

## Quest Diagnostics Health & Wellness

### Insights in Employer-sponsored Diagnostic Testing and Well-being Solutions: **2018**

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**Abstract** Rising healthcare costs present an ongoing financial burden to employers. As both an employer and the largest provider of diagnostic testing information and services in the United States (U.S.), Quest Diagnostics offers key insights for controlling future healthcare costs. This article details our experience and demonstrates that early identification of medical conditions and risk factors can help control healthcare costs, reduce risk profile, and provide better outcomes.

#### Introduction

The healthcare environment continues to evolve, characterized by rising costs and changing demographics. Aging and diversity in the workforce contribute to different health costs and risks, and require new ways to connect people to care. Today, employers and employees combined, spend approximately \$13,500 per employee per year on healthcare, a figure that has grown by 5% annually over the last five years (NBGH, 2018). Topping healthcare costs today, high-cost medical conditions, those costing insurers more than \$50,000 per individual per year, surpass medical inflation, pharmaceuticals, and any specific disease. The average cost of a high-cost claimant is \$122,382 per year (Wilson, 2016). These high-cost medical conditions are concentrated in a small proportion (1.2%) of the workforce-insured population, yet contribute to 31% of annual employer medical costs (figure 1). Moreover, 53% of the healthcare costs for high-cost claimants are for chronic conditions (Wilson, 2016). These chronic, high-cost conditions develop over time, providing an opportunity to identify them early in their course, during annual health screenings.



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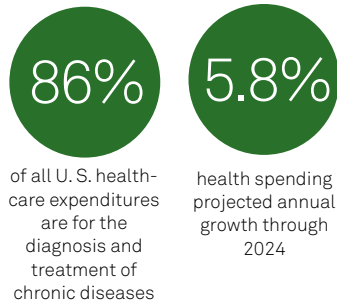


\$122,383  
 per year average cost of a high-cost claimant

Amongst cost-controlling strategies, employers' attention on high-cost conditions may support higher value extraction from total spend on health benefits. Such attention should focus on strategies to prevent "at-risk" individuals who present 1 or more risk factors for chronic disease from becoming high-cost claimants, while also improving the management of medical conditions in the high-risk population. Success in such efforts requires the identification of risk factors so that appropriate interventions may be implemented to reduce the incidence of high-cost claimants. Employer-sponsored diagnostic testing may serve as a key component for controlling future healthcare costs by identifying risk factors in employee populations and connecting individuals with early care to manage their risk.

#### The present environment

Health spending in the United States is projected to grow by 5.8% per year through 2024 (Keehan, 2015). Growth rates are a reflection of a variety of contributing factors such as faster economic growth, population aging, advances in technology, and coverage expansions as a result of the Affordable Care Act (Keehan, 2015). As a result, the share of U.S. gross domestic product attributed to healthcare is projected



to rise from 17.4% in 2013 to 19.6% in 2024 (Keehan, 2015). According to the National Center for Chronic Disease Prevention and Health Promotion, over 86% of all U.S. healthcare expenditures are for the diagnosis and treatment of chronic diseases (CDC).

In light of projected healthcare cost increases, the Institute for Healthcare Improvement has adopted a “Triple Aim” approach to healthcare improvement consisting of:

1. **Improving the experience of care,**
2. **Improving population health,** and
3. **Decreasing healthcare costs.**

Translating such strategies to self-insured employers has revealed 3 key strategies to drive value, including:

1. **Health plan and pharmacy benefit management** of demand and efficient access to the healthcare system,
2. **Benefit design,** and
3. **Population health.**

Diagnostic screening and evaluating risk factors in employee populations create the opportunity to implement efficient solutions to optimize the health of individuals and

## Changing demographics of the U.S. workforce

Today’s workforce is experiencing a demographic shift that mirrors changes in the U.S. population. The United States has experienced population aging that is expected to continue for at least the next decade (Buchmueller, 2017), resulting in an aging workforce; as late as 2000, 31% of employees were 55 years or older, yet in 2017 that group comprised 39% (Federal Reserve Bank of St. Louis). Compared to younger workers, older workers have a higher incidence of adverse health conditions and higher healthcare spending, which poses added challenges to self-insured employers seeking to finance healthcare for their aging workforces (Buchmueller, 2017). In addition, as millennials are making up a larger portion of the workforce, the desire for on-demand healthcare access through digital technology, poses the need for newer mechanisms to deliver healthcare and benefits. Moreover, diversity of the workforce marked by increases in the U.S. Hispanic working population, poses different health risks with notably higher incidence of potentially manageable chronic conditions such as diabetes, high blood pressure, and obesity (Buchmueller, 2017). Such changes in the workforce demographics present an increasing need to effectively screen and identify potential high-cost medical conditions for early and proper intervention to increase the likelihood of positive and lower-cost health outcomes.

