ASSESSING THE RELATIONSHIP BETWEEN SOCIAL DETERMINANTS OF HEALTH AND OUTCOMES: FINDINGS FROM THE PRAPARE PILOT

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Protocol for Responding to & Assessing Patients’ Assets, Risks & Experiences:

A national *standardized patient risk assessment protocol* designed to engage patients in assessing & addressing social determinants of health (SDH).

PRAPARE = SDH screening tool + implementation/action process

Customizable Implementation and Action Approach

Assess Needs → Respond to Needs

At the Patient and Population Level
TIMELINE OF THE PRAPARE PROJECT

Year 1 2014
• Develop PRAPARE tool

Year 2 2015
• Pilot PRAPARE implementation in EHR and explore data utility

Year 3 2016
• PRAPARE Implementation & Action Toolkit

Dissemination
Currently available:
- NextGen
- eClinicalWorks
- GE Centricity
- Epic
- Cerner
- Greenway Intergy

Available for FREE after signing EULA at www.nachc.org/prapare

In development:
- Greenway Success EHS
- Allscripts
- Athena
Chapter 1: Understand the PRAPARE Project
Chapter 2: Engage Key Stakeholders
Chapter 3: Strategize the Implementation Process

- Chapter 4: Technical Implementation with EHR Templates
- Chapter 5: Develop Workflow Models
- Chapter 6: Develop a Data Strategy
- Chapter 7: Understand and Evaluate Your Data

- Chapter 8: Build Capacity to Respond to SDH Data
- Chapter 9: Respond to SDH Data with Interventions
- Chapter 10: Track Enabling Services
PRAPARE Data Findings

1. High Risk vs General Populations
2. Hypertension
3. Controlled vs Uncontrolled Diabetes

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Gathered aggregated PRAPARE data from 17 health centers in CA, HI, IA, NY, OR, and TX

Categorized populations of focus into “high risk” and “general” populations
  ▪ High Risk: patients with co-morbidities, patients who see chronic disease management team, etc.
  ▪ High Risk: 2,679 patients
  ▪ General Population: 4,432 patients
  ▪ Overall Total Population: 7,344 patients

Developed “SDH Total Score” – sum of the total number of SDH risks as informed by literature
  ▪ e.g., for housing status, risk = not having housing vs no risk = have housing

T-tests to identify social determinant differences between two groups (p-value < 0.05)
  ▪ T-tests used known percentages that did not include "I choose not to answer this question" "Question not administered" and "Patient skipped question" categories.

### High Risk vs General Population: Method

<table>
<thead>
<tr>
<th></th>
<th>High Risk Population</th>
<th>General Population</th>
<th>Total Overall Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Risk:</td>
<td>2,679 patients</td>
<td>4,432 patients</td>
<td>7,111 patients</td>
</tr>
</tbody>
</table>

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High Risk vs General Populations: 
Percent of Patients with Number of Social Determinant Risks

- **High Risk Population:** Mean SDH Total Score = 10.03
- **General Population:** Mean SDH Total Score = 5.74
- **Both Groups Mean SDH Total Score** = 7.36

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HIGHER RISK GROUP HAD SIGNIFICANTLY MORE SOCIAL DETERMINANT RISKS THAN GENERAL POPULATION

<table>
<thead>
<tr>
<th>Social Determinant</th>
<th>% of High Risk Group with Social Determinant</th>
<th>% of General Population with Social Determinant</th>
<th>P-value &lt; 0.05</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education (High School Degree or Less than High School Degree)</td>
<td>81%</td>
<td>61%</td>
<td></td>
</tr>
<tr>
<td>Low Income (100% FPL and below)</td>
<td>69%</td>
<td>60%</td>
<td></td>
</tr>
<tr>
<td>Medicaid</td>
<td>63%</td>
<td>28%</td>
<td></td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>52%</td>
<td>34%</td>
<td></td>
</tr>
<tr>
<td>Limited English Proficiency</td>
<td>43%</td>
<td>30%</td>
<td></td>
</tr>
<tr>
<td>Transportation Needs</td>
<td>33%</td>
<td>18%</td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>28%</td>
<td>22%</td>
<td></td>
</tr>
<tr>
<td>Worried about Losing Housing</td>
<td>23%</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>21%</td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>Native Hawaiian</td>
<td>13%</td>
<td>1%</td>
<td></td>
</tr>
<tr>
<td>Need for Child Care</td>
<td>9%</td>
<td>5%</td>
<td></td>
</tr>
</tbody>
</table>

