Incorporating SDOH Data into Risk Stratification Models to Improve Health Equity

April 1st, 2021
9-10am HT | 12-1pm PT | 3-4pm ET
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Moderators

Sakura Miyazaki
Program Manager, Training and Technical Assistance
Association of Asian Pacific Community Health Organizations

Albert Ayson, Jr.
Associate Director, Training and Technical Assistance
Association of Asian Pacific Community Health Organizations
About AAPCHO

AAPCHO is dedicated to promoting **advocacy, collaboration, and leadership** that improves the health status and access of Asian Americans (AAs), Native Hawaiians (NHs), and Pacific Islanders (PIs) within the United States, the U.S. territories, and the Freely Associated States.
Presenters

Vivian Li
Research Project Manager/Analyst
Association of Asian Pacific
Community Health Organizations

Milton Armston, PsyD, MSPP, HSPP
Director of Behavioral Health and Integrative Services
Community HealthNet Health Centers
Poll

Which of the following best describes your organization type?

- Community Health Center (FQHC, Look-Alike)
- Primary Care Association (PCA)
- National Training & Technical Assistance Partner (NTTAP)
- Health Center Controlled Network (HCCN)
- Government
- Academic Institution
- Social Service or Community-Based Organization (CBO)
- Other
Learning Objectives

• Understand the importance of using social risk factor data to improve population health at health centers.

• Incorporate takeaways from a national Protocol for Responding to and Assessing Patients’ Assets, Risks, and Experiences (PRAPARE) risk stratification model (RSM) vetted by health centers, Primary Care Associations (PCAs), and Health Center Controlled Networks (HCCNs).

• Learn from a health center example leveraging social risk data to identify and address individual patient needs.
Agenda

• Introduction to Risk Stratification (15 minutes)
• Community HealthNet Health Centers (20 minutes)
• Q&A and Closing (20 minutes)
Definitions

“Risk Stratification is an intentional, planned and proactive process carried out at the practice-level to effectively target clinic services to patients.”

Risk stratification: process or tool for identifying—and predicting—which patients are at high risk—or likely to be at high risk—and prioritizing the management of their care in order to prevent worse outcomes (care team, clinic level)

Risk adjustment: method to offset the cost of providing health insurance for individuals who represent a relatively high risk to insurers (policy, payment level)
Joe:
- 3 Chronic conditions
- 90 yrs old
- Lives alone
- On 8 medications
- 3 falls in the last year
- 2 hospital admissions in the last year

Jen:
- Recently diagnosed w/ Type II Diabetes
- 55 years old
- Has mild cognitive impairment
- On 3 medications

5% of the population accounts for 50% of the cost

Risk Stratification incorporating SDOH Positioning Health Centers For Sustainability

• Funders and stakeholders hold health centers accountable
• More shifts towards value-based payment
• Greater demands for evidence of impact
• Growing competition

• Health centers’ unique model of care positions them to address the SDOH
• Need for tools to
  • Stratify patients by social risks to address these risks
  • Document patient complexity and demonstrate value
Poll

Do you currently use PRAPARE at your organization to screen for patients’ SDOH needs?

- Yes
- No
- Not yet, but we plan to
- What’s PRAPARE?
- Not sure
What Is PRAPARE?

A national standardized patient risk assessment protocol built into the EHR designed to engage patients in assessing and addressing social determinants of health

Customizable Implementation and Action Approach

Assess Needs ➔ Respond to Needs
At the Patient and Population Level

PRAPARE Risk Stratification Learning Collaborative

1. Help participants and national PRAPARE team better understand and assess potential risk stratification strategies and possible pathways toward a common national standardized approach with options for localized methodologies

2. Help the national PRAPARE team understand how organizations apply and use risk stratification as a strategy for improving population health

3. Help participants identify best practices and lessons learned as well as resources to improve organizations’ capacity to apply risk stratification methodologies
Learning Collaborative Outcomes

• A core national standardized risk stratification model (with optional measures/methods) that can be tested with PRAPARE data

• Development of publication on best practices and lessons learned

• A plan to test the predictive validity and clinical utility of the risk stratification model
Principles for Risk Stratification Model

Intended to inform but not replace clinic care team judgment
Encourage use of a hybrid approach using quantitative data for risk algorithm and qualitative data from clinic staff judgment

