What is the Value on Investment (VOI) for Diabetes and Hypertension Programs at the Workplace?

A Technical Report and Employer Guide

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EXECUTIVE SUMMARY

The COVID-19 pandemic has highlighted the high burden of chronic disease in the United States, and the need for workplace health promotion programs to address the underlying health conditions that put working-aged Americans at greatest risk.

In this study, conducted by the Johns Hopkins University School of Public Health with support from Transamerica Institute[®], we examined research compiled by the Centers for Disease Control and Prevention (CDC) and the Community Preventive Service Task Force (CPSTF) which formed the basis for the CDC Worksite Health ScoreCard. We also conducted interviews and focus groups with subject matter experts (SMEs) drawn from academic, corporate, provider, and consultant disciplines.

This report summarizes the evidence base and reviews the effectiveness and value on investment (VOI) of workplace-based programs directed at two common and costly health conditions: diabetes and hypertension. In an easy-to-use guide, it addresses this key question: *Where should employers invest their scarce resources to achieve* the greatest health improvement impact at a reasonable cost – that is, where is the biggest "bang for the buck?"

In our findings, we identified three broad categories of workplace interventions focused on diabetes and hypertension:

- Foundational: awareness building campaigns, assessments, screenings, and health education;
- 2) **Interactive:** engagement strategies that facilitate behavior change; and,
- 3) **Cultural:** environmental supports and health promoting workplace policies and norms.

To achieve the best health and financial outcomes from workplace diabetes and hypertension programs, employers are advised to consider a holistic approach that includes initiatives from each of the above categories. While there is compelling evidence that individual interventions can indeed achieve positive health impacts, it is through combining the effects of multiple interventions that employers can achieve the best VOI.

BACKGROUND

As this report was being prepared, the world was in the midst of a global pandemic. By early 2021, the U.S. had witnessed a loss of over half million lives due to the COVID-19 virus. However, the incredible burden of COVID-19 in the U.S. cannot be viewed in isolation, as simply the unlucky product of this novel coronavirus. It must be examined through a wider lens of population health.

It has been shown that individuals with chronic conditions, including obesity, type 2 diabetes, hypertension, and heart disease, are at increased risk of experiencing severe complications or death from COVID-19.¹⁻⁶ Considering the poor outcomes of many COVID-19 patients, it is clear that we need to pay closer attention to the health and well-being of Americans in general, and most especially to the pervasive non-communicable diseases (NCDs) that have facilitated this perfect storm.

With the pandemic as backdrop, the question on many employers' minds is—or should be— "What can my organization do to reduce our workers' risk of developing chronic disease conditions that worsen outcomes from COVID-19?" One answer is to bolster workplace health promotion programs (also known as wellness programs, or health and well-being programs) as preventive complements to disease management.

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Among the most common programs offered at the workplace are those addressing hypertension and diabetes. There is a growing consensus among employers that evidence-based workplace health promotion programs can be effective in improving workers' health, stabilizing health care spending, and enhancing performance. However, these programs need to "work" and be worth the money spent on them. In other words, they must offer a good value-on-investment (VOI) for employers.

With support from Transamerica Institute[®], we offer this report as a guide for employers on the VOI of workplace programs with a specific focus on hypertension and diabetes. Our analysis is built on a strong evidence base assembled by the Centers for Disease Control and Prevention (CDC) and the Community Preventive Services Task Force (CPSTF) housed at the CDC. The report summarizes the evidence base and offers an easy-to-use guide to hypertension and diabetes workplace programs. The key question addressed in the report is: Where should employers invest their scarce resources to achieve the greatest health improvement impact at a reasonable cost – that is, where is the biggest "bang for the buck"?

