Measuring actionable social determinants of health to improve health care access

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Disclosure

- No financial conflicts
- No industry affiliations
- I am accepting donations
Genetics 30%

Health Care 10%

Social, Environmental, Behavioral 60%

Adapted from McGinnis et al., *Health Affairs* (2002)
B Survival curves for men

- Income measured at age a-2 y for ages 40 y to 62 y
- Income measured at age 61 y for ages 63 y to 76 y
- Gompertz extrapolation for ages 77 y to 90 y
- NCHS and SSA mortality rates for ages >90 y

Income percentile:
- 5th (mean income, $6551)
- 95th (mean income, $230267)
The changing health care landscape
Payment reform

Pay Providers Differently for Care

Providers Change Their Behavior

Better Outcomes

Better Experience

Lower Costs

Adopted from Muhlestein et al., *Health Affairs Blog* (Aug 2018)
ACOs and Covered Lives over Time

- ACOs and Lives covered over time from 2011 Q1 to 2018 Q1.
- The number of ACOs and lives covered has significantly increased over the years.
- In 2011 Q1, there were 58 ACOs and 66 covered lives.
- In 2018 Q1, there were 32.7 million ACOs and 1,011 million covered lives.

Source: Muhlestein et al., Health Affairs Blog (Aug 2018)
Medicare Alternative Payment Model Participants

- Medicare Shared Savings Program
  - ACO Models
    - Next Generation
    - Oncology Care Model
    - Comprehensive ESRD Care Model
- Comprehensive Care for Joint Replacement
- Bundled Payments for Care Improvement (all models)
- Comprehensive Primary Care Plus

2017 | 2018
---|---
480 | 561
45 | 51
190 | 184
37 | 37
465 | 792
1,191 | 1,100
2,891 | 2,965

Muhlestein et al., Health Affairs Blog (Aug 2018)
Financial imperative: Payers can't control costs without addressing social determinants

By Shelby Livingston

Volunteers for Project Angel Food prepare medically tailored meals for the seriously ill. L.A. Care Health Plan provided a $150,000 grant for a pilot project to prove healthy meals can reduce readmissions. (L.A. Care Health Plan)

The movement to better address the social and environmental factors that affect health has insurance companies and other payers looking beyond the hospital or clinic and stepping into the community to give patients help where it's needed.
Genetics
30%

Health Care
10%

Social, Environmental, Behavioral
60%

Adapted from McGinnis et al., *Health Affairs* (2002)
Figure 6: Individuals best positioned to help patients

* Asterisks indicate statistically meaningful differences between the indicated percentage and the average percentage of respondents selecting that option across all questions in this question group (i.e., an asterisk indicates that the bar is significantly different from bars of the same color).

Source: Authors’ analysis of Leavitt Partners survey, 2017
Where to begin?
## Integration into EHR

<table>
<thead>
<tr>
<th>Question #</th>
<th>Question &amp; Response Options (from paper version or Flowsheet)</th>
<th>Responses that Flag a Positive Screen</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>How do you learn best? □ Reading □ Listening □ Pictures</td>
<td>None</td>
</tr>
<tr>
<td>2.</td>
<td>What is the highest level of school that you have finished? □ Less than a high school diploma □ High school diploma / GED □ More than high school</td>
<td>None</td>
</tr>
<tr>
<td>3.</td>
<td>How hard is it for you to pay for the very basics like food, housing, heating, medical care, and medications? □ Not hard at all □ Somewhat hard □ Very hard</td>
<td>Somewhat hard or very hard</td>
</tr>
<tr>
<td></td>
<td>If you answered “Somewhat hard” or “Very hard,” what is it hard to pay for? Food, Utilities, Transportation, Medicine or Medical Care, Health Insurance, Clothing, Rent/Mortgage Payment, Child Care, Phone</td>
<td>Yes to any of these</td>
</tr>
<tr>
<td>4a.</td>
<td>In the last month: Have you slept outside, in a shelter, or in a place not meant for sleeping? □ Yes □ No</td>
<td>Yes</td>
</tr>
<tr>
<td>4b.</td>
<td>In the last month: Have you had concerns about the conditions and quality of your housing? □ Yes □ No</td>
<td>Yes</td>
</tr>
<tr>
<td>5.</td>
<td>In the last 12 months, how many times have you moved from one home to another?</td>
<td>2 or more moves flagged for follow-up</td>
</tr>
<tr>
<td>6a.</td>
<td>In the last 12 months: (I/we) worried whether (my/our) food would run out before (I/we) got money to buy more. □ Often true □ Sometimes true □ Never true</td>
<td>Often true or sometimes true</td>
</tr>
<tr>
<td>6b.</td>
<td>In the last 12 months: The food that (I/we) bought just didn’t last, and (I/we) didn’t have money to get more. □ Often true □ Sometimes true □ Never true</td>
<td>Often true or sometimes true</td>
</tr>
<tr>
<td>6c.</td>
<td>In the last 12 months: (I/we) couldn’t afford to eat balanced meals. □ Often true □ Sometimes true □ Never true</td>
<td>Often true or sometimes true</td>
</tr>
<tr>
<td>7.</td>
<td>In the last 12 months: Have you ever been physically or emotionally hurt or threatened by a spouse/partner or someone else you know? □ Yes □ No</td>
<td>Yes</td>
</tr>
<tr>
<td>8a.</td>
<td>On average, how many: Days per week do you engage in moderate to strenuous exercise (like walking fast, running, jogging, dancing, swimming, biking, or other activities that cause a light or heavy sweat)? (0 – 7)</td>
<td>Multiply days per week (8a) by number of minutes (8b); &lt;150 flagged for follow-up</td>
</tr>
<tr>
<td>8b.</td>
<td>On average, how many: Minutes do you exercise at this level?</td>
<td></td>
</tr>
</tbody>
</table>
14.1% of Seattle's children were in poverty, compared to an average of 23.6% across the Dashboard's 500 cities.
Seattle

