foundation for
healthy generations

HEALTHY BEHAVIOR ADOPTION WHITE PAPER

Contents

Introduction

The United States spends more on health care than any other nation in the world, yet it ranks poorly on nearly every measure of health status.[1] The Institute of Medicine reports that despite being one of the wealthiest nations in the world, the United States is "far from the healthiest."[2] The same report explains that, in comparison to its peers, the United States fares worse in at least nine health areas, including infant mortality and low birth weight, obesity and diabetes, heart disease, and chronic disease.

Research suggests that five determinants in the following proportions affect people's health status and their contribution to premature death, as illustrated in Figure 1[3].

1. ***environmental exposure (5%),*** such as exposure to toxic conditions and other ecological conditions such as extreme weather;
2. ***health care (10%),*** such as access to quality health care services and comprehensive insurance coverage;
3. ***social circumstances (15%),*** such as socioeconomic status, discrimination, access to healthy food;
4. ***genetic predispositions (30),*** such as family history of heart disease, cancer, and addiction; and
5. ***behavioral patterns (40%),*** such as nutrition, exercise, and tobacco use.[4]

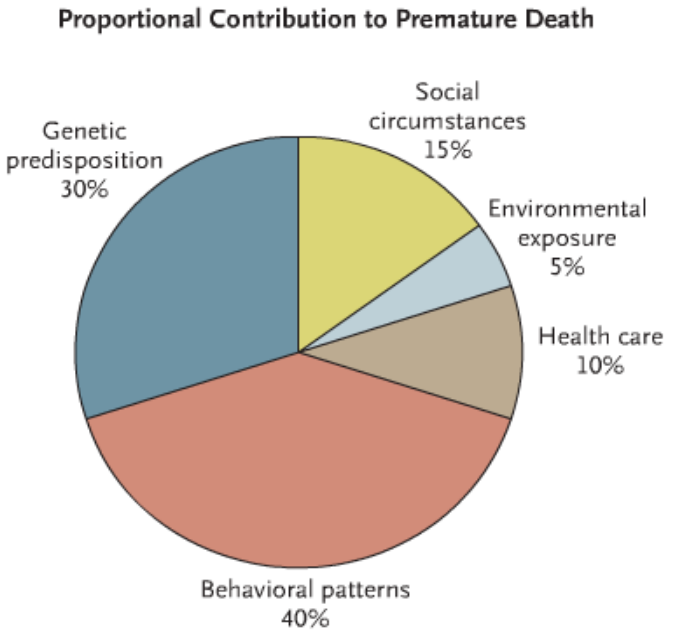

Figure 1. Determinants of Health and Their Contribution to Premature Death.

Source: New England Journal of Medicine, 2007

These proportional determinants help us understand the paradox between health care spending in the United States and the nation's low ranking in health status. The ratio of social to health spending is significantly associated with better health outcomes including less infant mortality, low birth weight, premature death and longer life expectancy.[5] The health care sector is bearing the brunt of an inadequate social service sector. Moreover, research indicates that there is a close connection between people's behavior and the social conditions where they live, work, and play. Social conditions support or inhibit healthy behavior. People are more likely to adopt a healthy lifestyle if the healthy choice is the easy choice.[6]

However, even when healthy choices are readily available, people do not always choose them. Given this challenge, how can we support people to change unhealthy habits? How do we help them make changes that would improve their health? How do we help them maintain those changes?

This paper sheds light on these questions. We conducted an initial literature review from peer reviewed journals to better understand promising approaches to helping people adopt healthy lifestyles. We begin our discussion by describing the ways in which social conditions help or hinder people's ability to adopt healthy lifestyles. We then review a range of evidence about the efficacy of various interventions in helping people adopt and maintain healthy behaviors. Finally, we discuss how this literature can guide practitioners to engage, motivate, and support people to adopt and maintain healthy behavior.

