Investing in Prevention: A National Imperative

Key Findings and Recommendations of the Vitality Institute Commission on Health Promotion and the Prevention of Chronic Disease in Working-Age Americans
The Vitality Institute convened a Commission on Health Promotion and the Prevention of Chronic Disease in Working-Age Americans from May 2013 to June 2014. A diverse group of thought leaders and expert practitioners contributed their perspectives and insights through a series of private meetings and public forums. The Commission has generated five recommendations, each of which includes actionable and scalable pathways to achieve the Vision: Health should be embraced as a strategic imperative across sectors and as a core value in society.

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This report is dedicated to Clarence Pearson, who has been an inspiring mentor for several generations of health leaders.
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A Letter from

William Rosenzweig, Vitality Institute Commission Chair, and Derek Yach, Vitality Institute Executive Director

A healthy society begins with healthy people. Healthy communities provide more economic opportunity for all their residents. Healthy citizens are more creative, productive, and resilient. A nation that is truly committed to promoting health and preventing disease reaps the greatest return on its investment: longer and healthier lives for all its citizens and a thriving, productive society.

There is ample evidence that the short- and long-term economic competitiveness of the United States is directly linked to the health of our workforce. A healthy workforce has the power to improve economic growth, national security, and global competitiveness. It can maximize worker productivity, spur unparalleled innovation, and reduce economic drag as fewer resources are allocated toward treating costly preventable diseases. The impact of an unhealthy workforce on economic and personal well-being spans beyond our lifetime and affects future generations, generations that are already threatened by a shorter lifespan than we have today.

The Vitality Institute convened the Commission on Health Promotion and the Prevention of Chronic Diseases in Working-Age Americans in 2013-14 with the goal of placing the power of evidence-based prevention at the center of health policies and actions in the US. The Commissioners, a nonpartisan group of distinguished thought leaders from the private, public, and social sectors, developed five catalytic recommendations to improve the health of the working-age population nationwide. We thank the Commissioners for their valued input and commitment to the Commission’s research and recommendations.

Fulfilling the Commission’s Vision—Health should be embraced as a strategic imperative across sectors and as a core value in society—requires trusting partnerships among disparate sectors and communities. It necessitates alignment between public and private sector voices to strengthen and amplify the rationale and message of prevention. It requires shifting resources to invest in prevention science, where we see exciting opportunities ranging from greater support for prevention research within the National Institutes of Health, the Centers for Disease Control and Prevention, and the private sector, to the application of behavioral economics and new developments in personalized technologies that hold promise for promoting health. Finally, it encourages employers to value their most important source of capital—the health and well-being of their workforce—which we hope to see reflected in the integration of workforce health metrics into financial reporting.

Implementing the recommendations of the Vitality Institute Commission requires cross-disciplinary collaboration and commitment. We must be both urgent and patient in our intention to generate positive impacts. Each improvement in health may seem minuscule, but in aggregate, they create a meaningful cultural force that has potential to improve the health and thereby the competitiveness of America and its diverse population for our generation and generations to come.

WILLIAM ROSENZWEIG
Commission Chair, Vitality Institute
Managing Partner, Physic Ventures

DEREK YACH, MBCh B, MPH
Executive Director, Vitality Institute
Executive Summary

The vibrancy of America’s future depends on its investment in the physical, mental, and social well-being of its people. The occurrence of non-communicable diseases (NCDs)—including cancer, diabetes, cardiovascular and chronic respiratory diseases, musculoskeletal disorders, and mental illness—threatens America’s economic competitiveness, national security, and position as a world power. The consequences of NCDs have short- and long-term effects by forcing individuals to exit the workforce prematurely due to their own poor health, or to care for ill relatives. Lower productivity and higher absenteeism, combined with soaring costs of treatment, impede innovation and crowd out productive investment in education and research and development.

A significant portion of NCDs—perhaps as much as 80 percent—can be prevented through existing evidence-based methods. The Commission estimates an annual saving of $217–303 billion (5-7 percent of total healthcare spending) on healthcare costs by 2023. Without coordinated leadership and immediate action, the costs and impact of NCDs will further burden future generations and stifle economic and personal well-being for decades to come. We are faced with an opportunity to shift NCDs and their associated costs toward a culture of health, a term pioneered by the Robert Wood Johnson Foundation. Throughout the Commission, health refers to: “A state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.”

The Vitality Institute Commission

The Vitality Institute convened a Commission on Health Promotion and the Prevention of Chronic Disease in Working-Age Americans from May 2013 to June 2014. Composed of a diverse group of thought leaders and expert practitioners, Commissioners from public health, academia, business, and the social sector contributed their perspectives and insights through a series of private meetings and public forums. Original research was commissioned to fill gaps in evidence to make an irrefutable case for health promotion and disease prevention. An interdisciplinary perspective and systems approach were used to identify and propose cross-sector pathways to achieve the Commission’s Vision: Health should be embraced as a strategic imperative across sectors and as a core value in society.

The Commission has generated five recommendations to catalyze a widespread culture of health in America. Each recommendation includes actionable and scalable pathways for implementation, and measures of success over short- (2017), medium- (2020) and long-term (2025) horizons. Commissioners have committed to direct action on some of them. Taken together, the recommendations offer a focused strategy to create sustained well-being and competitive advantage at local, state, and national levels—a blueprint to transform America’s health.

Call to Action

The time is ripe to take action to improve the health of working-age Americans. The Patient Protection and Affordable Care Act (ACA) includes provisions focused on prevention, and it is becoming increasingly clear that employers cannot sustain the burden of rising healthcare costs.

The Commission has delineated substantial evidence that the short- and long-term economic vitality of the US is directly linked to the health of its workforce. The research and recommendations of the Commission emphasize the need to embrace health as a strategic imperative and as a core value in society. The Commission aims to catalyze coordinated action across sectors, realizing that a healthy workforce increases productivity, prosperity, and personal well-being as it spreads from the workplace to families, communities, and beyond. As the backbone and engine of the nation’s economy, a healthy workforce supports national competitiveness and ensures a more vibrant future for generations to come.
**RECOMMENDATION 1**

**Invest in prevention science.**

Prevention science, as the systematic application of scientific methods to the causes and prevention of health problems in populations, should be supported. It should also be extended beyond epidemiology and public health to include behavioral economics and new personalized technologies. Health education and leadership should reach beyond public health and policy to include medicine, law, architecture, technology, ergonomics, human factors, transportation, and agriculture.

**RECOMMENDATION 2**

**Strengthen and expand leadership to deliver a unified message for health and prevention.**

Advocates of prevention in the public and private sectors should be coordinated and join in common cause to develop coherent messages supporting a culture of health. A credible and influential multi-sector network should be developed that operates synergistically, using evidence-driven advocacy for the value of prevention. This includes local leaders who tackle challenges and implement solutions tailored to the needs of their communities.

**RECOMMENDATION 3**

**Make markets work for health promotion and prevention.**

Markets should be stimulated to encourage consumers to purchase and use healthier products and services. New products, services, and technologies for healthier lifestyles should be commercialized with the support of incentives and structures that favor innovation and early adoption.

**RECOMMENDATION 4**

**Integrate health metrics into corporate reporting.**

Companies should generate shared value by integrating standardized metrics on the health of their workforce into annual financial reports. Forward-thinking business leaders will understand that the health of their workforce is an asset: Human capital is core to sustained competitive advantage.

**RECOMMENDATION 5**

**Promote strong cross-sector collaborations that generate a systemic increase in health promotion and prevention across society.**

Non-health sectors should be engaged to tackle all factors that influence health. Advocates for health should understand the priorities of other sectors where they aspire to make progress, and should work collaboratively to develop policies and a case for prevention.
“All Americans deserve the chance to lead a healthy life and achieve their full potential. And as a Nation, the health and well-being of our people must remain a top priority. ...Through the Affordable Care Act and other initiatives, my Administration is supporting efforts across our country to improve public health and shift the focus from sickness and disease to wellness and prevention. And each of us has the opportunity to make choices every day that can keep us healthy and safe. ...We can raise awareness about health issues in our communities, serve as role models to others, and teach children about the importance of preventive care and making smart choices. By investing in our individual health today, we will create a stronger America in the years to come.”

President Barack Obama
Introduction: The Time is Now

Health as defined by the World Health Organization (WHO), is “A state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.” The vibrancy of America’s future depends on its investment in the health of its people. We face a crisis that threatens our economy, national security, and position as a world power. Non-communicable diseases (NCDs)—cancer, diabetes, cardiovascular and chronic respiratory diseases, musculoskeletal disorders, and mental illness—carry consequences that touch us all. The majority of these diseases can be prevented. Reducing their toll calls for systematic engagement and action on the part of individuals, communities, groups, institutions, and leaders in all sectors of society.

“Rising healthcare costs are the primary driver of our national debt, and that is in large part due to our chronic disease epidemic.”

Senator William H. Frist, MD, Bipartisan Policy Center

The effect of NCDs on the nation’s workforce is of signal importance. An unhealthy workforce impedes America’s competitiveness in the global marketplace. Workers may exit the workforce because of their own poor health or to care for chronically ill relatives. For employers, lower productivity and higher absenteeism coupled with skyrocketing healthcare costs rob resources that could otherwise be reinvested in innovation or distributed as profits. For the nation, rising healthcare costs crowd out investment in other priority areas, such as education, defense, and infrastructure. The costs and impacts will burden generations to come, further stifling economic as well as personal well-being (see Fig 1).
In contrast, improvements in population health can fuel economic development, through greater workforce productivity, higher profits, increased personal income, and a rise in GDP. The workplace is well positioned to positively influence the health of 155 million working-age Americans and to see benefits in risk reduction through prevention and health promotion.11

Meaningful progress can be driven by the development and widespread use of integrated health metrics that reflect the equation between workforce health and economic strength.

“A healthy population is an engine for economic growth.”

World Health Organization Commission on Macroeconomics and Health

Fifty years ago, when the Surgeon General’s report on smoking was issued, it was commonplace for people to smoke in movie theaters, workplaces, restaurants, and other public indoor spaces. There were ashtrays in taxicabs and on airplanes, and cigarettes ads blanketed the media—television, radio, and glossy magazines. The US was Marlboro Country, and young and old alike were exposed to second-hand smoke even if they were not smokers themselves.

Change began with the Surgeon General—a leader armed with evidence on the health hazards of smoking—but it took decades of covert and overt conflict with big tobacco companies and their marketing allies; the building of coalitions of advocates for health in many sectors; restrictions and regulations on multiple levels, from private businesses to local, state, and federal governments; messaging to counter the blatant appeal of the cigarette cult; lawsuits and levying punitive taxes; development of programs and products to support those who wanted to stop smoking; and over time, a shift in the cultural norm. It was a systems change. Today, smoking is the exception rather than the rule. It has been banned from the airwaves and public spaces. Perhaps most important, people understand the hazards of smoking and many in the grip of the habit would like to quit.

“Enough is enough. We can’t just say ‘Health and wellness is important.’ No! We must treat health and wellness as a national strategic imperative.”

Rear Admiral Boris D. Lushniak, Acting Surgeon General

Today we face a more complex challenge and a more formidable foe: the epidemic of NCDs and the risky behaviors that underlie it. We can draw lessons from the campaign against smoking, but we cannot wait another half century to win the battle.

The Vitality Institute Commission asks: What if we applied what we already know about what works? How can we recruit the leaders, muster the forces, and create the groundswell that will eventually result in a change in culture? What would it look like if the power of evidence-based prevention were at the center of health policies and actions in the US?

It is time to seize the opportunities that have arisen from the convergence of legislative action through the Patient Protection and Affordable Care Act (ACA), the awareness in the private sector of the central role health plays in sustainability, and new technology tools that enable individuals to proactively improve their own health. America is at a pivot point: We can plan for a healthy future by investing in prevention now or plan to pay much more in the future for our failure to make that investment.
VISION:

Health should be embraced as a strategic imperative across sectors and as a core value in society.
The health of our nation extends beyond healthcare to the very heart of the social compact. It requires us to think of health as more than the absence of disease, but as a societal benefit and a human right. It requires a concerted effort by individuals and communities, as well as the private, public, and social sectors to apply what we know works to promote health. It also requires commitment, investment, and cooperation by all sectors to ensure continued progress.

Purpose and Goals

The Commission was convened by the Vitality Institute, an evidence-driven and action-oriented research organization dedicated to health promotion and the prevention of NCDs and the creation of a new culture of health. Membership of the Commission was drawn from a diverse group of stakeholders and was designed to tap the collective wisdom of thought leaders from a broad range of sectors of American society (see page i for full list). The Commission was tasked with applying a cross-disciplinary perspective to devise new pathways for health to be embraced as a strategic imperative across sectors, and as a core value in society. Taking a systems approach, it focused on high-leverage, high-impact spheres that have the potential to work synergistically to place prevention science at the center of health policies and practice in the US.

Prevention Science

The systematic application of scientific methods to the causes and prevention of health problems in populations.

The Commission supports this definition, but advocates a more expansive view of prevention science to generate a stronger and more comprehensive platform for intervention design and implementation.

- Classic scientific methods extended beyond the confines of epidemiology and public health
- Broader scope by advances arising from behavioral economics and innovations in personalized technologies
- Public sector interventions adapted to complement opportunities arising from private sector innovations to improve health behaviors and outcomes
The Commission’s process involved private meetings and public forums, as well as consultation with a group of multidisciplinary experts, with research and analysis presented in original papers prepared to inform the Commission’s work (see Appendix: Background Working Papers).

In view of the economic consequences of NCDs, the Commission sees the urgent need to integrate the innovative strength of the private sector with the authority and funding resources of the public sector. The Commission recommends that priority be given to investment in research to establish an evidence base for prevention, creating a career path for the next generation of prevention scientists and practitioners, and developing leadership for evidence-driven advocacy. The prevention message should be delivered not only by voices from the field of health, but also by leaders in business, manufacturing, education, the faith community, agriculture, energy, urban design, transportation, public policy, the social sector, as well as federal, state, and local governments.

