanings and misunderstandings: a social determinants of health lexicon for health care systems. *Milbank Q*. 2019;97(2):407-419. doi: 10.1111/1468-0009.12390.
 18. Green K, Zook M. When talking about social determinants, precision matters. *Health Affairs*. 2019. <https://www.healthaffairs.org/doi/10.1377/hblog20191025.776011/full/>. Accessed November 21, 2019.
 19. Ahonen EQ, Fujishiro K, Cunningham T, Flynn M. Work as an inclusive part of population health inequities research and prevention. *Am J Public Health*. 2018;108(3):306-311. <https://ajph.aphapublications.org/doi/full/10.2105/AJPH.2017.304214>.
 20. Social Determinants of Health. Centers for Disease Control and Prevention. 2018. <https://www.cdc.gov/socialdeterminants/faqs/index.htm>. Accessed June 2, 2019.
 21. Social Determinants of Health. Social Determinants of Health | Healthy People 2020. 2020. <https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-of-health>.
 22. The Employment Situation. BLS. 2017. <https://www.bls.gov/news.release/archives/empst11032017.pdf>. Accessed June 2, 2019.
 23. DeRigne L, Stoddard-Dare P, Quinn L. Workers without paid sick leave less likely to take time off for illness or injury compared to those with paid sick leave. *Health Aff (Millwood)*. 2016;35(3):520-527.
 24. Burtle A, Bezruchka S. Population health and paid parental leave: what the United States can learn from two decades of research. *Healthcare (Basel)*. 2016;4(2):30.
 25. Robert Wood Johnson Foundation. Work matters for health; 2008. Brief No: 4. <http://www.commissionon-health.org/PDF/0e8ca13d-6fb8-451d-bac8-7d15343aacff/Issue%20Brief%204%20Dec%2008%20-%20Work%20and%20Health.pdf>
 26. Shain M, Kramer DM. Health promotion in the workplace: framing the concept; re-viewing the evidence. *Occup Environ Med*. 2004;61(7):643-648.
 27. Brooker A, Eakin JM. Gender, class, work-related stress and health: toward a power-centered approach. *J Community Appl Soc Psychol*. 2001;11(2):97-109. doi: 10.1002/casp.620.
 28. O'Neil BA, Forsythe ME, Stanish WD. Chronic occupational repetitive strain injury. *Can Fam Phys*. 2001;47(2):311-316.
 29. Ross P. Ergonomic hazards in the workplace: assessment and prevention. *AAOHN J*. 1994;42(4):171-176.
 30. Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health. Cincinnati, OH: Worker Health Chartbook, 2004; 2005.
 31. Centers for Disease Control and Prevention. Adult blood lead epidemiology and surveillance—United States, 2003–2004. *MMWR Morb Mortal Wkly Rep*. 2006;55(32):876-879.
 32. Hager LD. Hearing protection. Didn't hear it coming . . . noise and hearing in industrial accidents. *Occ Health Saf*. 2002;71(9):196-200.
 33. Nelson DI, Nelson RY, Concha-Barrientos M, Fingerhut M. The global burden of occupational noise-induced hearing loss. *Am J Ind Med*. 2005;48(6):446-458.
 34. Patten E. Racial, gender wage gaps persist in U.S. despite some progress. Pew Research Center. 2016. <https://www.pewresearch.org/fact-tank/2016/07/01/racial-gender-wage-gaps-persist-in-u-s-despite-some-progress/>. Accessed June 2, 2019.
 35. Berkman LF, Kawachi I, Theorell T. Working conditions and health. In: *Social Epidemiology*. New York, NY: Open University Press; 2014. p. 153-181.
 36. Krivkovich A, Nadeau M-C, Robinson K, Robinson N, Starikova I, Yee L. Women in the Workplace 2018. McKinsey & Company; 2018. <https://www.mckinsey.com/featured-insights/gender-equality/women-in-the-work-place-2018>. Accessed June 1, 2019.
 37. Catalyst. Pyramid: Women in S&P 500 Companies. Research. 2019. <https://www.catalyst.org/research/women-in-sp-500-companies/>. Accessed June 2, 2019.
 38. Valentina Zarya, "Why There Are No Black Women Running Fortune 500 Companies," *Fortune*, January 16, 2017, available at <http://fortune.com/2017/01/16/black-women-for-tune-500/>. Accessed July 9, 2019.

