Organizational Barriers and Novel Solutions to Improving Occupational Health

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work@health®

Training Employers | Promoting Health | Maximizing Performance

NHW National Healthy worksite™

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Outline

- Description of the CDC's Work@Health® program and National Healthy Worksite Program (NHWP)

- Perceived barriers to successful program implementation

- Motivators and success factors

- New opportunities in OHP research and practice through emerging technologies

- Q&A

Disclaimer: The findings and conclusions in this presentation are those of the author and do not necessarily represent the official position of the Centers for Disease Control and Prevention

Work@Health® is an employer-based training program. The ultimate aim of the program is to improve the organizational health of participating employers using certified trainers, with an emphasis on strategies to reduce chronic disease and injury risk to employees and an eye to improving overall worker productivity and wellbeing.

- Two components:

  - Direct training to 173 employers
  - Train-the-trainer (T3) program
    - designed to prepare participants to recruit and train five other employers on the Work@Health® core curriculum
    - participants completed the Work@Health® core curriculum along with six additional modules designed to enhance their training and facilitation skills.

Work@Health® Core Curriculum

Eight modules designed to guide employers through the assessment, planning, implementation and evaluation phases of an evidence-based worksite health promotion program:

1) Making the Business Case
2) Assessing Your Worksite
3) Building Leadership Support
4) Planning and Designing Your Program
5) Developing Policy, Benefit and Environmental Supports
6) Designing Effective Communications
7) Implementing and Sustaining Your Program
8) Evaluating Your Program

Training models

- Hands-on
  - On-site, instructor-led one-day training workshop
    - Lectures, skills lessons, practical demonstrations, case studies, participant discussion, group exercises

- Online
  - Self-paced training activities on a computer using a web-based platform
  - Flexibility to move through the curriculum independently over several weeks
    - E-learning modules, webinars, teleconferences, streaming videos, online coach, peer learning networks

- Blended
  - Combination of hands-on and online
    - First six modules online; last two in person

- Free, online, user-friendly tool:
  http://www.cdc.gov/dhdsp/pubs/docs/hsc_manual.pdf
- Validated questions, centered on evidence-based interventions and strategies
- Way to measure and track common data points across worksites
- Useful for :

  ✓ Assessing what is currently in place

  ✓ Planning for what could be implemented

  ✓ Evaluating on an annual basis progress in key topic areas, including:

    • Nutrition
    • Physical activity
    • Weight management
    • Stress management
    • Organizational support
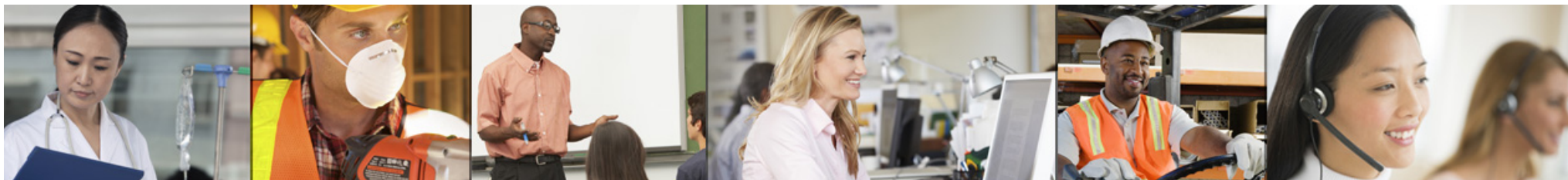
Participant-level data

- In addition to ScoreCard data, participants also completed:

  - Organizational Assessment
    - Information about existing health promotion efforts, factors motivating implementation, & barriers to implementation

    - Measured at baseline and 12-15 months post-training

  - Knowledge, Attitudes, & Behavior (KAB) survey
    - Information on participants' knowledge of workplace health promotion concepts, motivation, confidence, and other attitudes related to implementing a program

    - Measured at baseline and 12 months post-training

Work@Health® Participating Employers

Oakland: 25

Chicago: 38

Philadelphia: 6

Baltimore: 49

Raleigh: 20

Atlanta: 29

Virtual: 6

Total N = 173

Employer Size:
1-20 employees: 2.3%
21-99: 32.4%
100-249: 24.9%
250-749: 20.8%
750+: 19.7%

