Population Health Management:

Social Determinants of Health – How Data Demonstrates Their Impact on the Health of a Population
Integrating Social Determinants of Health with Clinical Data

Providence Journey

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Healthcare Intelligence
Providence St Joseph Health

HIMSS Oregon Chapter Annual Conference
Social Determinants of Health – How Data Demonstrates Their Impact on the Health of a Population
Panel Presentation
May 17, 2018
What is 360C?

- Foundational project that integrates, transforms and augments data from multiple source systems into meaningful data sets
- Can be used by healthcare intelligence developers, data scientists, and our partners
- Provides a 360 degree view of patient populations across the continuum of care
- Solutions for deeper patient assessment, rigorous program development and evaluation, and new digital tools
Where Does Health Start?

According to the CDC, 70% of someone’s health comes from socio-economic environment (e.g. family structure, location etc.).

- Social and economic factors drive ~ 40% of consumer health and behavioral elements account for another 30%.

- Key elements that contribute to the sustained health of a patient often are not captured in EMR
  - Need to look for external data

Source: BARHII.http://barhii.org/framework/
National SDH Initiatives: IOM Recommended Domains

CAPTURING SOCIAL & BEHAVIORAL DOMAINS & MEASURES IN ELECTRONIC HEALTH RECORDS: PHASE 2

This document showcases the core domains and measures that constitute an efficient panel, which the committee recommends for inclusion in all electronic health records.

TABLE 5-3 Core Domains and Measures

<table>
<thead>
<tr>
<th>Domain</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Race/ethnicity</td>
<td>U.S. Census (2 Q)</td>
</tr>
<tr>
<td>Education</td>
<td>Educational attainment (2 Q)</td>
</tr>
<tr>
<td>Financial resource strain</td>
<td>Overall financial resource strain (1 Q)</td>
</tr>
<tr>
<td>Stress</td>
<td>Bio et al. (2003) (1 Q)</td>
</tr>
<tr>
<td>Depression</td>
<td>PHQ-2 (2 Q)</td>
</tr>
<tr>
<td>Physical activity</td>
<td>Exercise Vital Sign (2 Q)</td>
</tr>
<tr>
<td>Tobacco use and exposure</td>
<td>NHIS (2 Q)</td>
</tr>
<tr>
<td>Alcohol use</td>
<td>AUDIT-C (2 Q)</td>
</tr>
<tr>
<td>Social connections and social isolation</td>
<td>NAMHIS III (4 Q)</td>
</tr>
<tr>
<td>Exposure to violence: intimate partner violence</td>
<td>HARK (4 Q)</td>
</tr>
<tr>
<td>Neighborhood and community compositional characteristics</td>
<td>Residential address</td>
</tr>
<tr>
<td></td>
<td>Census tract median income</td>
</tr>
</tbody>
</table>

NOTE: Q = question(s).

Why Geocoding?

- Patient addresses are transformed into a geographic location by determining its latitude and longitude using BING technology via licensing
  - 87% of address were accurately geocoded
  - 13% had some postal information (e.g. PO Box) and were tied to the center of the Zip code
  - Less than 1% did not have an address to match
- R code reads shape files (“maptools” library) and transforms the latitude and longitude to block group and census tract ids
What SDH Data We Have That Describe Communities?

- Economic Stability: Income and poverty
  - Population receiving SNAP benefits
  - Population with housing assistance
  - Population in poverty*
  - Children under age 18 living in poverty*
  - Median household and per capita income
  - Gini Index Value
  - Cost burdened households (Over 30% of income)*

- Community and housing
  - Overcrowding
  - Units in substandard conditions
  - Median home value
  - Percentage of rented and vacant units
  - Average Years of living in the area

- Health Behaviors
  - % of food expense of fresh fruits and vegetables
  - % of food expense on soda
  - Walking or biking to work
  - % of food expense on beer, wine or liqueur

- Community Demographics
  - Population with a disability
  - Linguistically isolated population
  - Percent Urban and Rural
  - Population without high school diploma

- Transportation
  - Households without car
  - Population using public transportation

- Food Access
  - Population with low food access
  - Modified Retail Food Access

- Air Quality
  - Days exceeding standards

* Healthy People 2020 SDH measure
What EPIC’s SDH Data Are Included?

- Demographics
  - Age
  - Gender
- Payer type (Commercial, Medicare, Medicaid, Uninsured)
- Race and ethnicity
- Primary Language
- Self-reported Employment

- Community and housing
  - Homelessness
- Social Isolation
  - Marital status as proxy for social support
- Behavioral and psychological factors
- Addiction and substance use (drugs, tobacco, alcohol)
- Depression
- Other mental health issues
How Do We Use Information?