39. Data Visualization. 2018. <https://www.census.gov/content/dam/Census/library/visualizations/2018/demo/p60-263/figure2.pdf/>. Accessed July 9, 2019.
40. Employed persons by detailed occupation, sex, race, and Hispanic or Latino ethnicity. U.S. Bureau of Labor Statistics. 2019. https://www.bls.gov/cps/cpsaat11.htm#TB_inline?height=200&width=325&inlineId=cps_program_links. Accessed June 2, 2019.
41. Women's Earnings by Occupation. 2017. https://www.census.gov/content/dam/Census/library/visualizations/2017/comm/cb17-tps21_womens_earnings.pdf/. Accessed July 9, 2019.
42. Household Data Annual Averages. <https://www.bls.gov/cps/cpsaat37.pdf/>. Accessed July 9, 2019.
43. IWPR. The Gender Wage Gap: 2017. IWPR; 2018. https://iwpr.org/wp-content/uploads/2018/03/C464_Gender-Wage-Gap-2.pdf. Accessed June 2, 2019.
44. The Cost of the Closet and the Rewards of Inclusion. Human Rights Campaign Foundation; 2014. http://assets2.hrc.org/files/assets/resources/Cost_of_the_Closet_May2014.pdf. Accessed June 2, 2019.
45. Kochhar R., Cilluffo A., Key findings on the rise in income inequality within America's racial and ethnic groups. Pew Research Center. 2018. <https://www.pewresearch.org/fact-tank/2018/07/12/key-findings-on-the-rise-in-income-inequality-within-americas-racial-and-ethnic-groups>. Accessed November 21, 2019.
46. Centers for Disease Control and Prevention. CDC health disparities and inequalities report—United States, 2013. *MMWR Morb Mortal Wkly Rep*. 2013;62(3 suppl):3-128.
47. Okechukwu CA, Souza K, Davis KD, de Castro AB. Discrimination, harassment, abuse, and bullying in the workplace: contribution of workplace injustice to occupational health disparities. *Am J Ind Med*. 2014;57(5):573-586.
48. Sherman BW, Stiehl E. Health Management in Commercially Insured Populations. *J Occup Environ Med*. 2018;60(8):688-692. doi: 10.1097/jom.0000000000001344.
49. Fendrick M. Center for Value-Based Insurance Design (V-BID) | Institute for Healthcare Policy & Innovation. 2019. <https://ihpi.umich.edu/center-value-based-insurance-design-v-bid>. Accessed June 11, 2019.
50. Mitts L. Slideshow: What is VBID (Value Based Insurance Design)? Families USA. 2016. <https://familiesusa.org/product/slideshow-what-vbid-value-based-insurance-design>. Accessed June 11, 2019.
51. Population Health Alliance Quality and Research Committee. Social Determinants of Health and Health Disparities. 2018. <https://populationhealthalliance.org/wp-content/uploads/2018/07/PHA-Social-Determinants-Brief-July-2018.pdf>
52. Springboard Healthy Scranton - Geisinger Health System. Springboard. <https://www.springboardhealthy.org/>. Accessed June 11, 2019.
53. CECP, Imperative, PwC. Making Work More Meaningful: Building a Fulfilling Employee Experience; 2018. <https://d0cb2f2608c-10c70e72a-fc7154704217aa017aa46150b-f00c30c.ssl.cf5.rackcdn.com/pwc-build-ing-a-fulfilling-employee-experience.pdf>. Accessed June 11, 2019.
54. Meyer LC. Digital Therapeutics: The Future of Behavioral Health. BPI Network; 2018. http://www.bpinetwork.org/pdf/DigitalTherapeutics_TheFutureofBehavioral-Health_LesC Meyer_BPI.pdf. Accessed June 12, 2019.
55. Pruitt Z, Emechebe N, Quast T, Taylor P, Bryant K. Expenditure Reductions Associated with a Social Service Referral Program. *Populat Health Manage*. 2018;21(6):469-476. doi: 10.1089/pop.2017.0199.
56. Artiga S, Hinton E. Beyond Health Care: The Role of Social Determinants in Promoting Health and Health Equity. Kaiser Family Foundation; 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 12, 2019.
57. Healthy Generations. Anthem. 2019. <http://www.anthemcorporateresponsibility.com/healthy-generations>. Accessed June 13, 2019.
58. Humana Bold Goal | Improving Community Health Together. Humana. 2019. <https://populationhealth.humana.com/>. Accessed June 13, 2019.
59. Improving community conditions. Kaiser Permanente. <https://about.kaiserpermanente.org/community-health/improving-community-conditions>. Accessed June 13, 2019.
60. AHIP. Beyond the Boundaries of Health Care: Addressing Social Issues; 2017. https://www.ahip.org/wp-content/uploads/2017/07/SocialDeterminants_IssueBrief_7.21.17.pdf. Accessed June 12, 2019.
61. UnitedHealth Group. UnitedHealthcare and the AMA Collaborate to Understand and Address Social Barriers Preventing People's Access to Better Health. 2019. <https://www.unitedhealthgroup.com/newsroom/2019/2019-04-02-uhc-ama-social-barriers.html>. Accessed June 12, 2019.
62. B Impact Assessment: Tom's of Maine. 2018. <https://s3.amazonaws.com/blab-impact-published-production/public/rpRM67b4S84h43iXNzWsp9mRRIN0JahnUiiMnw0v>. Accessed June 12, 2019.
63. Candid. Tech Firms Invest \$20 Million in Affordable Housing in Silicon Valley. Philanthropy News Digest (PND). 2018. <https://philanthropynewsdigest.org/news/tech-firms-invest-20-million-in-affordable-housing-in-silicon-valley>. Accessed June 13, 2019.
64. Zellner S, Bowdish L. The ROI of Health and Well-Being: Business Investment in Healthier Communities. National Academy of Medicine. 2019. <https://nam.edu/roi-health-well-business-investment-healthier-communities/>. Accessed June 13, 2019.
65. Worker Health and Well-being in the Supply Chain. Shine. 2019. <https://shine.sph.harvard.edu/worker-health-well-being-supply-chain>. Accessed June 13, 2019.
66. Walmart. Providing Access to Affordable, Sustainable and Healthier Food; 2017. <https://corporate.walmart.com/2016grr/enhancing-sustainability/providing-access-to-affordable-healthy-food>
67. Sustainable Farming Program. PepsiCo; 2018. https://www.pepsico.com/docs/album/a-z-topics-policies/sfp-scheme-rules.pdf?sfvrsn=fb5b95cf_4. Accessed June 13, 2019.
68. What is Community Wealth Building? Community. 2016. <https://community-wealth.org/>. Accessed June 13, 2019.
69. Worline MC, Dutton JE. Awakening Compassion at Work the Quiet Power That Elevates People and Organizations. Oakland, CA: Berrett-Koehler Publishers; 2017.
70. Adkins JHA. What Great Managers Do to Engage Employees. Harvard Business Review. 2015. <https://hbr.org/2015/04/what-great-managers-do-to-engage-employees>. Accessed June 13, 2019.
71. Stiefel M, Gordon NP, Wilson-Anumudu FJ, Arsen EL. Sociodemographic determinants of health and well-being among adults residing in the combined kaiser permanente regions. *Permanente J*. 2019;23(18). doi: 10.7812/tpp/18-091.
72. ACLU. Back to Business: How Hiring Formerly Incarcerated Job Seekers Benefits Your Company. American Civil Liberties Union. 2017. <https://www.aclu.org/report/back-business-how-hiring-formerly-incarcerated-job-seekers-benefits-your-company>. Accessed June 13, 2019.
73. The King's Kitchen Mission. The King's Kitchen. 2017. <http://kingskitchen.org/mission/>. Accessed July 17, 2019.