Taking a systems view, the Commission looked at ways to break down silos and harness the power of collaborative and coordinated action. It developed a set of recommendations that are specific, actionable, and attainable. Citing best practices as models that can be scaled up or down for adoption throughout society, it outlined pathways to progress that emphasize multi-stakeholder and cross-sector partnerships. Measures of success—early advances by 2017, meaningful progress by 2020, and perceptible shifts in cultural norms by 2025—are realistic and within reach.

Although these recommendations call for a large-scale reassessment of the legislative, regulatory, and policy environment, the Commission recognizes that improvement in population health through the prevention of NCDs will ultimately occur at the local and individual levels. Policies both shape and are shaped by cultural norms, but health depends on individual action. The personal engagement and motivation of individuals and the communities in which they live and work are critical if American society is to make progress toward building a culture of health.

“To reverse—not just arrest—the rising prevalence of chronic disease, we need to approach this problem as we would a ‘syndemic’ that can neither be controlled nor eradicated without simultaneously addressing each co-occurring epidemic. To make an impact at scale, we need interventions that activate and engage not just individuals but also the households, workplaces, and communities where lifestyles, habits, and routines are learned, practiced, and perpetuated. We know that unhealthy lifestyles and obesity spread like a communicable disease through social networks with a rate of transmission greater than 50 percent. So why shouldn’t it also be possible to spread healthy lifestyles, habits, and routines like a communicable disease using technology innovations as catalysts?”

Dennis Schmuland, MD, Chief Health Strategy Officer, US Health and Life Sciences, Microsoft Corporation, and Vitality Institute Commissioner
Scope

Recognizing the complexity of the challenge, the Commission has focused on health promotion and the prevention of NCDs among working-age Americans as its complementary mandate. This focal point complements, without overlapping, the important work of the Robert Wood Johnson Foundation (RWJF), which is primarily concerned with the health of children and communities (see Appendix: Related Commissions and Reports).

Why the Workplace?

The Commission believes that the health of working-age adults has both broad and deep implications for business and the economy as a whole. Working-age Americans are as diverse as the nation itself. They work for small, medium, and large companies, in their own homes or the homes of others. They are white- and blue-collar workers. Some work part-time or as day laborers. Some are students, some are unemployed, and some have retired early.

Because NCD risks accumulate over the lifespan, employers assume a crucial role during the working years, a time when risk levels are already high but before the highest levels of disease prevalence and costs occur. Disease costs rise rapidly from middle age onward, increasing significantly into retirement (see Fig 2). The fragmented approach to life-course prevention in the US leads to less effective prevention.

The workplace is rich with opportunities to make an impact on the health of both the population and the economy. In the past, employer-provided healthcare coverage primarily emphasized treatment, but it is poised to include health promotion and NCD prevention, due in part to changes mandated by the ACA. Interventions initiated in the workplace and supported by employers have the potential to improve the health of working-age individuals, including incentives to change habits that increase risk for NCDs and to establish healthier behaviors. Companies that have successfully invested in the health of their workforce can serve as models. Best practices should be evidence based and linked to a corporate health index.
Health is the Bottom Line

Employers have much to gain from a healthy workforce, including improvements in worker morale, productivity, and profitability. Prior to passage of the ACA, more than half the population had employment-based health insurance coverage through their own or another person’s employer. These numbers are likely to change once the law is fully implemented. Private employers currently spend less than 2 percent of their total health budget on prevention.

The cost of health insurance is of great concern for employers. In 2010, employers in the US spent a total of $560.9 billion for group health insurance, an increase of 67 percent since 2000. For three consecutive years, an annual survey of chief financial officers (CFOs) showed nearly 60 percent citing healthcare costs as their main financial concern, above revenue growth, cash flow, and corporate tax rates. Businesses are also aware of the contribution of NCDs (including mental illness) to this cost, with half of all business leaders voicing concern that at least one NCD will hurt their company’s bottom line in the next five years.

The workplace is an ideal setting for interventions that improve broader population health, reaching beyond the workforce to families and communities (see Fig 3). It is a microcosm of society, and a model laboratory for prevention science.

FIG 3—WHY THE WORKPLACE
The workplace provides many opportunities for health promotion interventions.
The Time to Build a Culture of Health is Now

The Vision of the Vitality Institute Commission that health be embraced as a strategic imperative and as a core social value echoes the culture of health envisioned by RWJF, which its President and CEO, Risa Lavizzo-Mourey, says “will require us to think and work differently...[about] the bigger picture of what defines health in America—how health will always be linked to health care, but also extends to work, family, and community life; how health equity is connected to opportunity; and how we, as a nation, must balance the costs, benefits, and effectiveness of treatment and prevention to provide our people with care of the highest possible value.”

The RWJF defines a culture of health as one in which:

1. Good health flourishes across geographic, demographic, and social sectors.
2. Being healthy and staying healthy is valued by our entire society.
3. Individuals and families have the means and the opportunity to make choices that lead to healthy lifestyles.
4. Business, government, individuals, and organizations work together to foster healthy communities and lifestyles.
5. Everyone has access to affordable, quality health care.
6. No one is excluded.
7. Health care is efficient and equitable.
8. The economy is less burdened by excessive and unwarranted health care spending.
9. The health of the population guides public and private decision-making.
10. Americans understand that we are all in this together.

The Vitality Institute Commission endorses the RWJF vision of a culture of health and supports its efforts to develop a framework to measure success.
Affordable Care Includes Prevention

Passage and gradual implementation of the ACA have provided an opportunity to test strategies for improving the health of the nation. The law has spurred renewed interest in well-being programs and optimism that they could become part of the nation’s broader health strategy to prevent and control chronic disease and healthcare costs. Although many ACA provisions relate to treatment, insurance, and reforms in the healthcare system, the law includes a “vibrant emphasis on disease prevention.” An estimated 71 million additional Americans were receiving coverage for preventive services without cost-sharing as of March 31, 2014, the end of the law’s first open enrollment period.

Among the prevention provisions included in the ACA:

- **SECTION 2705** increases the maximum permissible reward from 20 to 30 percent of the cost of coverage under a health-contingent wellness program offered with a group health plan. The maximum permissible reward can be further increased to 50 percent for health programs that prevent or reduce tobacco use.

- **SECTION 2713** expands access to clinical preventive services, requiring that they be covered at no out-of-pocket cost to the insured by employer-sponsored group health plans and private health insurance policies.

- **SECTION 4001** mandates The National Prevention, Health Promotion, and Public Health Council to develop a National Prevention Strategy to work across the federal government and its agencies (including non-health agencies) to present evidence-based findings and recommendations about preventive services, programs, and policies to improve health.

- **SECTION 4002** establishes the Prevention and Public Health Fund to provide expanded and sustained national investment in prevention and public health.

- **SECTION 4108** authorizes grants to states to offer incentives to beneficiaries of Medicaid who participate in prevention programs and show improvements in health risks and outcomes. These programs are required to use evidence-based research.
“Creating a true ‘culture of health’ in the United States will require reshaping our environment such that health becomes the natural outcome of life and the default ‘choice’ for individuals. Many hands and sectors will need to collaborate to get us there: governments at all levels, businesses, education, and nonprofits, all of whom must now start by making the loudest possible case for investing in disease prevention and health promotion.”

Susan Dentzer, Senior Policy Adviser to the Robert Wood Johnson Foundation, and Vitality Institute Commissioner
In the decades since 1990, progress has been made against some NCDs. Death rates from lung cancer and cardiovascular disease have decreased, due in large part to declines in smoking and greater access to drugs to manage high blood pressure and cholesterol. But the prevalence of diabetes, and the related risk factors of overweight and inactivity, has increased, and along with them the percentages of deaths, years of life lost due to premature mortality (YLL), and years lived with disability (see Fig 4).

A recent National Research Council and IOM report and comparative analyses using the latest Global Burden of Disease data show that life expectancy and disease-specific survival rates in the US have not improved at rates seen in peer countries. Americans live shorter lives and experience more illnesses, they reach age 50 with a less favorable cardiovascular risk profile, lung disease is more prevalent and associated with higher mortality, and the death rate from heart disease is the second highest among peer countries. The trend can be tied to smoking, unhealthy diet, obesity, and physical inactivity, all of which are modifiable through behavior change (see Appendix: Tables 1 and 2).
Prevention is Health Promotion

The principal NCD risk factors arise from a complex chain of behaviors, some originating in early childhood, coupled with social and environmental factors. Years of exposure to multiple risk factors increase the probability of disease, disability, and death.

Fortunately, every point in life represents an opportunity to reduce risk by adopting healthier habits. Eating a healthy diet, engaging in regular physical activity, avoiding tobacco use and excessive alcohol intake, and adhering to medications go a long way toward delaying the onset, reducing the severity, and preventing the development of NCDs. The onset of NCDs can be further postponed toward the end of the lifespan so that chronic illness is compressed into a shorter period (see Fig 5). The age of onset of chronic disease may even be postponed longer than the age of death, resulting in a longer and disability-free life.

What is Prevention?34

The aim of prevention is to eradicate, eliminate, or minimize the impact of disease and disability, or if none of these is feasible, to delay the progress of disease and disability.

- **PRIMARY PREVENTION** aims to reduce the incidence of disease by such efforts as enhancing nutritional status, immunizing against communicable diseases, and eliminating environmental risks.

- **SECONDARY PREVENTION** aims to reduce the prevalence of disease by shortening its duration through early detection and prompt intervention to control disease and minimize disability.

- **TERTIARY PREVENTION** aims to reduce the number and/or impact of disease complications by eliminating or reducing impairment, disability, and handicap; minimizing suffering; and maximizing potential years of useful life.

Progress in preventing NCDs would represent a giant step toward promoting the health of the nation and the aspirational goal of health and well-being for all.
Obstacles to Building a Culture of Health

The US has historically viewed health as merely the absence of disease and has thus undervalued and underinvested in public health and preventive services. While partisans in the US argue about whether health is a human right, the constitutions of other nations, such as India and South Africa, include health among the rights guaranteed all citizens. Scandinavian countries share with the US a commitment to personal freedom, political voice, and to science and technology, but they invest far more than the US in programs to support mental and social well-being, not just health. Across the Organisation for Economic Co-operation and Development (OECD), for every $1 spent on healthcare, $2 is spent on social services, compared to only 55 cents for social services in the US.

The Social Progress Index, which rates 132 countries on more than 50 indicators, including health, sanitation, shelter, personal safety, access to information, sustainability, tolerance and inclusion, and access to education, placed New Zealand at number 1 in its 2014 list. The remaining top 10 were Switzerland, Iceland, Netherlands, Norway, Sweden, Canada, Finland, Denmark, and Australia. The US ranked 16th. Japan ranked first in Health and Wellness, the US 70th.

Although the US spends 17.9 percent of GDP on healthcare—the highest in the world—it receives a meager return on its investment. A World Economic Forum/Mercer ranking placed it 43rd out of 122 countries in health and well-being worldwide and 112th in obesity (see Fig 6). In a comparison with 17 peer nations, the US came in last in average body mass index (BMI) for individuals between 35 and 44 years of age (see Fig 7).
It does not take overwhelming evidence to change policy. It takes sufficient evidence and political will.”

Brig. Gen. (ret) Rhonda Cornum, Director of Health Strategy, Techwerks, and Vitality Institute Commissioner

What accounts for the paradox of high spending on healthcare with relatively poor health status and life expectancy? The answer lies not in the amount, but in how and where the money is spent. Public health and preventive services in the US are highly fragmented and are financed by a complex set of federal, state, local, and private sources that vary across communities in ways unrelated to underlying need. Poor population health at the state and county levels contributes to the nation’s poor performance on international health indices.

As hopeful as the potential for prevention and health promotion is, many forces undermine widespread support, some of which are detailed here. A systems perspective reveals leverage points for overcoming the obstacles and building multi-sector support for a culture of health.

### Legislative, Regulatory, and Tax Policies

Although the ACA includes provisions related to prevention, some obstruct rather than support evidence-based practices. For example, the ACA encourages implementation of workplace and community-based prevention and health promotion programs, but it imposes constraints at the same time as it establishes low standards, effectively undermining evidence-based program design. One category of programs, termed “health contingent,” requires an individual to satisfy a health-related standard, such as quitting smoking, or to complete an activity, such as a walking program, in order to obtain a reward. ACA mandates that health-contingent programs be “reasonably designed to promote health or prevent disease,” but the responsible federal agencies explained that there “does not need to be a scientific record that the method promotes wellness.” The government’s role would be better served by establishing protocols to strengthen the requirements for employers and program operators to utilize practice- and evidenced-based programs.

A consequence arising from the 2012 Supreme Court decision allowing states to opt out of the Medicaid expansion provision of the ACA is that low-income working-age adults without dependent children are the group most likely to be left without health insurance, and the prevention services that go along with it (see Fig 8).
Another obstacle on the federal level stems from how the fiscal impact of prevention is assessed. The Office of the Actuary of the Centers for Medicare and Medicaid Services (CMS) contends, “There is no consensus in the available literature or among experts that prevention and wellness efforts result in lower costs.”

CMS funding for evaluation of community-based well-being programs focuses on current Medicare beneficiaries with no appropriations for the evaluation of health promotion interventions for working-age Americans, who will ultimately enter the Medicare pool. A Healthy Aging, Living Well Evaluation was authorized by the ACA to evaluate community-based programs for Medicare beneficiaries, with a focus on nutrition, physical activity, tobacco use reduction, substance abuse, screenings, and referrals for treatment of chronic diseases. This five-year pilot was intended to provide grants to state health departments for screening and education for 55 to 64 year olds and operate from 2010 to 2014, but it was never funded. This omission deserves reexamination in light of the substantial Medicare savings potential from effective workplace health promotion measures.

