Evidence-Based Primary Prevention Strategies

Maryland State Council on Cancer Control Annual Cancer Conference

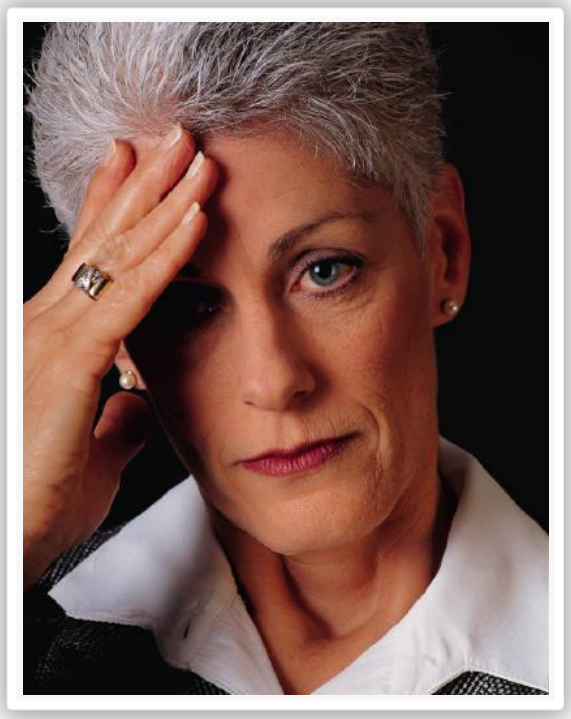
November 15, 2016 -- Annapolis, MD

Ron Z. Goetzel, Ph.D. , Johns Hopkins University
and Truven Health Analytics, an IBM Company

JOHNS HOPKINS BLOOMBERG SCHOOL of PUBLIC HEALTH

TRUVEN HEALTH ANALYTICS™ an IBM Company

Q: What problem are we trying to solve?
A: Spending a lot of money on sick care!



- The United States will spend $3.351 trillion in healthcare in 2016, or $10,346 for every man, woman and child.
- Spending by sector
  - Private health insurance - $1.093 trillion
  - Medicare - $681.3 billion
  - Medicaid - $577.7 billion
  - Out of pocket -- $350.1 billion
- Health expenditures as percent of GDP:
  - ➢7.2 % in 1970
  - ➢18.1% in 2016 (projected)
  - ➢20.1% in 2025 (projected)

Source: Keehan et al., *Health Affairs*, 35:8, August 2016

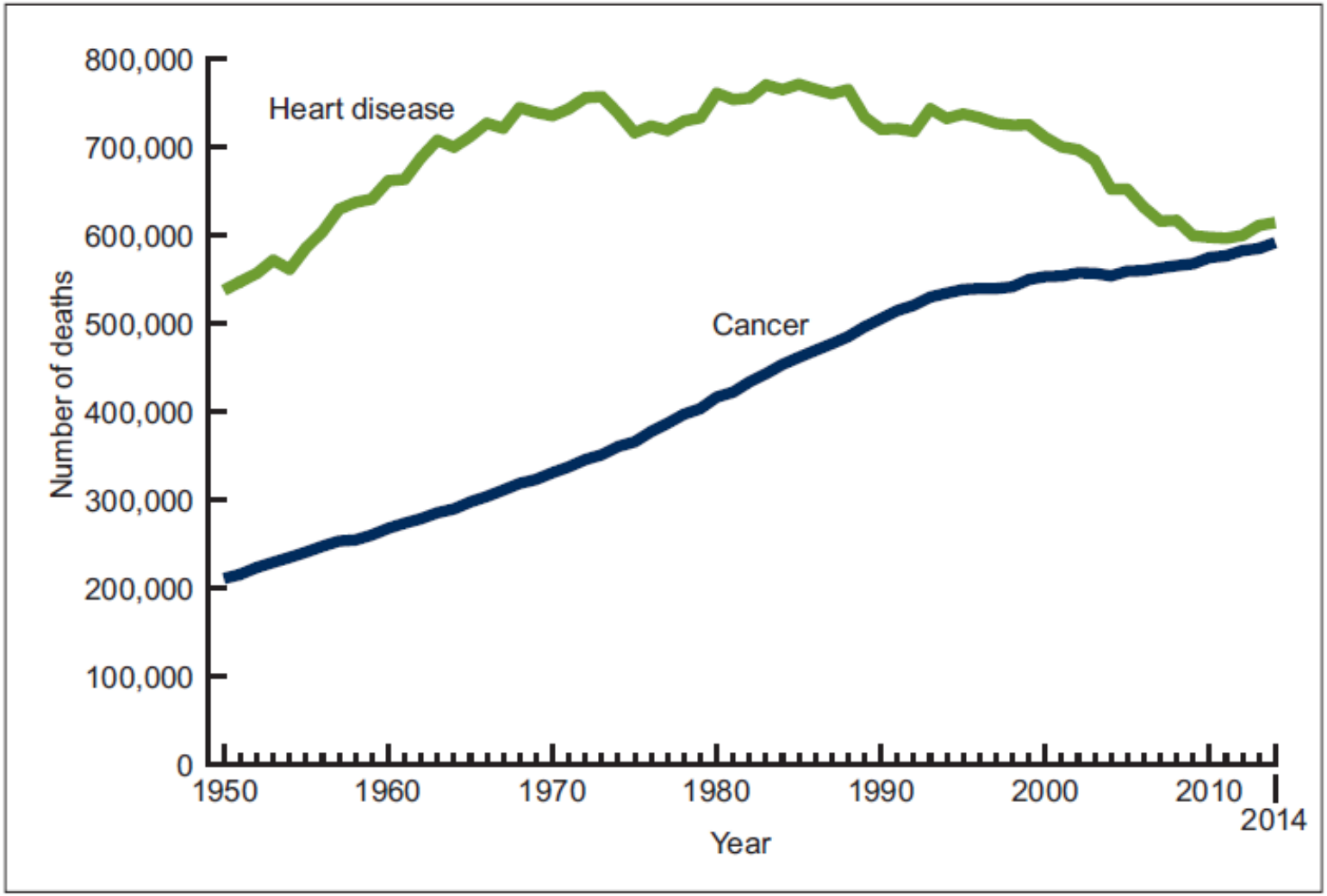
LEADING CAUSES OF DEATH IN THE U.S.

Cause of Death	# of Deaths	Percentage
Heart Disease	710,760	30%
Malignant Neoplasm	553,091	23%
Cerebrovascular Disease	167,661	7%
Chronic Lower Respiratory Tract Disease	122,009	5%
Unintentional Injuries	97,900	4%
Diabetes	69,301	3%
Influenza / Pneumonia	65,313	3%
Alzheimer's	49,558	2%
Nephritis	37,251	2%
Septicemia	31,224	1%
Other	499,283	21%
Total	**2,403,351**	**100%**

***Source:** Year 2000, Mokdad et al., JAMA,291:10, March, 2004

Heart Disease is Declining – But Cancer Rates are Increasing

Figure 1. Number of deaths due to heart disease and cancer: United States, 1950–2014



NOTES: Leading cause is based on number of deaths. Access data table for Figure 1 at: http://www.cdc.gov/nchs/data/databriefs/