Employer Sector:
Government: 21.4%
Non-profit/education: 41.6%
Private sector: 34.1%
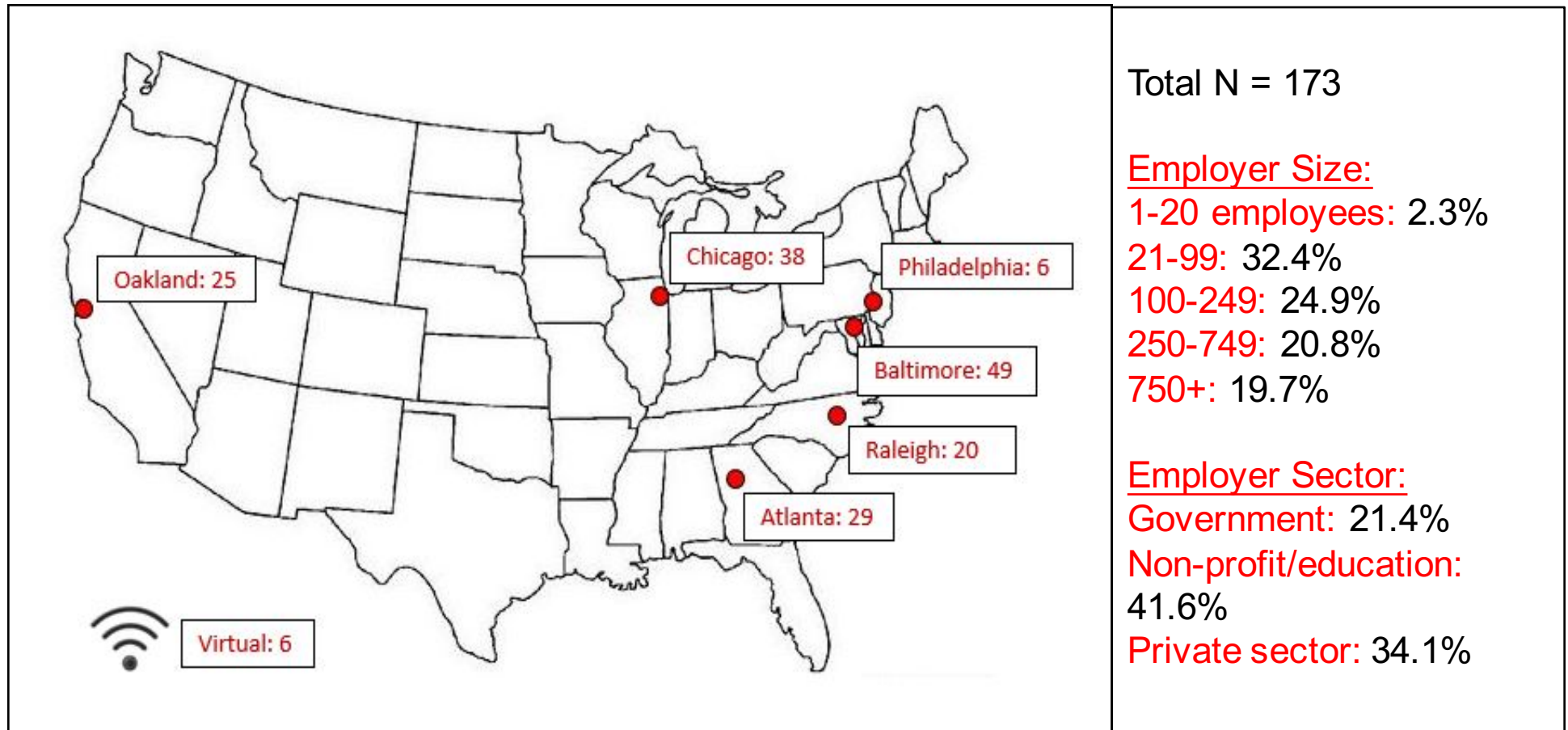
Training Model:
Blended: 22.5%   Hands-on: 47.4%   Online: 30.1%

Work@Health® ScoreCard: Number and Type of Interventions

Significant increases in the number of interventions implemented were seen in nearly all categories, including:

- Organizational supports
- Tobacco control
- Lactation support
- Physical activity
- Weight management
- Stress management
- Depression
- High blood pressure
- Diabetes
- Signs & Symptoms of Heart Attack and Stroke
- Emergency Response to Heart Attack and Stroke
- Occupational Health and Safety

Significant increases in each type of intervention:

- Programs
- Policies
- Environmental Supports
- Benefits

Model Comparisons: ScoreCard

- Overall, no significant differences in ScoreCard changes between models

Dependent Variable	Test	Parameter Estimate	Standard Error	t Value	Pr > |t|
Total HSC Score	Blended vs. Hands-on	3.7440	14.2901	0.26	0.7942
	Blended vs. Online	-8.1010	14.1762	-0.57	0.5697
	Hands-on vs. Online	-11.8450	12.6003	-0.94	0.3508

- Only significant differences:

Organizational Supports	Blended vs. Hands-on	-3.2604	2.1955	-1.49	0.1424
	Blended vs. Online	-4.3913	2.1779	-2.02	0.0480
	Hands-on vs. Online	-1.1308	1.9440	-0.58	0.5628
Occupational Health and Safety	Blended vs. Hands-on	3.4167	1.8327	1.86	0.0669
	Blended vs. Online	-0.1650	1.8180	-0.09	0.9280
	Hands-on vs. Online	-3.5817	1.6227	-2.21	0.0309

Changes in Motivation, Confidence, Knowledge

	T1	T2	P value[2]	N
How **motivated** to implement/enhance a worksite health program?[1]	4.5	4.2	< .001	150
How **confident** are you in your ability to start/ expand a worksite health program?[1]	4.0	3.9	0.159	150
No. Correct Knowledge Quiz Answers (88-pt scale)	53.1	61.2	< .001	152

- Motivation slightly decreased
- No significant change in confidence
- Significant increase in knowledge

[1]Means at T1 (baseline) and T2 (follow up) on (1 = Not at all motivated/confident to 5=Extremely motivated/confident)
[2]Means were compared using dependent t-tests.

Model Comparisons:

- No significant differences in motivation, confidence, or knowledge between models

Dependent Variable	Test	Parameter Estimate	Standard Error	t Value	Pr > |t|
Motivation	Blended vs. Hands-on	0.1933	0.1259	1.53	0.1270
	Blended vs. Online	-0.01098	0.1305	-0.08	0.9331
	Hands-on vs. Online	-0.2042	0.1191	-1.72	0.0884
Confidence	Blended vs. Hands-on	0.1939	0.1584	1.22	0.2228
	Blended vs. Online	0.01990	0.1643	0.12	0.9038
	Hands-on vs. Online	-0.1740	0.1499	-1.16	0.2477
Knowledge Quiz Score	Blended vs. Hands-on	-0.1292	1.4368	-0.09	0.9285
	Blended vs. Online	0.01878	1.4888	0.01	0.9900
	Hands-on vs. Online	0.1480	1.3583	0.11	0.9134