1. **Aging workers** with chronic diseases
2. **Younger workers** with different expectations and skills to manage their health
3. **Shift in racial demographics** poses shifts in disease burden

Analysis of the Quest Diagnostics Health & Wellness database consisting of 2.7 million (mean age 45.5y; 53% female) working-aged individuals who participated in employer-sponsored healthcare screening programs between 2016 and 2017, reveals that today’s workforce carries a high pending chronic disease burden (**Figure 8**), where 5 out of 10 employees have evidence of hyperlipidemia, 2.2 out of 10 have metabolic syndrome, and 6 out of 10 have elevated blood pressure (and may develop cardiovascular disease, diabetes, and chronic kidney disease with associated degradation of quality-of-life and financial resources).

## Can the workplace be a healthy place?

16.3%

of employees do not have a primary care physician

1 in 3

working-age adults may have unidentified disease(s)

Our research shows that most U.S. workers carry laboratory evidence of chronic disease risk factors. For example, 7 out of 10 are overweight or obese; more than 1 in 3 working-age adults may have unidentified disease(s) (Kaufman, 2011); 1 in 4 employees is at increased risk for obstructive sleep apnea (Quest Diagnostics, Blueprint for Wellness, 2015), which results in insufficient or inadequate sleep and contributes to decreased productivity and accidents (Garbarino, 2016); and 1 in 6 (16.3%) employees does not have a primary care physician (Quest Diagnostics Blueprint for Wellness 2017 HRA). Yet, many adults do not seek preventive medical care in the absence of symptoms (Andersen, 2011). There is some evidence that despite high-deductible health plans with “first dollar” coverage, many do not access that benefit on the assumption of incurring an out-of-pocket obligation. Given that most full-time working Americans spend more than one-half of their waking hours, 5 days per week, at the workplace, health programs in the workplace have the potential to greatly impact employees’ health behaviors and risks for disease. Another challenge is the growing percentage of workers who work at home (24% of employees in 2015; U.S. Department of Labor Bureau of Labor Statistics). The employer can create a culture of health that engages not only onsite and at-home employees, but also employees involved in transportation. Considering the gaps in engaging individuals in primary care, the workplace presents an environment where health screening may help steer at-risk individuals to care sooner. Healthy behaviors and participation in preventive health screenings may be further supported through social and cultural norming.

## Behavioral economics

Despite the growing evidence for preventative health and the importance of healthy living, a large gap continues to separate theoretically achievable outcomes in health from what individuals and populations actually achieve. For example, individuals may not always make rational decisions regarding their health and their healthcare benefits, despite having good intentions (Kaufman & Chen, 2017). Such is explained by theories in behavioral economics. Human behavior is powerfully influenced not only by knowledge and experience, but also, and perhaps more powerfully, by social and cultural factors, which influence emotions, identity, and environment. Research on health behaviors has demonstrated a powerful role of social connection in influencing the health behaviors of individuals within a group—for example, whether or not to smoke. In addition, individuals tend to exhibit 3 main biases when it comes to health behaviors;

1. **A tendency to overvalue the prospect of losing something of value** compared to gaining something of value;
2. **Deep-rooted values and selective filters requiring substantial influence** to overcome;
3. **A tendency to stick with the status quo or not to change**, especially when choices are complex.