Actual Causes of Death

Table 3.1.2. U.S. Deaths Related to Modifiable Risk Factors, 2005

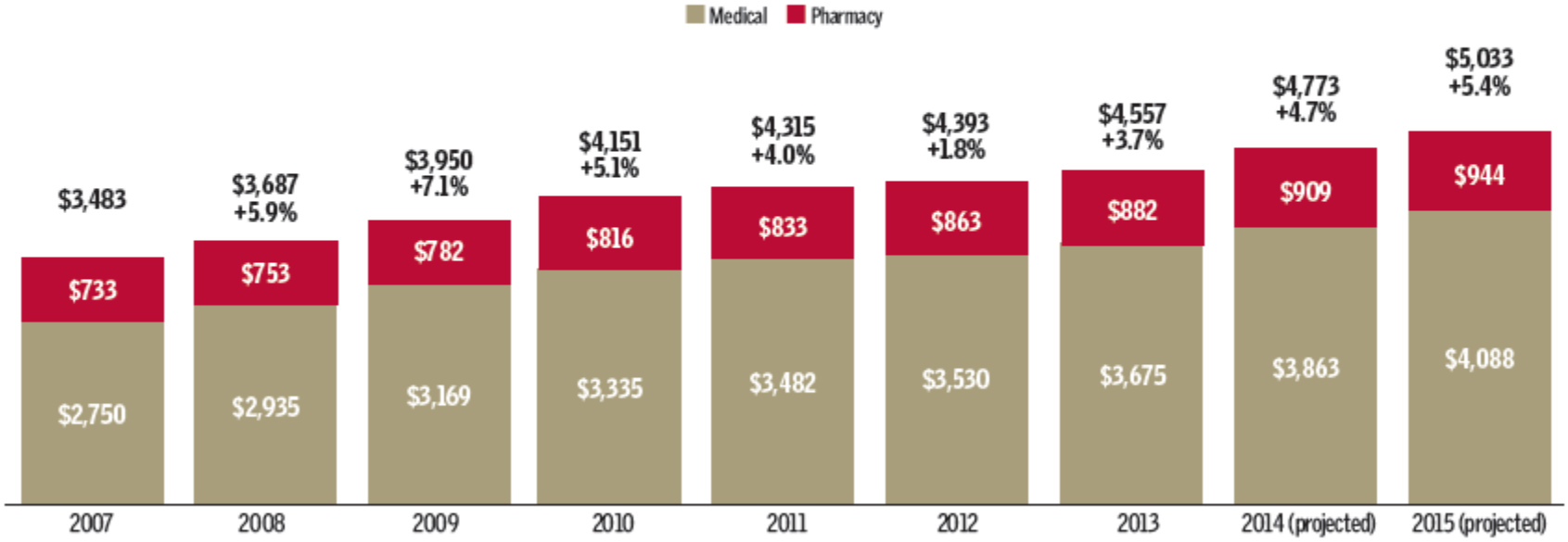
Cause of Death	2005
Tobacco Smoking	467,000
High Blood Pressure	395,000
Overweight – Obesity (high BMI)	216,000
Physical Inactivity	191,000
High Blood Glucose	190,000
High LDL Cholesterol	113,000
High Dietary Salt (sodium)	102,000
Low Dietary Omega-3 Fatty Acids	84,000
High Dietary Trans Fatty Acids	82,000
Alcohol Use	64,000
Low Intake of Fruits and Vegetables	58,000
Low Dietary Polyunsaturated Fatty Acids	15,000

Note. Source: Danaei et al. (2009).

And, Costs Continue to Rise
Employer Per Capita Spending on Healthcare

TRENDS IN MEDICAL AND PHARMACY CLAIMS COSTS

U.S. employers experienced average trends of 4.6% annually in the PMPY allowed amount for medical and pharmacy costs from 2007 through December 2013. Truven Health expects continued increases of 4.7% and 5.4% in 2014 and 2015, respectively. At this rate, these costs will have increased by $1,550, or nearly 45%, over the course of nine years.



SOURCE: Truven Health, *U.S. Healthcare Benchmarks and Trends*, October 2014.

Opportunities For Intervention – The Workplace – A Microcosm Of Society

Communication with workers is straightforward

Social and organizational supports are available

Workplaces contain a concentrated group of people who share common purpose and culture

Certain policies, procedures and practices can be introduced and organizational norms can be established

Workplace programs can reach large segments of the population not exposed to and engaged in organized health improvement efforts

Financial or other types of incentives can be offered to gain participation in programs

Convince me…

Why should I invest in the health and well-being of my workers?

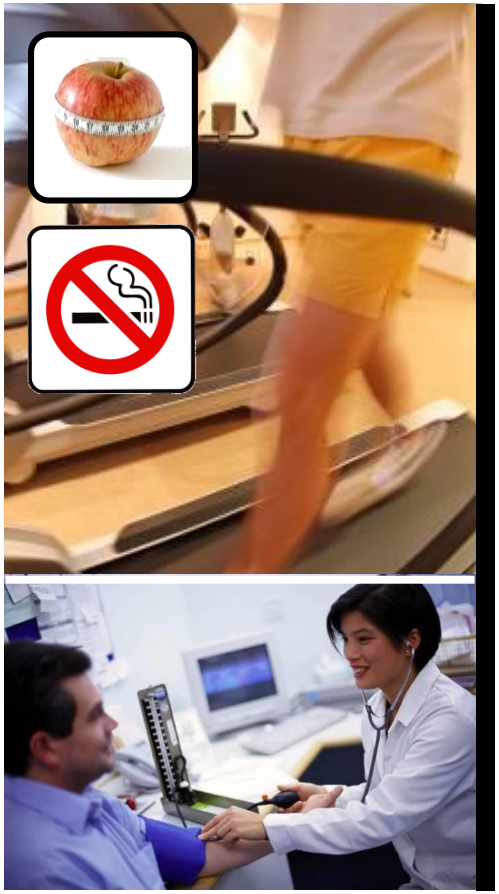
What Is the Evidence Base?

- A large proportion of diseases and disorders is preventable. Modifiable health risk factors are precursors to a large number of diseases and disorders and to premature death (Healthy People 2000, 2010, Amler & Dull, 1987, Breslow, 1993, McGinnis & Foege, 1993, Mokdad et al., 2004)
- Many modifiable health risks are associated with increased health care costs within a relatively short time window (Milliman & Robinson, 1987, Yen et al., 1992, Goetzel, et al., 1998, Anderson et al., 2000, Bertera, 1991, Pronk, 1999, Goetzel 2012)
- Modifiable health risks can be improved through workplace sponsored health promotion and disease prevention programs (Wilson et al., 1996, Heaney & Goetzel, 1997, Pelletier, 1991-2011, Soler et al. 2010)
- Improvements in the health risk profile of a population can lead to reductions in health costs (Edington et al., 2001, Goetzel et al., 1999, Carls et al., 2011)
- Worksite health promotion and disease prevention programs save companies money in health care expenditures and produce a positive ROI (Citibank 1999-2000, Procter and Gamble 1998, Highmark, 2008, Johnson & Johnson, 2011, Dell 2015, Duke University 2015)

Diseases Caused (at Least Partially) by Lifestyle

- **Obesity:** Cholesystitis/Cholelithiasis, Coronary Artery Disease, Diabetes, Hypertension, Lipid Metabolism Disorders, Osteoarthritis, Sleep Apnea, Venous Embolism/Thrombosis, Cancers (Breast, Cervix, Colorectal, Gallbladder, Biliary Tract, Ovary, Prostate)
- **Tobacco Use:** Cerebrovascular Disease, Coronary Artery Disease, Osteoporosis, Peripheral Vascular Disease, Asthma, Acute Bronchitis, COPD, Pneumonia, Cancers (Bladder, Kidney, Urinary, Larynx, Lip, Oral Cavity, Pharynx, Pancreas, Trachea, Bronchus, Lung)
- **Lack of Exercise:** Coronary Artery Disease, Diabetes, Hypertension, Obesity, Osteoporosis
- **Poor Nutrition:** Cerebrovascular Disease, Coronary Artery Disease, Diabetes, Diverticular Disease, Hypertension, Oral Disease, Osteoporosis, Cancers (Breast, Colorectal, Prostate)
- **Alcohol Use:** Liver Damage, Alcohol Psychosis, Pancreatitis, Hypertension, Cerebrovascular Disease, Cancers (Breast, Esophagus, Larynx, Liver)
- **Stress, Anxiety, Depression:** Coronary Artery Disease, Hypertension
- **Uncontrolled Hypertension:** Coronary Artery Disease, Cerebrovascular Disease, Peripheral Vascular Disease
- **Uncontrolled Lipids:** Coronary Artery Disease, Lipid Metabolism Disorders, Pancreatitis, Peripheral Vascular Disease