The Congressional Budget Office (CBO), the agency responsible for estimating costs of proposed federal legislation, uses a 10-year window, which cannot account for the long-run impact—both budgetary and health—of effective prevention measures. A study conducted for the Campaign to End Obesity recommends using a 75-year time horizon. Extending to 75 years may more accurately represent the prevention opportunities over a lifetime because, the report contends, “very little of the federal savings [effective prevention interventions] induce may be captured in the first decade, especially if an intervention is geared toward children or young adults and yields meaningful impacts on health care costs for individuals receiving Medicare decades in the future.” In April 2014, the Long-Term Studies of Comprehensive Outcomes and Returns for the Economy (SCORE) Act (H.R. 4444) was introduced in the House of Representatives. The bill would require CBO to conduct 50-year scoring estimates of disease prevention and medical research legislation. Such long-range projections, however, are viewed by some as too uncertain to be the basis of policy decisions.

Recently, the CBO has shown a willingness to alter the time frame of its projection. For example, it used a 72-year horizon to project the effects on outlays of increasing the tax on cigarettes, taking into account increased longevity and lower per capita healthcare spending (see Fig 9).

Although the CBO makes projections, not recommendations, Director Douglas W. Elmendorf said the Office incorporates “behavioral responses to the extent feasible.” Among the key types of health policies the Office is studying is whether improving population health would help not only people but the federal budget (see Fig 10).

“It is encouraging to see that the Congressional Budget Office appears to be beginning to consider longer scoring estimates for prevention-related activities. This is a pivotal step for prevention to be placed at the core of policy making.”

Heidi Margulis, Senior Vice President, Public Affairs, Humana, and Vitality Institute Commissioner

**BACKGROUND**

**FIG 10.–CBO ON EFFECTS OF HEALTH IMPROVEMENT**

Possible federal policies include **taxes**, **subsidies**, or other ways to:

- Reduce smoking or obesity
- Increase screening diseases
- Enhance compliance with regimens for chronic conditions

Presumed links between policy and the federal budget:

**CHANGE BEHAVIOR → IMPROVE HEALTH → REDUCE HEALTH CARE COSTS**

The federal budgetary effects depend on the combination of:

- Any reduction in annual health care costs per person
- Any increase in tax revenues from a larger or healthier workforce
- Any increase in costs for Social Security and health care benefits from people living longer
- Any budgetary cost or savings of the policy itself
Healthcare Delivery System

The prevailing “sick care” model in the US prioritizes treatment over prevention. While 97 percent of national health expenditure is directed toward healthcare services, only 3 percent goes toward prevention and health promotion. Stakeholders for treatment (including hospitals and rehabilitation facilities, physicians and other healthcare providers and technicians, pharmacies, diagnostic labs and imaging centers, pharmaceutical and medical device manufacturers) devote most of their time and resources to people who are sick.

Advances in treatment come at a price for the nation’s economy and society as a whole. A better balance could be achieved if prevention took its place alongside treatment. Effective prevention of NCDs costs less than diagnosis, treatment, and management of lifelong, incurable, and debilitating disease. Moreover, it results in a healthier, more vibrant society.

Treating disease is an idea that is easier to embrace than the complexity of behavior change required to prevent NCDs. Elevating prevention requires a greater share of the investment dollars that attract researchers, academic institutions, and leaders in science. In the policy world, the healthcare debate must give equal emphasis to prevention and disease management when considering long-term costs and benefits.

“Prevention reverses the usual order of clinical thinking: it often starts at the population level and then translates information back to the individual. Rather than dwell on the pathology of disease, preventive medicine focuses on risk. In curative care, the goal is usually to restore patients to their earlier, normal state of health. In prevention, as in dealing with hypertension or elevated cholesterol levels in a community, the goal is to shift the entire population-wide distribution to a healthier level, thus changing the norm. In curative care, the principal professional responsibility is to the individual patient, whereas in preventive care, focus is often at the population level and entails a responsibility to the entire community. In curative care, solutions involve prescribing medication, performing operations, or delivering other clinical therapies; in prevention, there is a much wider array of possibilities, from changing behavior choices to altering social conditions, in addition to clinical interventions such as immunizations. Ensuring the health of a population is more difficult than delivering health care to an individual.”

Harvey Fineberg, President, Institute of Medicine

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INVESTING IN PREVENTION: A NATIONAL IMPERATIVE
Disparities

Disparities in health status between distinct groups of people, including differences by race or ethnicity, income, education, gender, sexual orientation, religion, disability, or geography, have been documented in the US since 1985. A 2006 study highlighted a life expectancy gap of 35 years for race-county combinations. The prevalence of NCDs and their associated risk factors are readily apparent. For example, Mississippi has the nation’s second-highest level of obesity after Louisiana, with females in Issaquena County engaging the least in sufficient physical activity and suffering the most from obesity. In contrast, Colorado has the lowest level of adult obesity in the nation, with Routt County having the greatest number of individuals engaging in sufficient physical activity (see Figs 11a and b).

Areas that have poor population health tend to be poorer economically; those with better population health are often more affluent. Statewide, Mississippi’s median household income is $38,882 while Colorado has a median household income of $58,224. (For an interactive map showing county-by-county correlations among poverty, risk factors, and life expectancy: viz.healthmetricsandevaluation.org/us-health-map.)
50 Years After the Surgeon General’s Report, America Is Still Not Smoke-Free

In the US, the number of adults who smoke cigarettes has dropped dramatically since 1965, from 42 percent to 18 percent in 2012. As a result, 8 million premature deaths have been prevented in the past 50 years. Still, more than 40 million Americans continue to smoke. Socioeconomic disparities can be seen in smokers and non-smokers. An examination of 3127 counties from 1996 to 2012 found significantly fewer smokers in higher income counties than in those with the lowest income. During the study period, smoking among men declined in only 14.0 percent of the lowest income counties compared to 75.4 percent of the highest income counties. Among women, decline in smoking was seen in only 4.2 percent of the lowest income counties compared to 45.2 percent in counties with the highest income (see Fig 12).62

It is essential that prevention move beyond diseases alone to address the determinants of health in the context of families, homes, communities, and worksites. Progress is being made in this direction. The National Partnership for Action to End Health Disparities (NPA) was established by the Department of Health and Human Services (HHS) to mobilize a comprehensive, community-driven, and sustained approach to combating health disparities and to move the nation toward achieving health equity. As an outgrowth of nationwide town meetings, HHS issued two guidance documents, which are intended to coordinate action to address racial and ethnic health disparities: The National Stakeholder Strategy for Achieving Health Equity outlines four categories of determinants of health: social, behavioral, environmental, and biological and genetic.64 The HHS Action Plan to Reduce Racial and Ethnic Health Disparities builds on the objectives of Healthy People 2020 and leverages key provisions of the ACA.65

"We cannot improve the health of our nation or workforce without addressing health disparities. We must identify opportunities to close the health gap between different groups and deliberately act in a targeted manner to improve health equity."

Paul Jarris, Executive Director, Association of State and Territorial Health Officials, and Vitality Institute Commissioner
Short-Term Thinking about a Long-Term Challenge

Individuals, policymakers, and private and public sector stakeholders are all subject to making decisions based on irrational responses rather than informed thinking. One of these so-called decision errors is present bias, a concept drawn from behavioral economics to describe the tendency to favor short-term wins over long-term gains.66,67

Individuals want immediate rewards—a cigarette, a slice of pizza, an evening watching television—rather than adopting healthy habits and behaviors that have the potential to pay off in the future. Employers expect a positive return on investment (ROI) for implementing workplace well-being programs, but the timeframe to reap financial benefits through healthcare cost savings extends beyond the average employee’s tenure.11 Politicians who want to justify actions and expenditures while they are still in office may be reluctant to support programs that will pay dividends in a more distant future. Policymakers want immediate impact, so the time lag between introducing a prevention policy and the realized benefit to health puts prevention at a disadvantage to other policies that produce rapid results. Funding bodies use relatively short timelines, with grants and other support rarely extending long enough to test the long-term results of prevention interventions.

Across the entire spectrum of decision making, present bias represents an obstacle to facing the long-term challenges of health promotion and NCD prevention. Overcoming the challenges will take a widespread shift in cultural norms. Embracing health as a strategic imperative may be the best way to move beyond short-term thinking.

Evidence Trumps Short-Termism

A Commentary on a paper published in The Lancet on the effects of smoke-free legislation observes: “One reason that politicians are reluctant to invest in aggressive tobacco control policies and programmes is the perception that the costs (money and the risk of irritating tobacco companies) come now, whereas the benefits (reduced disease and medical costs) are years away. ... In addition to clearing the air, smoke-free laws bring rapid health benefits and improved lives, whilst, at the same time, reducing medical costs by avoiding emergency department visits and admissions to hospitals.”

The paper focused on infant and child health, but the comment also observed “benefits for adults, including drops in hospital admissions for cardiac disease, cerebrovascular accidents, and respiratory disease, and reduced ambulance calls.” It concluded that “the rapid economic benefits that smoke-free laws and other tobacco control policies bring in terms of reduced medical costs are real. Rarely can such a simple intervention improve health and reduce medical costs so swiftly and substantially.”68,69

Broader prevention policies have the potential to yield similar gains, in both the short and long terms.
Inadequate Funding for Research to Build Evidence Base

Four barriers related to health research fuel the debate about whether prevention saves money and represents a good investment.

1. Knowledge gaps about specific cost-effective prevention and health promotion policies and programs

2. Failure to realize the full potential of behavioral economics

3. Lack of effective strategies to implement programs for different population groups and settings

4. Failure to effectively communicate robust evidence where it exists

As a result, opportunities are missed to improve population-based health through disease prevention and health promotion.

The Institute of Medicine (IOM) has proposed that burden of disease and preventability should be major factors for setting public health priorities and research funding. However, a comprehensive analysis of National Institutes of Health (NIH) funding for human behavioral interventions that target modifiable risk factors of NCDs found that of its $30 billion annual budget, NIH spends approximately $2.2–2.6 billion on behavioral studies, equivalent to less than 10 percent of its total budget.

Although federal spending on research related to NCD risk factors is generally consistent with the burden of disease in the US, the proportion of NIH spending on prevention remains low compared to discovery of new treatments for NCDs and does not reflect their preventability. For every dollar spent on discovery by the NIH, pennies are spent on research to understand how to effectively implement prevention interventions.
The ACA-mandated Patient-Centered Outcomes Research Institute (PCORI) has set five national priorities for funding comparative effectiveness research, which is designed to inform healthcare decisions by providing evidence on the effectiveness, benefits, and harms of different treatment options. The first priority is “evaluating prevention, diagnosis, and treatment options.” Indeed, this research area has thus far received the most funding and has approved the greatest number of research proposals, but NCD prevention is minimally represented among them. PCORI is expected to receive an estimated $3.5 billion to fund patient-centered outcomes research through September 2019, the date through which ACA authorizes its funding source. PCORI-funded research could be an important avenue for establishing an evidence base for prevention interventions. What is needed are more proposals for research targeting prevention of NCDs and more funding for that research.

Many community-based health promotion and disease prevention programs have shown promising health outcomes, but information on how programs affect healthcare costs is lacking. While not all preventive interventions should receive unqualified support, a more level playing field for funding between prevention and treatment could provide policymakers with critical information for evidence-driven decision making.

The need is urgent for increased and more targeted investment in primary, population-based prevention by federal funding agencies to support scientific inquiry to advance disease prevention and health promotion, and to continue progress toward building a culture of health.

**Leadership Gap**

Above all, what is lacking to turn the tide against NCDs and make health promotion the cornerstone of a culture of health is leadership. Public health, which is itself underfunded, cannot be expected to single-handedly advocate for prevention.

Stakeholders currently operate in silos, rather than participating in a broader discussion where they can learn from others what the needs are, what works and what does not, and what each brings to the table in terms of ideas, resources, strategies, and skills. When it comes to prevention and health promotion, lack of a sense of common interest and common cause bars leaders from different sectors from finding a common language. Competition within sectors makes leaders reluctant to share ideas. Disease-specific associations guard their own domains rather than joining forces against a common foe. Researchers compete for scant funding resources. And in a striking example of short-termism, graduate institutions are not proactively training the next generation of leaders to advocate for prevention, either in practice or in policy.

First Lady Michelle Obama has led the way in child health, emphasizing more activity and better nutrition. The Office of the Surgeon General has issued a National Prevention Strategy. These high-profile voices are calls to action, but action requires dynamic leaders with influence within their own spheres and the authority to work with their counterparts.
Mapping the future allows for better understanding of potential successes over the short, medium, and long terms.
The Institute for the Future has mapped out the future of technology-enabled health.

The Commission engaged the Institute for the Future (IFTF) to envision technologies that could have an impact on prevention in the future and the implications for the health of Americans into the next two decades (see Fig 13). Download the IFTF map at: [www.thevitalityinstitute.org/technologycatalysts.pdf](http://www.thevitalityinstitute.org/technologycatalysts.pdf).

The Institute for Alternative Futures, with funding from the RWJF and the Kresge Foundation, has developed four alternative scenarios of public health in 2030. Their draft recommendations for action align with those of the Commission:

- Transform public health agencies into “Health Development Agencies” with dedicated, sustainable, and sufficient funding.
  - Implement policies for the systematic use and development of evidence and best practices.
  - Build public health agencies’ role in fostering and promoting prevention strategies.
- Partner in healthcare transformation to facilitate the evolution from a healthcare system to a health system.
- Build the capacity for dialogue about inclusion, opportunity, and equity.
- Dialogue with other sectors to support innovation.
Health for all Americans requires multi-sector collaboration.

