Strategies to Address Complexities Associated with the Assessment, Storage and Use of Social-Behavioral Determinants of Health in the Electronic Health Record

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Learning objectives

• Discuss the complexities associated with the assessment, storage and use of social-behavioral determinants of health in the electronic health record (EHR).
• Describe strategies that permit scoring by domain to create equivalency across instruments, settings and populations and propose the use of LOINC for encoding.
• Articulate psychometric and encoding methods to achieve equivalency of meaning across populations, settings and time.

Policy Drivers and Constraints of SBDH Assessment

• Pressures of value-based care on healthcare delivery systems.
• Proliferation of recommendations, both voluntary and mandated, since 2014.
• Domains recommended for inclusion in electronic health record vary.
• Wide range of use cases for SBDH data capture and use.
• Lack of holistic vision of SBDH application within health policy circles, which affects healthcare delivery systems.
• Lack of health professions understanding of meaning and actionable use.

Conflicts of Interest

• None reported

SBDH Domain Recommendations

<table>
<thead>
<tr>
<th>Social</th>
<th>Behavioral</th>
<th>Psychological</th>
<th>Socio-Demographic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure to Violence (Safety)</td>
<td>Alcohol Use</td>
<td>Stress</td>
<td>Race</td>
</tr>
<tr>
<td>Social Connections: Social Isolation</td>
<td>Physical Activity</td>
<td>Health Literacy</td>
<td>Gender (sexual orientation)</td>
</tr>
<tr>
<td>Tobacco Use &amp; Exposure</td>
<td>Dietary/Food Patterns</td>
<td>Financial Resource Strain</td>
<td>Education</td>
</tr>
<tr>
<td>Physical Activity</td>
<td>Psychological/Emotional Well-being</td>
<td>Employment</td>
<td>Country of Origin/Ancestry</td>
</tr>
<tr>
<td>Nutrition patterns</td>
<td>Negative Mood and Affect (Depression)</td>
<td></td>
<td>Ethnicity</td>
</tr>
<tr>
<td>Psychological/Emotional Well-being</td>
<td></td>
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</tbody>
</table>

To excel in population health, an organization must understand how patient characteristics and contextual factors, external to the care delivery process, impact a population’s health.
Measurement Constraints of SBDH Assessment and Use

- Assessment instruments vary by population and discipline.
- Instruments with undocumented validity and reliability have been adopted.
- Lack of standardization across instruments.
- Scoring scales are dissimilar.
- Lack of terminology to represent SDH concepts in standardized code sets.
- Importance (weighting) of SDH varies across populations.
- Importance (weighting) of SDH varies across outcomes.

Foundation for SBDH Assessment, Data Capture and Use

Interoperability is key
- SBDH data should be collected once using standardized tools/instruments.
- Encoded to be used for multiple purposes, despite the data source.
- Apply equivalency methods to promote consistent meaning across populations and health systems.

SBDH Domains/subdomains assessed in 8 tools

Collect data once for multiple uses

Achieving Equivalency: Psychometrics versus EHR
**SBDH Data and Three-Tier Equivalency Scoring**

<table>
<thead>
<tr>
<th>Point of Care</th>
<th>Point of Care and Decision Modeling</th>
<th>Decision Modeling and Analytics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnosis and Treatment</td>
<td>Referrals</td>
<td>Patient Experience</td>
</tr>
</tbody>
</table>

- **Tier 1:** Point of Care scoring makes data actionable for intervention.
- **Tier 2:** Scoring to achieve equivalency of domains across instruments, settings and populations to make data usable in analytics and algorithms.
- **Tier 3:** Composite scoring that reflects total SBDH burden across settings and health systems.