BOTTOM LINE: THE VAST MAJORITY OF CHRONIC DISEASE CAN BE PREVENTED OR BETTER MANAGED



The Centers for Disease Control and Prevention (CDC) estimates…

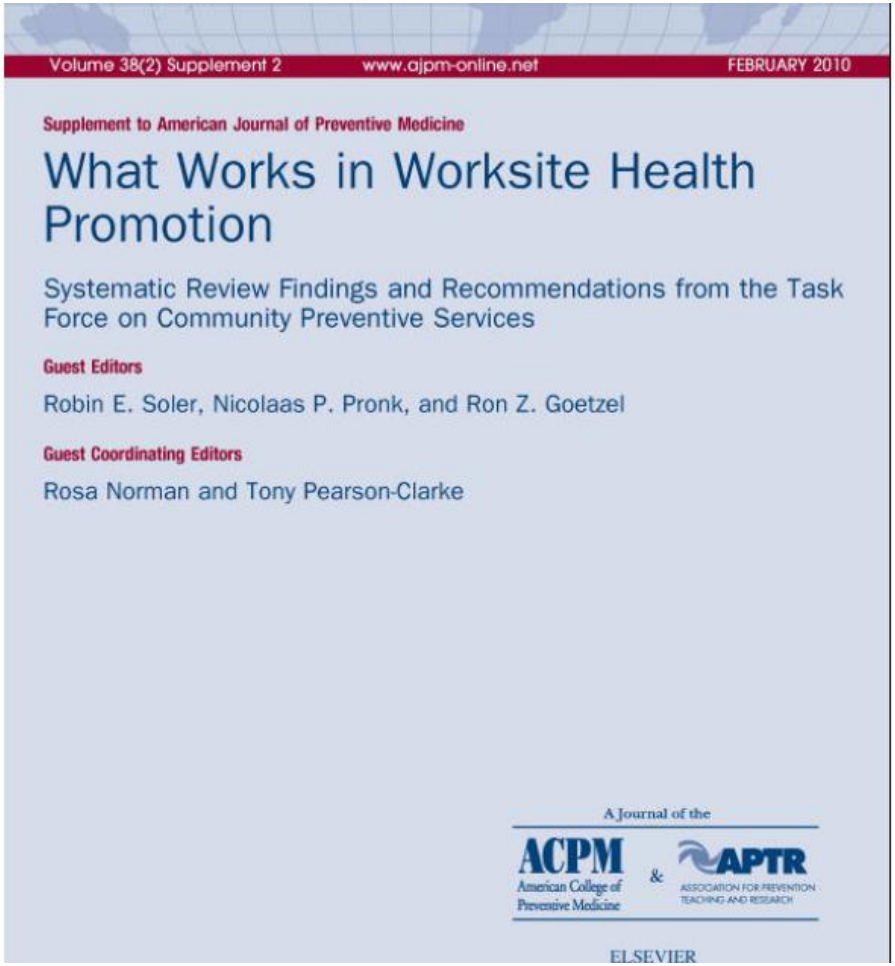
- 80% of heart disease and stroke
- 80% of type 2 diabetes
- 40% of cancer

…could be prevented if only Americans were to do three things:

- Stop smoking
- Start eating healthy
- Get in shape

Good News – Worksite Health Promotion Works!

Caveat: If you do it right…



CDC Community Guide to Preventive Services Review – AJPM, February 2010
86 Studies Reviewed

A Systematic Review of Selected Interventions for Worksite Health Promotion

The Assessment of Health Risks with Feedback

Robin E. Soler, PhD, Kimberly D. Leeks, PhD, MPH, Sima Razi, MPH, David P. Hopkins, MD, MPH, Matt Griffith, MPH, Adam Aten, MPH, Sajal K. Chattopadhyay, PhD, Susan C. Smith, MPA, MLIS, Nancy Habarta, MPH, Ron Z. Goetzel, PhD, Nicolaas P. Pronk, PhD, Dennis E. Richling, MD, Deborah R. Bauer, MPH, RN, CHES, Leigh Ramsey Buchanan, PhD, MPH, Curtis S. Florence, PhD, Lisa Koonin, MN, MPH, Debbie MacLean, BS, ATC/L, Abby Rosenthal, MPH, Dyann Matson Koffman, DrPH, MPH, James V. Grizzell, MBA, MA, CHES, Andrew M. Walker, MPH, CHES, the Task Force on Community Preventive Services

Summary Results and Team Consensus

Outcome	Body of Evidence	Consistent Results	Magnitude of Effect	Finding
Alcohol Use	9	Yes	Variable	**Sufficient**
Fruits & Vegetables	9	No	0.09 serving	Insufficient
% Fat Intake	13	Yes	-5.4%	**Strong**
% Change in Those Physically Active	18	Yes	+15.3 pct pt	**Sufficient**
Tobacco Use				**Strong**
Prevalence	23	Yes	–2.3 pct pt	
Cessation	11	Yes	+3.8 pct pt	
Seat Belt Non-Use	10	Yes	–27.6 pct pt	**Sufficient**