Percentages are out of known responses.
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Socioeconomic Differences between High Risk Patients & General Patient Populations: Race and Ethnicity

p-value < 0.05

[Bar chart showing Hispanic/Latino data: 50% High Risk, 33% General Population]

[Bar chart showing Race data: Asian 36%, Native Hawaiian 1%, Pacific Islander 4%, Black/African American 12%, American Indian/Alaskan Native 19%, White 68%, Other 4%, Did Not Answer 0%]

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Socioeconomic Differences between High Risk Patients &
General Patient Population: Limited English Proficiency

p-value < 0.05

[Graph showing the differences in Limited English Proficiency between High Risk, General Population, and Overall Total.]
Socioeconomic Differences between High Risk Patients & General Patient Population: Insurance Status

<table>
<thead>
<tr>
<th></th>
<th>High Risk</th>
<th>General Population</th>
<th>Overall Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unknown</td>
<td>4%</td>
<td>6%</td>
<td>1%</td>
</tr>
<tr>
<td>Private insurance</td>
<td>52%</td>
<td>23%</td>
<td>15%</td>
</tr>
<tr>
<td>Other public insurance (CHIP)</td>
<td>21%</td>
<td>28%</td>
<td>27%</td>
</tr>
<tr>
<td>Other public insurance (Non-CHIP)</td>
<td>6%</td>
<td>13%</td>
<td>4%</td>
</tr>
<tr>
<td>Medicare</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>CHIP Medicaid</td>
<td>1%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Medicaid</td>
<td>25%</td>
<td>1%</td>
<td>10%</td>
</tr>
<tr>
<td>None/uninsured</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

p-value < 0.05

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Socioeconomic Differences between High Risk Patients & General Patient Population:

Income

- High Risk:
  - Unknown: 25%
  - Over 200%: 3%
  - 151-200%: 36%
  - 101-150%: 11%
  - 100% or below: 2%

- General Population:
  - Unknown: 18%
  - Over 200%: 3%
  - 151-200%: 7%
  - 101-150%: 17%
  - 100% or below: 2%

- Overall Total:
  - Unknown: 20%
  - Over 200%: 3%
  - 151-200%: 9%
  - 101-150%: 9%
  - 100% or below: 24%

p-value < 0.05

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Differences between High Risk Patients & General Patient Population: Transportation Needs

<table>
<thead>
<tr>
<th></th>
<th>High Risk</th>
<th>General Population</th>
<th>Overall Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did Not Answer</td>
<td>1%</td>
<td>4%</td>
<td>3%</td>
</tr>
<tr>
<td>No</td>
<td>41%</td>
<td>57%</td>
<td>51%</td>
</tr>
<tr>
<td>Yes</td>
<td>20%</td>
<td>13%</td>
<td>4%</td>
</tr>
</tbody>
</table>

p-value < 0.05

Publication pending. Do not quote or distribute without permission from NACHC, AAPCHO, or OPCA.
Differences between High Risk Patients & General Patient Population:
Worried About Losing Housing

- High Risk Population:
  - 37% did not answer
  - 11% were worried

- General Population:
  - 34% did not answer
  - 9% were worried

- Overall Total:
  - 36% did not answer
  - 10% were worried

p-value < 0.05

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### Socioeconomic Differences between High Risk Patients & General Patient Population: Employment