**Alignment of Three-Tier Scoring Strategy to Care Delivery**

- **Evaluate**
  - SDH and Behavioral Burden Equivalency Scores (Tier 3)
  - SBDH referral impact
  - SBDH questionnaire

- **Assess**
  - SBDH response
  - POC (Tier 1) Equivalency Score
  - SBDH diagnosis
  - SBDH Health Concern
  - SBDH patient goal

- **Plan**
  - Domain (Tier 2) Equivalency Score

- **Implement**
  - SBDH intervention

**Using SBDH to improve health care delivery management**

- **What is the degree of financial strain among older diabetic patients in our health system?**
  - Data storage: Age, Financial strain, Gender, Condition (DM)
  - Among diabetic persons younger than age 65 years old:
    - Financial strain: North, South, East, West
    - Very hard: 45, 5, 40, 20
    - Hard: 25, 15, 20, 15
    - Somewhat hard: 20, 10, 20, 20
    - Not very hard: 10, 7, 10, 45

**Using SBDH to improve POC health care delivery**

- **7613-1**
  - How hard is it for you to pay for the very basics like food, housing, medical care and heating?
    - Very hard: LA15832-1
    - Hard: LA14785-6
    - Somewhat hard: LA22683-9
    - Not very hard: LA22682-1

  - LA15832-1 represents that it is very hard for this patient to pay for the very basics and has the same meaning at each clinic site.

**SBDH in complexity identification algorithms**

- **Complex Patient Identification**
  - Complexity
  - Conditions
  - Social determinants
  - Behaviors
  - Medications

**SBDH in complexity identification algorithm**

- **Social Determinants**
  - Biological
  - Environmental
  - Personal
  - Educational
  - Employment
  - Health literacy

- **In what way is it hard?**
  - Housing
  - Medications
  - Food, etc.
  - Refer to social services
  - Refer to community resource
Understand how patient factors influence outcomes

**Outcomes**
- Diabetes Control Measures
- HbA1c screenings
- % of persons with target HbA1c levels in normal range versus in abnormal range
- At least two LDL-C screenings
- Most recent LDL-C < 130 mg/dl
- Most recent LDL-C < 100 mg/dl
- Statin treatment for elevated LDL
- Nephropathy screening
- dilated retinal examination
- foot examination
- most recent BP < 140/90 mm Hg
- prescribed ASA/antiplatelet therapy
- have a self-management goal
- received an influenza vaccination

**Patient Characteristics**
- Behavioral Antecedents
  - Knowledge
  - Attitudes
  - Beliefs
  - Self-efficacy
  - Intentions
  - Readiness to Change
- Health Care Process
  - Social Determinants
    - Gender
    - Identity
    - Race/Ethnicity
    - Income
    - Education
    - Marital Status
    - Social Support
    - Primary Language
    - Insurance
- Lifestyle Behaviors
  - Tobacco Use
  - Alcohol Use
  - Illicit Drug Use
  - Sexual Activity
  - Physical Exercise
  - Nutrition Habits
- Self-Care Behaviors
  - Patient Engagement
  - Health Literacy

**Disease Burden**
- Physical Conditions
- Mental Conditions
- Comorbid Conditions

**Diabetes Quality Measures**
- HbA1c screenings
- % of persons with sequential HbA1c tests in normal range versus in abnormal range
- At least two LDL-C screenings
- Most recent LDL-C < 130 mg/dl
- Most recent LDL-C < 100 mg/dl
- Statin treatment for elevated LDL
- Nephropathy screening
- dilated retinal examination
- foot examination
- most recent BP < 140/90 mm Hg
- prescribed ASA/antiplatelet therapy
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**Financial Resource Constraint scoring for 3 screening tools**

<table>
<thead>
<tr>
<th>Subdomain</th>
<th>IOM</th>
<th>PRAPARE</th>
<th>WellRx</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Transportation</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Childcare</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Food</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Utilities</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Healthcare-Rx</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clothing</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phone</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Score Range</td>
<td>1-2</td>
<td>1-9</td>
<td>1-5</td>
</tr>
</tbody>
</table>