Note: The Congressional Budget Office (CBO) scores government programs worthy of investment
The Vitality Institute Commission’s recommendations seek systemic progress toward achieving a culture of health (see Fig 14). The recommendations are bold and aspirational, but attainable through decisive leadership and collaboration among stakeholders. Each recommendation includes targeted, actionable, measurable, and scalable pathways to success in the short (by 2017), medium (by 2020), and long (by 2025) terms. Taken together, the recommendations offer a strategy for creating sustainable competitive advantage for our local, state, and national economies and a blueprint for improving the health of all Americans.

Best Practices: Learning from What Works

Perhaps the most effective way to ensure progress is to learn from and build on what works. Best practices and pilot programs are models to inform decision-making and drive policy change. Replicating successful intervention programs at scale and achieving consistent effects will develop practice-based evidence. Looking beyond its borders for models may be useful as the US strives to improve the health of its population. Where ground has not yet been broken in the field of prevention and health promotion, analogues from other fields may show pathways. Examples of programs and initiatives that work are offered along with the Commission recommendations. These strategies may be used as a toolkit for pushing progress.

Alignment of Commission Recommendations with Institute of Medicine Reports

The Institute of Medicine (IOM) is the health arm of the National Academy of Sciences. An independent, non-partisan body, the IOM provides unbiased, authoritative, evidence-based advice on the nation’s most pressing questions about health and healthcare to decision-makers and the public. In addition to consensus reports from expert panels requested by Congress, federal agencies, and independent organizations, the IOM also convenes forums, roundtables, and other activities to facilitate discussion, discovery, and cross-disciplinary critical thinking.

In developing its own recommendations, the Commission consulted with the IOM to identify alignment with the Institute’s most recent recommendations related to prevention. (See Appendix: Table 3 for selected examples of correlations between Commission and IOM recommendations; greater detail can be found at: www.thevitalityinstitute.org/RecsIOM.)
Invest in prevention science.

The Commission believes that prevention science, as the systematic application of scientific methods to the causes and prevention of health problems in populations, should be supported. It also believes that the discipline should extend beyond the traditional fields of epidemiology and public health to gain insights and gather evidence from behavioral economics and innovations in technology. A complementary approach that adapts public sector intervention to opportunities arising from private sector innovations to improve health behaviors and outcomes will result in a stronger and more comprehensive platform for intervention design and implementation.

Scientific evidence is necessary to develop effective public policies that improve health. A timely and heated example is electronic cigarettes (e-cigs), battery-powered devices that deliver vaporized nicotine without burning tobacco. In February 2014, the European Parliament approved rules to regulate e-cigs throughout the 28-nation European Union, and in April, the US Food and Drug Administration proposed a similar regulatory framework. Although some argue that e-cigs have potential as a harm-reduction strategy, others view them as a gateway to smoking and a threat to the gains made in reducing the incidence of smoking. Opponents and proponents alike lack evidence to support their views. Systematic studies are needed regarding untoward health effects, optimal safety features, impact on children, and whether e-cigs offer a viable alternative for existing smokers that may be equally or more effective than nicotine replacement therapies such as patches and gum.

If prevention is to gain the support and resources it needs, evidence in its favor must be generated, coordinated, and presented in a way that enables decision- and policymakers to understand the value of investing in prevention and takes into account their priorities, interests, and constituencies.

What Constitutes Evidence?

Randomized controlled trials (RCTs), the “gold standard” in biomedical research, have limitations when it comes to moving from what works under ideal circumstances (efficacy) to scaled-up, real-world application (effectiveness). It is possible to reach beyond the narrow confines of conventional RCTs to study complex issues in community settings, as Esther Duflo and Abhijit Banerjee have done in their fieldwork on poverty. Studying the effectiveness of interventions to alter behavior that increases risk for one or more NCD is similarly complex, requiring diversification of the type of methodologies used to evaluate public health trials.

CMS outlined the challenges of gathering evidence for the cost-benefit analysis required under Section 4202 of the ACA. It developed a lengthy, three-stage process of evidence gathering, which has yet to be completed. The first phase, a literature review, found “several established wellness and prevention programs with a firm evidence base. These programs typically demonstrated improvements in health behaviors and proximate health outcomes. Results for chronic disease self-management and physical activity programs were especially promising,” but concluded that “there are some gaps in the established evidence that make more widespread implementation of programs challenging.”

“Ensuring adequate funding for prevention science should be a high national priority, as it’s the public’s health that is at stake. America should be increasing its commitment to public health and prevention science and practice at a time when our fiscal strength depends increasingly on that commitment. What higher national priority should there be?”

Linda P. Fried, MD, MPH, Dean and DeLamar Professor of Public Health, Columbia University Mailman School of Public Health, and Vitality Institute Commissioner
New Kinds of Research Yield New Kinds of Evidence

Other types of evidence are needed to establish the long-term effectiveness of prevention strategies. The speed of adoption of personal devices to track changes in risk behaviors in relation to biological measures creates a demand for innovative designs to better evaluate impact beyond the current reliance on large-scale surveys.

Some alternatives include:

- **Pragmatic Trials**: Conducted in “real-world” settings, pragmatic trials are centered on individuals rather than symptoms and measure a range of outcomes. “Policy makers have an active interest in pragmatic trials, since these are designed to answer the question most relevant to a decision maker’s agenda: comparative effectiveness of interventions in the routine practice. Along with the implementation of cost-effectiveness analyses, pragmatic trials can inform policy makers and health care providers of a treatment’s cost in real-life situations.”

- **Practice-Based Evidence**: This type of translational research can be applied to evaluating prevention programs through systematic reviews and case studies. It is well-suited to programs involving lifestyle modification to reduce multiple risk factors because it recognizes that health is multifaceted and people are too complex to fit the “cause and effect” paradigm of the scientific method.

- **Rapid-Cycle Research**: This “push-pull” model captures and feeds back data once a program is launched, allowing early insights and the opportunity to fine-tune, add elements, conduct interim analyses, and perhaps most useful, learn from both success and failure.

- **Implementation Research**: This research investigates policies and programs in real, complex contexts to discover challenges that are not foreseen in controlled research studies but that may arise during implementation. Implementation research can be used to develop an evidence base on how to achieve consistent effects when programs operate at scale, which is of particular value for decision-makers.

It is a hopeful sign that the Office of Disease Prevention (ODP) at the NIH, under the leadership of David M. Murray, has prioritized prevention research, including development of new methodologies well suited to evaluating interventions. ODP completed its first strategic plan in February 2014, laying out six strategic priorities to improve existing programs and to establish new initiatives to advance research on prevention.

1. Systematically monitor NIH investments in prevention research and assess the progress and results of that research.

2. Identify prevention research areas for investment or expanded effort by the NIH.

3. Promote the use of the best available methods in prevention research and support the development of better methods.

4. Promote collaborative prevention research projects and facilitate coordination of such projects across the NIH and with other public and private entities.

5. Identify and promote the use of evidence-based interventions and promote the conduct of implementation and dissemination research in prevention.

6. Increase the visibility of prevention research at the NIH and across the country.
Learning from What Works

Prevention science as defined by the Commission breaks out of the biomedical research silo to draw from other disciplines and other sectors. In private industry, for example, innovation research and development uses market research, pilot projects, focus groups, and other strategies that focus on their end users to discover what works. Behavioral economics draws insights from psychology and microeconomic theory.

In the UK, the Foresight Program relies on multidisciplinary input to study a range of societal challenges. Established by the UK government in 1994, the Program is tasked with systematically envisioning the country’s future to help policymakers tackle complex issues with an understanding of opportunities and challenges. The Program’s 2007 report, Tackling Obesities: Future Choices, is a prime example of the use of scientific evidence from a range of disciplines to inform a strategic view of a major societal challenge. The report, which was prepared under the leadership of the Treasury—not the Ministry of Health—highlights the diversity in public and private stakeholders required to address obesity. (For an interactive map of obesity: http://www.shiftn.com/obesity/Full-Map.html.)

Behavioral Economics

Pioneered by Nobel laureate Daniel Kahneman, behavioral economics is a powerful, evidence-based tool for both understanding and influencing human behavior in individuals, groups, and institutions. In addition to applications in advertising, marketing, and advocacy, behavioral economics has been adopted by policymakers. According to Harvard University economist David Laibson, behavioral economics has only just begun to extend its influence over public policy.

Nudging Public Policy

In the UK, the Behavioral Insights Team (the “Nudge Unit”) was established in 2010 within the Department for Business, Innovation & Skills to apply research findings in behavioral economics and psychology to policymaking. Its initiatives have included encouraging people to pay taxes on time, insulate their homes, enroll for organ donation, and stop smoking during pregnancy. Early in 2014, the unit was spun off as a “social purpose company” operating as a joint venture of the UK government, team employees, and the social sector technology incubator, Nesta (founded as National Endowment for Science Technology and the Arts). The new venture will broaden its scope to work in both the UK and internationally with business and social sector organizations, as well as local and national governments.

The White House Office of Science and Technology Policy has proposed an inter-agency Social and Behavioral Science Initiative. As part of a larger effort to promote evidence-based policy, the initiative will explore how academic findings from social and behavioral sciences can be used to design public policies that work better, cost less, and better serve citizens. It will promote collaboration among federal agencies in order to embed social and behavioral research insights into a range of policy initiatives and to test outcomes using rigorous experimentation and evaluation methods.
“Behavioral economics has the potential to transform health interventions by leveraging important learnings about decision errors that make people predictably irrational to design more effective approaches to help people get healthier.”

Kevin G. Volpp, Director, Leonard Davis Institute Center for Health Incentives and Behavioral Economics, University of Pennsylvania

By applying an understanding of messages, incentives, and the way choices are structured and presented, behavioral economics can help people achieve their own goals without limiting freedom of choice. For example, arranging food in a cafeteria line so that healthier foods appear first or are easier to reach than less healthy foods is likely to increase healthy food consumption without denying people the freedom to choose less healthy foods. Using financial incentives to encourage positive choices can reduce short-termism by nudging those who are prone to making irrational decisions, while not harming those making informed, deliberate decisions.

Behavioral economics is particularly well-suited to prevention science, and shows promise when integrated into the design of prevention and health promotion programs focused on altering behavior to reduce risk for NCDs.

A randomized clinical trial testing the effects of incentives on smoking cessation gives evidence of the value of behavioral economics as a prevention strategy. Out of 878 members of the General Electric workforce, 442 received information on smoking-cessation programs while 436 received program information plus the promise of incentives: $100 for completing a smoking-cessation program; $250 for stopping smoking within 6 months after enrolling in the study; and $400 for remaining smoke-free for an additional 6 months after quitting. Non-smoking status was confirmed by a lab test. Those in the incentives group enrolled in a smoking-cessation program at a higher rate (9.4 percent) than those who received program information only (3.6 percent). Quit rates within 6 months were also higher—10.8 percent with incentives versus 2.5 percent with information only. At 9 or 12 months after enrollment in a cessation program, the group receiving incentives remained smoke-free at a rate of 14.7 percent versus 5 percent of those who did not receive incentives.

Training Tomorrow’s Leaders in Prevention Science

If prevention science and practice are to take their place in the nation’s health system, a new generation of leaders—researchers, practitioners, and policymakers—must be educated. Gaps in training programs and curricula must be filled, particularly in the multidisciplinary areas required to conduct research and influence policy. Schools of public health need a stronger focus on health policy. Schools of medicine and nursing need a stronger focus on prevention. In schools of law, business, and public policy the gap is even greater: they rarely consider health, let alone prevention.

Graduate training for the health professions mirrors the limited real-world attention to disease prevention and health promotion. Medical and nursing education are primarily oriented toward treatment, rather than prevention. For example, one survey found that 94 percent of physicians believe that nutrition counseling should be incorporated into primary care visits, yet only 14 percent feel adequately trained to provide it. In 1985, the National Academy of Sciences recommended that all medical schools include a minimum of 25 contact hours of nutrition education. Nonetheless, only 38 percent of medical schools had met these minimum standards as part of their general curricula in 2004, and by 2010 that number had fallen to 27 percent. A bill introduced in Congress would require the Secretary of HHS to issue guidelines to federal agencies to develop procedures and requirements to ensure that primary care professionals have at least six credits of continuing medical education related to nutrition. As of April 2014, the Education and Training for Health Act of 2014 had been referred to the House Committee on Energy and Commerce.

NIH funding has a significant impact on medical schools and the career development of research scientists since more than 80 percent of the NIH budget funds grants that support an estimated 350,000 scientists at the nation’s medical schools. Since that funding is generally targeted to exploring treatment therapies, universities and, in turn, individual faculty tend to set their priorities on clinical and laboratory science at the expense of prevention. The content focus of health research matters because researchers, especially junior scholars, will likely be attracted to a line of inquiry that offers a promising career path.

As a practical matter, there will be little incentive for universities to undertake radical revisions to current curriculum content until there is greater investment in prevention science and a critical mass of careers in health promotion and prevention. Although reforming the content of graduate education will not solve the problem on its own, it will contribute to furthering research in prevention science and training a new generation of leaders in building a culture of health.
Learning from What Works

Alternatives to Curriculum Reform

Many suggestions for reform call for expanding health-related curricula,99 but students are often overwhelmed by existing degree requirements. Initiatives in both health education and the broader education sector suggest other opportunities to strengthen and better integrate prevention in graduate-level and career training.100 Some possibilities include:

**Practice-Oriented Course Offerings**

Existing courses could be adapted to provide practice-oriented opportunities, such as internships and practicums in community health centers and legal clinics. Georgetown University’s Law Center, for example, has transitioned several courses previously offered as lectures or seminars to experiential learning courses.101 In the health-law practicum, students are assigned to projects from a number of sources, including social sector organizations and local health systems, both of which require multidisciplinary solutions.

**Dual-Degree Programs**

Joint-degree programs are multidisciplinary by design, and many schools of medicine, law, and policy already offer joint degrees in cooperation with schools of public health. Students self-select into these programs and welcome the intensive training across competencies, which generally includes more robust public health curricula.