Social risk stratification does NOT replace social risk screening

Use of a national standardized numeric score is important for policy and comparison with other providers

Localization of risk group cutoffs is important for informing care and targeting interventions at the clinic level

Risk factors organized in categories to better understand aspects of each component for each patient to target appropriate care

Use a point system to be useful at the point of care
- Higher score = higher risk patient
- Range is 0 to 25, 5 for each component

Piloting and validating within health centers is essential

Publication pending. Do not quote or distribute without permission from NACHC, AAPCHO, or OPCA.
## PRAPARE Learning Collaborative Risk Stratification Model, version Dec 2019

<table>
<thead>
<tr>
<th><strong>Target population</strong></th>
<th>Complex patients based on general population of adult patients</th>
</tr>
</thead>
</table>
| **Top Risk Stratification Goals** | 1. Identify complex patients to facilitate appropriate interventions primarily for clinic use (clinical/community)  
2. Demonstrate the complexity of patients (policy) |
| **Data sources** | **Predictor Variables**  
1. Clinical  
2. Behavioral Health  
3. Social Determinants of Health  
4. Utilization  

**Outcome Variables for Validation**  
4. Cost  
5. High Risk Medications |
| **Risk Stratification Process/Steps** | 1. Compile data from active patients having a visit in the past one year  
2. Assign a score for each data component, using most recent 1-yr patient data  
3. Combine and calculate total risk scores for each data component  
4. Sort by total risk score and stratify patients into risk groups using statistical methods  
5. Clinic team huddles to validate the risk groups (e.g., Did patients fall into expected groups?), accounting for clinic/community characteristics (e.g. capacity for interventions, strong community interventions) and patient characteristics (e.g., ability to manage risk, benefit, acceptability)  
6. Target interventions based on the risk groups |
| **Risk stratification groups** | 1. Urgent Need  
2. High Need  
3. Moderate Need  
4. Low Need |
| **Resources provided to risk groups** | 1. Intensive care coordination  
2. Community health worker intervention (community referrals) with closed loop follow-up  
3. Community referrals without closed loop follow-up |
NATIONAL PRAPARE RISK STRATIFICATION MODEL, version Dec 2019

Predictors: Clinical + Mental Health/Substance Abuse + SDH + Utilization

Outcomes

PRAPARE Risk Stratification Model

- Social Determinant of Health Component Score
- Clinical Component Score
- Mental Health/Substance Abuse Component Score
- Utilization Component Score

Total Risk Score

Patient Population

- Urgent/Emergent Need
- High Need
- Average Need
- Low Need

SD = standard deviation

Publication pending. Do not quote or distribute without permission from NACHC, AAPCHO, or OPCA.
Risk Stratification Process

1. Compile data from active patients having a visit in the past one year
2. Assign a score for each data component, using most recent 1-yr patient data
3. Combine and calculate total risk scores for each data component for each patient
4. Sort by total risk score and stratify patients into risk groups

- Clinic team huddles to validate the risk groups
- Target interventions based on the risk groups
- LOCAL OPTION: Vary cutoffs of risk groups based on local situation (e.g. capacity for interventions)
- Use standardized total risk score for national comparisons

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AAPCHO Data Collection Protocol: The Enabling Services Accountability Project

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

Enabling Services Accountability Project (ESAP)

The ONLY standardized data system to track and document non-clinical enabling services that help patients access care.

<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>
</tbody>
</table>

[Handbook for Enabling Services 3rd Edition]

[Handbook for AAPCHO]
Use Cases of the Risk Stratification Model – Stakeholder Perspectives

- Improve Care Management and Interventions
- Standardization and National Comparison
- Demonstrate Complexity of Patients
- Inform Value-based Care and Cost Savings

- Qualify for PCMH and Quality Incentives
- Inform Payment and Policy
- Prioritize Patients to Outreach to Address SDOH Barriers During COVID
Fact Sheet: The Impact of COVID-19 on PRAPARE Social Determinants of Health Domains

This fact sheet outlines how PRAPARE SDOH domains impact individuals’ risk of morbidity and mortality from COVID-19. Care team members and aligned social service partners can use this information to identify those who may be most vulnerable during the pandemic, prioritize patients in need of outreach and additional services, and develop plans for addressing social risks in the community.