By considering how behavioral biases influence rational judgment, employers may better position health programs to encourage people toward better decisions that produce better outcomes. In addition, by considering principles from behavioral economics, employers can encourage employees to make better health decisions that will improve outcomes for themselves and the organization. In the workplace, social and cultural factors include the shared beliefs and values underlying an employer’s programs, policies, and actions and the priority it places on health and well-being. Establishing

an employer-sponsored annual health screening, and a culture that supports and celebrates participation, creates a broader opportunity to identify and address risk factors. Leadership alignment at all levels in support of health goals is foundational to cultural efforts to improve the health of a workforce (NIOSH, 2015). In addition, a supportive health culture can be built through communications, workplace policies,

## Employers and the burden of unengaged disease

Without intervention, the disease burden in the employee population is expected to rise. Currently, national estimates show that approximately half of all adults in the U.S. —117 million people — have 1 or more chronic health conditions, with 1 in 4 adults having 2 or more chronic health conditions (Ward, 2012). Among adults with chronic disease, more than 1 in 3 adults (approximately 92 million) has at least one type of cardiovascular disease (Benjamin, 2017). Chronic diseases, including cardiovascular diseases (angina pectoris; essential hypertension, myocardial infarction), diabetes mellitus, and musculoskeletal issues of the spine are among the most costly physical health conditions reported by large employers (Goetzel, 2003). In addition to medical costs, workers experiencing poor health in the workplace may be less productive, make lower quality decisions, be more prone to be absent from work (Boyd, 1997), and make consistently diminishing overall contributions to the organization (Price & Hooijberg, 1992). Absence and disability losses have been shown to constitute 29% of the total health-and productivity-related expenditures for physical health conditions (Goetzel, 2003), and chronic diseases account for 45% total disability (Friedman, 2004).



of the total health-and productivity-related expenditures for physical health conditions are attributable to absence and disability



or one half of all adults in the U.S have one or more chronic health conditions

Many chronic diseases could be prevented, delayed, or alleviated, through simple lifestyle changes. The U.S. Centers for Disease Control and Prevention (CDC) (Mensah, 2006) estimates that eliminating 3 risk factors – poor diet, inactivity, and smoking – would prevent: 80% of heart disease and stroke; 80% of type 2 diabetes; and 40% of cancer. As such, employers can play an important role in reducing the disease burden among employees through targeted interventions aimed at the risk factors for chronic disease (Friedman, 2004).



of participants in an employer-sponsored health screening program who show improvement in chronic disease risk factors



of employees eat the recommended 5 servings of fruit and vegetables per day or participate in aerobic exercise on 5 or more days per week.

Lifestyle choices influence a variety of chronic disease outcomes, yet employees often do not practice the health behaviors required for optimal health. Health risk assessment of employees participating in an employer-sponsored health program, reveals that only 10% eat the recommended 5 servings of fruit and vegetables per day or participate in aerobic exercise on 5 or more days per week (Blueprint for Wellness OurCompany Profile 2017). Yet, 75% and 77% plan to improve their diet or increase physical activity, respectively, “within 6 months” (Blueprint for Wellness OurCompany Profile 2017).

While behavioral economics reminds us that what is theoretically rational, may not be fully achievable, employers have achieved considerable cost savings and health improvement through employer-sponsored health programs. A recent study of a voluntary, outcome-based biometric screening program, incentivized with health insurance premium discounts, in a large, (26,388 employees) U.S.-based employer, found that on average, individuals at high health risk who participated improved their health indices over time (Fu, 2016). Participants with health risks at baseline decreased their Body Mass Index (BMI) (1%), blood glucose (8%), blood pressure (systolic 9%, diastolic 8%), and total cholesterol (8%) by year 2 with improvements generally sustained or continued during each additional year of participation (Fu, 2016). Similarly, our data has shown that 11% -33% of participants in an employer-sponsored health screening program who show chronic disease risk factors improve (Figure 4). Moreover, employers have achieved annual cost savings of ~\$225 per

participating employee per year over 4 years through managing hypercholesterolemia and hypertension in employee populations (Johnson & Johnson’s Health and Wellness Program; Ozminkowski, 2002) and \$442 per year over 2 years through implementing an employer-sponsored health screening program (Quest Diagnostics Dominos Case