**Online Delivery Platforms**

The burgeoning field of massive open online classrooms (MOOCs) offers free online courses in a variety of subjects to the public at large. A growing number of schools see MOOCs as an opportunity to engage a broader audience. In the public health field, Johns Hopkins University offers courses on biostatistics, epidemiology, and data analysis.102 Universities should consider partnering across departments to create multidisciplinary offerings, without necessarily having to create new content.

“The harsh, commercial atmosphere of the marketplace has permeated many academic medical centers. Students hear institutional leaders speaking more about ‘throughput,’ ‘capture of market share,’ ‘units of service,’ and the financial ‘bottom line’ than about the prevention and relief of suffering. Students learn from this culture that health care as a business may threaten medicine as a calling.”

American Medical Education 100 Years after the Flexner Report 91

Prevention at George Washington University

Gifts totaling of $80 million will enable George Washington University’s school of public health to focus on some of the most complex public health issues, beginning with the health impacts of obesity and ways to improve health, nutrition, and physical activity. Newly renamed the George Washington University Milken Institute School of Public Health, the School will house the Sumner M. Redstone Global Center for Prevention and Wellness. Recognizing that “advances in treatment and cures have been rapid, but the benefits for public health have been muted as these strides are largely offset by poor nutrition, insufficient focus on prevention and wellness, environmental factors and lifestyle decisions,” the Redstone Center will leverage its location in the nation’s capital to work with other major US and international health institutions and schools of public health to drive change.
Investing in Prevention: A National Imperative

**Recommendation 1**

**Invest in Prevention Science.**

**Pathways**

Increase public and private sector funding for prevention science and research, through companies, foundations, the NIH, CDC, and PCORI.

Expand the understanding of prevention science to encompass epidemiology, behavioral economics, and application of personalized technology, as reflected by influential papers published in peer-review journals.

Reinforce the understanding among individuals and institutions that prevention is a critical investment with high-value returns.

**Measures of Success**

**Short term 2017**

- The federal government has increased the proportion of total health funding for prevention science research by at least 10 percent, measured by the number and size of grants.

- Private-public partnerships have been formed at local, state, and federal levels to advance prevention science and to develop common metrics to report on progress.

- The Council on Foundations has reported on and given priority to NCD prevention and health promotion in its future funding.
RECOMMENDATION 1  INVEST IN PREVENTION SCIENCE

The IOM has reviewed and recommended new science-based guidelines for assessing the effectiveness of prevention and community- and workplace-based health promotion programs that go beyond a sole reliance on RCTs.

The curricula of graduate schools of health, medicine, law, policy, and business have evolved to reflect the cross-disciplinary importance of health and prevention as a required subject of study.

A growing body of convincing, robust evidence demonstrating that a healthy workforce is vital to our nation’s security, job creation, economic growth, and global competitiveness is disseminated and used by policymakers and corporate leaders.

Enrollment in graduate programs to develop into executive health leaders for prevention across sectors has seen a meaningful increase.

A dynamic and attractive career path for prevention science leaders has been widely established and adopted with support of the NIH and CDC as well as the social, education, and business sectors.

The CBO uses evidence-based prevention research in scoring and recommending the size of prevention and health promotion budgets across federal agencies.

Medium term 2020

Long term 2025
Strengthen and expand leadership to deliver a unified message for health and prevention.

Advocates for prevention have not coalesced around a position or agreed upon key messages. They come from disparate realms representing different interests and priorities. Public health rarely talks to business, the social sector rarely talks to academic researchers who in turn do not speak the language of policymakers. The media further muddles these messages. It is not surprising that the strongest and most consistent voice in the health arena—the voice for treatment and disease management—is heard most clearly and is most often acted upon.

Stakeholders for prevention have not historically seen value in working together and, to date, have not joined in common cause. It is essential that they develop coherent messages that are backed by a robust evidence base and a compelling argument for the economic value of a healthy workforce. And they must speak with a unified voice.

Leadership

In its Bipartisan Rx for Patient-Centered Care and System-Wide Cost Containment, the Bipartisan Policy Center asserted that visible and sustained senior leadership commitment to prevention is critical to its success. There is an urgent need to recruit champions to spearhead a movement for prevention. If prevention is to take its proper place in the health system, with policies to support research and implementation, it will take a broad coalition of those who have the most to gain from a healthier nation and the greatest leverage to achieve it.

Effective leaders are able to listen as well as speak with conviction. They are as forceful as they are forward looking. Working with others, they create synergies. They must be brought together from diverse fields, ranging from private industry to the military, law to law enforcement, transportation to agriculture, finance to retail, education, technology innovation, research, manufacturing, health insurance, architecture, urban design, labor, service industries, local governments, the faith community, professional sports, entertainment, media, advertising, and communications—the entire spectrum of American life.

Leaders in prevention must be equipped with the best evidence from prevention science that is relevant to their own fields and willing to listen to what matters to those in other fields. They must be open to sharing their specialized knowledge as well as learning from others. Only then will they be able to create the synergy needed to promote the prevention message, and to take their places at the table where the research agenda, funding, and health policy are debated.

In the US, advocacy by a small number of government and political figures has raised the profile of prevention and galvanized some action by industry, the social sector, and communities. Within industry, a small but growing group of chief executive officers (CEOs) has championed prevention programs for their workforce and some have formed coalitions with other companies and groups. Many CEOs of US corporations have been drivers of the World Economic Forum’s Workplace Wellness Alliance. Despite these exemplars, the leadership cadre remains small, and there is a significant lack of representation from smaller businesses. Small businesses with fewer than 20 employees account for the majority (89.8 percent) of firms in the US. Collectively, small and medium-sized enterprises (SMEs) employ nearly half (48.5 percent) the American workforce, so it is crucial to develop and support leaders from the SME community (see Appendix: Table 4).
Notably, the Federal Reserve Bank of San Francisco (which covers Alaska, Arizona, California, Hawaii, Idaho, Nevada, Oregon, Utah, Washington, the Northern Mariana Islands, American Samoa, and Guam) has actively linked health with community investment to improve health disparities that exist across populations of differing socioeconomic and demographic backgrounds. Investing in What Works for America’s Communities is a joint project of the Federal Reserve Bank of San Francisco and the Low Income Investment Fund. The Healthy Communities Initiative, a partnership with RWJF, was designed to enrich the debate on how cross-sector and place-based approaches to revitalize low-income communities might also improve health, and to encourage stronger linkages between the two sectors and move them forward toward a healthier future.

On the local level, leadership from mayors, school and planning boards, and church and civic organizations, has been influential in tackling challenges and implementing solutions tailored to the needs of their communities. The impact of ill health and the benefits of prevention touch the lives of ordinary citizens in ways that local leaders are well positioned to address in innovative ways. Grassroots efforts have the potential to grow and spread to other communities and eventually to society as a whole.

People in leadership positions act as catalysts, inspiring action that builds momentum. First Lady Michelle Obama launched Let’s Move! in 2010, the first national initiative dedicated to increasing physical activity and decreasing obesity among children. The stature of the First Lady gives her an unprecedented leadership role, but she can serve as a model for other high-profile people in all sectors of society.

Learning from What Works

Perhaps the best analogues for what the Commission views as Corporate Health Accountability are the well-established business principles of sustainability and corporate social responsibility (CSR). As recently as two decades ago, these were novel concepts. Very few people were trained as professionals in these areas and fewer still held leadership positions in major corporations. Today, CSR and sustainability are crucial to overall business strategies, with key representation on executive leadership teams.

Leadership in the Business Community

CEOs of a number of major corporations have championed the health of their own workforce. Examples include:

- **STEVEN BURD** developed Healthy Measures at Safeway, which provides the supermarket giant’s workforce with reductions in their insurance premiums if they remain within specific limits on four risk factors—smoking, obesity, blood pressure, and cholesterol.

- **MICHAEL CRITELLI** was a pioneer in workforce health and prevention when he headed Pitney Bowes. Along with former Corporate Medical Director Jack Mahoney, he instituted an integrated approach focused on preventive care, removing barriers to receiving care and providing resources that empower employees to take control of their health.

- **JOHN HAMMERMOREN** introduced Vitality’s voluntary workplace program to over 85 percent of McKesson Corporation’s workforce. McKesson aims to empower their workforce to improve their health by encouraging them to set health goals, including regular physical activity and healthy eating.

- **INDRA NOOYI** initiated PepsiCo’s Performance with Purpose, a promise to deliver sustainable growth by investing in a healthier future and a commitment to PepsiCo’s workforce that also extends to consumers, the communities in which it operates throughout the globe, and the planet.

- **WILLIAM WELDON** led an entire culture shift at Johnson & Johnson by realizing that workforce health makes business sense at the same time as it provides personal benefits. Weldon implemented the Tobacco-Free Workplace Policy that prohibits tobacco use at 98 percent of the company’s locations.

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**Bipartisan Policy Center CEO Council on Health and Innovation**

The Bipartisan Policy Center is harnessing the collective influence and experience of CEOs of some of the nation’s largest employers. Their mandate is to identify and share innovative strategies and best practices to improve workforce health and the quality and cost-effectiveness of care, with the goal of encouraging adoption of such practices by other large and medium-sized companies. A Health Care Advisory Board representing clinicians, consumers, health plans, and hospitals, has been formed to provide expert guidance in this collaborative effort.
The Denver Metro Chamber of Commerce

Chambers of Commerce can provide leadership among smaller businesses, which may not have the financial resources or political clout to do it on their own. The Denver Metro Chamber of Commerce considers workplace health as material to the metropolitan area’s economic viability and core to its brand as a magnet for healthy lifestyles.

As Kelly J. Brough, Chamber President and CEO, states, “Our workforce is our most competitive advantage. Ninety percent of our companies in Colorado have fewer than 20 employees and they employ one half of our workforce. We make sure that employers understand that they can have as high as 25 percent increase in productivity from folks who are healthy, who aren’t calling in sick, who don’t need more time off, who aren’t slowing down in the afternoon.”

Partnership for a Healthier America

A nonpartisan, nonprofit organization led by some of the nation’s most respected health and childhood obesity advocates, Partnership for a Healthier America (PHA) is dedicated to addressing childhood obesity by catalyzing commitments between public, private, and social sector groups. Founded in 2010 in conjunction with, but independent from Let’s Move!, PHA has to date secured commitment from over 60 partners, affecting 45 million Americans in nearly 2000 cities. In 2012, Birds Eye committed to invest $6 million in marketing vegetables to children. In 2014, Del Monte Foods committed to improving the nutrient density of products and an $18 million marketing campaign to promote fruit and vegetable consumption.

The Healthy Weight Commitment Foundation

A CEO-led organization designed to help reduce obesity in the US by 2015, the Healthy Weight Commitment Foundation (HWCF) brings together more than 250 retailers, food and beverage manufacturers, restaurants, sporting goods and insurance companies, trade associations, and professional sports and social sector organizations. Its mission is to promote solutions that help people achieve a healthy weight by balancing the calories they consume with the calories they burn. In January 2013, HWCF published results on their pledge to reduce 1 trillion calories from the marketplace by 2012 and 1.5 trillion by 2015. An independent assessment determined that HWCF had already exceeded their 2015 goal by over 4 trillion calories.

The Clinton Global Initiative

The Clinton Global Initiative (CGI) is a major venue and approach to building tangible commitments to prevention. Established in 2005 to convene global leaders to address the world’s challenges through innovative and creative solutions, CGI is focused on turning ideas into action. A Commitment to Action made through CGI must be new, specific and measurable. To date, members of the CGI community have made more than 2800 Commitments to Action, which are already improving the lives of more than 430 million people in over 180 countries. When fully funded and implemented, these commitments will be valued at $103 billion.

In 2013, for example, Pro Mujer, Sesame Workshop, the Mayo Clinic, and Pfizer committed to leverage their core competencies to promote healthy habits among more than 271,000 Pro Mujer clients and their families in Latin America, where chronic diseases account for 68 percent of mortality. By utilizing new technological platforms, such as social marketing videos, internet and web content, remote consultation and training, and mobile technology to address chronic disease prevention from multiple angles, the Pro Mujer initiative aims to educate and support patients, families, and providers.

“Healthier Futures: Prioritizing Prevention”

At its 2013 annual meeting, CGI hosted a plenary session to explore how to position prevention, invest in more economical measures to address NCDs, and leverage new insights from behavioral economics to incentivize change. Participants in the panel discussion moderated by Chelsea Clinton, Vice Chair of the Clinton Foundation, were Margaret Chan, Director-General of the World Health Organization; Adrian Gore, Chief Executive Officer of Discovery Limited; and Risa Lavizzo-Mourey, President and CEO of the Robert Wood Johnson Foundation.
Recommendation 2

Strengthen and expand leadership to deliver a unified message for health and prevention.

Pathways

Generate frequent references to and advocacy for prevention as a top priority and strategic asset by leaders from the public, private, and social sectors.

Establish trusted collaborations between public, private, and social sectors that catalyze investment in prevention.

Develop and disseminate clear and compelling messages for government and business leaders (through private-public consortiums) that convey the human and economic value of prevention.

Measures of Success

Short term 2017

- Business groups and convening platforms covering different industries and small, medium, and large companies have formed councils to share best practices and work to integrate health as a core value in their corporate charters.

- *A Culture of Health* has become part of the policy and leadership lexicons, with new and established voices from diverse sectors referring to it in public statements and documents.

- Health has been incorporated as a core attribute within existing corporate social responsibility (CSR) and sustainability leadership strategies, metrics, and annual reports.
**RECOMMENDATION 2  STRENGTHEN LEADERSHIP**


Workforce health is expressly articulated as part of the organizational strategy of a majority of Fortune 500 companies.

Half of the regional Federal Reserve Banks across the US explicitly support investment in prevention as essential to economic growth.