Social and Economic Factors

- High School Graduation
- Racial/Ethnic Diversity
- Third-Grade Reading Proficiency
- Absenteeism
- Children in Poverty
- Housing Cost, Excessive
- Income Inequality
- Neighborhood Racial/Ethnic Segregation
- Unemployment
- Violent Crime
Seattle

Health Outcomes

- Breast Cancer Deaths +
- Diabetes +
- High Blood Pressure +
- Obesity +
- Cardiovascular Disease Deaths +
- Frequent Mental Distress +
- Life Expectancy +
- Opioid Overdose Deaths +
- Colorectal Cancer Deaths +
- Frequent Physical Distress +
- Low Birthweight +
- Premature Deaths (All Causes) +
Strengthening the science

Little is known about the mechanisms through which nonmedical determinants, particularly those related to socioeconomic status and social conditions, affect health...

Just because a factor is related to poor health, we cannot assume that interventions that ameliorate that condition alone will lead to immediate improvement in population health...

Because populationwide [sic] interventions have far-reaching social and economic implications, it is particularly important that public policy be based on sound science.

@khchайлайчати
Transportation Case Study
Hospitals Are Partnering With Uber to Get Patients to Checkups

The convenience could greatly reduce the likelihood of missed appointments.

Lyft, Uber Increasingly Offering Medical Transportation Services

"This is one of those rare innovations where you can both improve the service and reduce cost at the same time."

Medical Providers Try Uber, Lyft For Patients With Few Transportation Options

By Carolyn Y. Johnson  March 1 at 2:14 PM  Email the author
Transportation trial

- Will a convenient, on-demand transportation option reduce missed appointments to primary care?
- Goal: 10% absolute reduction in missed appointments among Medicaid population (baseline 49%)

<table>
<thead>
<tr>
<th>Sample size target*</th>
<th>390</th>
<th>390</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allocation (2d before appointment)</td>
<td>Called ODD # day (appointment reminder)</td>
<td>Called EVEN # day (appointment reminder)</td>
</tr>
<tr>
<td>Procedures</td>
<td>Usual travel mode (blinded)</td>
<td>One-time, rideshare-offer (not blinded)</td>
</tr>
</tbody>
</table>

Chaiyachati et al., JAMA Internal Medicine (2018)
Results: Missed appointments

<table>
<thead>
<tr>
<th>Intent-to-Treat* (All called)</th>
<th>Control group</th>
<th>Intervention group</th>
</tr>
</thead>
<tbody>
<tr>
<td>36.7%</td>
<td>36.6%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Treatment-as-provided (Answered phone call)*</th>
<th>Control group</th>
<th>Intervention group</th>
</tr>
</thead>
<tbody>
<tr>
<td>34.8%</td>
<td>30.6%</td>
<td></td>
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</table>

Subgroups*

Better post-hospital discharge (Odds ratio: 0.31)

*Not significant

Chaiyachati et al., JAMA Internal Medicine (2018)
What happened?
Transportation

Transportation is a significant barrier for low income patients to attend appointments.

Limited options in traveling
“*If you don’t have the money [to take the bus], then you can’t get there. It [doesn’t] really cost that much because I’m not that far, but a lot of times, when you don’t have a lot, a little bit is a lot.*”

Unreliable or undesired current transportation modes
“*There is one [transportation] agency that everybody has a problem with, and I missed two appointments messing around with them...I was not happy because I didn't get a chance to take care of my medical situation and had to find somebody else to take me to the doctor.*”
Social and external obligations to employers and family members complicate travel logistics further.

“My sister's very sick, and she needs a lot of care and a lot of attention. I'm the only one that's available to her a lot of the time when she needs help... so sometimes something comes up where I cannot make my appointment.”
Personal health factors negatively impact patients’ ability to get to appointments.

"I didn't feel good, and I wanted to make my appointment, but I just didn't feel good [enough] to get there."

“It's not that far, but I can't make it. I'm heavy and I'm sickly.”
“Why isn’t my car horn magically fixing everything?”
Differences in 2014 Readmission Rates by Community Benefit Spending

Total community benefit

Health care related

Community directed

P-value
- 0.83
- 0.96
- 0.71
- 0.65
- 0.8
- 0.92
- 0.92
- 0.87
- 0.02
<0.01
<0.01
<0.001

Under review
Effect of Community Health Worker Support on Clinical Outcomes of Low-Income Patients Across Primary Care Facilities
A Randomized Clinical Trial

Shreya Kangovi, MD, MS; Nandita Mitra, PhD; Lindsey Norton, MSS, MLSP; Rory Harte; Xinyi Zhao, MPH; Tamala Carter, CHW; David Grande, MD, MPA; Judith A. Long, MD

- Primary outcome - similar self-rated health between two arms
- Secondary outcome:
  - Higher quality of care reported (comprehensive and supportive)
  - Fewer days spent in the hospital (69% reduction)
  - Shorter length of stay (-3.1 days)
  - Fewer hospitalizations
  - Reduced 30-day readmissions
The Ask

• Advance statistical approaches to understand the complex interplay between (many) social needs, health care outcomes, and health
• Help shift the field towards causality and interventions
• Do not ignore the science of implementation
• Multi-stakeholder collaboration will be critical
Questions

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