74. Greyston: Open Hiring. Greyston Bakery. 2019. <https://greyston.org/open-hiring>. Accessed July 17, 2019.
75. Centers for Disease Control and Prevention. A Practitioner's Guide for Advancing Health Equity: Community Strategies for Preventing Chronic Disease. US Department of Health and Human Services. 2013. <https://www.cdc.gov/nccdphp/dch/pdf/HealthEquityGuide.pdf>.
76. Work and the Loneliness Epidemic. Harvard Business Review. 2018. <https://hbr.org/cover-story/2017/09/work-and-the-loneliness-epidemic>. Accessed June 13, 2019.
77. Meyer LC, Palliative Care Everywhere: A Conversation with Diane E. Meier, MD, FACP. Collective Impact of Palliative Care at Work, Home and in the Community. CMSA Today Magazine, Issue 3 2017 Digital. 2017. <http://www.nxtbook.com/naylor/CMSQ/CMSQ1117/index.php?startid=16#16>. Accessed June 12, 2019.
78. The PERMA Model: Your Scientific Theory of Happiness. Positive Psychology Program. 2019. <https://positivepsychologyprogram.com/perma-model/>. Accessed June 13, 2019.
79. Galea S. Well: What We Need to Talk about When We Talk about Health. New York, NY: Oxford University Press; 2019.