**Medium term 2020**

- The business community has adopted a C-Suite position for a Chief Health Officer, who is responsible for the systematic health of the workforce through programs that have conventionally been part of human resources, occupational safety, and facilities management.

- Prevention stakeholders have as strong and effective a presence as those from the pharmaceutical and biomedical industries in influencing the health agenda and allocation of resources, as expressed through industry collaboration and coordination.

- Prevention messages are inspired and effective, and integrated into all health information communicated to the public by the media, organizations, and public sector agencies.

**Long term 2025**
Make markets work for health promotion and prevention.

Much decision-making about health, and especially about behavior related to health, ultimately occurs at the individual level. Markets both stimulate and respond to consumer demand. Investment in the development of an ecosystem of health—from healthy options in food and activity to personalized technology tools—will pay off by making the healthy choice the easy and appealing choice.

Innovation can be accelerated through private-public partnerships, including federal research and commercialization funding similar to that used in R&D for pharmaceuticals and medical devices. Such collaboration will necessitate clear and mutually agreed-upon outcomes subject to independent audit and public reporting to avoid real or perceived conflicts of interest.

“As investors, we seek out companies that enable insurers, employers, and other healthcare purchasers to reduce disease risk and associated costs. A healthy population translates to a healthy bottom line.”

Oliver Moses, Senior Managing Director, MTS Health Investors, and Vitality Institute Commissioner

Investing in Companies that Invest in Health

Financial institutions, including Bank of America Merrill Lynch and UBS, have begun to spotlight businesses committed to enabling consumers to make healthier choices. For example, Danone, Dean Foods, and Whole Foods Market are singled out by Bank of America Merrill Lynch as leaders in fighting obesity in the food sector. Similarly, the Access to Nutrition Index (ATNI) assesses and ranks 25 of the largest manufacturers in the world on its commitments, practices, and performance related to obesity, taking a holistic view that encompasses weight management, pharmaceutical interventions, and physical activity in addition to nutrition. In 2013, Danone, Unilever, Nestle, and PepsiCo were the top food and beverage industry performers.

Increasingly, food and beverage companies have responded to market demand by expanding their portfolios to include healthy alternatives and reformulating their existing products lines using healthier ingredients. PepsiCo, for example, pledged to reduce sugar, sodium, and saturated fat content in their products by up to 25 percent by 2015. The food and beverage leader also expanded its product portfolio to include baked, rather than fried, chips and whole-grain snacks.

Companies with product portfolios emphasizing health often outperform the market. The Hudson Institute’s Obesity Solutions Initiative aims to deliver practical, market-oriented strategies to overcome obesity by “giving consideration to the needs of all vested parties—corporations, the public health community, consumers and regulators.” It has found that companies focused on healthy products had overall sales growth over two times the rate of those focused on traditional items.
Learning from What Works

Taking Tobacco Off the Shelves

CVS Caremark, the largest drugstore chain in the US based on sales, announced in February 2014 that it would discontinue the sale of tobacco products in its 7600 retail locations. The company is transitioning its business model to become a health provider rather than a retail business.

In the immediate aftermath of the announcement, CVS stocks rose while shares of tobacco giants fell. It remains to be seen what the long-term effects are on CVS’s bottom line, but as Ross Muken, an analyst at ISI Group, said: “Anytime a company puts public health and the long-term good ahead of short-term profit, it’s sort of an eye opener.”

Companies in many industries are recognizing the profit potential of more socially acceptable products and practices. ... While the public accolades are nice for a while, companies like CVS don’t give up a profitable line of business unless it is in their best long-term financial interest to do so. What CVS did is what I call having a moment of profitable morality.”

— Hank Cardello, Director, Obesity Solutions Initiative

"Technological innovations for health are exploding. They are tracking our steps, measuring our sleeping hours, and enabling us to better understand the impact of our daily lifestyle choices. Market winners among health technologies will be those can demonstrate effectiveness in reducing chronic disease risk factors.”

Ilene Klein, MD, FAAFP
Director,
Global Employee Health Services,
Qualcomm Incorporated,
and Vitality Institute Commissioner

Personal Intelligent Technologies

Technological innovations are transforming the landscape for health promotion and prevention. The advent and expansion of personal intelligent technologies provide individuals with both the tools and the opportunity to take greater responsibility for their health. Wearable tracking devices that measure steps walked and hours slept; embeddable sensors that passively release medications into the body; and diagnostic tests that sequence genes to customize prevention, detection, and treatment, have rapidly emerged to personalize health for early adopters. Adoption of personal, intelligent health monitoring is likely to mirror that of smart phones—accessibility and ubiquity will rise as prices fall.

One example is the McDevitt Programmable Bio-Nano-Chip (p-BNC), which has the potential to transform biochemical screening (blood and urine testing). The credit card-sized disposable device is designed to work in conjunction with an imaging platform the size of a toaster, which analyzes biomarkers found in body fluids and relays test results to consumers through a smart phone interface. This is just one example of a disruptive technology that may facilitate access through reduced costs and distribution by leveraging existing points of sale and widespread use of smart phones.
In the near future, we can expect to see more physical objects with highly accurate sensors that wirelessly communicate with users and coaches, both as wearable devices and placed within the environment. Digital coaches will become more responsive as algorithms become more personalized, converging with technologies based on artificial intelligence and virtual reality. When combined with behavioral economic strategies that nudge individuals to make healthier decisions, personal health technology has the power to reinforce healthy habits, including physical activity and not using tobacco, and to improve medication adherence.116 Technology-enabled personal health monitoring and assessment are poised to spread beyond early adopters, ushering in a new era that may alter the economic as well as the health landscape. It remains to be seen, however, when and how gadgets and programs delivered by this route will transcend novelty for the “worried well” and scale to broad access and efficacy.

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Adoption of personal health technology at scale will likely be dependent on whether solutions are found to the following challenges:

- Access across social and economic barriers, with a particular emphasis on lower-income populations
- Maintaining engagement over the long-term to ensure development of sustainable new habits among individuals and communities
- Privacy and confidentiality concerns associated with the collection and analysis of personal health data, including analyses of big data that can help to improve population health status

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Ethical, Legal, and Social Implications of Personal Health Technologies

The National Human Genome Research Institute’s Ethical, Legal and Social Implications Research Program focuses on genomic research, genomic healthcare, broader societal issues, and legal, regulatory, and public policy issues. The work of the program has provided an ethical framework for the use of genetics and genomics in research. An analogous framework is needed to investigate and resolve issues related to personal privacy, data confidentiality, and ownership of data associated with new technologies developed for monitoring health and prevention activities. This framework would necessitate closer interactions between government and technology innovators. It would also require strong government oversight and action by public health and prevention stakeholders.

As part of its eHealth Action Plan 2012-2020, the European Commission opened a public comment period in April 2014 to solicit ideas and methods for resolving existing barriers and issues related to privacy and confidentiality associated with mobile health. A similar process for overcoming related challenges is required in the US.117

The following actions would go far to address the ethical, legal, and social implications for the use of personal health technology without creating insurmountable obstacles for their development and adoption at scale:

- Create a trust framework for the way personal health and prevention data gathered from sensors and monitors is managed between individuals, private companies, employers, and health insurers.
- Generate standards for health and prevention metrics and protocols that are adopted across technology platforms to create interoperability.
- Encourage aggregation of blinded data of population health for study by universities and other researchers.

“Overcoming ethical, legal, and social challenges associated with emerging health technology and big data is essential to ensuring the safety of all Americans. We have a mandate to ensure supporting frameworks exist so that our personal data is not exposed.”

Ezekiel J. Emanuel, MD, PhD, Chair, Department of Medical Ethics and Health Policy, University of Pennsylvania, and Vitality Institute Commissioner

The private sector has spurred investment in personal health technology. In 2013, approximately $13.8 billion was spent on R&D of digital enablers for health.118 It is expected that private sector investment will continue to incentivize development of integrated health functionality across operating platforms and systems.

The economic effects are consistent with “Kondratieff wave” theory (see Fig 16), which views the world economy over time as a waveform, with downward trends due to crises such as the Great Depression and up cycles associated with new technologies, ranging from the steam engine to automobiles. According to Jeffrey Sachs, Director of The Earth Institute and Professor of Health Policy and Management at Columbia University, the sixth wave will build on intelligent technologies.
To spur innovation and investment in health-enabling technology, “early-stage” research grants and forms of financing that will attract later-stage sources of private capital—akin to the non-dilutive funding available for biomedical research—could be established by the federal government. One example is the Small Business Innovation Research program, which provides research grants that help attract private sector investment. Another is the Advanced Research Projects Agency-Energy (ARPA-E), which promotes technologies that generate, store, and use energy in new ways. On a smaller scale, some states and municipalities use grants and tax incentives to attract technology enterprises. Similar funding systems for prevention could further leverage existing private sector investment in personalized and intelligent health technologies.

Learning from What Works

Persuasive Technology

BJ Fogg, founder of the Persuasive Technology Lab at Stanford University, brings the science of behavior change to the design of innovative systems to change human behavior, with a focus on health. According to the Fogg Behavior Model, the three basic components of behavior change are motivation, abilities, and triggers. The model can guide designers of devices and other technologies to identify precise behaviors, find a way to make the behavior easy to do, and then put a timely “trigger” in place to prompt people to adopt the new behavior.

Fogg contends that the most practical approach to behavior change is to focus on people who are already motivated but have not yet taken action. He argues for viewing change as coming from hope rather than from fear. Systems that catch people when they are highly motivated and able can promote hope, which increases the odds of bringing about meaningful and sustainable behavior change. In his view, the most effective behavior change systems build small incremental actions that move toward larger behaviors that people want to change. An incremental profile of the behaviors that are relevant to the final outcome fosters momentum through practice, revision of behaviors, small steps, and appropriate rewards.
Recommendation 3
Make markets work for health promotion and prevention.

Pathways
Establish federal research and commercialization funding mechanisms and incentives to develop innovative and profitable products, services, and technologies for healthier lifestyles.

Deploy financial and environmental incentives for consumers that expand the successful adoption of healthier products and services.

Forge effective private-public collaborations that generate positive, measureable health outcomes and impacts through innovative and transparent financing and operations.

Measures of Success

Short term 2017

- New business competitions have been organized at universities to focus on health and prevention innovations.
- The CDC and NIH Foundations have developed a strategy to build private-public partnerships by investing federal dollars to accelerate private sector innovation for prevention, similar to those that have led to pharmaceutical advances.
- A framework that proactively addresses ethical, legal, and social issues with respect to the use of data collected by personal prevention technologies has been established through a systematic review and extensive public consultation, and adopted across sectors.
Local governments and pension funds invest in community health-related innovations and social enterprises.

A federal agency, similar to ARPA-E in the Department of Energy, has been established to fund research and commercialization for technologies and businesses that support health and prevention.

Financial and behavioral incentive programs that provide broad access to health and prevention initiatives across society have been tested and scaled up.

GDP driven by health—related not only to the treatment of disease but also focused on building sustainable healthy communities—is increased by 20 percent over current levels.

Health and prevention products and services are a major market segment and a long-term driver of the consumer economy.

A thriving private sector built on innovation becomes a powerful and profitable voice for prevention and health promotion.
Integrate health metrics into corporate reporting.

Traditionally, the value of a company has been measured in terms of profit and stock price. More recently, sustainability has been added to that measure, often in the realm of CSR. It is time for Corporate Health Accountability to become the third leg of the stool on which a strong enterprise stands.

**Workforce Health is a Shared Value**

The notion of CSR may have seemed like little more than a “feel good” idea when first introduced, initially as a public relations tactic and more recently as a way for companies to mitigate risk. For forward-looking companies, CSR has evolved into the concept of shared value, which has now become a core business strategy.

As Michael E. Porter and Mark R. Kramer explain it, shared value “involves creating economic value in a way that also creates value for society by addressing its needs and challenges. Businesses must reconnect company success with social progress. Shared value is not social responsibility, philanthropy, or even sustainability, but a new way to achieve economic success. It is not on the margin of what companies do but at the center. We believe that it can give rise to the next major transformation of business thinking.”

It will be truly transformational if human capital, measured as workforce health, takes its place in the shared value system. That will require development and standardization of metrics that are material to the financial performance of companies. Further, the metrics need to be used in an integrated manner. The transformation will be realized only when CEOs, CFOs, and shareholders understand that workforce health is an investment in future profitability, not an expenditure to be minimized (see Fig 17).
Learning from What Works

C. Everett Koop National Health Award Winners

The Koop awards are given annually to private and public sector initiatives that have measurably improved the health of Americans. Most companies that have won the award have been led by CEOs who have taken a strong public as well as internal stand on the value of health and the importance of prevention. The winner for 2013 was Dell, which was cited for “Well at Dell,” which provides financial incentives to engage and reward participants who monitor, maintain, and improve their health. Past winners include L. L. Bean, Eastman Chemical, Alcon Laboratories, and Prudential Financial.

Corporate Health Accountability Begins in the Workplace

RK Mechanical, a Denver-based contracting company, worked with Centura Health, a healthcare network, to improve the health and safety of its 700-person workforce. RK Mechanical adapted Centura Health’s Tobacco Cessation Program to mandate smoke-free construction zones on all their job sites.

“What if you train people and they leave? Well, what if you don’t train them and they stay? The same goes for health and well-being.”

Jon Kinning, CEO, RK Mechanical

Measuring Sustainability and CSR

The time has come for health metrics to be included alongside other measures that are driving a new vision of what truly leads to the creation of long-term value. To inform the necessary work of developing standardized metrics for workforce health, the established structures for measuring and valuing sustainability and CSR should be used as analogues and models.

- The Dow Jones Sustainability Index (DJSI), launched in 1999, was the first global index to track the financial performance of companies that have adopted sustainability best practices. It uses a defined set of criteria to evaluate the sustainability performance of the largest 2500 companies listed on the Dow Jones Global Total Stock Market Index. Currently, it addresses only occupational health and safety, not the major drivers of workforce health.