### Case study – type 2 diabetes

The number of Americans diagnosed with diabetes has almost quadrupled from 7.6 million to more than 30 million since 1997 (CDC Division of Diabetes). Although much of this increase is attributable to lifestyle and health risk factors, it should be noted that a change to diagnostic criteria was also adopted during this time accounting for a portion of this change (Wareham, 1998). Increases in prevalence are associated with considerable healthcare expenditures as annual per capita expenditures for persons with diabetes is 2.3x higher than those without diabetes (Dall, 2014). While, approximately one-third of the U.S. adult population – 84 million Americans – has prediabetes, or impaired fasting glucose, the development of type 2 diabetes is often preventable. A seminal study known as the Diabetes Prevention Program found that the risk of progression from prediabetes to diabetes was reduced by 58% over 3 years through lifestyle modification, including sustained weight loss of 5%-7%, diet, and exercise (Diabetes Prevention Program, Lancet 2009). Prevention of diabetes may result in 34%–44% lower medical costs attributable over 10 years due to lower hospital, emergency room, urgent care, and outpatient services (Diabetes Prevention Research Group, 2012). However, without workplace health screenings to identify employees who could benefit from such intervention, the awareness of prediabetes is exceedingly low; the American Diabetes Association reports that 90% of those with pre-diabetes are unaware of the condition (CDC). Individuals most amenable to behavior change are those who have either been recently diagnosed, or have suffered a significant consequence of their condition; e.g., a heart attack. Diabetes is most often diagnosed in the working age population, with 45.3% between the ages of 45-64 and 12.7% between 18-44 years old. Direct healthcare spending in people with diabetes can be attributed either to diabetes (hospitalizations and drugs) or associated co-morbidities such as hypertension, obesity, high cholesterol, and chronic obstructive pulmonary disease (COPD). In addition, diabetes leads to microvascular (retinopathy, nephropathy, neuropathy) and macrovascular (ischemic heart, peripheral vascular, cerebrovascular) complications resulting in significant organ damage including blindness, renal failure, and limb amputation. The risk of developing complications is often dependent upon the duration and severity of the hyperglycemia (persistently elevated blood sugar). Onset and progression is often asymptomatic and may begin in patients with prediabetes or be identified as metabolic syndrome, further emphasizing the need for early screening and diagnosis.



increase in the number of Americans diagnosed with diabetes since 1997



reduction of progression from prediabetes to type 2 diabetes over 3 years through lifestyle modification



of those with pre-diabetes are unaware that they have the condition



annual healthcare expenditures for persons with diabetes versus those without

### Case study – chronic kidney disease

Chronic kidney disease (CKD) includes conditions that damage the kidneys and decrease their ability to effectively remove waste from the body through urine. Deaths from CKD have increased 52% over the last 16 years. While CKD affects 31-34 million Americans, it is often described as a “silent disease” until advanced stages. Patient awareness of CKD is <8% for Stages 1-3 (Plantinga, 2008). Diabetes and hypertension are the leading risk factors for CKD. The importance of screening for CKD is often overlooked, increasing the likelihood for associated kidney failure and cardiovascular events (NKF, 2000; Sarnak, 2003). Because the progression of CKD may be halted for a period of time with identification and early intervention, screening for early detection is critical to improve the disease prognosis. Early and regular care with nephrology specialists is associated with decreased morbidity and mortality (Locatelli, 2002). In addition, clinical evidence has shown that early detection and treatment can also reduce the risk of heart attack, stroke, and death (James, 2010).



increase in deaths from chronic kidney disease over the last 16 years

Employees participating in an employer-sponsored screening showed evidence of CKD (eGFR  $\leq 60$  mL/min/1.73m<sup>2</sup>) in 3.23% of those tested (Quest Blueprint for Wellness database), indicating a need for follow-up testing. Of those (n=198) who were identified in an employer-sponsored screening with low estimated glomerular filtration rate (eGFR)  $\leq 60$  mL/min/1.73m<sup>2</sup> and no evidence of kidney-related health claims, 52% (n=104) showed confirmed evidence of CKD with enhanced screening and were invited to follow-up with a network physician for care (Quest Diagnostics CKD pilot 2017-2018). With non-invasive diagnostic testing, a slightly elevated level of protein in the urine, or urinary albumin-creatinine ratio, is one of the earliest markers of kidney damage when no other symptoms are present. The National Kidney Foundation (NKF), American Diabetes Association (ADA), National Institutes of Health's National Kidney Disease Education Program (NKDEP), and National Heart, Lung, and Blood Institute (NHLBI), all recommend annual urinary albumin-creatinine ratio testing to monitor kidney damage among patients with hypertension, diabetes, cardiovascular disease, and other CKD risk factors. Yet, the majority of patients with evidence of kidney disease, as well as diabetes and/or high hypertension did not receive a widely available, inexpensive, and non-invasive urine test to check for urinary albumin-creatinine ratio in the previous 12 months (Health Trends).