This paper is presented with the understanding that comprehensive, rigorous research studies that tell us what works to create healthy behavior change with all members of the population do not currently exist. Thus, this paper serves as a middle point between rigorous scientific study and practice. By looking at what we do know, we may inform further efforts to influence behavior change and, ultimately, population health. Many books and papers have been written about behavior change. Much of the writing is theoretical, and often proof is anecdotal. Where there is statistical proof, scientific studies often place a precise lens on studying behavior change interventions with very narrow audiences, such as motivational interviewing with HIV-positive African American women or financial incentives for low-income women requiring follow-up care for cervical health. These highly specific studies make it hard to generalize efficacy to a broader population. Therefore, we used less rigorous studies as indicators of promising approaches and have provided an explanatory footnote for those studies that were especially limited or of lesser quality.

The literature revealed the following key considerations for helping people adopt healthy behaviors.

- Adoption of a healthy lifestyle involves an interaction between contextual, individual, and situational factors. As such, behavior change is strongly influenced by environmental and social conditions.
- Effective interventions for healthy lifestyle adoption exist. Some interventions have more conclusive evidence of their efficacy.
- Increasing a person's intrinsic motivation is more likely to lead to long-lasting behavior change.

- Social norms and peer influence have a strong effect on helping people to change unhealthy habits and sustain a healthy lifestyle.
- Health care delivery teams are able to help people improve outcomes and self-management, particularly for people with complex medical conditions.

Health Lifestyles are Strongly Influenced by Environmental and Social Conditions

A person's ability to adopt a healthy lifestyle is influenced by environmental and social conditions.

Surroundings and the built environment encourage or hinder a healthy lifestyle. The environments where people live, learn, work, and play have a profound influence on their health. Environment is a positive force for health when policies and the built environment make it easier for people to make the healthy choice. For example, policies affecting physical activity, access to healthy foods, and the prevalence of tobacco and alcohol products in neighborhoods can promote or discourage behavior associated with cancer and other chronic diseases.[7] Similarly, built environments that facilitate active lifestyles and reduce barriers to physical activity are associated with physical activity and health.[8] Long distances, dangerous traffic, and crime have all been shown to be barriers to children walking or cycling to school, so policies addressing these factors could be a first step in changing the built environment.[9] Other opportunities exist to change the built environment in ways that are more conducive to physical activity, but the available evidence is insufficient to identify which specific changes would have the most impact on physical activity levels and health outcomes.

Similarly, access to healthy food corresponds to healthier eating. Studies show that residents with greater access to supermarkets, or a greater abundance of healthy foods in neighborhood stores, consume more fresh produce and other healthy items than those who do not have access. One study found that for every additional supermarket in a census tract, produce consumption increased 32% for African-American community members and 11% for white community members. These findings are notable because access to healthy food is associated with lower risk for obesity and other diet-related chronic diseases.[10]

Social and physical environments also influence behavioral health. For example, poverty, high levels of neighborhood disorganization (crime, drug-selling, gangs, and poor housing), high turnover of residents, the number of places that sell alcohol, and the availability of drugs are community factors that put youth at risk for substance abuse and delinquency.[11] [12] [13] Researchers have also identified factors in schools that contribute to antisocial and violent behavior including overcrowding, poor building design, portable buildings, high student/teacher ratios, weak, inconsistent adult leadership, the absence of clear rules and school policies governing student behavior, and few allowances for individual differences in the school.[14]

Our social networks affect whether we are healthy or not. The physical environment is not the only factor that contributes to a person's ability to adopt healthy behaviors. Social networks are also influential. For example, a study of the spread of obesity in a large social network over the course of 32 years found that a person's chances of becoming obese increased by 57% if he or she had a friend who became obese. Among pairs of adult siblings, if one sibling became obese, the chance that the other would also become obese increased by 40%. The same trend was seen among married couples: if one spouse became obese,

the likelihood that the other spouse would become obese increased by 37%. This study suggests that social distance appears to be more important than geographic distance within these networks. Although people may share exposure to environmental factors, events, or other common features (e.g., genes) that cause them to gain or lose weight, this study suggests that network phenomena appear to be relevant to the biologic and behavioral traits of obesity.[15]