HYPERTENSION AND DIABETES

The guide is focused on two chronic conditions that affect a large number of workers across age, gender, race, ethnicity, and job type.²⁰ Because of their high prevalence and related comorbidities, hypertension and diabetes are costly for employers and often lead to more serious health problems, including heart disease and stroke.²¹ Diabetes and hypertension have been shown to increase the severity of COVID-19 infections, disproportionally affecting "essential" workers who are more likely to be members of racial and ethnic minorities, immigrants, low wage earners, and hold jobs where physical distancing is almost impossible (e.g., in service and manufacturing industries).^{6, 22}

Hypertension

Nearly half of adults in the U.S. (108 million, or 45%) have hypertension, a condition that puts them at higher risk for heart disease and stroke, which are among the leading causes of death in the U.S.²³ In 2018, hypertension was a primary or contributing cause of death for nearly 495,000 people in the U.S.; more than 1,300 deaths a day.²⁴ Unfortunately, studies suggest that only about one in four adults (24%) have their hypertension under control.²³ One reason hypertension is so poorly controlled is that people are not always aware that their blood pressure is high. In fact, hypertension is called the "silent killer" because there are usually no signs or symptoms, and detection most often requires screening by a health professional.⁵

Hypertension costs the U.S. economy \$53.2 billion each year.²⁵ This total includes the cost of healthcare services, medicines to treat hypertension, and missed days of work.⁵ Much of this financial burden is borne by employers.

On a positive note, managing high blood pressure is one of the most cost-effective methods of reducing premature cardiovascular disease and death.^{6, 15} Each year in the U.S., 14,000 lives would be saved for each 10% increase in hypertension treatment.^{3, 26} Because of this, both the U.S. Preventive Services Task Force and the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure recommend blood pressure screening for all adults age 18 and older at least once every one or two years depending upon risk level.^{4, 6, 7} The National Commission on Prevention Priorities gives hypertension screening a score of 7 out of 10 in terms of cost-effectiveness and disease prevention.¹⁶



Diabetes

More than 34 million people in the U.S. have diabetes, and 88 million adults—over a third—have prediabetes.²⁷ Prediabetes is a health condition where blood glucose levels are higher than normal, but not high enough for one to be diagnosed as having the disease.²⁸ In the last 20 years, the number of adults diagnosed with diabetes has more than doubled as the American population has aged and overweight and obesity have become more prevalent.²⁹ Moreover, the health implications are substantial. Diabetes is the seventh leading cause of death in the U.S.³⁰ The risk of death from heart disease for adults with diabetes is higher than for adults who do not have diabetes.³¹

Medical costs for those with diabetes are twice as high compared to those who do not have the illness. Nationally, medical costs and lost work and wages for people with diagnosed diabetes total about \$327 billion each year.* Employers share a large part of these costs, which may be seen in the form of increased insurance premiums, lower employee productivity, and increases in short- and long-term disability claims.^{32, 33}

Here, too, employers can introduce interventions that make a meaningful difference. It is estimated that about 1 in 5 individuals with diabetes are not aware they have the condition, and more than 4 in 5 with prediabetes are unaware they have it. Lifestyle changes and appropriate medical care provided through a diabetes prevention program can reduce the incidence of type 2 diabetes by 58% in high-risk adults.³⁴ Therefore, screenings for high blood glucose have been shown to be cost-effective, particularly when they target high-risk populations such as obese individuals or older persons.³⁵

^{*} This translates to a cost burden of \$237 billion in direct medical costs including lost wages for those diagnosed with the disease, and indirect costs include increased absenteeism (\$3.3 billion) and reduced productivity at work (\$26.9 billion) for employees.²⁷

APPROACH

To help employers best target workplace programs for hypertension and diabetes, we reviewed the scientific literature on the topic, held roundtable discussions with subject matter experts (SMEs), and collected case studies of "real world" programs.

Literature Review

Our examination of workplace programs addressing hypertension and diabetes relied primarily on an extensive review of scientific articles conducted by the CDC and Transamerica Center for Health Studies[®] (TCHS), a division of nonprofit Transamerica Institute[®].^{36, 37} The CDC review was organized by the CPSTF and led to the development of a widely available organizational health assessment called the CDC Worksite Health ScoreCard. The TCHS analysis, which was also based on a scientific literature review, resulted in the release of an employer-friendly handbook and *Harvard Business Review* article.^{37, 38}

To support employer decisions about which hypertension and diabetes program offers the best VOI, we applied the scoring methodology used for the CDC Worksite Health Scorecard that rated each intervention as "good," "better," or "best" based on the intervention's impact on health outcomes and the strength of the scientific evidence. Where available, we also referenced the cost and cost-effectiveness of interventions. (The full literature review summary tables with associated references and additional information can be found in Appendix A.)