### Value of employer-sponsored health screenings

Employer-sponsored health screenings are an integral part of an employee health management program intended to improve health status, reduce health risks, reduce healthcare costs, and improve the engagement, productivity, and performance of the workforce. The value of investments in employee well-being are recognized by large employers as approximately 94% of employers with more than 200 employees now offer workplace wellness programs (McLellan et al. 2017) and more than 90% of employers believed they could reduce their healthcare costs by getting employees to adopt healthier lifestyles (Mello 2008).



savings on absenteeism, healthcare costs, and workers' compensation and disability management claims costs from new and early identification, and treatment



of employers believe that healthcare costs can be reduced by getting employees to adopt healthier lifestyles

The convenience of the workplace offers an ideal environment to screen employees for risk factors of disease. More than 1 in 3 participants had laboratory evidence of at least 1 common medical condition newly identified through employer-sponsored health screenings (Kaufman, 2011). In particular, analysis of over 50,000 employees who participated in an employer-sponsored diagnostic testing program (Kaufman, 2011) revealed that of all participants with evidence of hyperlipidemia, 59% were newly identified through the health screening; of all participants with evidence of diabetes, 28% were newly identified through the health screening; and of all participants with laboratory evidence of chronic kidney disease, 89% were newly identified through the health screening (Kaufman, 2011).

Early identification of chronic disease risk factors may translate to cost savings. Interestingly, participants in the laboratory-based wellness program spent 30% less in overall per-employee per-year claims (Source: H&W Frequency of Screening Key Points from Mercer Analysis). In addition, as a result of new and early identification and treatment, participation in employer-sponsored health screenings provides considerable return on investments, yielding a 25% savings on each of the following: absenteeism, healthcare costs, and workers' compensation and disability management claims costs (Chapman, 2005). Returns on investment of ~\$4-\$6 (Ozminkowski, 1999; Baicker, 2010) and annual savings of \$101 to \$648 per person per year (Ozminkowski, 2006; Dominos Case Study \$884 in medical claims over 2 years) have been reported. Reports have shown that healthcare costs fell by \$3.27 and absentee costs fell by \$2.73 for every dollar spent (Baicker, 2010). In addition, a workplace health program at Duke University has demonstrated a positive return on investment (ROI) for its blood pressure (\$1.21 to \$1.00) and cholesterol programs (\$3.39 to \$1.00) (Goetzl, 1996).

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## Screening strategy

Preventive screening recommendations are provided by the U.S. Preventive Services Task Force, an independent, volunteer panel of national experts in prevention and evidence-based medicine. The U.S. Preventive Services Task Force works to improve the health of all Americans by making evidence-based recommendations about clinical preventive services, such as preventive screenings. The U.S. Preventive Services Task Force recommends regular screenings where early intervention and treatment can delay or lessen the impact of the onset of disease; blood pressure, diabetes, obesity, and tobacco use.

Beyond recommendations from the U.S. Preventive Services Task Force, annual employer-sponsored testing may aid in the identification of risks for previously unappreciated health conditions, gaps in care, and mitigation of avoidable healthcare spend, especially in populations with risk factors for hypertension, hyperlipidemia, diabetes, and obesity (Sherman, 2016). More comprehensive health screenings that span beyond fasting lipids and glucose to include hemoglobin A1c and estimated glomerular filtration rate (eGFR), aid in the identification of the 28% and 89% of working adults who have the risk factor, respectively, but may be unaware. With prevalence of health risk factors approaching 70% of the employee population (Quest Diagnostics Blueprint for Wellness Database), annual screening can add value for employer-sponsored population health efforts (Sherman, 2016). Employee population health screenings both improve the success of individuals in achieving their health goals

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## Quest Diagnostics employer well-being solutions

