Behavioral Economics and Physical Activity

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Background

• Physical activity is associated with lower rates of cardiovascular disease, diabetes, obesity, hypertension and all-cause mortality

• However, less than 50% of US adults get enough regular physical activity to obtain health benefits

• Our objective was to evaluate different way to design financial incentives to increase physical activity
Methods

• Design
  – Randomized trial with 13-week intervention and 13-week follow-up
  – Teams of 4 members use a smartphone application to track step counts
  – Goal of 7000 steps per day; each participant received daily feedback

• Sample
  – Adult employees from the University of Pennsylvania Health System in Philadelphia, PA

• Primary outcome
  – Mean proportion of participant-days achieving goal of 7000 steps
Interventions

- **50\textsuperscript{th}** percentile feedback
  - Team’s average steps that week compared to the median

- **75\textsuperscript{th}** percentile feedback
  - Team’s average steps that week compared to top quartile

- **50\textsuperscript{th}** percentile feedback + lottery incentives
  - 1 in 5 chance of $35, 1 in 100 chance of $350, only if team ≥ 7000 steps

- **75\textsuperscript{th}** percentile feedback + lottery incentives
  - 1 in 5 chance of $35, 1 in 100 chance of $350, only if team ≥ 7000 steps
Results – Intervention Period

Mean Proportion of Participant-Days Achieving Goal

- 75th: 0.27
- 50th: 0.45
- 75th + incentives: 0.67
- 50th + incentives: 0.19

P-values:
- 75th: 0.01
- 50th: 0.67
- 75th + incentives: 0.19
- 50th + incentives: 0.01

67%
Summary

- Smartphones were an effective method to track physical activity and deploy interventions in a sedentary population.

- Social comparison to the 50th percentile with incentives was most effective for increasing physical activity.

- Future studies to sustain higher levels of activity:
  - Testing different frequencies of financial incentives
  - Further leverage social incentives.
Framing Financial Incentives to Increase Physical Activity

- **Control**

- **Standard gain framing**
  - Each day you meet the 7000 step goal you earn $1.40

- **Combined lottery**
  - Each day you have about a 1 in 5 chance of winning $5 and a 1 in 100 chance of winning $50 (expected value ~ $1.40 per day)

- **Loss framing**
  - Each month you get $42 placed in a virtual account and you lose $1.40 each day you don’t meet the 7000 step goal

Physical activity was measured by smartphones that participants carried with them for a 3-month intervention and 3-month follow-up period.
Physical activity was measured by smartphones that participants carried with them for a 3-month intervention and 3-month follow-up period.
Individual vs. Team-Based Financial Incentives

• Individual incentive
  – If team selected as winner, each individual is rewarded $50 if he or she individually achieved the 7000 step goal on the prior day

• Team incentive
  – If team selected as winner, each individual is rewarded $50 if all members of the team achieved the 7000 step goal on the prior day

• Combined incentive
  – If team selected as winner, each individual is rewarded $20 if he or she individually achieved the 7000 step goal on the prior day and $10 for each additional team member that achieved the goal
Individual vs. Team-Based Financial Incentives

Mean Proportion of Participant-Days Achieving Goal

- **Control**: 0.20 (P = 0.13)
- **Individual Incentive**: 0.30 (P = 0.96)
- **Team Incentive**: 0.30 (P = 0.96)
- **Combined Incentive**: 0.50 (P < 0.001)

95% Relative Increase
We can’t assume information alone or economic rationality will prevail.

Information
- If people know what to do, they will do it.

Standard Economics
- People are perfectly rational.
- Size of reward is what matters.

Behavioral Economics
- People are predictably irrational.
- Decisions affected by present bias, loss framing, emotions, social context, inertia.
- Incentive delivery and design and choice environment are critical.

@kevin_volpp
## Medical Plan Comparison Chart

### Physician Office Services

<table>
<thead>
<tr>
<th>Service</th>
<th>Level 1</th>
<th>Level 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCP Office Visits</td>
<td>$15 copay</td>
<td>50% after deductible</td>
</tr>
<tr>
<td>Specialist Office Visit</td>
<td>$30 copay</td>
<td>50% after deductible</td>
</tr>
<tr>
<td>Other Services</td>
<td>90% after deductible</td>
<td>50% after deductible</td>
</tr>
<tr>
<td>Diagnostic Lab/Xray</td>
<td>90% after deductible</td>
<td>50% after deductible</td>
</tr>
<tr>
<td>Allergy Testing</td>
<td>90% after deductible</td>
<td>50% after deductible</td>
</tr>
<tr>
<td>Allergy Serums</td>
<td>50% up to $1500, then 100%</td>
<td>50% up to $1500, then 100%</td>
</tr>
<tr>
<td>Allergy Injections</td>
<td>100% after $5 copay</td>
<td>50% after deductible</td>
</tr>
</tbody>
</table>