<table>
<thead>
<tr>
<th>Category</th>
<th>High Risk</th>
<th>General Population</th>
<th>Overall Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did Not Answer</td>
<td>10%</td>
<td>13%</td>
<td>19%</td>
</tr>
<tr>
<td>Otherwise unemployed but not seeking work</td>
<td>28%</td>
<td>26%</td>
<td>27%</td>
</tr>
<tr>
<td>Full-time work</td>
<td>14%</td>
<td>25%</td>
<td>21%</td>
</tr>
<tr>
<td>Part-time work</td>
<td>17%</td>
<td>19%</td>
<td>18%</td>
</tr>
<tr>
<td>Unemployed and seeking work</td>
<td>23%</td>
<td>19%</td>
<td>21%</td>
</tr>
</tbody>
</table>

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Most Common Social Determinant Risks and Assets Across Populations

**Most Common Social Determinant Risks**
- Limited English Proficiency (32%)
- Less than High School Education (32%)
- Uninsured (25%)
- Experiencing High to Medium High Stress (24%)
- Unemployment (18%)

**Most Common Social Determinant Assets**
- Socially integrated (> 50% of patients see those they care about 5+ times a week)
PRAPARE Data Findings

1. High Risk vs General Populations

→ 2. Hypertension

3. Controlled vs Uncontrolled Diabetes

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Positive Correlation between the number of social determinant of health risks and Hypertension

% of POF  
% of the tally score with Hypertension

r = 0.61

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PRAPARE Data Findings

1. High Risk vs General Populations
2. Hypertension
3. Controlled vs Uncontrolled Diabetes

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Impact of PRAPARE SDH on Controlled vs Uncontrolled Diabetic Patients

- Sample: Patients diagnosed with diabetes from one health center in Iowa in a one-year PRAPARE implementation period (9/12/2016 - 9/13/2017)

- Sample size = 1,207 diabetic patients
  - 986 controlled diabetics
  - 221 uncontrolled diabetics

- t-tests to compare social determinant risks of controlled diabetics (HbA1c < 9) vs uncontrolled diabetics (HbA1c >= 9)

- Logistic regression analysis to assess relationship between number of social determinant risks and likelihood of being uncontrolled diabetic

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### Uncontrolled Diabetics Had Significantly More Social Determinant Risks than Controlled Diabetics

<table>
<thead>
<tr>
<th>Social Determinant</th>
<th>% of Uncontrolled Diabetics with Social Determinant</th>
<th>% of Controlled Diabetics with Social Determinant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stress</td>
<td>55%</td>
<td>46%</td>
</tr>
<tr>
<td>Challenge accessing care (includes behavioral health, dental, medical care)</td>
<td>33%</td>
<td>17%</td>
</tr>
<tr>
<td>Food insecurity</td>
<td>20%</td>
<td>13%</td>
</tr>
<tr>
<td>Lack of Housing</td>
<td>12%</td>
<td>7%</td>
</tr>
<tr>
<td>Worried about Losing Housing</td>
<td>11%</td>
<td>7%</td>
</tr>
<tr>
<td>Phone Needs</td>
<td>12%</td>
<td>8%</td>
</tr>
<tr>
<td>Utility Needs*</td>
<td>12%</td>
<td>9%</td>
</tr>
<tr>
<td>Transportation*</td>
<td>20%</td>
<td>15%</td>
</tr>
<tr>
<td>Safety Needs* (&quot;Do you feel physically &amp; emotionally safe where you currently live?&quot;)</td>
<td>8%</td>
<td>4%</td>
</tr>
<tr>
<td>Legal Aid Needs*</td>
<td>8%</td>
<td>5%</td>
</tr>
</tbody>
</table>

- P-value < 0.05
- P-value < 0.10

• Indicates marginal significance (p < 0.10).

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Social Determinants Impact the Likelihood of Having Uncontrolled Diabetes

- **Logistic Model:**
  - Final data set included 644 patients (528 Controlled vs. 116 Uncontrolled)
  - Response variable: status of diabetes (Controlled vs. Uncontrolled)
  - Explanatory variables: age, gender, language, and all the PRAPARE SDH factors.