In addition, the literature shows increasing evidence that social networks are instrumental in influencing behaviors and beliefs, such as what constitutes healthy eating and what is an ideal body weight. One study explores the idea that being obese is socially contagious because social networks influence people's adoption of eating norms and body image norms. Another study found that people are more likely to eat bigger portions of food when observing another person eating large portions, but they are more likely to eat smaller portions if they perceive that the other diner is obese.[16] While more research is needed, it appears that social influence contributes to the obesity epidemic.[17]

The ability to quit smoking is also affected by social networks. Simply put, when people try to quit smoking, they are less successful if the people around them smoke. A longitudinal analysis of unaided smoking cessation found that those who successfully abstained from smoking 1 month into cessation were significantly more likely to report that less than one-fourth of their friends and acquaintances smoked cigarettes (80% of abstainers compared to 54% of non-abstainers). In addition, a significantly smaller proportion of abstainers versus non-abstainers lived with people who smoked (26% versus 72%).[18] Studies also show that the support offered by partners, friends, and colleagues (both generally and as it pertains to abstaining) appears to predict stress in the person stopping smoking.[19] This finding is important because myriad studies have shown that between 35% and 100% of people report they relapsed in their attempt to quit smoking due to stress or other negative affect.[20] Moreover, social support's impact on the person abstaining depends upon the timing of the support and whether the person attempting to quit perceives it as positive or negative. Multiple studies show that positive support is most important during the initial stages of quitting.[21]

The literature on adolescent substance abuse reveals similar findings regarding the effects of social networks on personal behavior. One study found that young people's alcohol use behaviors are strongly predicted by their friends' alcohol use behaviors.[22] Another study examined the degree to which a high-quality social network with more protective factors can mediate the effects of tobacco use on alcohol and other drug use, finding that positive social networks can, in part, mediate tobacco use as a "gateway" to other substance use.[23] In another study, researchers found that the likelihood of youth drinking among young men increased when the young people lived with adults who had a history of drunkenness, again demonstrating the significant influence of social networks on behavior.[24]

Numerous studies suggest that the quality of a person's social relationships predict a person's health and morbidity. For example, one meta-analysis of 148 studies found that those patients with stronger social relationships were 50% more likely to survive life-threatening illnesses, and this finding was constant across age, sex, initial health status, cause of death, and follow-up period.[25] Another study found that social relationships have a causal impact on health, with isolation serving as a risk factor for mortality. The

authors further suggest that "social relationships, or the relative lack thereof, constitute a major risk factor for health – rivaling the effects of well-established health risk factors such as cigarette smoking, blood pressure, blood lipids, obesity, and physical activity."[26]

The literature clearly suggests that physical environments and social networks have a strong influence on a person's behavior and whether or not they adopt a healthy lifestyle. Exploring ways to make the healthy choice the easy choice and increasing positive influences within social networks are both important ways to create the context for healthy behavior. However, these two factors alone are insufficient to ensure that people will adopt healthy behaviors. We will now examine interventions that have been shown to help people adopt a healthy lifestyle.

Interventions for Healthy Lifestyle Adoption

This section of the paper discusses five interventions that show varying degrees of efficacy in helping people adopt healthy lifestyles, including financial incentives, worksite-based interventions, stage-based versus non-staged based interventions, motivational interviewing, and peer support.

Financial incentives. The literature suggests that financial incentives can be effective in motivating people to adopt certain simple healthy behaviors, such as vaccinations, cancer screenings, and pre- and post-natal visits.[27] Financial incentives also appear to be effective in bringing about a brief, infrequent, or one-time change in behavior.[28] Evidence is insufficient, however, to show that financial incentives are as effective in producing complex and sustainable behavior change like smoking cessation.