- The FTSE4Good Index Series, launched in 2001, objectively measures the performance of companies that meet globally recognized CSR standards.

- Pioneered in 2009 by the Johannesburg Stock Exchange (JSE), the King Code of Governance (King III) recommends companies produce an integrated report that includes social, environmental, and economic performance along with financial reporting. The code was one of three developed by the King Committee on Corporate Governance, chaired by Justice Mervyn E. King.

- Companies that adopt B Corporation status are able to pursue strategies they believe benefit society, rather than maximize short-term profits. For example, if a B Corporation wants to report on its environmental footprint, it can make a decision that forgoes creating shareholder value in the short term for the longer-term environmental benefit. Reporting health metrics should be included as a qualifier for B Corporations.

- Business in the Community (BITC) is a social sector organization based in the UK that promotes responsible business practices for a sustainable future. BITC encourages businesses to adopt an integrated approach, which currently includes reporting on sustainability strategy alongside commercial activity. Workforce health should be integrated as well.

- The United Nations Global Compact has created a platform for businesses to align operations and strategies with human rights, labor, environmental, and anti-corruption issues. These companies also must issue an annual Communication on Progress report, a public disclosure of actions supporting the UN Global Compact’s principles and broader UN development goals.
RECOMMENDATION 4

MAKE HEALTH MEASURABLE
**Recommendation 4**

Integrate health metrics into corporate reporting.

**Pathways**

Develop effective health reporting metrics through a credible collaboration among key, respected stakeholders.

Incorporate health performance into existing integrated reporting and sustainability reports.

Generate evidence-based recognition that the health and well-being of workforces is a key metric for long-term successful business performance.

**Measures of Success**

**Short term 2017**

- Meetings have been convened for companies committed to integrated health metric reporting to develop an initial set of metrics to be piloted and iterated over time, in consultation with major reporting bodies, such as the Global Reporting Initiative and Dow Jones.

- Early adopter companies have begun to incorporate standardized workforce health metrics into corporate financial and sustainability reporting.

- Small, medium, and large companies have formed a task force to pilot reporting metrics on the health of their workforce, and have issued a report to the broader community.
Several hundred small, medium, and large companies across industries have published the health status of their workforce alongside corporate financial and sustainability reports.

Global reporting agencies such as the Global Reporting Initiative, Coalition for Environmentally Responsible Economies, and Sustainability Accounting Standards Board have adopted and called for health and associated metrics to become an integrated component of corporate financial reporting.

Corporate boards and investors have begun to demand and use information on workforce and organization health alongside corporate financial and sustainability metrics to drive strategy and inform valuation models.

Medium term 2020

- Standard metrics for health reporting have been widely adopted throughout the business sector.

- The Dow Jones Sustainability Index has incorporated workforce health as a core metric.

- Recognition of the value of workplace health leads to a 50 percent greater investment in workplace programs that tackle major contributors to the burden of NCDs.

Long term 2025
Promote strong cross-sector collaborations that generate a systemic increase in health promotion and prevention across society.

A theme in many IOM reports and recommendations is the need to engage non-health sectors to tackle all factors that influence health. Constructive engagement with decision-makers in other sectors involves developing strategies that help each other.

**Health in All Policies**

Achieving a culture in which health is embraced as a strategic imperative and as a core social value requires the inclusion of health in all sectors and all policies. But just as the health sector might find it challenging if asked to integrate programs to achieve education or economic development aims when time and human and financial resources are stretched thin, other sectors driven by their own specific pressures might reasonably resist difficult demands from the health sector.

“Health in All Policies is an approach to public policies across sectors that systematically takes into account the health implications of decisions, seeks synergies, and avoids harmful health impacts, in order to improve population health and health equity.”

World Health Organization

**When Health is Not the Priority**

Many non-health sectors are driven by considerations other than health. Advocates for health need to understand the priorities of the sectors in which they want to make progress and must work collaboratively to develop a case for prevention and policies that support it. Advocates for prevention will be more successful if they ask such questions as: What are the values and aims in these sectors? How might health interventions be strengthened to provide benefits and reduce harm to them? How can attaining their goals be done in ways that also improve health? What areas of collaboration have not been discovered yet? The answers may yield “win-win” approaches that will encourage other sectors to collaborate and share their resources to ultimately promote health side by side with other community priorities.

In the UK, for example, the Oxford Martin Commission, a group of highly respected global leaders, has called for progress in climate change, economic inequality, corporate practices, and chronic disease. The Oxford Martin Commission proposed fighting NCDs using an action-focused and city-based network termed “Fit Cities,” which would partner food, beverage, and alcohol providers with public health and city officials as well as civil society to minimize the burden of chronic disease on health systems.

**Infrastructure Planning and Development**

Public sector investments in transportation focus disproportionately on roads and neglect efforts that would promote active transportation such as walking and cycling. Advocates for prevention can involve themselves in the early stages of projects designed to develop and enhance urban infrastructure to ensure health benefits such as walkable neighborhoods, recreational facilities, and more accessible retail outlets for healthy foods are part of the master plan. This approach is truly collaborative across sectors.
A prime example of the creative merger of health with urban planning and infrastructure development is the Atlanta BeltLine. The most comprehensive transport and economic development revitalization project in the Georgia city's history and currently the largest such initiative in the US, the BeltLine will provide a network of public parks, multi-use trails, and transit by reusing 22 miles of historic railroad right-of-way. The project represents a major infrastructure investment that carries health benefits with it. Recreation is built into the project, which will provide an environment where the community can experience the fun of physical activity. It can serve as a model by other cities of innovative, sustainable, and health-promoting urban design.

“The Atlanta BeltLine is arguably the largest grassroots undertaking in the history of Atlanta, largely driven by residents of neighborhoods. ... It is among the largest economic and social experiments going on in the country because the community is teaching us as we grow.”

Paul Morris, CEO, Atlanta BeltLine

Education

Education policy, whether at the national, state, or local levels, has incorporated health considerations to a degree. Nonetheless, “No Child Left Behind” and its successor, “Race to the Top,” along with the current emphasis on the common core, have forced children off the playgrounds and into their seats for high-stakes testing. The decline in physical education and time allotted for recess has consequences that reach beyond the health of our children. Learning, classroom management, and behavior issues all suffer when children are deprived of physical activity as part of their experience for the developmentally important years from kindergarten through high school. This is an expression of a societal value that must change if we are to achieve a culture of health in the US.10,36,126

Food and Agriculture

Food and agriculture policy, which is set at the federal level, can be especially challenging for advocates of prevention, since political priorities and special interests have tended to sideline health considerations or include them as an afterthought if they include them at all.78 The $8.6 billion cut in the USDA Supplemental Nutrition Assistance Program (SNAP) as part of the much larger 2014 Farm Bill is a stunning example. On the plus side is the USDA Food and Nutrition Service’s implementation of the Healthy, Hunger-Free Kids Act of 2010, which authorized federal funding for child nutrition programs and school meals, and increased access to healthy food for lower income children.

Health and the Food Chain

The USDA recommends that fruits and vegetables make up 50 percent of daily food intake, but these products are currently grown on 2 percent of US farm acres. Meat consumption disproportionately utilizes resources compared to other plant-based protein sources, and high-fat meats are a less healthy choice (see Fig 18). A truly sustainable diet makes eating healthily possible without drawing heavily on planetary resources.123,127
Learning from What Works

California’s Health in All Policies Task Force

California founded a Health in All Policies Task Force in 2010 to foster inter-agency partnerships to examine health, equity, and environmental sustainability. The Department of Public Health and the Public Health Institute head the task force and use a co-benefits approach to identify collaborative opportunities to improve health. The task force recommends building healthy and safe communities and applying health to public policy and program development.129

Prevention for National Security: “Fueling the Soldier” and The Healthy Base Initiative

Risk factors for NCDs pose a risk for national security. Growing numbers of potential recruits are rejected for service because of their weight and poor physical fitness. In 2010, 59 percent of female candidates for enlistment and 47 percent of males failed the military’s entry-level physical fitness test. Subpar physical fitness also compromises retention of personnel trained at great expense to American taxpayers. For example, the Navy discharges an average of 2000 sailors a year who do not pass physical fitness tests.130

Among the armed forces, health spending has increased to $50 billion annually, approaching 10 percent of the Department of Defense (DoD) budget. To lower healthcare costs as well as improve performance and readiness, the DoD is tackling unhealthy behaviors with programs such as the Healthy Base Initiative (HBI). HBI was launched in 2013 in 14 pilot locations and focused on obesity and tobacco use. Another program, “Fueling the Soldier,” begun in 2011 at 69 Army training bases, promotes healthy eating to enhance performance. In addition, the private sector is taking action to support health in the military. For example, Sodexo, a member of the Partnership for a Healthier America, is working to improve nutrition in the military by increasing the quality, taste, and appearance of healthy food and redesigning the dining environment to boost consumer demand for healthy products.130
The National Diabetes Prevention Program

This private-public partnership of community organizations, private insurers, healthcare organizations, employers, and government agencies has developed community-based lifestyle change programs for people at increased risk for type 2 diabetes. The program design is based on evidence from a major multicenter clinical research study comparing lifestyle intervention (modest weight loss through dietary changes and increased physical activity) with treatment with an oral diabetes drug as strategies for preventing or delaying the onset of type 2 diabetes in high-risk individuals. The study found that lifestyle intervention reduced the chance of developing diabetes by 58 percent over the placebo group; the diabetes drug also reduced risk, though only by 31 percent. The incidence of diabetes was 39 percent lower dramatically. The incidence of diabetes was 39 percent lower with lifestyle intervention than with the diabetes drug.131

GENYOUth Foundation

GENYOUth is a private-public partnership with the National Dairy Council, the National Football League, and local schools across the country. Its school-based initiatives aim to inspire and educate the next generation about the importance of nutrition and physical activity to their health. GENYOUth collaborates with students, schools, communities, business partners, and thought leaders to make a lasting difference in children’s lives. Its 2013 report, “The Wellness Impact: Enhancing Academic Success through Healthy School Environments,” reinforced the “learning connection” that eating a healthy diet and engaging in regular physical activity were associated with better academic performance in schools.132

Clinton Health Matters Initiative

Clinton Health Matters Initiative (CHMI) aims to activate individuals, communities, and organizations to make meaningful contributions to improve the health and well-being of all people. The goals are to reduce the prevalence of preventable diseases, health disparities, and healthcare costs. CHMI builds strategic partnerships, works across sectors, and engages industry and NGOs to develop solutions at the community, national, and global levels. Currently in the US, CHMI is focused on the Coachella Valley, California; Central Arkansas; Northeast Florida; and Greater Houston, Texas.

Double Up Food Bucks and SNAP Healthy Incentives Pilot

Michigan’s Double Up Food Bucks, a private-public partnership to stimulate markets and improve health, is currently the largest healthy food incentive program in the country. It incentivizes SNAP participants to buy locally grown produce by doubling food stamp value when used at participating grocery stores or farmers markets. Seventy-eight percent of customers reported that Double Up Food Bucks helped them increase the amount of fruits and vegetables they buy.134

In 2011, 50,000 SNAP households in urban, suburban, and rural cities and towns in Hampden County, Massachusetts, were selected for a 14-month USDA Healthy Incentives Pilot to promote consumption of fruits and vegetables without added sugars, fats, oils, or salt. The majority (70 percent) of households said the pilot made fruit and vegetables more affordable, helping them purchase greater quantity and variety.135

County Health Rankings & Roadmaps

County Health Rankings & Roadmaps is a collaboration between RWJF and the University of Wisconsin Population Health Institute. The county rankings measure more than 30 indicators of health, including obesity, smoking, access to healthy foods, and air and water quality. The roadmaps provide guidance and tools to comprehend the data, and strategies to encourage action. The 2014 County Health Rankings & Roadmaps indicates linkages between NCDs—for example, the close association of depression with obesity and tobacco use. It also concludes that the counties with the lowest health rankings have twice as many premature deaths as the highest ranking counties.133
“Professionals in all fields—from urban planners who can make neighborhoods safer for exercise to farmers who can improve access to healthy foods to economists who can make better investments in healthy choices—need to understand how important prevention is to America and their vocational goals. Quite simply, prevention must be an intentional focus of every sector of our society.”

Jeffrey Levi, PhD, Executive Director, Trust for America’s Health, and Vitality Institute Commissioner
Recommendation 5

Promote strong cross-sector collaborations that generate a systemic increase in health promotion and prevention across society.

Pathways

Develop and implement a strategy to integrate a Health in All Policies approach across the US, leveraging and strengthening the health component of impact assessments.

Establish partnerships between government sectors (including the Departments of Health and Human Services, Agriculture, Education, Transportation, and the Interior) to facilitate the integration of health into policies and programs using standardized health metrics.

Foster collaboration at the local level to promote and improve community health, involving leaders in business, education, health, and civic and faith organizations in planning of all municipal programs and infrastructure projects.

Measures of Success

Short term 2017

- Building on past IOM reports, action plans have been generated that translate existing recommendations into policy development with federal, state, and local government departments and agencies.

- The Community Preventive Services Task Force collaborates formally with sectors such as agriculture, transportation, education, and infrastructure planning, to define the specific health issues at stake and determine how to address them in the context of each sector’s priorities.

- NGO leaders involved in key sectors (including agriculture, transportation, education, and infrastructure planning) have convened to define how best to integrate health across advocacy platforms for near-term, high-impact action.
RECOMMENDATION 5

PROMOTE CROSS-SECTOR COLLABORATION

○ Health risks and outcomes are measured, reported, and used in decision-making by non-health businesses and public sector agencies.