Access now: Printer-friendly version available here!
Next Steps

• Pilot testing of risk stratification model

• PRAPARE national analysis strategy with a plan to test the nationally developed risk stratification model with large patient-level dataset

• Development and dissemination of publication on best practices and lessons learned

• Development of resources for implementation (e.g., workflow use case scenarios, intervention recommendations for different risk groups, visualization examples)

• Development of PRAPARE Social Intervention codes
THE IMPORTANT WORK OF RISK STRATIFICATION IN CHRONIC DISEASE MANAGEMENT

Dr. Milton Armston, Jr.
Community HealthNet Health Centers
Gary, Indiana
COMMUNITY HEALTHNET HEALTH CENTERS

Milestones

2016
- Implemented the PRAPARE tool into the screening process for all patients.
- Accepted to the SDoH Academy, a 6-month virtual training.

2017
- Recognized by OCHIN and Kaiser Permanente Center for Health Research as a high performer in addressing SDoH with our patients and invited into the ASCEND study.

2018
- Presented at IPHCA Annual Conference on SDoH.

2019
- Adopted the Patient Support Questionnaire to replace the PRAPARE tool as the screener.
- Accepted into the PRAPARE Risk Stratification Learning Collaborative.
- Received an invitation to present at the PRAPARE Educational Session at NACHC’s CHI Conference.
RATIONALE

- With the aging of the population and concomitant health care expenditure growth, national interest exists in improving quality of care while reining in the cost of care.

- Different models seek to optimize health care organizations and financing of health care services, especially for individuals with complex medical, behavioral, and social needs.

- Refining traditional methods to determine what level of risk a patient is for utilization in the present and near future is a core and key important strategy to target.

- Historically, other models have been constrained to information available through medical claims, diagnoses, and biometric data. However, the observation that social determinants of health factors (SDoH) as a good predictor of health outcomes is increasingly supported by disparities research and clinical practice.

- Risk models that incorporate SDoH measures have clinical and administrative value.
  - Identify high-risk populations and individual patients appropriate for intensive intervention
  - Inform planning decisions related to targeted outreach and resource allocation
Impact of Different Factors on Risk of Premature Death

Examples of Social and Environmental Factors Influencing Health:
- Income and employment status
- Housing and transportation
- Literacy and language
- Hunger and access to healthy food options
- Social integration and support
- Safety

Bresnick, 2016
SPECIFIC AIMS

The overall aim of this work was to assess how well using traditional risk scoring data along with SDoH information could characterize patient risk status to optimize a variety of chronic disease management purposes. The following specific aims were addressed:

- **Aim 1:** How does high-risk status defined using traditional predictive risk models compare to that defined using a model that incorporates SDoH patient screening questionnaires?
- **Aim 2:** Does the incorporation of SDoH measures improve predictive power of risk adjustment?
- **Aim 3:** To what extent do SDoH measures from patient screening questionnaires and traditional data sources predict risk-adjusted hospital admission rates, emergency room utilization, and clinical characteristics?
METHODS

▪ The sample consisted of 337 patients seen at five of our primary care clinics that enrolled in the Promoting the Integration of Primary and Behavioral Health Care (PIPBHC) Grant and answered a SDoH survey between September 2018 and September 2020. The SDoH survey was administered to patients quarterly. Of the 337 patients, we did a random sample of 30 patients to report results. Of the 30 patients, there were 20 valid cases.

▪ The data from this project was derived from the Indiana State Department of Health and a linked data warehouse that is managed by SAMHSA’s Center for Mental Health Services. Community HealthNet Health Centers utilized its electronic health record, OCHIN EPIC, which maintains SDoH screening data and clinical data.

▪ At enrollment, intuitively, patients were sorted into risk groups (high, medium, and low) based on the presence or absence of such factors as chronic conditions, multiple comorbidities, increased no-show appointments, a lack of insurance, and frequent hospitalizations or emergency department (ED) visits. Patient interventions were adjusted based on complications of chronic disease as evidenced by biometric data, objective reporting on behavioral health screens, and/or high-risk social determinants of health. At the very least, participants could have up to 8 visits per year (4 with the CCHW, 4 with the PCP).
DEMOGRAPHICS OF PARTICIPANTS

Community HealthNet Count/Percentage of Gender

- Male: 5 (20%)
- Female: 15 (80%)