# What are the factors that impede implementing and sustaining programs?

- What are/were the greatest barriers to implementing a worksite health program at your worksite?
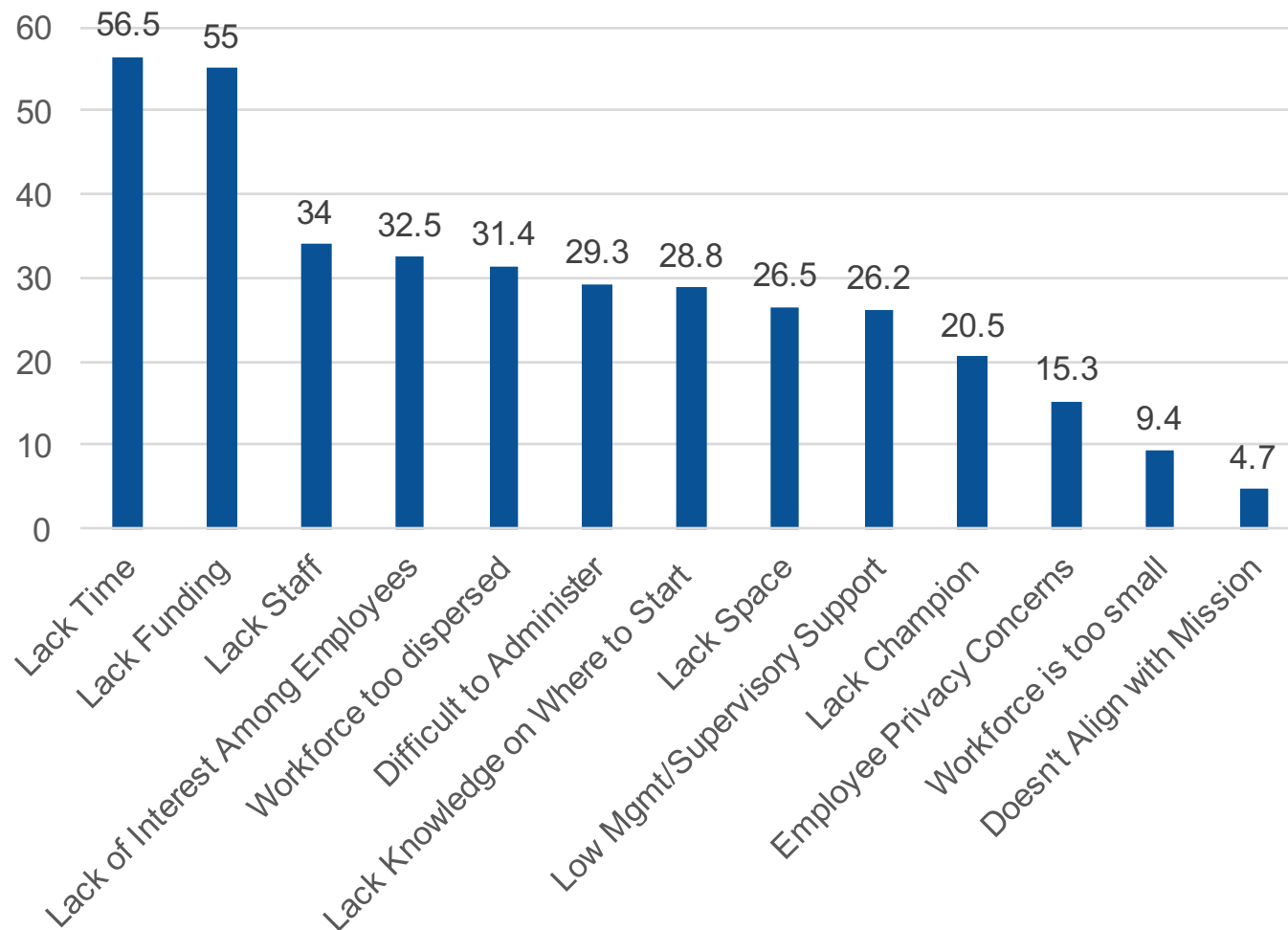
Percentage of Employers Perceiving Barriers as Significant (Baseline)

Motivators to Implement

- What are/were the most important reasons for implementing a worksite health program at your worksite? (1 = not at all important to 5 = very important)
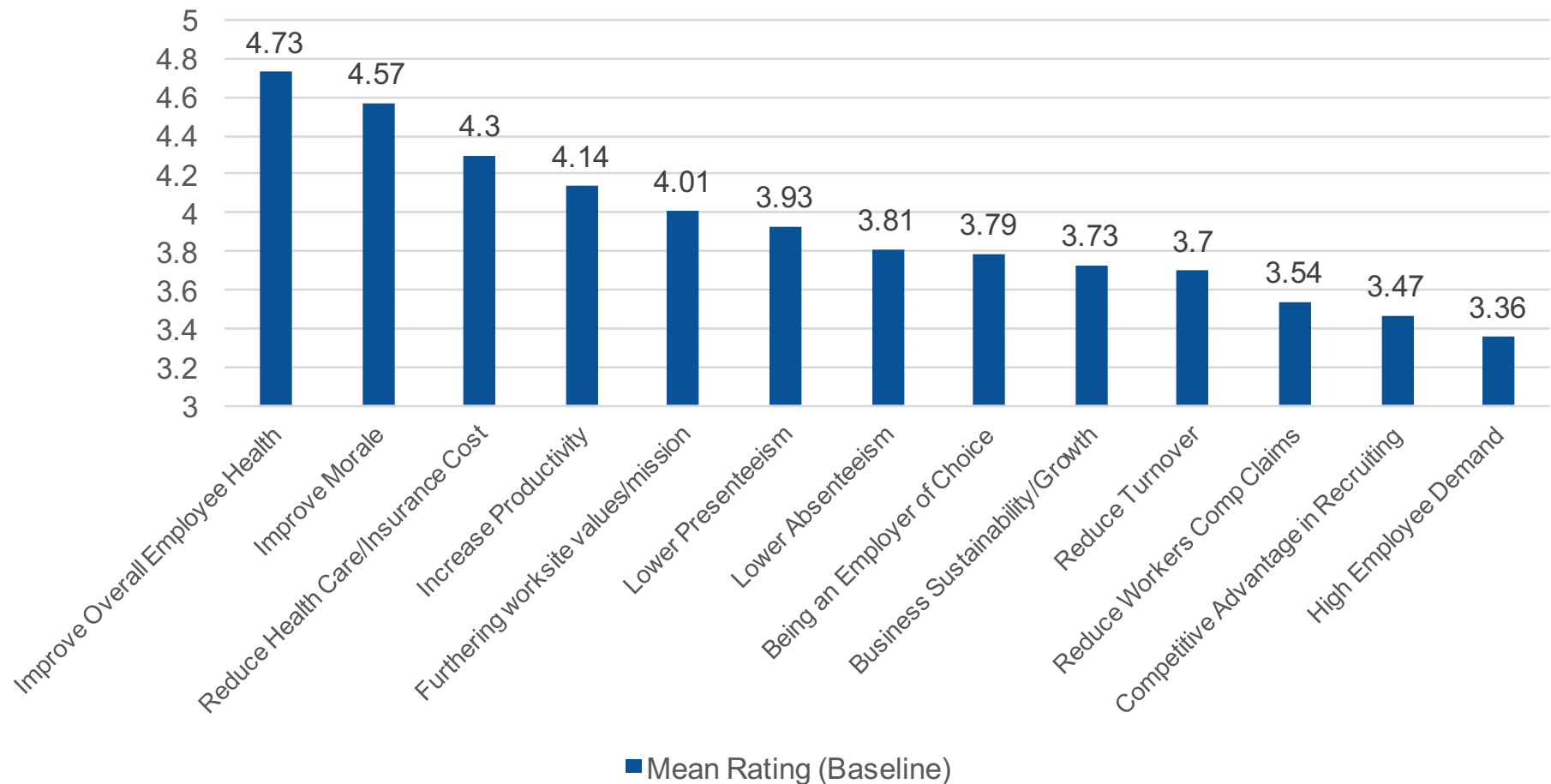
Work@Health® Training Helped Employers Overcome Barriers:

Which barriers to the successful implementation of a health program at your worksite did the training help you overcome?	N	%
Lack of funding	87	48.3
Lack of employee participation	87	28.7
Lack of management support	87	27.6
Lack of staffing support needed to manage the program	87	18.4
No senior level program champion	87	11.5

Barriers: Relationship with Health ScoreCard

- **Baseline barriers** significantly correlated with **baseline** overall Health ScoreCard score:

Baseline Barrier	r
Lack of knowledge about where to begin and how to do it	-.49*
Difficult to administer	-.29*
Lack of funding	-.25*
Lack of effective program champion(s)	-.19*
Our workforce is too small	-.17*
Lack of staff	-.17*

*$p<.05$

- **Baseline barriers** significantly correlated with **follow-up** overall Health ScoreCard score:
  - Lack of effective program champion(s) (r = -.31, $p<.05$)
  - Lack of knowledge about where to begin and how to do it: (r = -.29, $p<.01$)

- **Follow-up barriers** significantly related to **follow-up** overall Health ScoreCard:
  - Doesn't align with our worksite goals or mission (r = -.44, $p<.05$)

Motivators: Relationship with Health ScoreCard

- Baseline motivators significantly correlated with baseline overall Health ScoreCard score:

Baseline Motivator	r
Improve safety/reduce workers comp claims	.23*
Lower absenteeism	.18*
Lower presenteeism	.18*
Being an "employer of choice"	.15*
High employee demand	.15*

*p<.05

- None of the baseline motivators significantly correlated with follow-up overall Health ScoreCard score

- Two follow-up motivators significantly related to follow-up overall score:
  - Reduce health care/insurance costs ($r = .50$, $p < .05$)
 - Improve safety/reduce workers comp claims ($r = .57$, $p < .01$)

Motivating Employers to Make Changes

- There is a fairly strong, negative relationship between misalignment of a health program with the company's mission and goals and Health ScoreCard score

  – Important to tailor programs to fit within a given organization's culture

- Employers' motivations at follow-up to reduce health care/insurance costs and reduce workers' comp claims are positively related to their Health ScoreCard scores

  – Highlights the importance of making the connection between health program interventions and long-term (financial) outcomes

What matters most going forward?

- Importance of each of the following for **maintaining** the program, policies and/or environmental changes over the next 12 months:

Mean Rating (Follow-up), 5-point scale
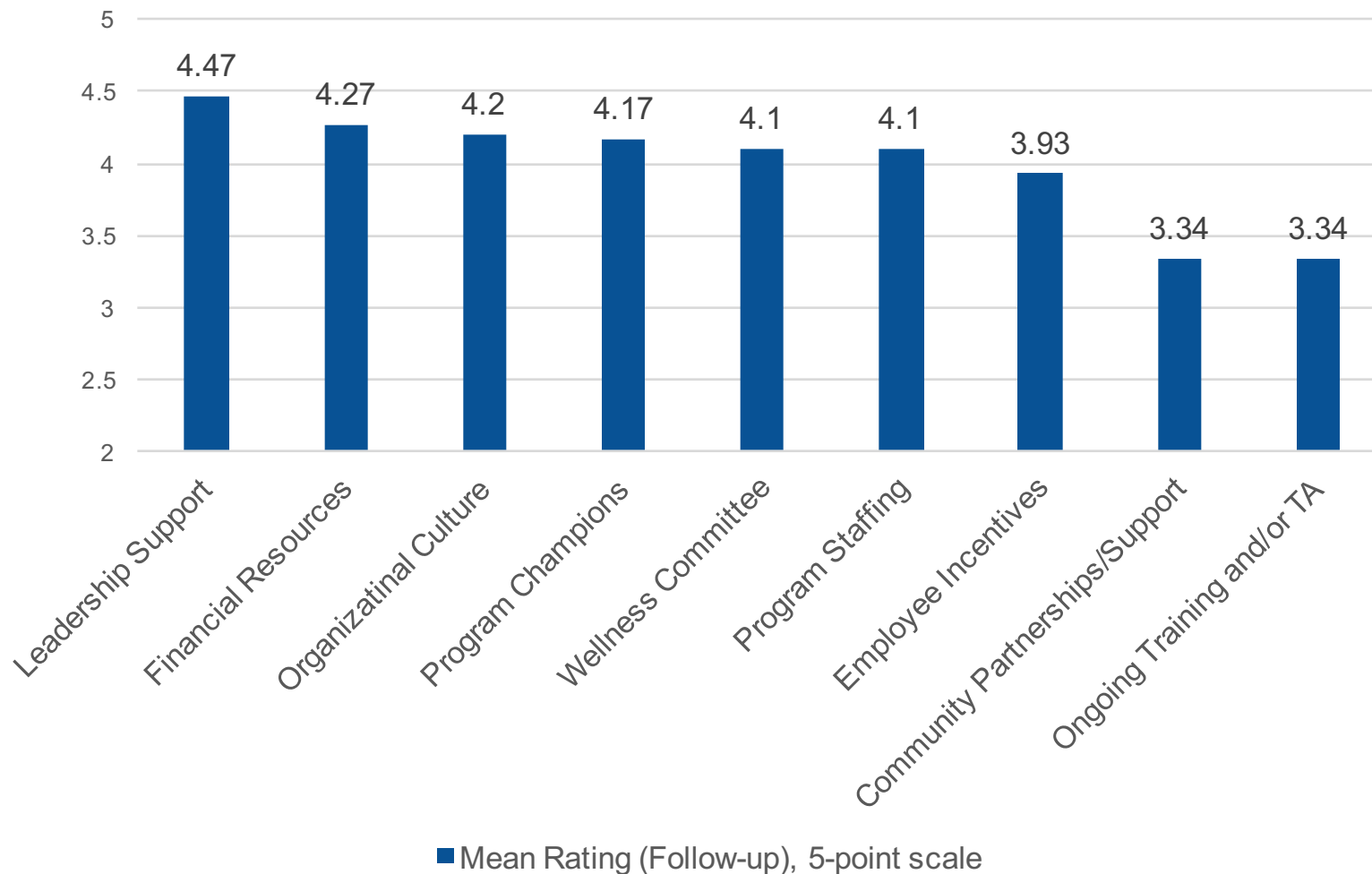
National Healthy Worksite Program (NHWP)

- Designed to assist approximately 100 employers in implementing science-based prevention and health promotion strategies that would lead to specific, measureable health outcomes to reduce chronic disease rates
- Emphasized strategies targeting physical activity, nutrition and tobacco use
- Goal: help more employers implement comprehensive programs, incorporating programs, policies and environmental supports
  - Targeted a large number of mostly smaller employers
  - Gave employers tools to select and implement their own interventions
- Evaluated:
  - the effect of employer participation in the NHWP on employers' implementation of evidence-based health promotion interventions
  - changes in employee-level attitudes and health-related outcomes

- Baseline and 18-month follow-up assessments
  - employee health surveys
    - health conditions
    - health behaviors
    - perceptions about the work environment
  - on-site biometric screenings
  - CDC Worksite Health ScoreCard

- Program Planning Tool
  - Outlined objectives with multiple interventions to address each one
    - For each intervention:
      - How and when it would be implemented (including who was responsible each action);
      - The method(s) for communicating to employees
      - The strategy for evaluating whether it was implemented and how effective it was (e.g., level of participation, employee satisfaction)

- Program Implementation/Technical Assistance

National Healthy Worksite Program (NHWP): ScoreCard Changes

Number of Interventions (from CDC Health ScoreCard)

Intervention Type	Total Possible	Baseline Mean	SD	Follow Up Mean	SD	P value (Baseline-Follow up)
All Interventions	123	42.0	14.2	75.4	16.6	< .001
Benefits	10	7.0	2.1	7.5	2.2	0.296
Environmental Supports	21	5.2	2.4	8.8	3.2	< .001
Policies	11	4.7	2.0	6.3	2.2	< .001
Programs	70	22.3	9.8	45.8	11.3	< .001

- As with Work@Health [®], significant improvement in the number of interventions implemented

National Healthy Worksite Program (NHWP): Employer Challenges (from employer case studies)
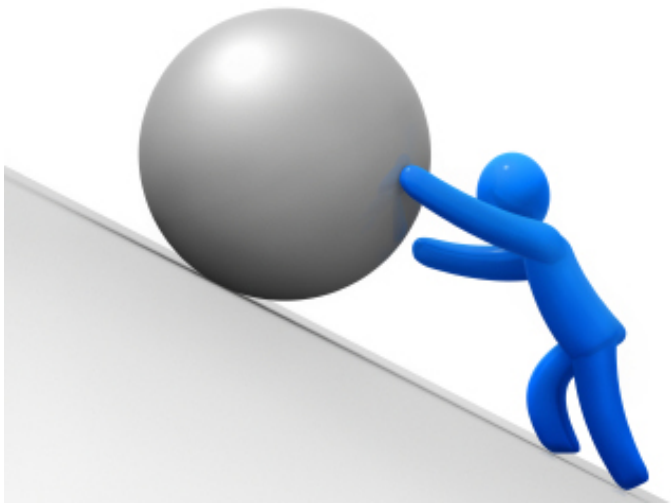
- Changes in leadership/lack of leadership support

- Sustaining high levels of engagement among health committee members

- Maintaining employee participation in wellness activities during busy periods

- Finding time to engage in healthy behaviors

- Communicating with employees across locations and with varying schedules

National Healthy Worksite Program (NHWP): Employer Successes (from employer case studies)

- Setting specific and concrete goals using the NHWP planning tool

- New and compelling program and initiatives for employees, including:

    – Engaging newsletters to staff
    – On-site nutritional counseling
    – Physical activity challenges
    – Recipe sharing
    – Providing on-site workout equipment and/or free or subsidized gym memberships
    – Bicycle rack installation
    – Team activities and sports