Financial incentives have shown promise when direct costs appear to be a barrier to behavior change, such as the cost of nicotine replacement therapy. In addition, offering financial incentives appears to communicate the importance of a behavior. For example, when transportation vouchers were provided to socio-economically disadvantaged women after abnormal cervical smears, follow-up rates improved even when people did not use the vouchers. Study participants explained that the vouchers communicated to them that getting follow-up care was important.[29] Financial incentives also appear to be the most effective in helping people adopt healthy behaviors when the rewards are large and are provided soon after the desired behavior has been completed.[30]

Worksite wellness programs. Wellness programs implemented in a work setting are a common intervention intended to help people adopt healthy behaviors and improve their health status. However, the literature provides mixed evidence as to whether worksite wellness programs achieve the results they are designed to achieve. Two systematic reviews of worksite wellness programs found some positive changes, such as improved diet.[*] [31] [32] Another found that worksite wellness programs appear to increase the likelihood of abstaining from smoking and reduces the frequency of alcohol use.[33] However, the same study found that worksite wellness programs appeared ineffective in lowering blood pressure, blood sugar, or cholesterol – three significant risk factors for disease.[34] One comprehensive review of 33 studies found that half led to improved diet and exercise-related outcomes, but effects were small.[35]

[*] One of these reviews, however, suggested a significant risk for bias in this change due to self-reporting.

Worksite wellness interventions are very common: in 2009 at least 58% of employers provided at least one wellness program.[36] Unfortunately, a 2013 study found that employee participation in worksite wellness programs is limited: while 46% of workers participated in an initial screening or assessment, only 20% of those identified for a direct health intervention chose to participate.[37] This finding implies that making wellness programs available in the workplace is not enough.

Another study found that the most impactful worksite wellness programs are comprehensive in nature, reaching a large number of employees. They not only involve health-related interventions such as a "Biggest Loser"-type competition, but the best programs address formal policy, environmental, and operational changes within the workplace to make the healthy choice the easy choice, such as instituting a policy allowing workers to take flexible breaks so they may exercise during their work day.[38] Characteristics of successful worksite wellness programs include:

- a well-defined theoretical model and behavior change principles;
- interventions at multiple levels of the organization (e.g., individual, organization, community and policy);
- programs tailored to the workplace culture and constraints;
- incentives to motivate employees to engage in healthy practices; and
- long-term involvement that supports program delivery and sustainability.[39]

Stage-based interventions versus non-stage-based interventions. The literature shows mixed evidence on whether interventions applied around the stages-of-change theory are any more or less effective than non-stage-based interventions. The majority of studies we reviewed provided little support for the efficacy of stage-based interventions. One study did find that individuals early in the change process may be helped in adopting new physical activity behaviors by policies that provide information. Further, the study found that individuals who are preparing to change their behavior may be positively influenced by policies that provide opportunities for change. However, intrinsic motivation needs to be already present in the person or be triggered by the policy.[40]

The majority of other studies reviewed offered little evidence of the efficacy of stage-based interventions, particularly in their application to dietary behavior and physical activity. Unlike smoking cessation (for which the stages-of-change model was developed), a continuum exists between eating only unhealthy foods and eating nutritiously or being completely physically inactive and exercising, which may explain why a stage-based intervention is not efficacious in changing these behaviors. For example, one analysis of 29 stage-based trials that included 13 physical activity interventions found no effect on the level of physical activity.[41] Another review of five studies of stage-based interventions in overweight/obese adults found no conclusive evidence for sustainable weight loss even though the intervention tended to produce changes in physical activity and dietary intake.[42] Even among smoking cessation interventions for which the stages-of-change model was originally developed, the literature does not offer promising evidence that stage-based interventions are working. One analysis of 23 randomized controlled trials studying the effects of stage-based smoking cessation interventions found stage-based interventions are not more effective than non-stage-based, or no intervention, in changing smoking behavior.[43]

Motivational interviewing and counseling. Unlike interventions built around the stages-of-change model, the literature contains relatively strong evidence that motivational interviewing and counseling approaches are effective in helping people adopt healthy behaviors such as healthy eating and physical activity. Studies and meta-analyses show that motivational interviewing appears to create a significant reduction in body weight in overweight and obese patients;[44] [45]statistically significant changes in adiposity, blood pressure, and cholesterol;[46] and significant effects in body mass index, total blood cholesterol, systolic blood pressure, blood alcohol concentration, and standard ethanol content.[47]