We then organized interventions into three broad categories: 1) *foundational* – awareness building campaigns, assessments, screenings, and health education; 2) *interactive* – engagement strategies that facilitate behavior change; and 3) *cultural* – encompassing environmental supports and health promoting workplace policies.

Subject Matter Expert Panel

Following our initial assessment of the literature, we brought together a group of subject matter experts (SMEs) drawn from academia, government, private businesses, and consulting firms. We sent them the list of interventions, referenced research articles, and ratings and asked them to review the materials and offer feedback. (See Appendix B for the participant list). Specifically, we asked the panelists: *"Where would you invest scarce organizational resources to achieve the greatest health impact at a reasonable cost?"* We also asked them their opinions on how to best deliver the interventions and whether they could point to case studies of effective programs.

FINDINGS

Foundational Category: Increasing Awareness

A foundational step in any workplace program is to provide employees with opportunities to assess their own health status, identify needs, become better informed, and become motivated to take action. This begins by administering a confidential health risk assessment (HRA), which, once completed, provides instantaneous feedback on potential health risk factors and specific steps one can take to reduce those risks. Feedback can come in the form of motivational messages from coaches, educational materials, and specific guidance on ways to improve health (e.g., eat a healthy diet, exercise regularly, get a good night's sleep), reduce health risks (e.g., quit smoking, monitor weight and blood pressure, manage alcohol consumption), or treat existing health problems (e.g., take prescribed medications to reduce high glucose or blood pressure levels).³⁹

An HRA is often accompanied by confidential biometric screenings (on-site, at a mobile clinic, or in a physician's office) that measure weight, blood pressure, blood glucose, blood lipids, and other clinical indicators. These are followed by verbal or written feedback, and, if necessary, referral to a health care provider. This is further supported with educational materials such as brochures, pamphlets, links to websites, or videos. (See Table 1.)

Intervention	Health Impact	Cost*	Value on Investment (VOI)
Health Risk Assessments (HRAs) with feedback and referral	× • •	\$ to \$\$	$\checkmark\checkmark\checkmark$
Biometric screening with feedback and referra	il 🎔 🎔	\$ to \$\$ per participant	$\checkmark \checkmark \checkmark$
Free onsite blood pressure monitoring	* * *	\$ to \$\$	$\sqrt{\sqrt{2}}$
Educational materials	۲	\$	~
Key: Health Impact: ♥ = small Cost: \$ = < \$50		♥♥♥ = large \$\$\$ = \$101-400 \$ \$ \$\$\$ = best	5\$\$\$ = \$401+

Table 1. Foundational Category: Increasing Awareness

Awareness building campaigns are the cornerstone of effective workplace programs, but on their own are usually insufficient in achieving wide-scale workforce health improvements. For that, more intensive interactive engagement is needed.

Interactive Category: Increasing Engagement

Through interactive campaigns, employees are provided ways to engage in practices to achieve their personal health goals. Newer engagement campaigns use automated smartphone apps or artificial intelligence (AI) virtual education sessions. Interactive apps promote physical activity, healthy eating, better sleep, medication compliance, and stress management. Other interventions may leverage on-line platforms, in-person or virtual lifestyle coaching, pre-packaged self-management guides, and social networks. To complement these interactive offerings, employers need to provide comprehensive medical benefits and ready access to affordable, high-quality providers, along with needed treatment services, medications, and supplies. (See Table 2.)

Intervention	Health Impact	Cost*	Value on Investment (VOI)
Interactive educational programming	***	\$ to \$\$\$ per participant	$\checkmark\checkmark\checkmark$
Targeted intensive lifestyle coaching/counseling	***	\$\$\$ to \$\$\$\$ per participant	$\checkmark\checkmark\checkmark$
Targeted self-management programs for diabetes and hypertension control	***	\$\$\$ to \$\$\$\$ per participant	$\checkmark\checkmark\checkmark$
Pharmacy-based intervention	***	\$ to \$\$\$\$ per participant	$\checkmark\checkmark\checkmark$
Benefits plan coverage	 ♥ ♥ (diabetes) ♥ ♥ ♥ (hypertension) 	\$ to \$\$\$\$	$\checkmark\checkmark$
Key: Health Impact:	♥ = sufficient ♥ = \$51-100 \$\$ ✓ = better ✓	♥♥ = large \$\$ = \$101-400 \$\$\$. √✓ = best	\$ = \$401+