Employee Health Outcomes

- Employee behaviors and outcomes (18-month follow-up)
  - Lack of evidence of significant improvement in some areas, such as:
    - Percentage of smokers decreased, but the change was not statistically significant
    - Absenteeism
    - Self-reported general health

  - Significant improvement in:
    - Physical activity
    - Increased consumption of:
      - Fruit and vegetables
      - Whole grain foods
    - Decreased consumption of soda

    - Employee perceptions of workplace support:
      - "The people I work with take a personal interest in me"
      - "The people I work with can be relied on when I need help"
      - "If my health get worse, my coworkers would support my recovery"
      - "My coworkers would support my use of sick days for illness or mental health"
      - "My organization encourages me to make suggestions about employee safety, health, and well-being"

Employees Perceive Increased Support

- Significant improvement in the percentage of employees who believe their employer provides opportunities to:
  - Be physically active
  - Eat a healthy diet

- Significant improvement in perceptions of:
  - Safety in the workplace
  - How supportive company is of your personal health

Work@Health® & NHWP: Conclusions

- Employers perceive significant barriers and challenges to implementing workplace health programs
- Yet, they are motivated to create and sustain such programs to improve employee health and improve the bottom line through reduced healthcare costs and increased productivity
- In both programs, participation led to a significant increase in the number and type of workplace health interventions implemented
- Some improvements seen in employee health in NHWP
  - Possible that longer time period is needed to see more effects on actual health outcomes
  - Measurement at more than two time points could give a more nuanced view of health behavior and outcome changes

Emerging Technologies in OHP

Public Health Informatics

Occupational Health Psychology
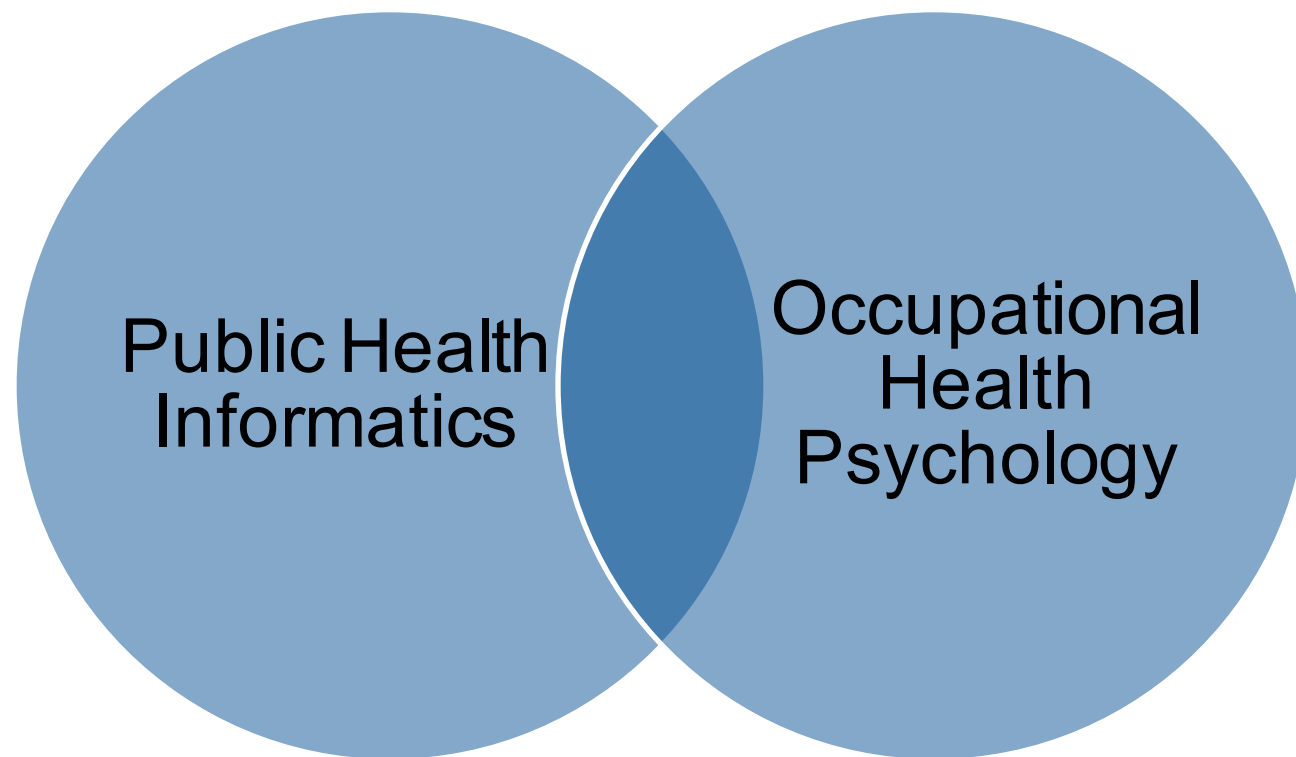
Defining Health

"a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity."

The Preamble of the Constitution of the World Health Organization". Bulletin of the World Health Organization 80 (12): 982.

Defining Public Health

"the science and art of preventing disease, prolonging life and promoting health through organized efforts and informed choices of society, organizations, public and private, communities and individuals"

Winslow, Charles-Edward Amory (1920). "The Untilled Field of Public Health". Modern Medicine 2: 183–191.

Defining Public Health Informatics

"The systematic application of information and computer science and technology to public health practice, research, and learning."

O'Carroll PW, et al. Public health informatics and information systems, Springer, 2002.

Evolving Public Health Practice

There has been a fundamental shift in public health practice to include passively-collected data in addition to actively-collected data.

This shift is enabled by new and emerging technologies.

The methods used in public health might be useful to OHP researchers as well.