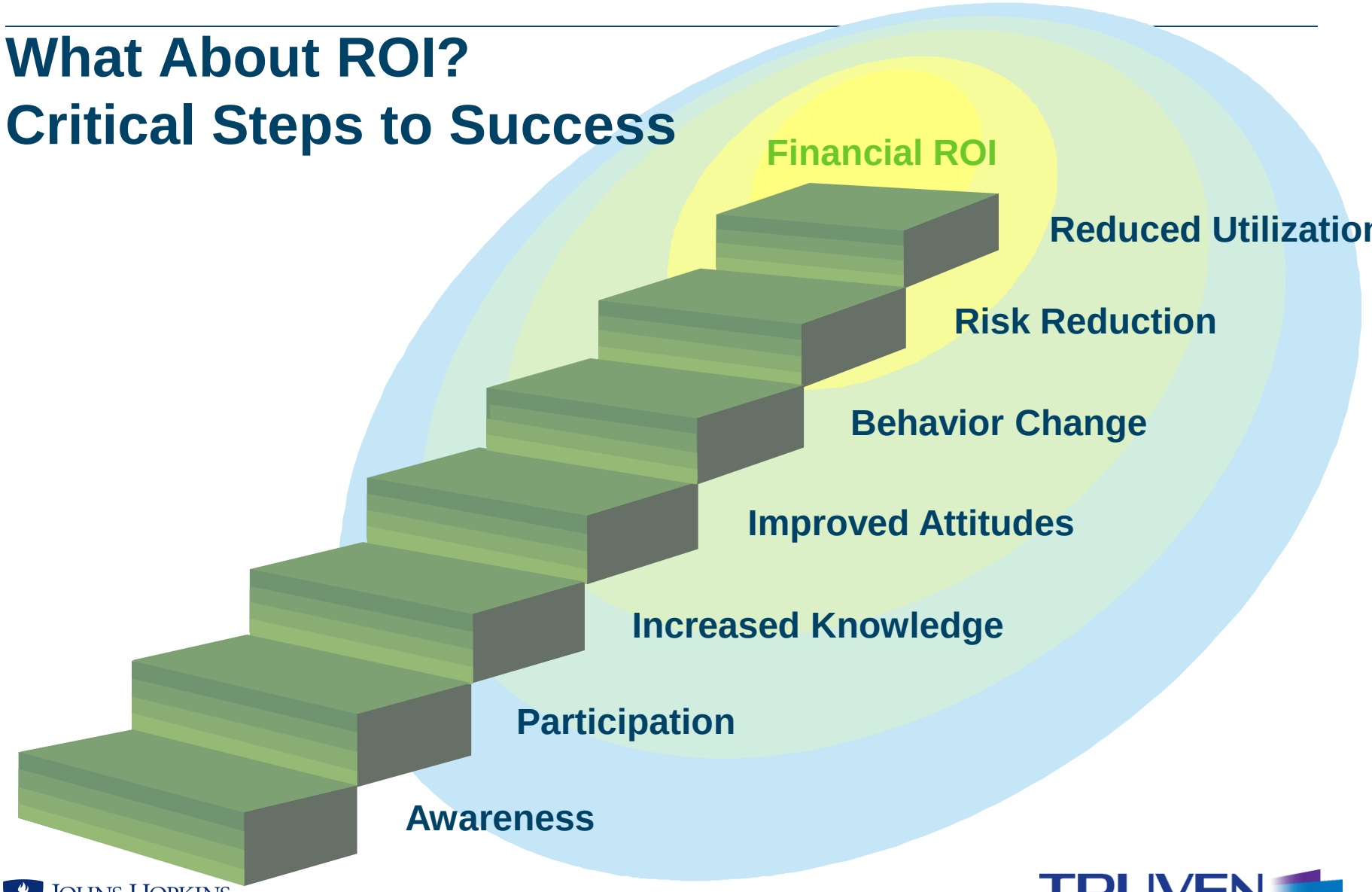
Summary Results and Team Consensus

Outcome	Body of Evidence	Consistent Results	Magnitude of Effect	Finding
Diastolic blood pressure	17	Yes	Diastolic:–1.8 mm Hq	**Strong**
Systolic blood pressure	19	Yes	Systolic:–2.6 mm Hg	
Risk prevalence	12	Yes	–4.5 pct pt	
BMI	6	Yes	–0.5 pt BMI	
Weight	12	No	–0.56 pounds	Insufficient
% body fat	5	Yes	–2.2% body fat	
Risk prevalence	5	No	–2.2% at risk	
Total Cholesterol	19	Yes	–4.8 mg/dL (total)	**Strong**
HDL Cholesterol	8	No	+.94 mg/dL	
Risk prevalence	11	Yes	–6.6 pct pt	
Fitness	5	Yes	Small	Insufficient

Summary Results and Team Consensus

Outcome	Body of Evidence	Consistent Results	Magnitude of Effect	Finding
Estimated Risk	15	Yes	Moderate	**Sufficient**
Healthcare Use	6	Yes	Moderate	**Sufficient**
Worker Productivity	10	Yes	Moderate	**Strong**

What About ROI?
Critical Steps to Success



Health Affairs ROI Literature Review

Baicker K, Cutler D, Song Z. Workplace Wellness Programs Can Generate Savings. Health Aff (Millwood). 2010; 29(2). Published online 14 January 2010.+

PREVENTION

By Katherine Baicker, David Cutler, and Zirui Song

Workplace Wellness Programs Can Generate Savings

doi: 10.1377/hlthaff.2009.0626
HEALTH AFFAIRS 29,
NO. 2 (2010): –

ABSTRACT Amid soaring health spending, there is growing interest in workplace disease prevention and wellness programs to improve health and lower costs. In a critical meta-analysis of the literature on costs and savings associated with such programs, we found that medical costs fall by about $3.27 for every dollar spent on wellness programs and that absenteeism costs fall by about $2.73 for every dollar spent. Although further exploration of the mechanisms at work and broader applicability of the findings is needed, this return on investment suggests that the wider adoption of such programs could prove beneficial for budgets and productivity as well as health outcomes.

Katherine Baicker (Kbaicker@hsph.harvard.edu) is a professor of health economics at the School of Public Health, Harvard University, in Boston, Massachusetts.

David Cutler is a professor of economics at Harvard University.

Zirui Song is a doctoral candidate at Harvard Medical School.

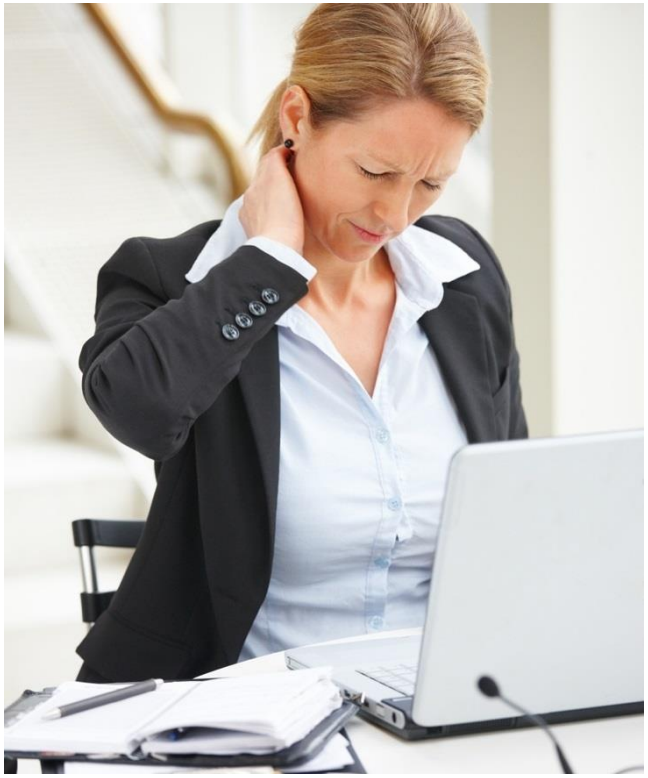
Results - Medical Care Cost Savings

Description	N	Average ROI
Studies reporting costs and savings	15	$3.37
Studies reporting savings only	7	Not Available
Studies with randomized or matched control group	9	$3.36
Studies with non-randomized or matched control group	6	$2.38
All studies examining medical care savings	22	$3.27

Results – Absenteeism Savings

Description	N	Average ROI
Studies reporting costs and savings	12	$3.27
All studies examining absenteeism savings	22	$2.73