### Preventive Services

**Routine Child Care (through age 17)**
- Immunizations: 100% after deductible
- Exam: 100% after copay

**Routine Adult Care (age 18 and older)**
- Annual Exam: 100% after copay
- First Mammogram of the year (up to $300): 100% after deductible
- Routine Pap Smears (1 per plan year): 100% after deductible
- Prostate Antigen Testing (1 per plan year): 100% after deductible
- Routine Colonoscopy: 100% after deductible

### Immediate Care

<table>
<thead>
<tr>
<th>Service</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urgent Care (all levels)</td>
<td>100% after $50 copay</td>
<td>100% after $50 copay</td>
<td>100% after deductible</td>
</tr>
<tr>
<td>Emergency Care</td>
<td>90% after $100 copay* and deductible</td>
<td>80% after $100 copay* and deductible</td>
<td>100% after deductible (Level 1)</td>
</tr>
<tr>
<td>Non-Emergency Care at ER</td>
<td>Not covered</td>
<td>Not covered</td>
<td>Not covered</td>
</tr>
<tr>
<td>Emergency Ambulance</td>
<td>80%</td>
<td>80%</td>
<td>80%</td>
</tr>
</tbody>
</table>

*Emergency care at out-of-network facilities is covered at 80% in the EPOPlus Plan.
**Convenience care like Minute Clinic may require either a PCP or specialist office visit copay. Copayments vary by provider.

The first $500 of care per person is covered at 100% after applicable copays. Annual preventative services are covered at 100% after applicable copay and do not count towards your $500 benefit allowance.
Making it easier: Simplifying plan design

- Copayments
- Deductibles
- Coinsurance
- Maximum out of pocket
- Dollar limits
- Visit limits
- Allowances
- FSAs
- HRAs
- HSAs
- Personal benefit allowances

How much is 10% of an ER visit? I don’t know how much I have spent this year and don’t know what 100% of an ER visit costs...
Humana Simplicity ChoicePOS 12

Illinois

How the plan works: When you or a covered member use the plan for in-network healthcare services, you pay a copayment (a specified dollar amount) for that service – there’s no deductible. The medical copayment applies towards the out-of-pocket maximum, which is the amount you are required to pay toward the covered cost of your healthcare. The out-of-pocket maximum amount is calculated on a calendar year basis, and does not include pharmacy copayment amounts.

Network: Humana’s ChoicePOS Network is a local network of physicians and hospitals in the state of Illinois. ChoicePOS is a PPO network, so members can seek care from any contracted provider in this network without the need for a referral or primary care physician selection. Members residing outside the ChoicePOS service area have access to Humana’s ChoiceCare Network, one of the largest, most cost-effective physician and hospital networks in the nation.

<table>
<thead>
<tr>
<th>Services</th>
<th>Option 1</th>
<th>Option 2</th>
<th>Option 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preventive services</td>
<td>$0 copay</td>
<td>$0 copay</td>
<td>$0 copay</td>
</tr>
<tr>
<td>Physician services for inpatient/outpatient hospital, emergency and</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>surgical</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laboratory and radiology</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Injections (including allergy)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office visit with primary care physician</td>
<td>$40 copay per visit</td>
<td>$50 copay per visit</td>
<td>$50 copay per visit</td>
</tr>
<tr>
<td>Convenient care clinic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office visit with specialist physician</td>
<td>$65 copay per visit</td>
<td>$75 copay per visit</td>
<td>$100 copay per visit</td>
</tr>
<tr>
<td>Urgent care with a Concentra physician</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home health care (limited to 100 visits per calendar year)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Manipulations, adjustments, physical, occupational, cognitive, speech</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>and audiology therapy (combined limit to 30 visits per calendar year)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Outpatient and office therapy for mental health, chemical and</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>alcohol dependency (combined limit to 15 visits per calendar year)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skilled nursing facility (limited to 60 days per calendar year)</td>
<td>$65 copay per day</td>
<td>$75 copay per day</td>
<td>$100 copay per day</td>
</tr>
<tr>
<td>Urgent care with a non-Concentra physician</td>
<td>$100 copay per visit</td>
<td>$125 copay per visit</td>
<td>$125 copay per visit</td>
</tr>
<tr>
<td>Emergency room facility (canopy waived if admitted)</td>
<td>$375 copay per visit</td>
<td>$500 copay per visit</td>
<td>$600 copay per visit</td>
</tr>
<tr>
<td>Advanced imaging</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambulance transportation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambulatory surgical facility</td>
<td>$700 copay per visit</td>
<td>$1,000 copay per visit</td>
<td>$1,500 copay per visit</td>
</tr>
<tr>
<td>Outpatient hospital surgical facility and non-surgical facility</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inpatient hospital services for mental health and chemical dependency</td>
<td>$700 copay per day for first three days</td>
<td>$1,000 copay per day for first three days</td>
<td>$1,500 copay per day for first three days</td>
</tr>
<tr>
<td>Inpatient hospital services for alcoholism</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1Out-of-network limited to 10 of the 30 visits.
2For groups with 51 or more employees, no limits apply to inpatient and outpatient services.