Table 2. Interactive Category: Increasing Engagement

Culture Category: Health Promoting Policies

For the above initiatives to be successful, workplace programs must be grounded in a culture of health. This includes enacting health promoting polices (e.g., flextime, encouraging participation in diabetes education while on the clock), physical supports (e.g., on-site fitness facilities, health educators, wellness champions, sharps containers, cafeterias and vending machines offering healthy meals or snacks, onsite pharmacies), and social supports (e.g., affinity groups, team building exercises, supervisor encouragement, and co-worker involvement). The main purpose of building a culture of health is to create an environment where healthy choices are easy and the default. (See Table 3.)

Intervention		Health Impact	Cost*	Value on Investment (VOI)
Environmental and social supp	port	**	\$ to \$\$\$	$\checkmark\checkmark\checkmark$
Flextime		**	\$	$\checkmark\checkmark$
Access to places for physical a	ctivity	***	\$ to \$\$\$\$	✓ to ✓ ✓ ✓
Encouraging stairwell use		***	\$	$\checkmark\checkmark\checkmark$
Managing stress in the workpl	ace	* * - * * *	\$ to \$\$\$\$	✓ to ✓ ✓ ✓
Workplace availability of healthy foods		* * - * * *	\$ to \$\$\$	$\checkmark\checkmark\checkmark$
Key: Health Impact: ♥ Cost: \$ VOI: ✓ * Cost is per eligible per year unlet	= small ♥¶ = < \$50 \$\$ = good ✓√	■ = sufficient ● = \$51-100 \$\$\$ ✓ = better ✓ ✓	♥ ♥ = large \$ = \$101-400 \$\$ 	\$\$\$ = \$401+

Table 3. Culture Category: Health Promoting Policies

FEEDBACK FROM SUBJECT MATTER EXPERTS

The SMEs emphasized the need for a holistic framework rather than just trying to address any one disease or risk factor in isolation. They noted that providing information about individual interventions is helpful as no single program, activity, service, or policy is effective by itself.

One SME commented, "Flextime, access to physical activity, stairwell use, and access to healthy food all contribute to a supportive culture, but these initiatives need to be done in combination; in isolation, each would have limited impact."

Another SME offered, "Interventions, particularly clinical intensive counseling and personalized treatment plans, need to address comorbidities including mental health problems, heart disease, and back pain, as well as financial stress."

Others commented that even when an employer is laser-focused on a particular health problem like hypertension or diabetes, the program needs to address the whole person because other risk factors, existing illnesses, and upstream social determinants of health all play a role in impacting a person's

health. For example, asking workers to exercise more, eat a healthy diet, or schedule preventive care visits may not work if workers live in unsafe neighborhoods, cannot afford fresh fruits and vegetables, or lack transportation to medical appointments. As one expert stated, *"Cultural elements need to be combined using best practices within the context of leadership and peer support, conducive policies, and a safe and inviting physical environment."*

To summarize, the SME panelists expressed concern about offering piecemeal interventions when an integrated, multilayered approach is needed – one that is consistent, reinforcing, comprehensive, and tailored to employees' particular physical, emotional, and social circumstances.

Two case studies were offered by the SMEs: one from the City of Austin Texas and the other from the American Cast Iron Pipe Company. (See Appendix C.)

WHAT ABOUT COSTS?

Typically, workplace interventions are not purchased à *la carte*, and so it is often difficult to lock down a price for any single program element or targeted condition. Instead, employers pay for pre-packaged programs offered by health plans and vendor partners that may be labeled under an umbrella term of health, lifestyle, case, or disease management.

Intervention programs usually begin with an assessment and screening, followed by awareness-building programs that include links to web pages, brochures, self-help guides, videos, posters, and leaflets. Sometimes, there are short-term campaigns focused on a rotating set of topics such as heart health, smoking cessation, stress management, and physical activity.