Poor Health Costs Money



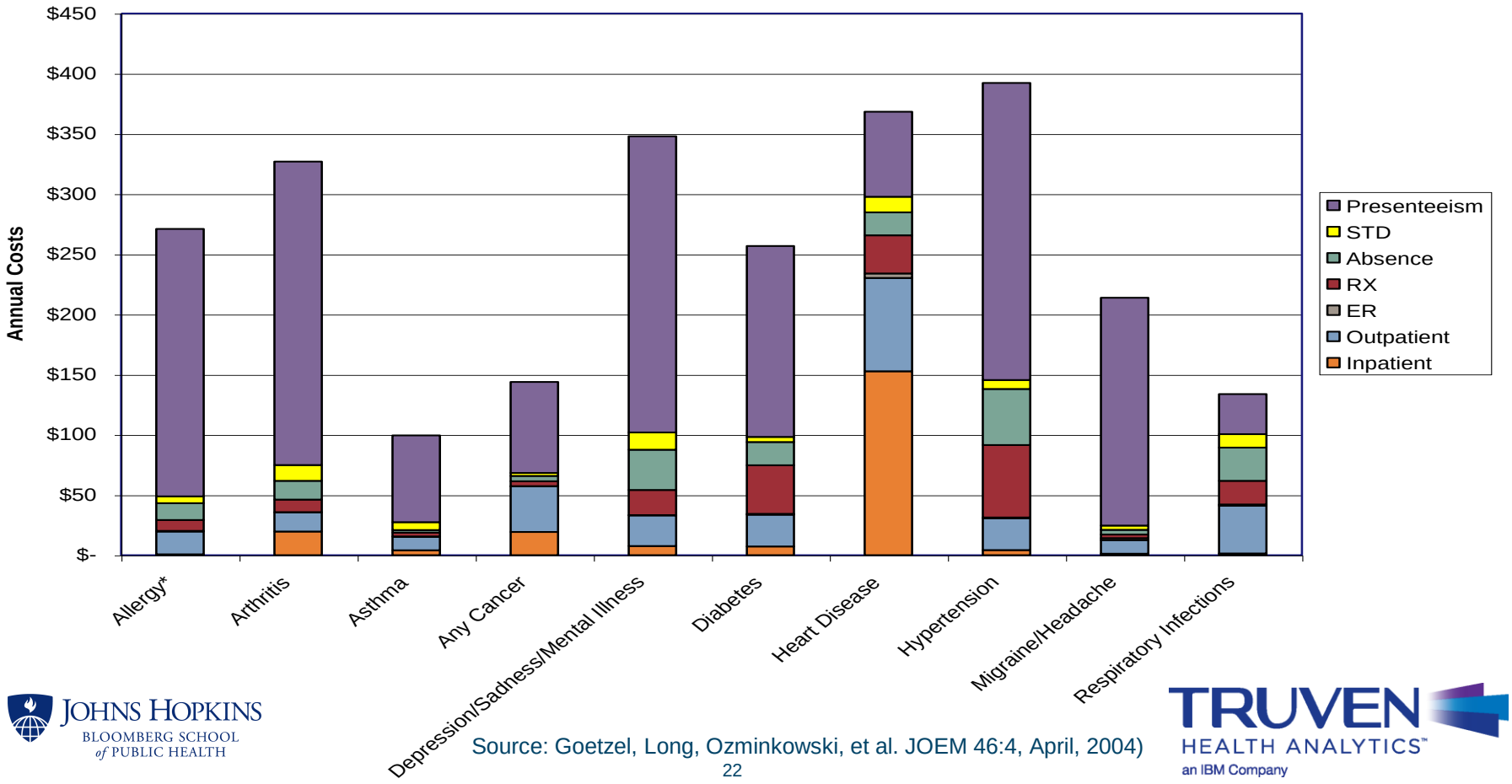
Drill Down…

- Medical
- Absence/work loss
- Safety
- Presenteeism

The Big Picture: Overall Burden of Illness

Using Average Impairment and Prevalence Rates for Presenteeism

($23.15/hour wage estimate)



Source: Goetzel, Long, Ozminkowski, et al. JOEM 46:4, April, 2004)

Kent et al., JOEM Study

CME IS AVAILABLE FOR THIS ARTICLE AT ACOEM.ORG

Promoting Healthy Workplaces by Building Cultures of Health and Applying Strategic Communications

Karen Kent, MPH, Ron Z. Goetzel, PhD, Enid C. Roemer, PhD, Aishwarya Prasad, MPH, MBBS, and Naomi Freundlich, MA

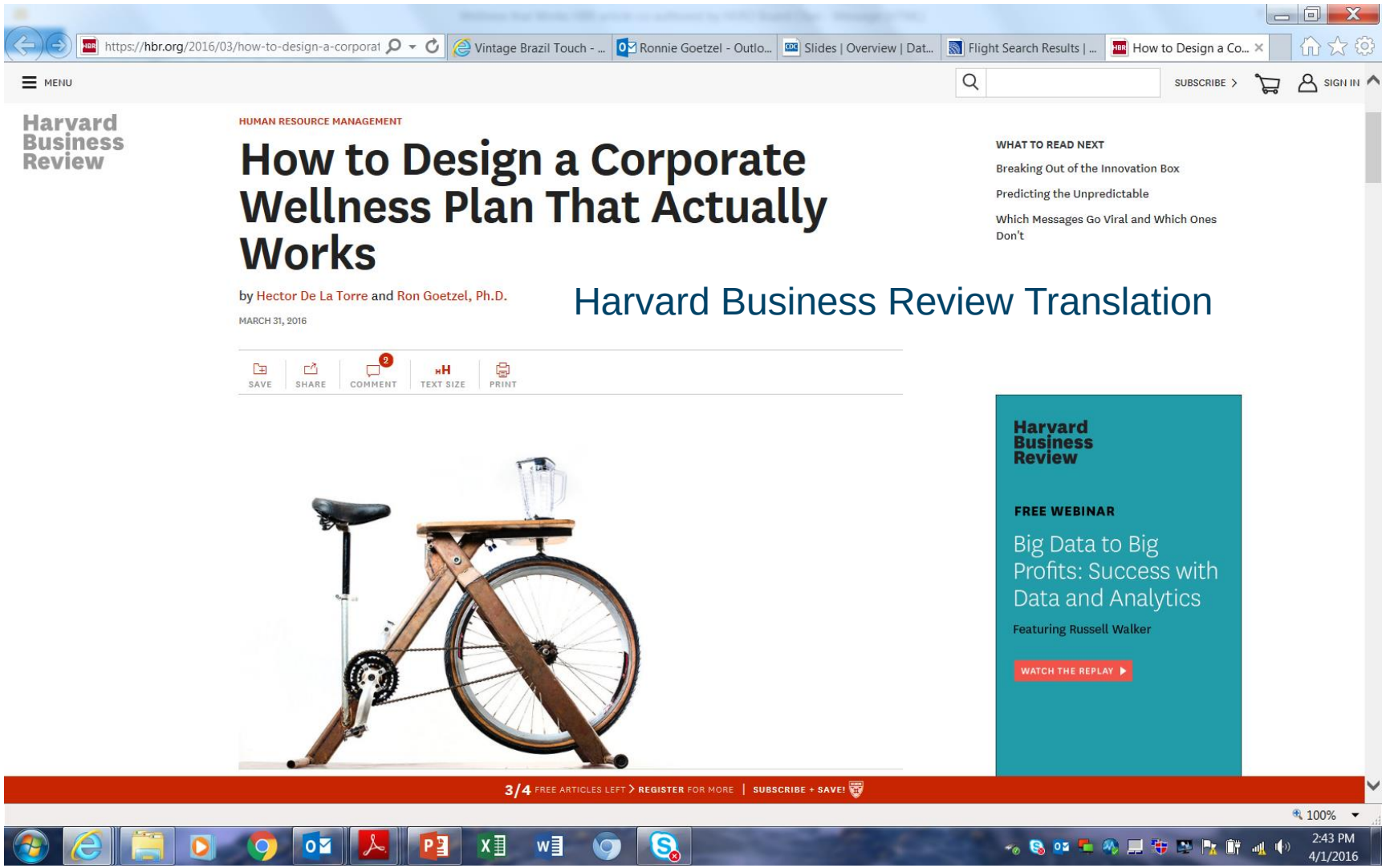
Objective: The aim of the study was to identify key success elements of employer-sponsored health promotion (wellness) programs. **Methods:** We conducted an updated literature review, held discussions with subject matter experts, and visited nine companies with exemplary programs to examine current best and promising practices in workplace health promotion programs. **Results:** Best practices include establishing a culture of health and using strategic communications. Key elements that contribute to a culture of health are leadership commitment, social and physical environmental support, and employee involvement. Strategic communications are designed to educate, motivate, market offerings, and build trust. They are tailored and targeted, multichanneled, bidirectional, with optimum timing, frequency, and placement. **Conclusions:** Increased efforts are needed to disseminate lessons learned from employers who have built cultures of health and excellent communications strategies and apply these insights more broadly in workplace settings.

Learning Objectives

- Summarize the methods used by Goetzel et al in their updated analysis of best practices in employer-sponsored health promotion (wellness) programs.
- Discuss the concept of building a culture of health and identify key elements contributing to it.
- Discuss the importance of strategic communications and the goals and characteristics of an effective communications strategy.

In 2007, an article entitled "Promising Practices in Employer

merit consideration. This updated review of workplace programs examines the establishment of cultures of health within the workplace, as well as a renewed focus on strategic communications, and the necessary elements that underlie culture and communications to form the foundation for a healthy workplace