Launched nationwide June 1, 2015
Time-limited incentives with sustained effects

Price J, Loewenstein G, Volpp KG. Journal of Health Economics. 2015
VAL Health Rewards drives sustained engagement for walking programs

Walking Program Weekly Engagement Rate

<table>
<thead>
<tr>
<th>Week</th>
<th>Engagement Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>56.8%</td>
</tr>
<tr>
<td>7</td>
<td>61.8%</td>
</tr>
<tr>
<td>8</td>
<td>62.6%</td>
</tr>
<tr>
<td>9</td>
<td>62.4%</td>
</tr>
<tr>
<td>10</td>
<td>60.9%</td>
</tr>
<tr>
<td>11</td>
<td>61.3%</td>
</tr>
</tbody>
</table>
VAL Health Rewards outperforms traditional financial incentive designs

**Standard Gift Card**
- Portal Registration: 0.3%
- Direct Mail: 3.3%
- $9.94 VAL Health Rewards: 7.8%

**Raffle**
- Telehealth App Registration: 2.6%
- Email: 30.5%

**Premium Adjustment**
- Tobacco Cessation Engagement: 50%
- Email: 69%

**Comparison**
- **Standard Gift Card**
  - Portal Registration: 0.3% higher registration than $10 Amazon Gift Card
  - Direct Mail: 3.3% higher registration than $10 Amazon Gift Card
  - $9.94 VAL Health Rewards: 7.8% higher registration than $10 Amazon Gift Card

- **Raffle**
  - Telehealth App Registration: 2.6% higher registration than $1.10 Raffle-Based Incentives
  - Email: 30.5% higher registration than $6.50 VAL Health Rewards

- **Premium Adjustment**
  - Tobacco Cessation Engagement: 50% decrease in incentives over $1000 Surcharge
  - Email: 69% decrease in incentives over $110 VAL Health Rewards

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Poll Question 1

A health insurance plan can be thought of as a health incentive plan tied to use of health services. How much do you use value-based principles in your designs:

A. Lowered cost-sharing for high value services
B. Raised cost-sharing for low value services
C. Did a combination of A & B
D. Did neither
Poll Question 2

What do the stakeholders behind your wellness programs consider most important, participation rates or health outcomes?

A. Primary focus is on Participation
B. Somewhat more focused on Participation
C. Equal interest in Participation and Outcomes
D. Primary focus is on Outcomes
Poll Question 3

Based on the evidence, what method do you consider the most effective for changing behavior?

A. Attainment incentives
B. Deposit Contract incentives
C. Lottery incentives
D. Tailoring methods according to demographic group differences
Poll Question 4

The NBGH Survey in 2016 indicates use of financial incentives for wellness is waning in wellness programs. Why?

A. They haven’t been effective
B. Too much backlash from employees
C. Too much negative press from media
D. We’ve moved on to other engagement strategies
E. I really have no idea
Poll Question 5

An organization made the national news providing incentives that a privacy advocacy group considered involuntary and “incredibly coercive.” Where do you draw the line between incentivizing wellness and coercion?

A. $300  
B. $600  
C. $1000  
D. $2,000  
E. It’s all voluntary so the higher incentive the better
Poll Question 6

An organization made the national news providing incentives that a privacy advocacy group considered involuntary and “incredibly coercive.” Where do you draw the line between incentivizing wellness and coercion?

A. $300  
B. $600  
C. $1000  
D. $2,000  
E. It depends on the organization’s culture
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SAVE-THE-DATE
Upcoming HERO Webinars

Wednesday, July 12 - 12:00 pm Central
Awakening Compassion at Work: New Avenues for Linking Well-Being and Performance
Monica Worline, PhD, Stanford University’s Center for Compassion and Altruism Research

Thursday, August 10 – 12:00 pm Central
Building Cultures of Resilience One Manager at a Time
Megan Hammes, MS, MCHES, The University of Iowa
Sarah Johnson, PhD, Pro-Change Behavior Systems, Inc.