Although there is evidence to demonstrate that employees may take actions that improve their health based solely on receiving results from a health screening, the value of screenings is more fully realized when health screenings are integrated into a connected care pathway. Following health screenings that include objective laboratory-based tests, health risk assessments, and biophysical measurements, cohorts of employees carrying varying health risks may be identified. Through an integrated platform, targeted health campaigns may be offered to drive engagement in health-improvement actions. Cohorts carrying a low health-risk burden may be routed to a follow-up call with a physician as part of the screening program to discuss results and prepare the individual to have a more enriching conversation with his/her primary care physician in follow-up. Individuals with active conditions or high-risk may be routed right into health plan triage with a primary care physician, or an appropriate specialist. Those in the “tipping point” population, prime targets to halt the progression of risk factors from developing into a chronic disease, may be routed into the appropriate target intervention such as prediabetes prevention, diabetes management, sleep apnea solutions, chronic kidney disease prevention, or pharmacogenomics (to aid in the identification of the right drug for the right person). The U.S. Preventive Services Task Force has recommendations for those in the “tipping point” population which include intensive behavioral counseling interventions to promote a healthful diet and physical activity in individuals with abnormal blood glucose, cardiovascular disease risk factors, or a body mass index (BMI) of 30 kg/m<sup>2</sup>. Technology-based health engagement platforms may facilitate the targeting of relevant messaging to improve engagement in the most suitable healthcare solution for the individual based on health risk.

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**New directions**

New directions in healthcare are leading towards a personalized approach to medicine that may further improve the delivery of the right treatment, to the right person, at the right time. Through the critical evaluation of population data to discover patterns in the diseases and similarity analysis, treatments may be more targeted and the likelihood of positive treatment outcomes may be improved. This data-driven approach incorporates the various dimensions of the social determinants of health (including lifestyle, sociodemographic, medical history, and activity) to extract and prioritize personalized health recommendations. The goal of such analyses is to take the guesswork out of medicine to give each person the best chance of getting well, staying healthy, and even achieving better health.

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**Policy, environmental,  
and educational factors**

Successful approaches to population health practices span beyond health screenings and health promotion programs to include policy, environmental, and educational components. To overcome the challenges to health improvement described in behavioral economics, health improvement strategies need to be supported by practices that make “health the easy choice.” For example, adoption of healthy food policies, improving the health of foods and beverages available onsite, creating environments to promote movement and physical activity (open stairways, stand-up desks, walking trails) and campaigns to improve health education, may support population health improvement programs and initiatives (Wyatt, 2015). Creative strategies are needed to reach the growing workforce who now works from home.

“After a federal court ruled that effective Jan. 1, 2019, workplace wellness programs must be fully voluntary (without monetary incentives or penalties), employers were left with more questions than answers. Until the Equal Employment Opportunity Commission (EEOC) provides additional guidance that clarifies the allowable incentives permitted, employers cannot be certain that any incentive will comply with the voluntary requirements. Because of this, most employers with such screenings/assessments will either add alternative means by which an employee can earn an incentive, or remove the financial incentives altogether.” (AAFP “Business Solver,” 2018)

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**Summary and  
conclusions**

**In an era of rising costs, Quest Diagnostics is delivering high-value solutions to employees and employers alike. Based on employer-sponsored screening, early identification of health risk factors and connections to care, population health, and member experience may improve, all while reducing healthcare costs to the employee and the employer.**



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## Figures and illustrations

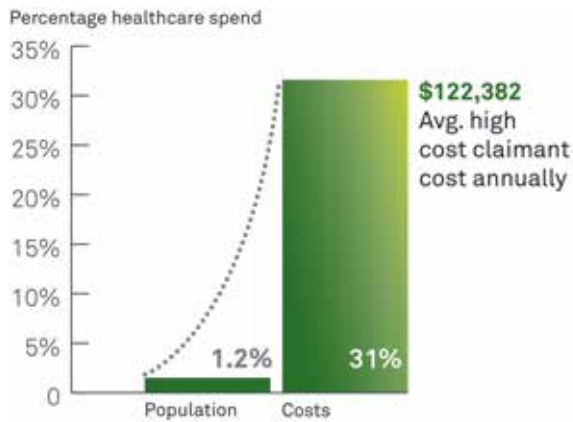


Figure 1

### Percent (%) of employer spend driven by high-cost conditions.

High-cost conditions drive 31% of employer healthcare spend yet represent 1.2% of the employed population.