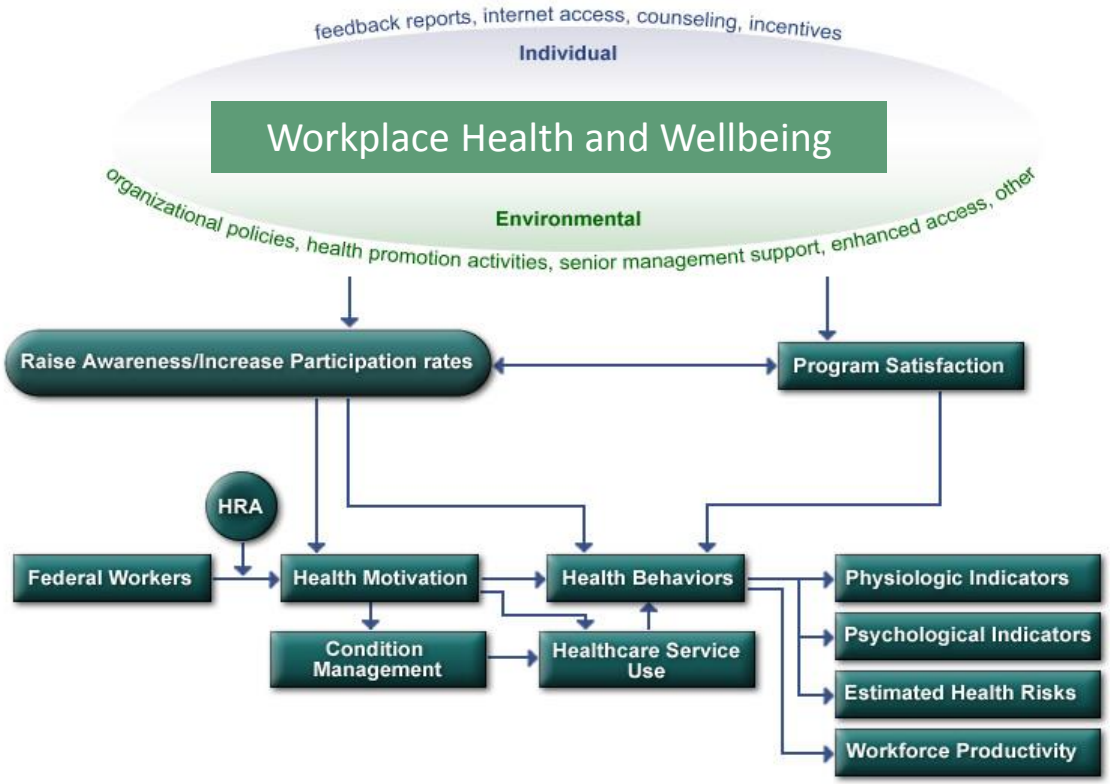
Harvard Business Review Translation

10. Measurement and Evaluation

STRUCTURE

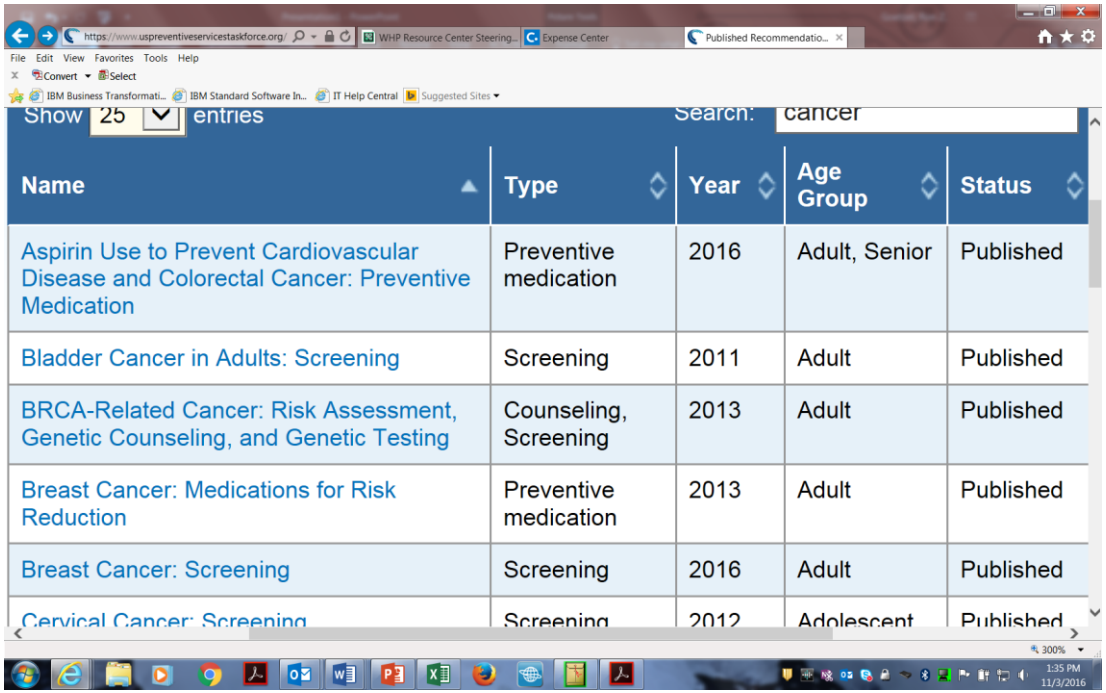
PROCESS

OUTCOMES



Modified Worksite Health Promotion (Assessment of Health Risk with Follow-Up) Logic Model adopted by the CDC Community Guide Task Force

In Clinical Settings Apply: U.S. Preventive Services Task Force (USPSTF) Cancer Screening Guidelines

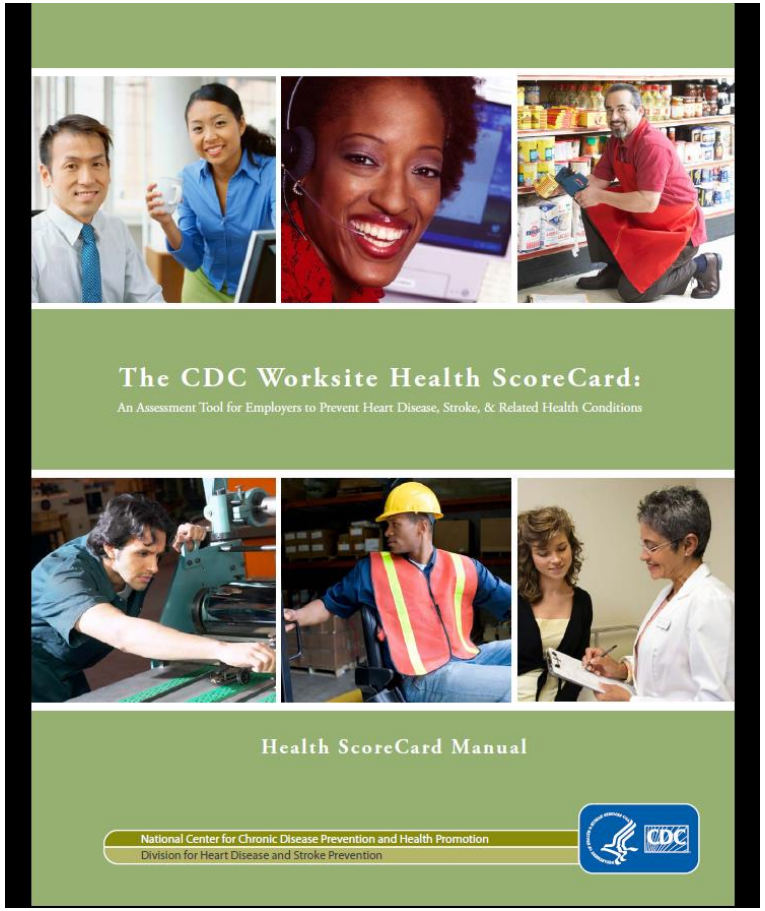


Show 25 entries Search: cancer

Name	Type	Year	Age Group	Status
Aspirin Use to Prevent Cardiovascular Disease and Colorectal Cancer: Preventive Medication	Preventive medication	2016	Adult, Senior	Published
Bladder Cancer in Adults: Screening	Screening	2011	Adult	Published
BRCA-Related Cancer: Risk Assessment, Genetic Counseling, and Genetic Testing	Counseling, Screening	2013	Adult	Published
Breast Cancer: Medications for Risk Reduction	Preventive medication	2013	Adult	Published
Breast Cancer: Screening	Screening	2016	Adult	Published
Cervical Cancer: Screening	Screening	2012	Adolescent	Published

https://www.uspreventiveservicestaskforce.org/BrowseRec/Search?s=cancer

In Workplace Settings Apply: The CDC Worksite Health ScoreCard



ORIGINAL ARTICLE

Reliability and Validity Testing of the CDC Worksite Health ScoreCard

An Assessment Tool to Help Employers Prevent Heart Disease, Stroke, and Related Health Conditions

Enid Chung Roemer, PhD, Karen B. Kent, MPH, Daniel K. Samoly, MPH, Laura M. Gaydos, PhD, Kristyn J. Smith, BA, Amol Agarwal, BS, Dyann M. Matson-Koffman, DrPH, MPH, CHES, and Ron Z. Goetzel, PhD

Objective: To develop, evaluate, and improve the reliability and validity of the CDC Worksite Health ScoreCard (HSC). **Methods:** We tested interrater reliability by piloting the HSC at 93 worksites, examining question response concurrence between two representatives from each worksite. We conducted cognitive interviews and site visits to evaluate face validity of items and refined the instrument for general distribution. **Results:** The mean question concurrence rate was 77%. Respondents reported the tool to be useful, and on average 49% of all possible interventions were in place at the surveyed worksites. The interviews highlighted issues undermining reliability and validity, which were addressed in the final version of the instrument. **Conclusions:** The revised HSC is a reasonably valid and reliable tool for assessing worksite health promotion programs, policies, and environmental supports directed at preventing cardiovascular disease.