An analysis of controlled studies found that, when used in connection with other therapies, motivational interviewing is as effective as most treatments for alcohol and drug problems, and often quicker and less expensive. Motivational interviewing has also been found helpful in treating bulimia, persuading schizophrenic patients to continue taking antipsychotic drugs, and encouraging people with diabetes and hypertension to change their diet and exercise habits.[48]

Where motivational interviewing may be less effective is in helping people maintain behavioral or physiological changes long term.[49] Moreover, the ideal dose of this intervention appears to be affected by the person conducting the motivational interview: in a review of 16 studies assessing weight-loss counseling in overweight and obese people, when motivational interviewing was conducted by a primary care physician or non-physician, the higher the intensity, the better the results. When the intervention was delivered by a dietician, dose did not matter.[50] This finding may suggest that a person seeing a specialist (i.e., dietician) to lose weight may be more intrinsically motivated to change than a person who is receiving basic dietary advice during a routine primary care visit.

Social and peer support. We established earlier that the literature shows that people's social networks can affect their adoption of healthy or unhealthy behaviors and that a lack of social connection and support appears to have a causal impact on morbidity and mortality. Not surprisingly, the literature also demonstrates that social and peer support interventions show promise in helping individuals adopt a variety of healthy behaviors. One meta-analysis suggests that social encouragement positively affects behavior change.[51] Another found that peer-support telephone calls were associated with a variety of healthy behaviors, such as increased mammography screening, greater continuation of breastfeeding 3 months postpartum, and changes in diet 6 months after heart attack.[†] [52] Table 1 outlines other studies that suggest social and peer support are emerging as effective interventions in helping people adopt healthy behaviors.

[†] The authors of this paper cautioned readers that not all studies were high quality.

Table 1: Social and Peer Support Interventions

Behavior or condition	Findings
Physical activity	Community-based social support interventions delivered in a new social network or in an existing network outside of the family (such as the workplace) were effective in helping people become more physically active in terms of duration and frequency. These interventions also led to increased aerobic capacity, improved fitness level, decreases in body fat, and increased knowledge of exercise.[53]
Smoking cessation	Smoking cessation interventions that improve social support may be more important to people who are less likely to access such support informally, such as people from disadvantaged groups.[54]
Diabetes	Some adults living with diabetes appear to benefit from peer support, but additional research is needed.[55]
HIV and Substance abuse	Peer interventions show some promise in positive changing sexual risk behavior, attitudes, and cognition, as well as HIV knowledge and substance abuse.[56]
Improved health care practices	Direct social support to middle-aged and older adults with type 2 diabetes led to improved medication adherence and going to health care appointments, which was associated with improved health outcomes over time (though this trend was not significant).[57]

Peer support interventions use one of the most powerful of human motivations – the longing for connection – to motivate, encourage, and support behavior change. Peer-based strategies are based on the premise that regularly gathering a small number of people with a common goal reinforces a new pattern of behavior and new identity and provides a structure for a new routine while holding its members accountable for failure.[58] Peers teach others by sharing their own personal history.[59] As one person explained, "I feel an identity with a new way of life. I can be like my friend whose life has changed."[60]

As noted above, social networks appear to be a factor in the spread of obesity. It may be possible to use social networks to slow the spread of obesity and other health risks. Smoking- and alcohol-cessation

programs and weight-loss interventions that provide peer support — that is, that modify the person's social network — are more successful than those that do not. [61] [62] [63] [64] People are connected, and so their health is connected. Because are rooted in social networks suggests that both healthy and unhealthy behavior might spread through various social ties.

The characteristics most commonly cited as those that facilitate the success of peer-to-peer interventions are as follows.