Reference: American Health Policy Institute (AHP) survey of 26 large employers

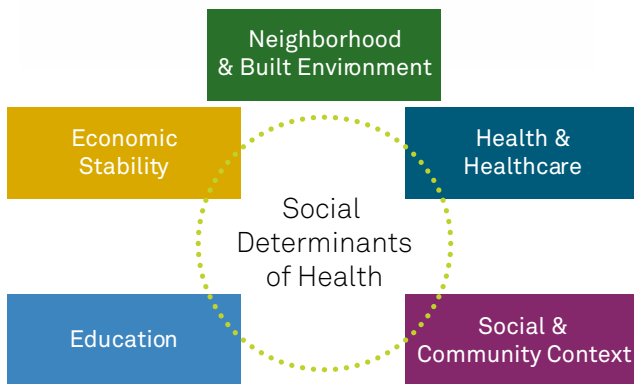


Figure 2

### Social determinants of health

Social determinants of health are "conditions in the environments in which people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks." Conditions can be reflected in 5 determinant areas.

Reference: Modified from U.S. Department of Health and Human Services. Healthy People 2020. Available at: <https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-of-health>

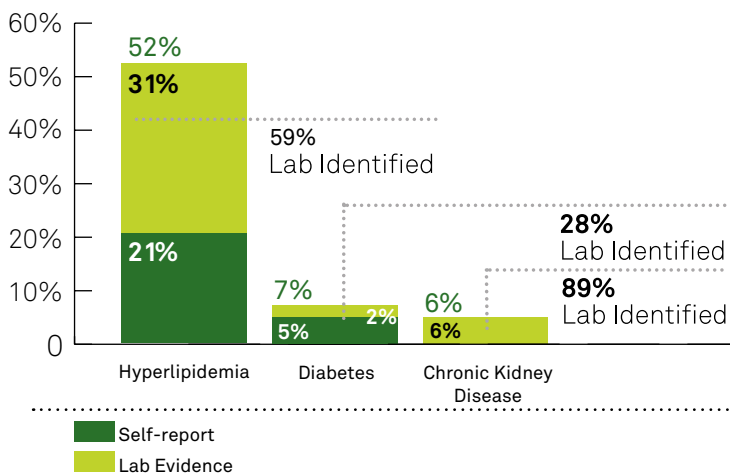


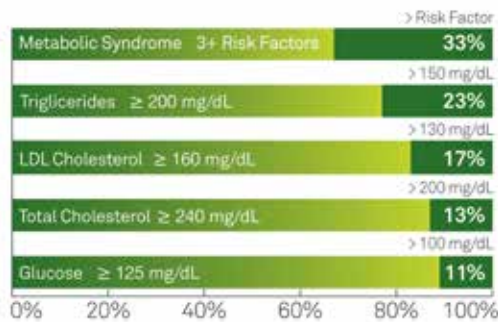
Figure 3

### Employees underestimate their illness burden

Eighty-nine percent of those at high risk for chronic kidney disease, 59% of those at high risk for high cholesterol, and 28% of those at high risk for diabetes first learned of their health condition through lab-based wellness programs.

Reference: Kaufman HW, Williams FR, Odeh MA. Value of laboratory tests in employer-sponsored health risk assessments for newly identifying health conditions: analysis of 52,270 participants. *PLoS One*. 2011;6(12):e28201. doi: 10.1371/journal.pone.0028201.

## Figures and illustrations

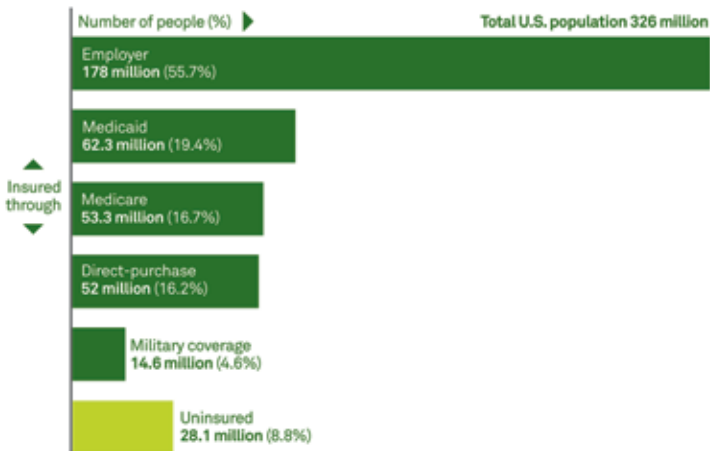


**Figure 4**

### Percent (%) of employees that self-correct abnormal diagnostic screening results

Of participants with high risk screening results in year 1, 11-33% lowered their risk in year 2.