The United States is facing an epidemic of chronic diseases, which is threatening the competitiveness of American businesses with large productivity losses and unsustainable health care costs. In 2010, the total cost of cardiovascular diseases, including heart disease and stroke, in the United States was estimated to be $444 billion.[1] Treatment of these diseases accounts for about $1 of every $6 spent on health care in the United States, and as the population ages, these costs are expected to increase substantially.[2] Although heart disease, stroke, and related chronic conditions are among the most common and costly of all health problems, they are also among the most preventable.[3] Studies estimate that 60% to 95% of heart disease risk is attributable to potentially modifiable behaviors.[4–6]

We know from prior research that individuals are more likely to adopt and sustain health-promoting behaviors if these behaviors are supported in their work or school environment.[8–12] Moreover, we also know that the most effective approach to impacting employee health is through a comprehensive evidence-based worksite health promotion program (defined as containing key elements of individual risk-reduction programs that are coupled with organizational, cultural, and environmental supports for healthy behaviors, and coordinated and integrated with other wellness activities[13]) and that the effects of such programs may be considerable. For instance, a 2012 literature review by Chapman[14] found that participants in worksite health promotion programs had about 25% lower medical and absenteeism expenditures than nonparticipants. Similarly, in 2010, Baicker et al[15] found the cost savings garnered by well-designed worksite wellness programs to be substantial: the return on investment considering medical expenditures was $3.27 for every dollar spent, and for absenteeism the return on investment was $2.73 for every dollar spent. Yet, despite these promising financial benefits, only 6.9% of US employers offer comprehensive worksite health promotion programs.[16]

To support the development of comprehensive evidence-based worksite health promotion programs, the Emory University Institute for Health and Productivity Studies, in partnership with the Centers for Disease Control and Prevention (CDC), developed the CDC Worksite Health ScoreCard (HSC). The purpose of the HSC is to help employers assess their current health promotion programs, identify gaps, and prioritize high-impact interventions to prevent heart disease, stroke, and related chronic conditions.

The HSC, a self-assessment survey instrument, includes questions on key evidence-based and best-practice interventions that have been recommended to be part of a comprehensive worksite heart disease/stroke prevention program. The HSC covers the following 12 domains: (1) organizational support, (2) tobacco control, (3) nutrition, (4) physical activity, (5) weight management, (6) stress management, (7) depression, (8) high blood pressure, (9) high cholesterol, (10) diabetes, (11) signs and symptoms of heart attack and stroke, and (12) emergency response to heart attack and stroke. Although each domain can be completed as a stand-alone module, we recommend that employers complete the whole survey to better assess the comprehensiveness of a worksite health promotion program.

The aim of this article was to document the steps taken to evaluate the validity and reliability of the HSC.

BACKGROUND

In Phase I of tool development, the Institute for Health and Productivity Studies partnered with the CDC to develop the self-assessment questions for the HSC; evaluate and improve the tool's scientific evidence base, usability, and relevance to employers; and develop a scoring methodology.

Subject-matter experts (SMEs) from various divisions of the CDC played a key role in assessing the content validity of the tool during this first phase, offering expertise in each of the 12 content domains of the tool. Specifically, SME teams provided a thorough review of the relevant scientific evidence, determined the questions that should be included on the HSC, and assigned scoring weights to

From the Emory University Institute for Health and Productivity Studies (Drs Roemer and Goetzel, Mr Samoly, and Ms Kent and Ms Smith), Washington, DC; and Emory University (Dr Gaydos and Mr Agarwal), Atlanta, Ga; Center for Disease Control and Prevention/National Center for Chronic Disease Prevention and Health Promotion/ Division for Heart Disease and Stroke Prevention (Dr Matson-Koffman), Atlanta, Ga; and Truven Health Analytics (Dr Goetzel), Bethesda, Md.

The authors declare no conflicts of interest.

Funding for this study was provided through a cooperative agreement between the Centers for Disease Control and Prevention and the Emory University Prevention Research Center; grant number 5U48DP001909.

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Address correspondence to: Enid Chung Roemer, PhD, Emory University Institute for Health and Productivity Studies, Rollins School of Public Health, 1341 22nd Street NW, Washington, DC 20037 (enid.c.roemer@emory.edu).

DOI: 10.1097/JOM.0b013e318283349a7

http://www.cdc.gov/dhdsp/pubs/worksite_scorecard.htm

Topics Covered (current version)

- Organizational Supports (18 questions)
- Tobacco Control (10 questions)
- Nutrition (13 questions)
- Lactation Support (6 questions)
- Physical Activity (9 questions)
- Weight Management (5 questions)
- Stress Management (6 questions)
- Depression (7 questions)
- High Blood Pressure (7 questions)
- High Cholesterol (6 questions)
- Diabetes (6 questions)
- Signs and Symptoms of Heart Attack and Stroke (4 questions)
- Emergency Response to Heart Attack and Stroke (9 questions)
- Occupational Health and Safety (10 questions)
- Vaccine-Preventable Diseases (6 questions)
- Community Resources (3 questions; not scored)

In the past 12 months, did you…

- Provide educational materials that address skin, breast, cervical, or colorectal cancer prevention?
- *Answer "yes" if, for example, your worksite offers brochures, videos, posters, pamphlets, reminders, or newsletters that promote sun protection, evidence-based vaccinations, or evidence-based cancer screenings.*

In the past 12 months, did you…

- Provide and promote interactive educational programming on cancer prevention?
- *Answer "yes" if, for example, your worksite offers seminars, workshops, or classes that address prevention, early identification, and survivorship. These sessions can be provided in-person or online; on-site or off-site; in group or individual settings; through vendors, on-site staff, health insurance plans/programs, community groups, or other practitioners.*

In the past 12 months, did you…

- Monitor employee exposure to known carcinogens within the workplace?
- *Answer "yes" if, for example, your worksite takes action to limit exposures to radon, asbestos, and other carcinogens that may exist at the worksite, and uses alternative materials (i.e., "green chemistry") where ever possible.*

In the past 12 months, did you…

- Offer free or low cost cancer screenings on-site?
- *Answer "yes" if, for example, your worksite offered cancer screenings (e.g., stool test kits) as part of a health campaign or as part of routine care at an on-site clinic.*