Community HealthNet Count by Race

- Black: 18
- White: 2
- Hispanic
- American Indian
DEMOGRAPHICS OF PARTICIPANTS

Community HealthNet Population Group by Age

- 18-44: 6 (30%)
- 45-64: 13 (65%)
- 65+: 1 (5%)

Community HealthNet Do You Have Enough Money

- A Little: 2 (10%)
- Not at All: 6 (30%)
- Completely: 4 (20%)
- Mostly: 2 (10%)
## RESULTS

### Physical/Mechanical Health Outcome Measures

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Number of Valid Cases</th>
<th>At-risk at Baseline</th>
<th>At-risk at Most Recently Follow Up</th>
<th>% Point Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood Pressure-Systolic</td>
<td>20</td>
<td>45.0%</td>
<td>35.0%</td>
<td>-10.0%</td>
</tr>
<tr>
<td>Blood Pressure-Diastolic</td>
<td>20</td>
<td>10.0%</td>
<td>15.0%</td>
<td>5.0%</td>
</tr>
<tr>
<td>Blood Pressure-Combined</td>
<td>20</td>
<td>35.0%</td>
<td>30.0%</td>
<td>-5.0%</td>
</tr>
<tr>
<td>BMI</td>
<td>20</td>
<td>90.0%</td>
<td>90.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>HgbA1C</td>
<td>20</td>
<td>20.0%</td>
<td>20.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>LDL Cholesterol</td>
<td>20</td>
<td>45.0%</td>
<td>30.0%</td>
<td>-15.0%</td>
</tr>
</tbody>
</table>
## RESULTS

### Services Outcome Measures

<table>
<thead>
<tr>
<th>National Outcome Measures (NOMs)</th>
<th>Number of Participants</th>
<th>Positive at Baseline</th>
<th>Positive at Most Recently Follow Up</th>
<th>Outcome Improved</th>
<th>% Point Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy Overall (NOMs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Homeless (Past 30 days)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospitalized for Mental Health Care (Past 30 days)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Utilized an emergency for behavioral health issues (Past 30 days)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Been to the emergency room for a physical healthcare problem (Past 30 days)</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Hospitalized for a physical healthcare problem (Past 30 days)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
STRATEGIES FOR IMPLEMENTATION

▪ Consider the whole care team’s perception of risk when assigning risk levels

▪ Use the huddles and staffing meetings to discuss patient risk scores

▪ Adjust risk levels as the patient’s situation changes or based on new information from staff or other sources

▪ Reassess individual risk levels regularly as they tend to change over time

▪ Make risk levels easy to find in the electronic health record

▪ Consider patient’s risk levels when allocating resources
Poll: Which one of the following strategies are you most invested in for your health center/organization? (choose one)

- Consider the whole care team’s perception of risk when assigning risk levels
- Use the huddles and staffing meetings to discuss patient risk scores
- Adjust risk levels as the patient’s situation changes or based on new information from staff or other sources
- Reassess individual risk levels regularly as they tend to change over time
- Make risk levels easy to find in the electronic health record
- Consider patient’s risk levels when allocating resources
## SUPPORT FOR PATIENTS WITH CHRONIC ILLNESS

### THE ROLES OF A CERTIFIED COMMUNITY HEALTH WORKER

<table>
<thead>
<tr>
<th>SELF-MANAGEMENT SUPPORT</th>
<th>BRIDGE BETWEEN CLINICIAN AND PATIENT</th>
<th>NAVIGATION OF THE HEALTH CARE SYSTEM</th>
<th>EMOTIONAL SUPPORT</th>
<th>CONTINUITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide information</td>
<td>• Serve as the patient’s liaison</td>
<td>• Connect the patient with resources</td>
<td>• Show interest</td>
<td>• Be a familiar face</td>
</tr>
<tr>
<td>Teach disease-specific skills</td>
<td>• Ensure that patient understands resources and agrees with care plan</td>
<td>• Facilitate support</td>
<td>• Inquire about emotional issues</td>
<td>• Follow up</td>
</tr>
<tr>
<td>Promote behavior change</td>
<td>• Impart problem-solving skills</td>
<td>• Empower the patient</td>
<td>• Show compassion</td>
<td>• Establish trust</td>
</tr>
<tr>
<td>Impart problem-solving skills</td>
<td>• Assist with the emotional coping of chronic illness</td>
<td>• Ensure the patient’s voice is heard</td>
<td>• Teach coping skills</td>
<td>• Be available</td>
</tr>
<tr>
<td>Assist with the emotional coping of chronic illness</td>
<td>• Encourage follow up</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Encourage follow up</td>
<td>• Encourage participation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Encourage participation</td>
<td></td>
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</tbody>
</table>

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Bennett et. al, 2010.
LIMITATIONS

▪ Patients with a chronic medical disease in addition to a mental health condition who potentially had more SDoH needs were targeted for screening.