Represents employees who moved from high risk into lower risk between 2015 and 2016. Blue-print for Wellness database population n=942,951

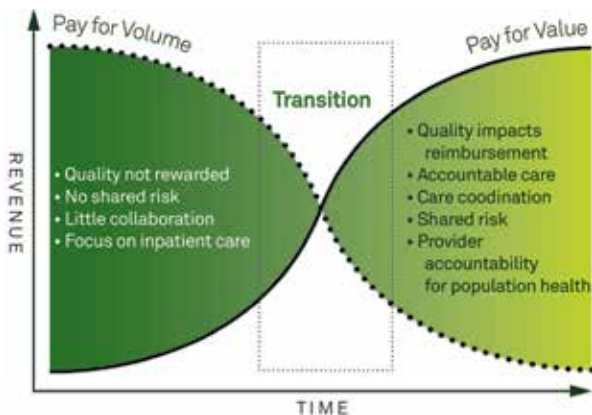


**Figure 5**

### Distribution of healthcare coverage in the U.S. by insurance product

More Americans (178.5M) receive health benefits through an employer than any other source of coverage

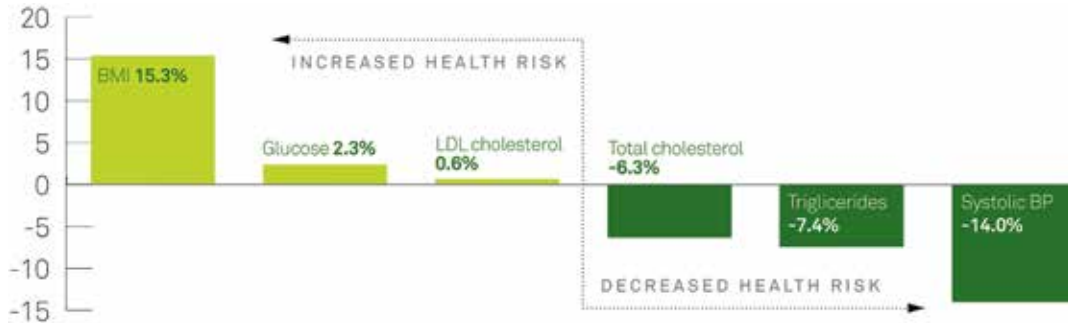
Reference: Barnett JC, Berchick ER. U.S. Census Bureau Report Number: P60-260. Health insurance coverage in the United States: 2016. September 12, 2017.



**Figure 6**

### System shifting from “pay for volume” to “pay for value”

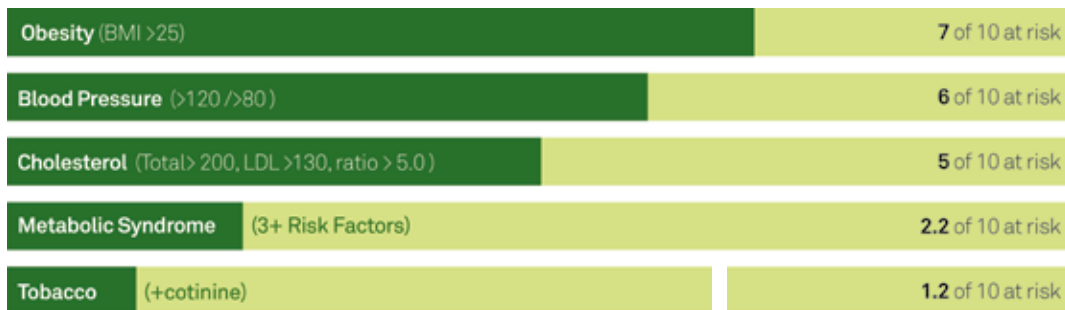
## Figures and illustrations



**Figure 7**

### Health trends in employer-sponsored health screening

Change in population health risk between 2008 (n~31,000) and 2017 (n~36,000) participants based on % tests in range for each year in non-cohort participants in the Quest Diagnostics program



**Figure 8**

### Annual prevalence of chronic disease risk factors in “database population”

Reference: Quest Diagnostics Health & Wellness Database & Kaufman et al. 2011