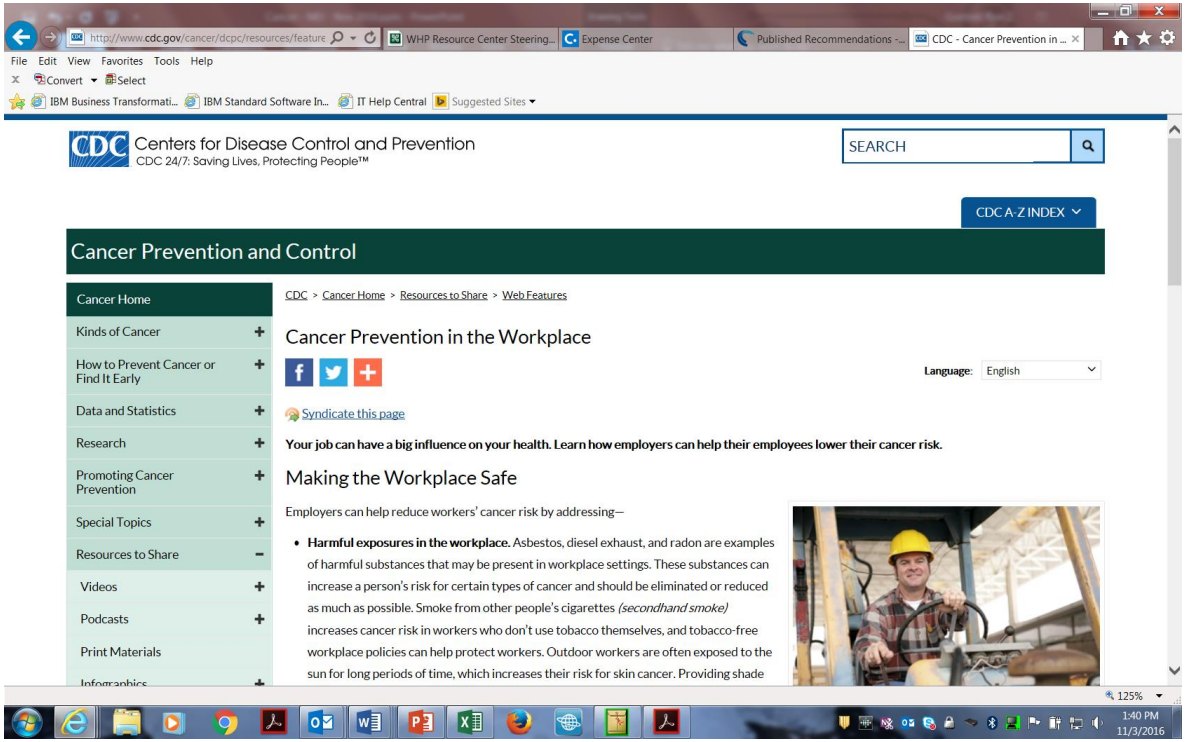
In the past 12 months, did you…

- Have a written policy that includes measures to reduce sun exposure for outdoor workers?
- *Answer yes if, for example, the policy encourages rotation of workers in UV intense positions, scheduling of tasks to avoid high-exposure periods, and the use of sun protective clothing, hats, and sunscreen* Provide and promote

In the past 12 months, did you…

- Provide employees with physical supports for sun protection?
- *Answer "yes" if, for example, your worksite offers shade, hats, or sunscreen to employees who work outdoors.* Awkward?

CDC Resource



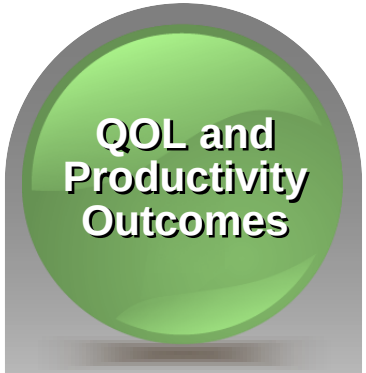
http://www.cdc.gov/cancer/dcpc/resources/features/cancerpreventioninworkplace/

Workplace Health and Wellbeing Works – If You Do it Right!

Cost savings, return on investment (ROI) and net present value (NPV). Where to find savings:

- Medical costs
- Absenteeism
- Short term disability (STD)
- Safety/Workers' Comp
- Presenteeism

- Adherence to evidence based medicine.
- Behavior change, risk reduction, health improvement.



- Improved "functioning" and productivity
- Attraction/retention – employer of choice
- Employee engagement
- Corporate social responsibility (CSR)
- Balanced scorecard

Another Benefit:
Engaged Workers Who Love Their Job!

Where We Need to Go…..

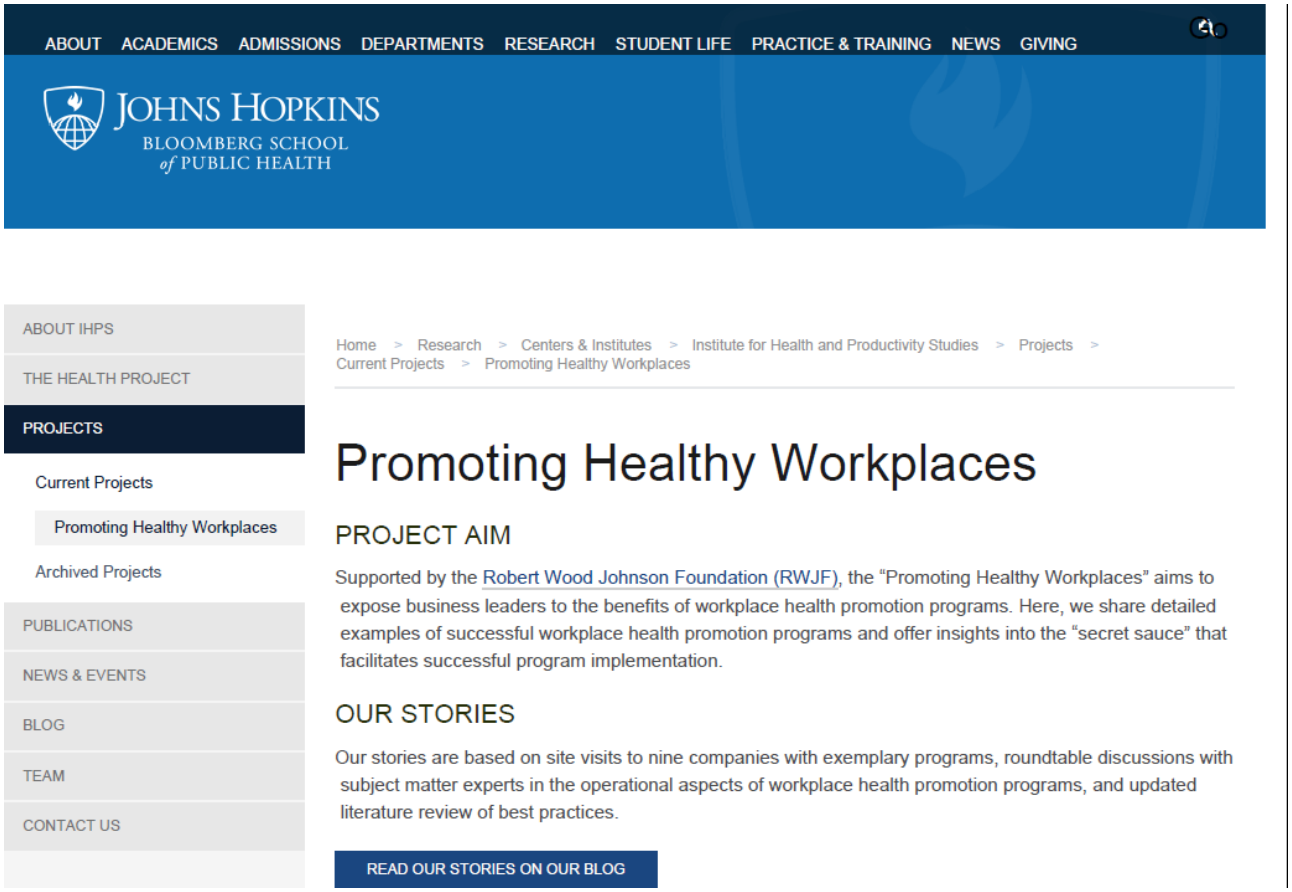
Old Paradigm

- Bad behavior (poor diet)…leads to
- High risk condition (obesity)…leads to
- Disease (diabetes)…leads to
- Death

New Paradigm

- Good health (physical, mental, emotional, social, financial, spiritual)…
  leads to
- Well-being (energy)…leads to
- Purposeful life
  AND HIGH VALUE

Learn More at….



http://www.jhsph.edu/promoting-healthy-workplaces

Thank You!

Ron Z. Goetzel, Ph.D.
Senior Scientist at the Johns Hopkins Bloomberg School of Public Health
Vice President at Truven Health Analytics, an IBM Company
ron.goetzel@truvenhealth.com

Learn about ***Promoting Healthy Workplaces*** project at: http://goo.gl/ui1rBQ

Follow us on Twitter @JHU_IHPS

Connect with us on LinkedIN