▪ Individuals could have misrepresented their SDOH needs given the sensitive nature of some of the domains and incentives provided.

▪ The limits in obtaining our organization’s specific data impacts our ability to comment on the benefits (Outcome Improved, No Longer At-risk, Outcome Remained At-risk) of incorporating SDoH in risk stratification on patient health outcomes.

▪ Provider implicit bias may explain the low screening of SDoH for young adults compared with their middle-age and older adult counterparts.

▪ Due to COVID, patients completing biometrics and in-person appointments declined.
### HIGH RISK

**Risk scoring data:**
- Significant claims history, diagnosis significant severity according to ICD-10 codes, electronic health record (EHR), 3 or more, conditions.
- SDoH factors, National Outcome Measures (NOMs) data.

**Utilization:**
- Three or more ED visits.
- Any readmission.
- One hospitalization related to chronic conditions.
- Admission to hospice or palliative care.

**Clinical:**
- One unstable behavioral health diagnosis.
- Two or more stable behavioral diagnoses.
- One hospitalization related to chronic conditions.
- Admission to hospice or palliative care.
- Active cancer.
- Clinical metric critically out of bounds (e.g., A1C > 9).

### MODERATE RISK

**Risk scoring data:**
- Moderate claims history, moderate severity according to ICD-10, EHR, 1 to 2 SDoH factors, NOMs data.

**Utilization:**
- One ED visit related to chronic condition.
- Any hospitalization.

**Clinical:**
- One stable behavioral health diagnosis.
- Fewer than three active chronic conditions.
- History of cancer.
- Clinical metric moderately out of bounds (e.g., A1C < 9).

### LOW RISK

**Risk scoring data:**
- Low claims history, low severity according to ICD-10, EHR, no SDoH factors, NOMs data.

**Utilization:**
- No ED visits or hospitalizations.

**Clinical:**
- No chronic health conditions.

### LEVEL 6
- Patient is potentially in danger of dying or being institutionalized within the next year.

### LEVEL 5
- Patient has complication of chronic conditions or high-risk social determinants of health.

### LEVEL 4
- Patient has chronic conditions that are out of control but without complications.

### LEVEL 3
- Patient has chronic conditions but is doing well.

### LEVEL 2
- Patient is healthy with no medical problems but with out-of-range biometrics.

### LEVEL 1
- Patient is healthy with no medical problem and in-range biometrics.

---

FUTURE WORK - THE ROAD AHEAD

▪ One potential focus of future work is how best to collaborate with the Indiana State Department of Health to collect data and interpret the findings specific to our health center.

▪ Use risk to identify patients for longitudinal care management.

▪ Schedule higher-risk patients for longer visits, groups/classes, and optimize Telehealth appointments.

▪ Consider patients’ risk levels when prioritizing resources, such as take home blood pressure machines, same-day appointments, or education classes.

▪ Make risk levels easy to find in the medical record.
Risk stratification that incorporates SDoH information which provides an expansive and more integrated view of patients.

Practices can use patient risk levels to make informed care management decisions, such as providing greater access and allocating resources to patients in higher risk levels.

Risk stratification helps practices to better allocate resources and focus attention on their most chronically ill patients.

Utilizing risk stratification as a predictive tools seems to have benefits in reducing healthcare costs and improve care.

CONCLUSION-A DIFFERENT WAY OF THINKING AND PRACTICING
ACKNOWLEDGEMENTS

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Brent Anderson, Practice Coach, Indiana State Department of Health
Indiana State Department of Health
Becca Sigafus and Essential Virtual Solutions, LLC
Indiana Community Health Workers Association
REFERENCES


Questions?
Please type them in the Q&A Box!
Thank you!

www.aapcho.org
training@aapcho.org