Public Health Informatics Projects

Public Health Quality Improvement Exchange

SMS4Health

Community Benefit Web Tool

Health Impact Assessment Clearinghouse

Video game about cyber-security

OHP and Public Health

OHP researchers often use *active* data collection methods, which are labor-intensive, and require researchers to manage participant burden.

Public Health researchers are charged with assessing the impact of one or more interventions; considering many of the same attributes that OHP researchers measure, but at the population level.

Similar foci between OHP and Public Health

Stress

Depression

Nutrition

Physical activity

Weight management

Tobacco control

Physical activity

High blood pressure

Diabetes

Emerging technologies

Self-generated health data

Data collected from online behavior

Health Information Exchanges

Prescription gaming
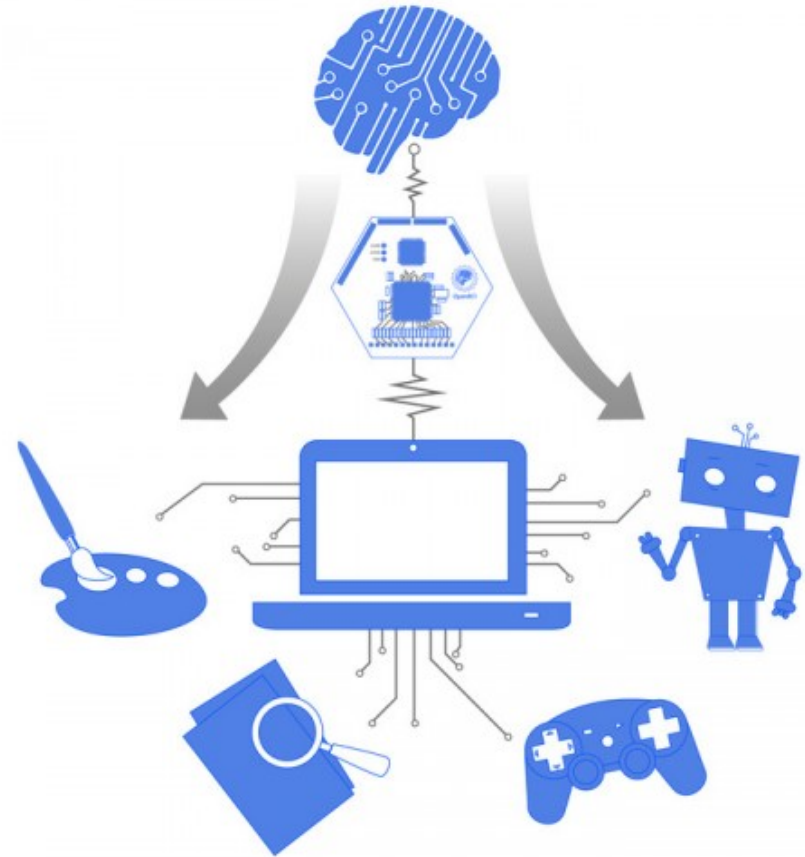
Self-Generated Health Data

Data about individuals that is collected by the individual. Some of this data is collected by tracking devices and mobile devices. Data is also generated through social media and online behavior.

Categories of Self-Generated Health Data

Volunteered data- created and explicitly shared by individuals (Facebook)

Observed data- captured by recording the actions of individuals (sensor-based activity monitors, cellular location data)

Inferred data- data about individuals based on analysis of volunteered or observed information (credit scores)

Research from Pew Research Center

Pew Internet/California HealthCare Foundation survey asked people about the impact of self-tracking on their lives.

They found that 60% of American adults track their weight, diet, or exercise routine. One-third of American adults track health indicators or symptoms, like blood pressure, blood sugar, headaches, or sleep patterns.

One-third of caregivers – people caring for a loved one, usually an adult family member – say they track a health indicator for their loved one.

7 in 10 American adults are self-trackers.

One-fifth of self-trackers use an app, a device, a spreadsheet, or a website. Half track on a regular basis

http://www.pewinternet.org/2011/05/12/the-social-life-of-health-information-2011/

There are new ways to access individual data, including:

Mood

Mental health

Location

Food consumed

Air quality

Blood oxygen

Physical activity

Physical performance

Sleep

Heart rate

Glucose

Pain

Popular devices and services

Fitbit - Energy intake/ expenditure, sleep measurement

Zeo - Tracks sleep patterns and provides feedback (amount of caffeine vs. minutes in REM) (now defunct)

Asthmapolis - Tracks time/location of asthma inhaler use

Body Media - Energy intake/expenditure, sleep measurement (now a part of Jawbone)

Basis - Heart rate monitor, Energy intake/expenditure, GSR

Withings - Blood Pressure Monitor, Wi-Fi body scale

Apple Health – Heartrate, movement, caloric intake, sleep, location

This information is often owned by commercial organizations, but many have research divisions that you can coordinate with to obtain de-identified data.

Online portals allow participants to opt-in to groups to share information

Online behaviors can be used to collect information about individuals and\or populations.
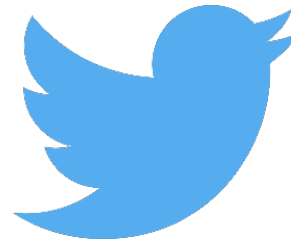
Data from online behaviors - Example

"Experimental evidence of massive-scale emotional contagion through social networks"

"We show, via a massive (N = 689,003) experiment on Facebook, that emotional states can be transferred to others via emotional contagion, leading people to experience the same emotions without their awareness. We provide experimental evidence that emotional contagion occurs without direct interaction between people (exposure to a friend expressing an emotion is sufficient), and in the complete absence of nonverbal cues."

Experimental evidence of massive-scale emotional contagion through social networks. Adam D. I. Kramera, Jamie E. Guilloryb, and Jeffrey T. Hancockb. PNAS http://www.pnas.org/content/111/24/8788.full

A Health information exchange (HIE) is an program or organization that facilitates easy information transfer between care facilities in a geographic region.