The costs for these programs may include staff salaries, operational expenses, direct payments to the health plan or vendor, or capital expenses. However, there are many high-quality awareness building programs available free or at low cost through local community or national organizations such as American Heart Association (AHA), American Diabetes Association (ADA), the Centers for Disease Control and Prevention (CDC), National Heart, Lung, and Blood Institute (NHLBI), or National Institute for Occupational Safety and Health (NIOSH). Costs are generally reported on a per-participant basis for such activities such as screenings, counseling, and fitness center use but may also be calculated on a per eligible per year (PEPY) basis when spread across an entire workforce, such as when providing educational materials, access to apps, or blood pressure monitoring hardware.

FURTHER INSIGHTS INTO COSTS

A survey conducted in July 2019 by the National Business Group on Health and Fidelity Investments found that large employers (N=164) spent about 3.5% of their healthcare budgets on well-being programs, but most of that money was spent on incentives (40%) and program administration (31%) –

not on staff, communications, environmental support, evaluation, or "other services."⁴⁰ Further, the survey revealed that the average financial incentive for wellness programs was \$762 – an amount often funded by charging employees higher insurance premiums, deductibles, or co-payments for medical treatment services to defray the cost of the incentive.

Informal discussions with the SMEs, health and well-being providers, and others in the wellness community revealed that robust workplace programs that include the three categories highlighted in this guide (awareness building campaigns, interactive programs, and a supportive culture of health) cost an average of \$250-\$450 per participant per year. This amount excludes financial incentives employers might pay to encourage program participation, which, in the opinion of experts, should be minimal (about \$100) and only applied to increase engagement.

Another source of cost data comes from the Health Enhancement Research Organization (HERO).⁴¹ Data gathered from 123 organizations completing the HERO Scorecard found that employers spent an average of \$403 (median amount \$180) per employee per year on their health and well-being programs (excluding outlier values at the top and bottom fifth percentiles).⁴²

DETERMINING COST-EFFECTIVENESS

Establishing a program's cost provides information about affordability and feasibility, but not necessarily whether a program provides sufficient value relative to its costs: its VOI. Determining value from health promoting interventions is challenging because of the variety of factors considered in the calculation. In health economics, interventions are assessed in terms of their cost-effectiveness, meaning, "the money spent offers good value in terms of the benefits and usage, and worth at least what is paid for them."⁴³ While cost-effectiveness analysis is nuanced, and needs to consider the variety of inputs, outcomes and perspectives, it generally boils down to answering the question: What is the value of health gain for the money spent?

In the health economics literature, where medical treatments are compared to one another, health value is measured in quality-adjusted life-years (QALYs) saved, where a QALY represents a year of life gained with no disability as a result of the intervention. Interventions are considered cost-effective, and a good value, if the net cost per QALY is below a certain threshold, usually between \$50,000 and \$100,000.⁴⁴

Although there are few studies examining the cost-effectiveness of diabetes or hypertension prevention programs offered in the workplace, the CPSTF found strong evidence of cost-effectiveness for diet and physical activity programs in a community or clinic setting. Per-participant costs for group-based diabetes prevention programs with two or more sessions were \$417 in the community and \$424 in a primary care setting, with a median cost of \$1,819 per QALY saved.⁴⁵

To prevent hypertension, the CPSTF concluded that self-measured blood pressure monitoring was costeffective when accompanied by web-based or phone-based support.⁴⁶ Overall, the cost was estimated at \$174 per participant per year and a QALY of \$2,800 to \$4,000 saved.

In a review of interventions to prevent and control diabetes, researchers determined that intensive lifestyle interventions were highly cost-effective.⁴⁵ Separately, a cost-effectiveness analysis of the landmark Diabetes Prevention Program concluded that the program was cost-effective and therefore a good value for the money spent.⁴⁷

Looking at workplace programs more broadly, those that assess and provide feedback on multiple health risks may save more in medical costs than the cost of the program itself. For example, those focused on alcohol, tobacco, diet, physical activity, seatbelt use, blood pressure, obesity, cholesterol, fitness, these cost anywhere from \$65 to \$385 per participant per year but could produce medical and absenteeism savings of \$1.40 to \$4.60 for every dollar invested.³⁹