- **Results after using Akaike Information Criterion (AIC) to narrow down the final model:**
  - *Compared to patients who did NOT have trouble affording medicine/care, patients who had trouble were 115% more likely to be uncontrolled diabetic. (p-value < 0.05)*

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Conclusions & Implications

- High risk populations experience greater social determinant risks than general populations.

- Uncontrolled diabetics experience greater social determinant risks than controlled diabetics.

- Social determinants are related to clinical outcomes (e.g., diabetes, hypertension):
  - Patient affordability of medicine affect the likelihood of having diabetes control.
  - Stress levels affect the likelihood of having hypertension control.

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Limitations and Next Steps

- Inability to control for social determinant interventions and enabling services that mitigate SDH

- Need to better understand the variety of enabling services that are commonly provided at health centers and understand how they mitigate social factors

- Acting on patient SDH through interventions can improve health equity and lower total costs of care.
BOTH are necessary to:

- Demonstrate value to payers
- Advocate for upstream investments
- Seek adequate financing to ensure interventions are sustainable
- Achieve integrated, value-driven delivery system and reduce total cost of care
FUTURE STUDIES - CONCEPTUAL FRAMEWORK

Social Determinants of Health (PRAPARE)

Appropriate Care (e.g., HbA1c test, preventive vaccinations)

Health Outcomes (e.g., HbA1c level, ED visits)

Enabling Services & other non-clinical SDH interventions
AAPCHO DATA COLLECTION PROTOCOL: THE ENABLING SERVICES ACCOUNTABILITY PROJECT

Data Collection Protocol, Handbook, and other resources at: http://enablingservices.aapcho.org

<table>
<thead>
<tr>
<th>Enabling Service Categories</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Services Assessment</td>
<td>SS001</td>
</tr>
<tr>
<td>Case Management</td>
<td>CM001</td>
</tr>
<tr>
<td>Referral- Health</td>
<td>RF001</td>
</tr>
<tr>
<td>Referral- Social Services</td>
<td>RF002</td>
</tr>
<tr>
<td>Financial Counseling/Eligibility Assistance</td>
<td>FC001</td>
</tr>
<tr>
<td>Health Education- Individual (one-on-one)</td>
<td>HE001</td>
</tr>
<tr>
<td>Health Education- Small Group (2-12)</td>
<td>HE002</td>
</tr>
<tr>
<td>Health Education- Large Group (13 or more)</td>
<td>HE003</td>
</tr>
<tr>
<td>Supportive Counseling</td>
<td>SC001</td>
</tr>
<tr>
<td>Interpretation</td>
<td>IN001</td>
</tr>
<tr>
<td>Outreach</td>
<td>OR001</td>
</tr>
<tr>
<td>Inreach</td>
<td>IR001</td>
</tr>
<tr>
<td>Transportation- Health</td>
<td>TR001</td>
</tr>
<tr>
<td>Transportation- Social Services</td>
<td>TR002</td>
</tr>
<tr>
<td>Other</td>
<td>OT001</td>
</tr>
</tbody>
</table>
Next Steps for PRAPARE Team

- Continue to support spread of PRAPARE to more organizations and patient populations

- Additional research and analysis on impact of social determinants on outcomes and costs

- Integration of PRAPARE + enabling services/interventions data in EMRs to document impact of non-clinical services and social determinant interventions
RESOURCES AVAILABLE NOW
WWW.NACHC.ORG/PRAPARE

- PRAPARE Tool

- PRAPARE Implementation and Action Toolkit
  - Electronic Health Record PRAPARE Templates
  - Chapters on Building Partnerships, Interventions, and Enabling Services
  - Readiness Assessment

- Webinars
  - PRAPARE Overview
  - EHR and Workflow-specific

- Frequently Asked Questions

- Contact: Michelle Jester at mjester@nachc.org
Thank You!

- All the PRAPARE Implementation Teams and Health Centers!
- Dave Faldmo, Siouxland Health Center
- Erin Hoefling, Siouxland Health Center
- Vivian Li, AAPCHO
Thank You!

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