- Peer support workers need appropriate initial training and ongoing training.[65] [66] [67]
- The most effective peer-to-peer models are those that involve peer supporters who have experienced similar problems and challenges as the person seeking support.[68] [69] [70]
- Having the same or similar sociocultural background is important.[71] [72]
- In some circumstances, such as breastfeeding initiation and continuation, the timing of both individual and group peer support is important to the efficacy of the peer intervention.[73]

Increasing Intrinsic Motivation Is More Likely to Lead to Long-Lasting Behavior Change

An important aspect of healthy behavior adoption is the sustainability of the behavior. There is solid evidence that intrinsic motivation to adopt a new behavior is more likely to lead to long-term behavior change as compared to extrinsic motivators or information alone.[74] The more important and deeply rooted a behavior is, the less impact information has. Often people already have the information. They know that eating junk food, smoking, and being sedentary are unhealthy behaviors. The problem is getting them to internalize it.[75] For a deeply engrained, habitual behavior to change, people must believe change is possible. A meta-analysis of 47 experimental tests of the relationship between intention and behavior found that a medium-to-large change in intention led to a small-to-medium change in behavior.[76] This analysis also found that intention was more likely to change behavior when people had control over the behavior, whether the control was perceived or actual. These findings are important, in that they show that intrinsic motivation (intention) has a significant impact on behavior, but the effect is somewhat smaller than correlational studies had suggested in the past.

Factors have been examined that enhance, versus undermine, intrinsic motivation, self-regulation, and well-being. There appear to be three innate psychological needs – competence, autonomy, and relatedness – which, when satisfied, yield enhanced self-motivation and mental health and, when thwarted, lead to diminished motivation and well-being.[77]

Health Care Delivery Teams Are Able to Help Patients Improve Outcomes and Self-Management

More and more, evidence points to the fact that high-cost, medically complex patients with a history of chronic conditions improve their self-management and ultimately, health outcomes when their care is coordinated across a health care team. While these teams include traditional members of the health care delivery workforce (e.g., physicians), they also include a culturally matched peer-type support, such as a community health worker, case manager, or health coach. Together, team members work with the patient to develop an individualized care plan that is monitored based on the specific needs of the individual. For

example, for the most challenging cases, the health coach contacts patients daily. This team-based approach is showing promise in improving outcomes and reducing costs. In fact, one study of health care teams found that patients had better self-management, both in terms of smoking cessation and medication adherence.[78] The same study found improved clinical outcomes (better control of hypertension, lower cholesterol levels, and better blood glucose control) as well as higher overall patient satisfaction. Notably, although the patient received more frequent case management and follow-up, total health care spending was significantly lower during the 12 months after enrollment in the program compared to the 12 months before enrollment (4% versus 31%); moreover, cost increases for study participants were lower than the 12% average increase seen among the general population of employees studied. Utilization indicators also improved, including reduction in inpatient days, length of stays, admissions, readmissions within 30 days of discharge, and emergency department utilization.

In the study of a similar model implemented by Boeing, high-cost, high-risk individuals were assigned to a care team that included both a dedicated physician and a registered nurse care manager. These care managers followed up with participants regularly to ensure they were following through on all elements of their care plan, including attending appointments and following a nutrition and exercise plan. Notably, patient-reported absenteeism from work declined by 56% as a result of the program, and per-capita costs were reduced by 20%.[79]

Similarly, a Healthy Weight Initiative developed by Boston Medical Center used multidisciplinary teams to address the health needs of obese children. Teams included a physician, nutritionist, and case manager who worked together with the child and family to address behaviors causing obesity. Again, this team-based approach found that participating children reduced or stabilized their BMI, reduced screen-time and intake of sweetened beverages, and increased physical activity and consumption of fruits and vegetables.[80]

Discussion

We can see from the literature that physical environments and social networks can influence the degree to which people adopt healthy lifestyles and that the quality of a person's social connections can predict his or her mortality. We have also reviewed multiple interventions with varying degrees of efficacy in helping people change their behavior. This paper described in its introduction that the majority of the studies we have reviewed have been tested with very specific sub-populations and as such, may not be generalizable to a broader population. While we accept that we do not have the magic formula for helping people adopt and maintain the behaviors that will help them improve their health and that no single formula may exist, we do have preliminary evidence that can inform practice. Of course, this inspires the question, "For whom?" This paper does not suggest that people with co-morbid conditions (such as someone with multiple chronic illnesses and a co-occurring mental health and addiction disorder) should be treated the same as people who are in generally good health but are facing health risks, such as someone who has been gaining weight and has a family history of type 2 diabetes. Indeed, these vastly different populations likely require vastly different interventions.