From the perspective of employers, preventing disease and disability among workers allows those workers to remain productive on the job. That employers value a variety of outcomes, not just medical cost savings, was reinforced by a 2019 survey of employers that found wellness programs positively impacted performance and productivity (84%), workers' health (83%), and workers' job satisfaction (81%).⁴⁸ As to the elements comprising their wellness program, more than half of employers reported offering screenings and follow-ups (58%), healthy food or drink choices (55%), a supportive physical and social environment (55%), and health education (51%).⁴⁸

As these studies highlight, when assessing the VOI for workplace health promotion programs, such as those targeting hypertension and diabetes, employers should keep in mind a broader set of desirable business outcomes including: higher engagement in one's job; increased loyalty to the organization; lower absenteeism and presenteeism; fewer safety incidents; improved attraction and retention of talent; building a market "brand" and reputation as socially responsible; and, becoming the employer-of-choice in a community or industry. Admittedly, these metrics are often difficult to operationalize and studies that tie these outcomes to workplace health promotion programs are still in their infancy. While a cost-effectiveness analysis is usually focused on medical cost savings, the auxiliary benefits (including those listed above) may substantially exceed the return based on a strict calculation of benefits resulting from avoided medical care.

CONCLUSIONS

Adults who lead healthy lifestyles are less likely to develop chronic conditions such as hypertension and diabetes and, in turn, less likely to feel the ill effects of viral infections such as COVID-19. Epidemiological research has shown that NCDs can be prevented or better managed by adopting healthy behaviors (e.g.,

eating healthy diets and regular exercise), adhering to evidence-based preventive screening and vaccination guidelines, and following the advice of trusted health professionals.

This guide offers employers advice on how to address two common chronic disease conditions: hypertension and diabetes. The guide is informed by evidence drawn from the scientific literature, subject matter expert opinions, and case studies. The tables offer a reference tool to evaluate the costeffectiveness of best practice programs – with the underlying message that a comprehensive approach produces the best results from both a health impact and cost perspective. While not every intervention listed must be included in a comprehensive program, as many elements as feasible from each category should be considered for a workplace health promotion program to achieve maximum value.

The guide highlights the broad range of options available to employers across categories (for example, a "do it yourself" (DIY) approach versus program offerings by vendors, health care providers, insurance companies, brokers, or consultants). Critical to overall success is the "dose" administered – that is, how many, how intensive, and how scientifically-rooted are the interventions, as well as how frequently they are accessed and appreciated by employees – the "dose" delivered. Finally, it is important to note that health promoting activities can take place outside the worksite – at home, before work, after work, and on weekends. Programs are most effective when they lead to adoption of healthy habits in one's daily life – not just when one is at a job site.

As discussed at the beginning of this guide, racial and ethnic minorities are at greater risk of infection from COVID-19 and other viruses partly because of the work they do (i.e., being "essential workers" with greater physical contact with people) and because they have a higher prevalence of risk factors that can lead to chronic conditions like hypertension and diabetes. The future of work is likely to change dramatically because of COVID-19 with more people teleworking and some of the interventions included in the guide being offered virtually. Applying creative thinking, employers can modify many if not all the interventions included in the guide so they can be applied to those at a worksite or working from home.

Selecting the "right" combination of interventions is not easy, and like all other organizational decisions, it requires a thoughtful analysis of the business value for dollars spent. In making these decisions, employers are advised to consult with their employees, vendors, health services researchers, and benefit consultants to determine which set of interventions will yield the best returns.



SO WHAT?

What is already known on this topic?

Hypertension and diabetes are among two of the top 10 primary or contributing causes of death in the U.S.^{23,25,30} and significantly impact morbidity rates, healthcare costs, and lost productivity. While workplace wellness programs can have a positive impact on the prevalence and incidence of hypertension and diabetes, there are few resources to guide employers in weighing the costs against benefits in identifying which elements to include when creating a program.

What does this guide provide?

The guide provides practical information on best practices targeting diabetes and hypertension in the workplace including evidence for health impact, cost ranges for specific interventions, and an overall VOI assessment.

What are the implications for health promotion practitioners?

While it is important to have targeted interventions for hypertension and diabetes, these programs provide the "biggest bang for the buck" when put in the context of a comprehensive approach that addresses the whole person.

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