○ The federal government mandates reporting on health indicators and metrics by the agriculture, transportation, education, and infrastructure planning sectors, and inclusion of health as a key component in all impact assessments.

○ In 10 cities and states, mayors and governors make prevention a top agenda item by spearheading task forces and other action, in collaboration with leaders from the business, financial, faith, education, public health, and social sectors, to improve the health of their communities.

Medium term 2020

○ Information generated from cities and states that made prevention a top agenda item have been shared with other cities and states to form task forces in collaboration with leading stakeholders.

○ Health in All Policies is the standard in 100 percent of the public sector.

○ Short- and long-term return on investment for health promotion and prevention is unequivocally adopted and widely accepted as common sense.

Long term 2025
Conclusion: A Call to Action

“The evolution in the aspirations, landscape, and financing of global health is being accompanied by a rapid shift in the global disease burden away from infectious diseases and towards non-communicable diseases (NCDs) and injuries.”

The Lancet Commission on Investing in Health

The twentieth century saw enormous strides against infectious diseases, with tuberculosis, smallpox, polio, and diphtheria nearly eradicated in the US. In the twenty-first century, the major threat is disease caused not by microbes but by lifestyle. The answer lies not in vaccines but in encouragement of healthy behaviors supported by programs and policies based on the best evidence from prevention science. The rising toll of NCDs has consequences for the health of the population as well as the nation’s economy. Reversing the upward trend requires a sustained and coordinated campaign that calls on the strengths of all sectors of society, using all available tools.

The Commission’s recommendations emphasize the need to embrace health as a strategic imperative and as a core value of society. Investing in health requires robust funding of research in prevention science. It requires tapping the potential of behavioral economics and innovative technologies. It requires developing health and prevention leaders in the public, private, and social sectors to use their leverage and deliver a coherent, evidence-driven message. It requires dialogue and partnerships across sectors, disciplines, and interests to create synergies that will drive progress. It requires new policies that support prevention at all levels of government. It requires new business models and innovation to design and deliver products and services that promote health. It requires a new focus on health not only in the medical community, but across the entire spectrum of American life.

The Commission has compiled convincing evidence that the health of the workforce is key to the health and economic vitality of the nation. It urges businesses to value the health of their workforce—human capital—as highly as it does financial performance, and to measure and report integrated health metrics as an indicator of Corporate Health Accountability. Workforce health not only increases productivity, it spreads beyond the workplace to families and communities. As the backbone of the nation’s economy, a healthy workforce supports the competitiveness of American business across the globe. And it ensures a better future for generations to come.
The Commission aims to act as a catalyst by offering high-leverage strategies and practical solutions. It invites individual leaders and forward-looking organizations to work in partnership to build a culture of health, a mission that calls for both strong leadership and grassroots energy. Support for prevention and health promotion embedded in the ACA and the National Prevention Strategy must be matched by a commitment from individuals, groups, and institutions to learn from what works and apply what we know (see Fig 19). Positive personal habits that promote health and well-being are the most potent and effective means to counteract NCDs and ensure a thriving society for generations. An enduring culture of health will be the greatest return on investment for our nation as a whole.

FIG 19.—NATIONAL PREVENTION STRATEGY.
Appendices

Links to organizations, reports, documents, and other resources can be found at: www.thevitalityinstitute.org/more-resources

Tables

<table>
<thead>
<tr>
<th>COUNTRY</th>
<th>RANKING</th>
<th>DISEASE &amp; INJURY</th>
<th>ISCHEMIC HEART DISEASE</th>
<th>LUNG CANCER</th>
<th>STROKE</th>
<th>COPD</th>
<th>ROAD INJURY</th>
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Table 1.—Rank of age-standardized years of life lost (YLL) rates of the US relative to top five countries\textsuperscript{127}

<table>
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<tr>
<th>COUNTRY</th>
<th>RANKING*</th>
<th>RISK FACTOR*</th>
<th>DIETARY RISKS</th>
<th>TOBACCO SMOKING</th>
<th>HIGH BLOOD PRESSURE</th>
<th>HIGH BODY MASS INDEX</th>
<th>PHYSICAL INACTIVITY</th>
<th>HIGH FASTING PLASMA GLUCOSE</th>
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Table 2.—Rank of risk factors based on consequent medical conditions measured using disability-adjusted life years (DALYS) of the US relative to top five countries\textsuperscript{129}
### APPENDICES

#### TABLE 3. ALIGNMENT OF VITALITY INSTITUTE COMMISSION RECOMMENDATIONS WITH SELECTED INSTITUTE OF MEDICINE REPORTS (2005-2013)

<table>
<thead>
<tr>
<th>COMMISSION RECOMMENDATION</th>
<th>RELATED INSTITUTE OF MEDICINE REPORT</th>
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For the Public’s Health: Investing in a Healthier Future (2012)  
Living Well with Chronic Illness: A Call for Public Health Action (2012)  
| Recommendation 2: Strengthen and expand leadership to deliver a unified message for health and prevention. | Accelerating Progress in Obesity Prevention: Solving the Weight of the Nation (2012)  
A Population-Based Policy and Systems Change Approach to Prevent and Control Hypertension (2010)  
| Recommendation 3: Make markets work for health promotion and prevention. | Accelerating Progress in Obesity Prevention: Solving the Weight of the Nation (2012)  
A Population-Based Policy and Systems Change Approach to Prevent and Control Hypertension (2010) |
| Recommendation 4: Integrate health metrics into corporate reporting. | Living Well with Chronic Illness: A Call for Public Health Action (2012)  
Integrating Employee Health: A Model Program for NASA (2005) |
Toward Quality Measures for Population Health and the Leading Health Indicators (2013)  
An Integrated Framework for Assessing the Value of Community-Based Prevention (2012)  
For the Public’s Health: Revitalizing Law and Policy to Meet New Challenges (2011)  

For more detail on specific IOM recommendations, go to [www.thevitalityinstitute.org/RecsIOM](http://www.thevitalityinstitute.org/RecsIOM)

#### TABLE 4. DISTRIBUTION OF FIRMS,* ESTABLISHMENTS,† AND EMPLOYMENT IN THE UNITED STATES: 2011

<table>
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<tr>
<th>ENTERPRISE EMPLOYMENT SIZE</th>
<th>FIRMS</th>
<th>FIRMS (%)</th>
<th>ESTABLISHMENTS</th>
<th>ESTABLISHMENTS (%)</th>
<th>EMPLOYMENT</th>
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<td>113,425,965</td>
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<td>1,191,985</td>
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*A firm is a business organization consisting of one or more domestic establishments in the same state and industry that were specified under common ownership or control. The firm and the establishment are the same for single-establishment firms. For each multi-establishment firm, establishments in the same industry within a state will be counted as one firm- the firm employment and annual payroll are summed from the associated establishments.

†An establishment is single physical location where business is conducted or where services or industrial operations are performed.
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6 Adapted from Bipartisan Policy Center extrapolations: Congressional Budget Office’s alternative fiscal scenario (February 2013), additionally assuming that combat troops overseas decline to 45,000 by 2015 and that Hurricane Sandy funding is not allocated in future years.


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California Department of Public Health. Health in all policies task force-
Background Working Papers

Original papers on the following topics were prepared to inform the Commission’s work:

**Agriculture and Urban Design Policies**
- Johanna Goetzel, MA—Vitality Institute
- Caitlin Morris—Nike, Inc.

**Behavioral Economics for Health**
- Kevin G. Volpp, MD, PhD—Leonard Davis Institute Center for Health Incentives and Behavioral Economics; Penn Medicine Center for Innovation; Departments of Medical Ethics and Health Policy, and Medicine, Perelman School of Medicine, University of Pennsylvania
- George Loewenstein, PhD—Leonard Davis Institute Center for Health Incentives and Behavioral Economics; Carnegie Mellon University
- David Asch, MD, MBA—Leonard Davis Institute Center for Health Incentives and Behavioral Economics; Penn Medicine Center for Innovation; Departments of Medical Ethics and Health Policy, and Medicine, Perelman School of Medicine, University of Pennsylvania

**Chronic Disease Prevention Priorities in the US**
- Mandana Arabi, MD, PhD—Sackler Institute for Nutrition Science, New York Academy of Sciences
- Ashkan Afshin, PhD—Harvard School of Public Health
- Dariush Mozaffarian, MD, MPH, DrPH—Harvard School of Public Health

**Cross-Sector Engagement for Health**
- Leigh Carroll—Institute of Medicine
- Bridget Kelly, PhD—Institute of Medicine
- Paul E. Jarris, MD—Association of State and Territorial Health Officials
- Derek Yach, MBChB, MPH—Vitality Institute
- William B. Rosenzweig—Physic Ventures

**Federal Funding for Prevention Research**
- Chris Calitz, MPP—Institute for Health and Social Policy, Department of Health Policy and Management, Bloomberg School of Public Health, Johns Hopkins University
- Keshia M. Pollack, PhD—Department Health Policy and Management, Bloomberg School of Public Health, Johns Hopkins University
- Chris Millard—Institute for Health and Social Policy, Department of Health Policy and Management, Bloomberg School of Public Health, Johns Hopkins University
- Derek Yach, MBChB, MPH—Vitality Institute

**Institute of Medicine Recommendations on Prevention and Health Promotion Strategies (2005-2013): A Review**
- Leigh Carroll—Institute of Medicine
- Bridget Kelly, PhD—Institute of Medicine
Personal Intelligent Technologies for Health

- Gillian Christie, MPhil—Vitality Institute
- Neil Adamson—Discovery Limited
- Derek Yach, MBChB, MPH—Vitality Institute

Graduate-Level Training in Prevention and Health Promotion

- Susan C. Kim, JD—O’Neill Institute for National and Global Health Law, Georgetown University
- Aliza Glasner, JD—O’Neill Institute for National and Global Health Law, Georgetown University
- Alyson Listhaus, MPH—Joseph L. Mailman School of Public Health, Columbia University
- Daryl Berke, MPH—Yale School of Public Health,
- Tanya Baytor, LLM—O’Neill Institute for National and Global Health Law, Georgetown University

Workplace Prevention and Health Promotion Programs: Implementation

- Katherine Tryon, MA, MBBS—Vitality Institute
- Howard Bolnick, MBA, FSA—Discovery Limited
- Jennifer Pomeranz, JD, MPH—Temple University
- Nicolaas Pronk, PhD—Harvard School of Public Health
- Derek Yach, MBChB, MPH—Vitality Institute

Workplace Prevention and Health Promotion Programs: Potential Savings

- Howard Bolnick, MBA, FSA—Discovery Limited
- Ali Mokdad, PhD—Institute for Health Metrics and Evaluation, University of Washington
- Francois Millard, FIA, FSA, MAAA—The Vitality Group
- Jonathan Dugas, PhD—The Vitality Group
- Derek Yach, MBChB, MPH—The Vitality Group

Workplace Prevention and Health Promotion Programs: ACA and Regulatory Issues (series)

- Jennifer Pomeranz, JD, MPH—Temple University
Related Commissions and Reports

The Vitality Institute Commission endorses and aligns itself with the work of the following groups, which drive the message that prevention is key to the health of America’s economy and its people.

- Bipartisan Policy Center, A Bipartisan Rx for Patient-Centered Care and System-Wide Cost Containment (2013), addressed unsustainable healthcare cost growth in the US and made recommendations to improve how healthcare is delivered and financed in the private and public sectors.
  

- Institute of Medicine, Improving Support for Health Promotion and Chronic Disease Prevention (2014), analyzed IOM reports published between 2005 and 2013 that address prevention.
  
  www.thevitalityinstitute.org/IOM

- The Lancet Commission on Investing in Health, Global Health 2035: A World Converging Within a Generation (2013), prompted by the 20th anniversary of the 1993 World Development Report, the Commission revisited the case for investment in health and developed a new investment framework to achieve better health outcomes by 2035.
  
  www.thelancet.com/commissions/global-health-2035

- Robert Wood Johnson Foundation Commission to Build a Healthier America, Time to Act: Investing in the Health of Our Children and Communities (2014), examined factors outside of medical care that influence health and issued 10 recommendations for action at the local, state, and federal levels to improve population health.
  
Vitality Institute Commission Calendar

**Launch of the Vitality Institute and Commission**
May 21, 2013  
New York, NY

**Commission Meetings**
May 21-22, 2013  
New York, NY  
September 20-21, 2013  
New York, NY  
February 19-20, 2014  
Washington, DC

**“Within Reach: An Action Plan for Our Nation’s Health and Prosperity”**
**Presentation of the Vitality Commission Report and Recommendations**
June 18, 2014  
New York, NY

**Commission Forums**
September 19, 2013  
Leveraging Technologies for Health Promotion  
Co-hosted by Mandana Arabi from The Sackler Institute for Nutrition Science at the New York Academy of Sciences  
New York, NY

January 7, 2014  
Business for Health: Fostering Healthy Workplaces  
Co-hosted by Kelly Brough from the Denver Metro Chamber of Commerce  
Denver, CO

February 20, 2014  
Health Promotion: Empowering Change through Policy  
Co-hosted by Lynn Goldman from the George Washington University Milken Institute School of Public Health  
Washington, DC

March 19, 2014  
Building Healthier Societies: Pioneer Perspectives  
Co-hosted by Michael Eriksen from Georgia State University School of Public Health and Jeffrey Koplan from Emory University Global Health Institute  
Atlanta, GA

April 17, 2014  
Food@Work: Exploring Links between Food and Productivity, Health, and Sustained Competitive Advantage in the Workplace  
Co-hosted by Michiel Bakker from Google Inc.  
San Francisco, CA

**Institute for the Future Expert Workshops on the Future of Technology-Enabled Strategies for Health Promotion & Disease Prevention 2030**
September 30, 2013  
The Role of Technology in Health Promotion and Disease Prevention  
Palo Alto, CA

October 21, 2013  
Adoption of Technology-Enabled Strategies  
New York, NY
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