A challenge with the concept of behavior change is that it traditionally places the burden for change

squarely on the shoulders of the individual. While individual motivation and action do matter, we know that the individual may well be more successful if we can surround them with the conditions that will help make the healthy choice easier, particularly when we combine behavioral interventions with environmental and social supports. We know that creating the conditions for health is not enough, but if these conditions do not exist, healthy behaviors are even more challenging to adopt. This paper outlines some suggestions that we believe merit more exploration.

1. Focus on health rather than just health care. The Affordable Care Act's triple aim calls for better care for individuals, better health for populations, and lower per-capita costs. The data related to social networks, social norms, and peer support is compelling and has the chance to improve progress toward meeting the triple aim by supporting people's behaviors, whether those relate to a community health worker helping an individual manage and adhere to a medication regimen, thereby reducing unnecessary hospitalizations; or whether a person's social connections help him or her adopt healthier behaviors around tobacco cessation, substance misuse, and nutrition.

According to the World Health Organization, "Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmary." This definition suggests that access to health care is an important part of health for the purpose of addressing disease or illness, but health care alone cannot create health.

2. Peer support appears to provide a compelling model from which we can equip a new workforce to help people become healthier. Research suggests that social networks influence a person's health and that social norms and healthy behaviors are, in part, transferred through social connections making peer support interventions a compelling model for helping people adopt healthier behaviors. This model appears to have power within both professional settings (i.e., health care teams integrating community health workers or health coaches with primary care physicians and specialty care providers) and lay settings (i.e., peer supports offered by a community member). For a deeply engrained, habitual, unhealthy behavior to change people must believe change is possible. Often that belief emerges with the help of a group – a daily gathering of likeminded friends to help find the strength to overcome obstacles. This intersection between intrinsic motivation and peer support is full of potentially powerful behavior change possibilities.

We are particularly interested in how we can integrate peer support efforts with other evidence-based or promising practices. For example, how can we equip neighborhood-based community health workers with motivational interviewing techniques that will help them more effectively work with their peers? How can we infuse peer-based supports with other evidence-based counseling strategies? For example, the literature suggests that behavior change is helped when people identify what triggers their unhealthy behavior and establish rewards for successful behavior.[81] [82] In this way their small successes fuel transformative change.[83] Similarly, people are more successful at changing their behavior when they create a structure or routine within which the healthy behavior becomes automatic.[84] Can peers use these strategies successfully to support people to change their behavior in ways that will improve their health?

Finally, we are interested in exploring the ways in which peer-based interventions can utilize scientific

information to develop effective culturally and linguistically appropriate interventions that could improve community health. For example, community health workers may be able to design interventions that mitigate against the impact of exposure to Adverse Childhood Experiences (ACEs) or reduce intergenerational ACE transmission.[85]

3. Developmental evaluation helps us continuously assess what is working and adjust what is not. While evidence should inform practice, we assert that we know something about what is working, and we should build upon that, allowing practice to inform evidence. Rather than jumping straight to an outcome evaluation that will only offer a narrow review of a highly specialized intervention for a specific condition and a precise group of people, developmental evaluation allows us to test strategies and adjust them in real time to continue to assess their promise in helping people adopt healthy behaviors and, ultimately, improve people's health. We believe that there will always be the need for the utmost scientific rigor, but topics as complex and challenging as influencing people's long-lasting adoption of healthy behaviors allow for practice-based interventions as an important feedback loop to inform more rigorously tested hypotheses.

4. More research is needed. This white paper is a work in progress. The topic of behavior change is broad, and we have only begun to scratch the surface to understand which practices may have the most potential to support people in adopting healthy behaviors. We will continue our review and to update this paper to reflect new learning.

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