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
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.

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

*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

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

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.

<table>
<thead>
<tr>
<th>Year</th>
<th>Medical</th>
<th>Pharmacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>$3,483</td>
<td>$733</td>
</tr>
<tr>
<td>2008</td>
<td>$3,687</td>
<td>$753</td>
</tr>
<tr>
<td>2009</td>
<td>$3,950</td>
<td>$782</td>
</tr>
<tr>
<td>2010</td>
<td>$4,151</td>
<td>$816</td>
</tr>
<tr>
<td>2011</td>
<td>$4,315</td>
<td>$833</td>
</tr>
<tr>
<td>2012</td>
<td>$4,393</td>
<td>$863</td>
</tr>
<tr>
<td>2013</td>
<td>$4,557</td>
<td>$882</td>
</tr>
<tr>
<td>2014 (projected)</td>
<td>$4,773</td>
<td>$909</td>
</tr>
<tr>
<td>2015 (projected)</td>
<td>$5,033</td>
<td>$944</td>
</tr>
</tbody>
</table>

**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

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

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

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)


• 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)

Diseases Caused (at Least Partially) by Lifestyle

- **Obesity:** Cholezystitis/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…
A Systematic Review of Selected Interventions for Worksite Health Promotion
The Assessment of Health Risks with Feedback

## Summary Results and Team Consensus

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Body of Evidence</th>
<th>Consistent Results</th>
<th>Magnitude of Effect</th>
<th>Finding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol Use</td>
<td>9</td>
<td>Yes</td>
<td>Variable</td>
<td>Sufficient</td>
</tr>
<tr>
<td>Fruits &amp; Vegetables</td>
<td>9</td>
<td>No</td>
<td>0.09 serving</td>
<td>Insufficient</td>
</tr>
<tr>
<td>% Fat Intake</td>
<td>13</td>
<td>Yes</td>
<td>-5.4%</td>
<td>Strong</td>
</tr>
<tr>
<td>% Change in Those Physically Active</td>
<td>18</td>
<td>Yes</td>
<td>+15.3 pct pt</td>
<td>Sufficient</td>
</tr>
<tr>
<td>Tobacco Use</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prevalence</td>
<td>23</td>
<td>Yes</td>
<td>–2.3 pct pt</td>
<td>Strong</td>
</tr>
<tr>
<td>Cessation</td>
<td>11</td>
<td>Yes</td>
<td>+3.8 pct pt</td>
<td></td>
</tr>
<tr>
<td>Seat Belt Non-Use</td>
<td>10</td>
<td>Yes</td>
<td>–27.6 pct pt</td>
<td>Sufficient</td>
</tr>
</tbody>
</table>
## Summary Results and Team Consensus

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Body of Evidence</th>
<th>Consistent Results</th>
<th>Magnitude of Effect</th>
<th>Finding</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diastolic blood pressure</strong></td>
<td>17</td>
<td>Yes</td>
<td>Diastolic: −1.8 mm Hg</td>
<td>Strong</td>
</tr>
<tr>
<td><strong>Systolic blood pressure</strong></td>
<td>19</td>
<td>Yes</td>
<td>Systolic: −2.6 mm Hg</td>
<td></td>
</tr>
<tr>
<td><strong>Risk prevalence</strong></td>
<td>12</td>
<td>Yes</td>
<td>−4.5 pct pt</td>
<td></td>
</tr>
<tr>
<td><strong>BMI</strong></td>
<td>6</td>
<td>Yes</td>
<td>−0.5 pt BMI</td>
<td>Insufficient</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>12</td>
<td>No</td>
<td>−0.56 pounds</td>
<td></td>
</tr>
<tr>
<td><strong>% body fat</strong></td>
<td>5</td>
<td>Yes</td>
<td>−2.2% body fat</td>
<td></td>
</tr>
<tr>
<td><strong>Risk prevalence</strong></td>
<td>5</td>
<td>No</td>
<td>−2.2% at risk</td>
<td></td>
</tr>
<tr>
<td><strong>Total Cholesterol</strong></td>
<td>19</td>
<td>Yes</td>
<td>−4.8 mg/dL (total)</td>
<td>Strong</td>
</tr>
<tr>
<td><strong>HDL Cholesterol</strong></td>
<td>8</td>
<td>No</td>
<td>+.94 mg/dL</td>
<td></td>
</tr>
<tr>
<td><strong>Risk prevalence</strong></td>
<td>11</td>
<td>Yes</td>
<td>−6.6 pct pt</td>
<td></td>
</tr>
<tr>
<td><strong>Fitness</strong></td>
<td>5</td>
<td>Yes</td>
<td>Small</td>
<td>Insufficient</td>
</tr>
</tbody>
</table>
## Summary Results and Team Consensus

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Body of Evidence</th>
<th>Consistent Results</th>
<th>Magnitude of Effect</th>
<th>Finding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated Risk</td>
<td>15</td>
<td>Yes</td>
<td>Moderate</td>
<td>Sufficient</td>
</tr>
<tr>
<td>Healthcare Use</td>
<td>6</td>
<td>Yes</td>
<td>Moderate</td>
<td>Sufficient</td>
</tr>
<tr>
<td>Worker Productivity</td>
<td>10</td>
<td>Yes</td>
<td>Moderate</td>
<td>Strong</td>
</tr>
</tbody>
</table>
What About ROI?
Critical Steps to Success

- Awareness
- Participation
- Increased Knowledge
- Improved Attitudes
- Behavior Change
- Risk Reduction
- Reduced Utilization
- Financial ROI
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 fell 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.
## Results - Medical Care Cost Savings

<table>
<thead>
<tr>
<th>Description</th>
<th>N</th>
<th>Average ROI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Studies reporting costs and savings</td>
<td>15</td>
<td>$3.37</td>
</tr>
<tr>
<td>Studies reporting savings only</td>
<td>7</td>
<td>Not Available</td>
</tr>
<tr>
<td>Studies with randomized or matched control group</td>
<td>9</td>
<td>$3.36</td>
</tr>
<tr>
<td>Studies with non-randomized or matched control group</td>
<td>6</td>
<td>$2.38</td>
</tr>
<tr>
<td>All studies examining medical care savings</td>
<td>22</td>
<td>$3.27</td>
</tr>
</tbody>
</table>
## Results – Absenteeism Savings

<table>
<thead>
<tr>
<th>Description</th>
<th>N</th>
<th>Average ROI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Studies reporting costs and savings</td>
<td>12</td>
<td>$3.27</td>
</tr>
<tr>
<td>All studies examining absenteeism savings</td>
<td>22</td>
<td>$2.73</td>
</tr>
</tbody>
</table>
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)

Kent et al., JOEM Study

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.

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.
How to Design a Corporate Wellness Plan That Actually Works

by Hector De La Torre and Ron Goetzel, Ph.D.

MARCH 31, 2016

Harvard Business Review Translation
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

https://www.uspreventiveservicestaskforce.org/BrowseRec/Search?s=cancer
In Workplace Settings Apply:
The CDC Worksite Health ScoreCard

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/
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.
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Vice President at Truven Health Analytics, an IBM Company
ron.goetzel@truvenhealth.com

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

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