**Financial Resource Categories**
- (5) Very hard = high
- (4) Hard = moderate
- (3) Somewhat = low
- (2) Hard = moderate
- (1) Somewhat = low
- (3) Very hard = high
- (5) Hard = moderate
- (4) Somewhat = low

**Item Assessment of three SBDH screening tools**

**WellRx Example**
### Three-tier equivalency scoring application

<table>
<thead>
<tr>
<th>Person</th>
<th>Domain (Tier 3)</th>
<th>Subdomain (Tier 2)</th>
<th>Health Concern (Tier 1)</th>
<th>Answer</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>John Doe</td>
<td>Behavioral</td>
<td>Substance Abuse</td>
<td>Drugs</td>
<td>No</td>
<td>0</td>
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</tbody>
</table>

#### Social-Demographics

<table>
<thead>
<tr>
<th>Person</th>
<th>Domain (Tier 3)</th>
<th>Subdomain (Tier 2)</th>
<th>Health Concern (Tier 1)</th>
<th>Answer</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>John Doe</td>
<td>Socio-Demographic</td>
<td>Education</td>
<td>Education</td>
<td>Yes</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
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<th>Subdomain (Tier 2)</th>
<th>Health Concern (Tier 1)</th>
<th>Answer</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>John Doe</td>
<td>Employment</td>
<td>Income</td>
<td>No</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>John Doe</td>
<td>Financial Resource</td>
<td>Daycare</td>
<td>Yes</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>John Doe</td>
<td>Financial Resource</td>
<td>Food</td>
<td>Yes</td>
<td>1</td>
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</tr>
<tr>
<td>John Doe</td>
<td>Financial Resource</td>
<td>Homelessness</td>
<td>Yes</td>
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<tr>
<td>John Doe</td>
<td>Financial Resource</td>
<td>Legal</td>
<td>No</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>John Doe</td>
<td>Financial Resource</td>
<td>Transportation</td>
<td>Yes</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>John Doe</td>
<td>Financial Resource</td>
<td>Utilities</td>
<td>Yes</td>
<td>1</td>
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</tr>
</tbody>
</table>

#### Total Burden Score

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<thead>
<tr>
<th>Person</th>
<th>Domain (Tier 3)</th>
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<th>Answer</th>
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#### Equivalency scores derived for SBDH screening tools

- Social Determinant Burden overall score
- Sociodemographic Factor score
  - Education level
  - Employment status
  - Financial constraint (food, housing, utilities, transportation, childcare, phone)
- Language
- Refugee status
- Individual-level Social Relationships score
  - Social isolation
  - Exposure to violence
  - Incarceration History
- Military service history
- Psychological domain score
  - Depression
  - Stress
- Behavioral Determinant Burden scores – overall score
  - Alcohol use
  - Physical activity
Summary and Conclusions

- Policies and practices associated with SBDH use are complex.
- Discordant data are not interoperable.
- Applying evidence-based scoring to “scoreless” forms
  - Addresses urgency/demand and variability
  - Resolves lack of methods for achieving equivalency using EHR data
    - Tier 1 scoring promotes clinical decision
    - Tier 2 scoring supports update into algorithms and analytics
    - Tier 3 scoring promotes understanding of social determinant burden and behavioral determinant burden
- Outputs of scoring strategy
  - Achieves IOM (2014) recommendations
  - Promotes exchange of data in a meaningful way
  - Paves path for interoperable SBDH data

References: Recommended SBDH Domains


References: SBDH Assessment Tools


QUESTIONS?

Contact information
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Dianna Dodd, RN, DNP, MSN

References:
- Kaiser-Permanente Care Management Institute. Your Current Life Situation Questionnaire (Corev.11-10-16, YCLS v.2.0 (shorter form) (11-10-16) KPNatl. Accessed December 12, 2018 from https://sirenetwork.ucsf.edu/sites/sirenetwork.ucsf.edu/files/Your_Current_Life_Situation_Questionnaire_v2-442878/data/chahandout1.pdf