Most states and territories in the U.S. have received federal funding to develop these programs. It is possible to reach out to these organizations to access de-identified health data.
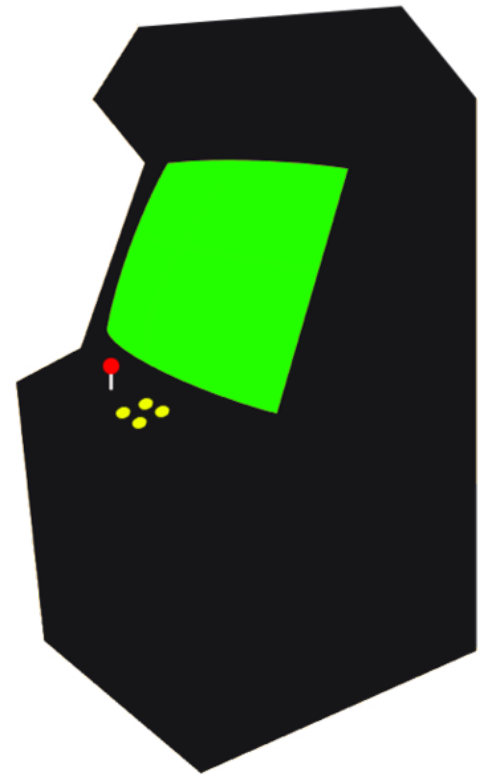
In research settings where many individuals work with one large employer this may be useful to OHP researchers.

Research is showing that electronic games positively impact work recovery and indictors of stress.

Some researchers have suggested that game playing could replace prescription medications for stress and anxiety.

"Switch on to games: Can digital games aid post-work recovery?"

Collins, E; Cox, AL

"The human resources departments of a variety of large companies were also contacted and asked to distribute the questionnaire to employees, although most refused."

"The present research surveyed 491 participants and found that the total number of hours spent playing digital games per week was positively correlated with overall recovery."

http://discovery.ucl.ac.uk/1418103/
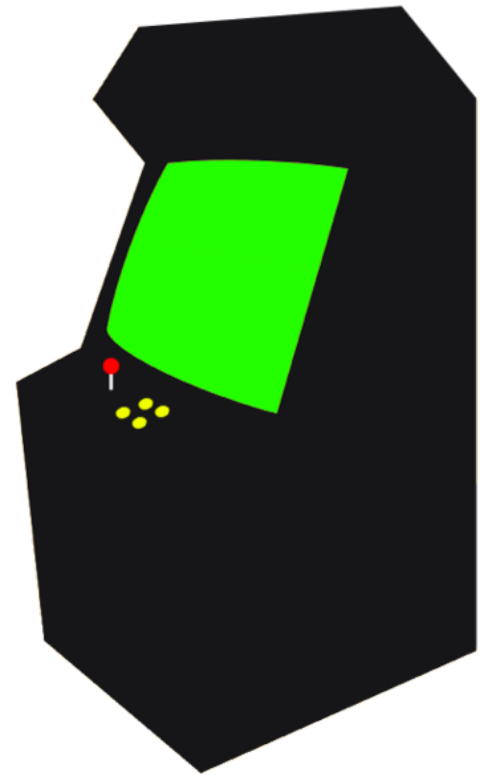
Gaming and Stress Reduction - Example

Work Recovery and prescription gaming

"The Effectiveness Of Casual Video Games in Improving Mood and Decreasing Stress"
Carmen V. Russoniello et al

"EEG changes during game play were consistent with increased mood and corroborated findings on psychological reports. HRV changes were consistent with autonomic nervous system relaxation or decreased physical stress."

http://digitalsmb.com/wp-content/uploads/2015/03/The-Effectiveness-of-Casual-Video-Games-in-Improving-Mood-and-Decreasing-Stress.pdf
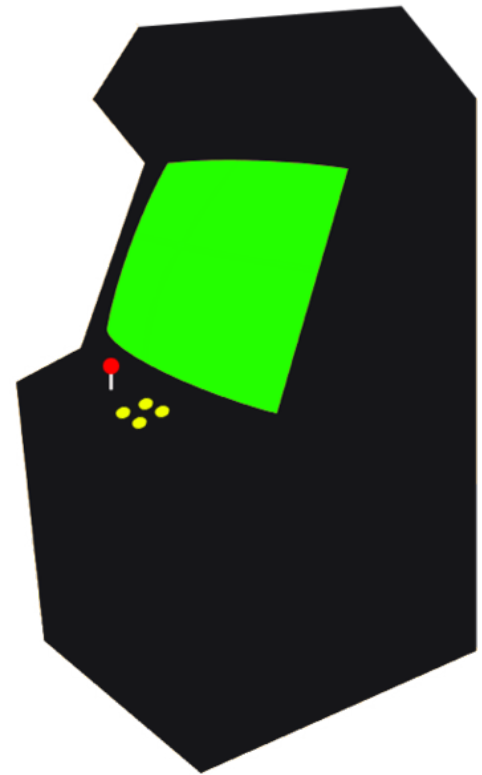
Additional Opportunities to Address Traditional OHP Research and Intervention Limitations

Advances in technology can further improve our ability to address many of the limitations often inherent in OHP research and practice, including:

- Common method variance
- Participant attrition
- Inaccuracy of self-reported health data and information
- Self-presentation bias
- Study fidelity issues
- Collecting data from a dispersed workforce
- Effective experience sampling

Conclusion

Organizations want to increase the health and wellbeing of their employees, but practical constraints to implementing and evaluating programs can serve as barriers

Self-generated health data and other technologies can help employers more accurately measure the impact of their employee health and wellness initiatives, as well as the effects of other psychosocial aspects of the work environment on employee health

This can lead to:

- More nuanced understanding of employees' experiences
- Ability to intervene earlier to prevent employee health problems
- More rigorous measurement and research
- Increasingly cost-effective employee initiatives

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