Why Employers Must Focus on the Social Determinants of Mental Health

Michael T. Compton, MD, MPH¹ and Ruth S. Shim, MD, MPH²



What Are the Social Determinants of Mental Health, and How Are They Different From the SDOH?

The SDOH are societal problems affecting communities, families, and individuals that interfere with achieving optimal health and increase risk for illnesses. In terms of physical health and physical illnesses, extensive research documents the social determinants that underpin chronic diseases like diabetes, cardiovascular disease, and chronic obstructive pulmonary disease, as well as communicable diseases such as sexually transmitted infections (STIs). The same societal problems that comprise SDOH are also social determinants of *mental* health. That is, the determinants that increase risk for diabetes, or for STIs, for example, also increase risk for psychiatric disorders, such as major depressive disorder, and for substance use disorders like alcohol use disorder and opioid use disorder.

In recent years, attention to the concept of the social determinants of *mental* health has been increasing,^{1,2} for several reasons. First, because mental illnesses are so highly prevalent and highly disabling, it makes sense to focus attention on them (especially as mental health is often neglected in conversations about health more generally). In fact, some behavioral health disorders (a term that encompasses both mental illnesses and substance use disorders), like depression, anxiety disorders, bipolar disorder, schizophrenia, and substance use disorders are among the leading causes of disability worldwide.³⁻⁵ Second, behavioral health disorders are very costly. In the United States alone, it is estimated that the annual cost of mental illnesses, including direct costs (like healthcare expenditures) and indirect costs (such as lost work productivity), totals \$467 billion.⁶⁻⁸ Third, although it is difficult to prove, we theorize that the social determinants might have an even more potent effect on mental health and mental illnesses than they do on physical health and physical illnesses. This is partly because the mechanism is relatively easy to trace (from ongoing psychological stress that the social determinants cause to altered physiologic functioning). It also relates to the unfortunate fact that, because of stigma and discrimination against individuals with serious mental illnesses, those individuals tend to experience the very social outcomes (eg, unemployment, housing instability, poor access to health care) that adversely impact course and outcomes. Fourth, the social

determinants are mainly responsible for health inequities, defined as differences in health status that are the result of unjust, unfair, and avoidable social and economic policies,⁹ and also for mental health inequities. Thus, effectively working to address the social determinants of mental health will lead to the reduction and ultimately the eradication of mental health inequities. Finally, as a field, mental health has struggled to embrace prevention. In addition to the usual categorizations of prevention (primary, secondary, and tertiary, as well as the more recent framework of universal, selective, and indicated preventive interventions), the social determinants perspective gives the field of mental health an additional set of lenses for understanding how to engage in the prevention of mental illnesses and substance use disorders, as well as the promotion of mental health.

The social determinants of mental health are societal, environmental, and economic conditions that affect mental health outcomes of populations. Many populations exist, including the entire nation's population, and smaller subsets thereof, such as all citizens of a state or county; all of the patients within a clinic or a health system; all of the students within a school or school district; or all of the employees within a large company or a multinational corporation. Given that the social determinants of mental health affect individuals, and given that individuals congregate in these latter settings (clinics, schools, workplaces), these settings serve as ideal sites for tending to individuals' social needs. At the same time, the greatest impact on mental health will be seen by addressing societal problems at the societal level. Below, we explain how employers will be best suited by engaging in both efforts, within the workplace (with their specific population of employees), and within the broader community and society.

A Conceptual Framework for the Social Determinants of Mental Health

In considering the social determinants of mental health more specifically, we have identified 16 different types of social determinants

¹ Department of Clinical Psychiatry, Columbia University College of Physicians & Surgeons, New York, NY, USA

² Professor of Psychiatry, Department of Psychiatry, Columbia University Vagelos College of Physicians and Surgeons, New York, NY, USA