- Predictive modeling for risk stratification and identification of factors that are most predictive of resource utilization
- In analytics to gain insights quickly
- To drive patient cohort selection
- To help answering many care management questions and do business differently:
  - What could we do differently knowing that patients live in certain areas?
  - Do we have specific skills to address certain SDH?
  - Do we have resources or community partners to address certain needs and vulnerabilities
Population Profile

Patient Attributes

Patient Snapshot

Population Profile:
- All region(s): Medicaid Managed, Medicaid Traditional, Medicare Medicaid payer(s): All ages
- 895,099 patients

Loc Region Cd
- OR: 320,622
- WA: 221,944
- EWA-WMT: 219,389
- ALASKA: 174,789
- Null: 6,084

Patient Attributes:
- KPI Summary:
  - Patient Count: 895,085
  - % of Population: 100%
  - % with Hosp Case: 39%
- Avg. Hosp Days: 1.2
- Avg. Hosp Charges: $8,906
- Avg. Dynamic KPI: 0.6
- Which attributes are more likely to be associated with higher utilization?
  - Payor: churn_flag: 207,862 (25%)
  - medicaid_managed: 598,489 (67%)
  - medicaid_trad: 168,498 (19%)
  - medicare_medicaid: 128,098 (14%)

Patient Snapshot:
- Summary:
  - Hospital Charges: $178,265
  - Hospital Cases: 79 / Days: 82
- Hospitals caring for this patient:
  - CHERRY HILL: 42
  - SWEDISH EDM: 22
  - FIRST HILL: 3
  - MILL CREEK: 3
  - PROV REGIONA: 3
- Services provided:
  - Substance Abuse
  - Gastroenterology
  - Dermatology
  - Medical Ophthalmology

Hospital Cases by Month 2016:
- Hosp Discharge Date
  - ED: 0, 1, 5, 10, 15
Mobile Health Diabetes Program

- Innovative nationally recognized project combining use of mobile app and cost efficient “health promoters” to improve care of patients with diabetes
- G2L-PSJH pilot aims to expand the initial project and demonstrate improved IHI’s Triple Aim health outcomes:
  - A1c reduction
  - Improvement in patient experience
  - Reduction in the per capital cost of care
    - Possible increased revenue with CMS recent additions for wellness and prevention coverage
- An IRB-approved quasi-experimental study design with propensity matched control group
How SDH and other data are used in PSJH-G2L Study?

- Custom query and visual analytics were developed
- Identify patient population for intervention
- Identify patient’s location of care and most populated zip codes
- Identify most social, clinical and high resource utilization areas of focus
Going forward with the pilot…

- **Operations**
  - Information on SDH and other patient factors help us better address their needs and connect with needed community resources
  - Will help to connect patients with a medical home

- **Performance Measurement**
  - Report on engagement of study patients
  - Report on study progress
  - Evaluate the program impact by measuring clinical, satisfaction and financial outcomes
Unity Center for Behavioral Health

Juliana Wallace – Director of Services
Risk Selector Tool

INTERACTIVE TOOL TO CREATE LISTS OF PATIENTS FOR PILOT INTERVENTIONS

MATTHEW MITCHELL
DATA STRATEGIST
Purpose

Match the right patients to the right intervention

Translate creative ideas into small pilots

- Right-size the pilot
- Identify clients on demand
- Self-service tool for leaders
Tool Details

Data Sources
- EHR registration
- Problem list
- Appointment utilization
- PreManage
- ServicePoint
- HCC risk adjustment model
- Custom hospital risk prediction model
- Custom population segmentation model

Platform
- Microsoft Power BI
- Enterprise data warehouse
High Risk Patient Selector

5605

Patient Count

OTC Status
All

HMIS Program
All

Care Team
All

Housing Status
All

Risk Scores

HCC Risk Score
0.00 5.01

Hospitalization Risk
0.1% 56.0%

Health Subgroup
All

Utilization (6 Months)

Inpatient Admits
0 12

ED Admits
0 118

Completed PC Appts
0 53

No Show PC Appts
0 20

Selected Diagnoses

- Select All
- Alcohol Use
- Anxiety
- Bipolar Disorders
- Blood
- Cognitive Disorders/Head L...
- Depression
- Diabetes
- Heart
- Hypertension
- Infection
- Kidney
- Liver
- Lung
- Musculoskeletal
- Neurological
- Opioid Use
- Pain
- Schizophrenia and Psychosis

High Risk Outreach List

<table>
<thead>
<tr>
<th>Client Name</th>
<th>Birth Date</th>
<th>PCP</th>
<th>Care Team</th>
<th>Hospitalization Risk</th>
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<tbody>
<tr>
<td>Gill MD, Richard</td>
<td>Summit</td>
<td>56.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Herr, FNP, Jennifer N</td>
<td>Bridges</td>
<td>53.4%</td>
<td></td>
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<td>Bajaj ND LAc, Kipp R</td>
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<td>Kohn AGNP, Mary Anne</td>
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<td>Sustencac MD, Brianna L</td>
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<td>Martin PA-C, Barbara E</td>
<td>Pioneers</td>
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High Risk Patient Selector

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Patient Count

OTC Status
All

HMIS Program
All

Care Team
All

Housing Status
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Risk Scores
HCC Risk Score
6.00
5.01

Hospitalization Risk
0.1%
56.0%

Health Subgroup
All

Utilization (6 Months)
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ED Admits
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Future Work

- Standard framework for evaluating impact of pilots
- Improve collection of housing status data
- Expand collection of SDoH data
Albertina Kerr Centers & SDOH

Oregon HIMSS
May, 17, 2018

Presented by: Craig Rusch – Chief Information Officer
EHR Selection

- In 2014, Kerr had 3 EHRs
- To provide seamless service, Kerr decided to consolidate all service lines in a single EHR
- The primary driver in selecting a new platform was to find a solution that would enable us to collaborate more deeply with our healthcare partners
Epic & Legacy

- Epic, with Legacy as the host agency, was our clear choice
- Epic agreed to work with us and a few other community partners to help design Epic’s Social Care module
- The first version of the Social Care module is available with Epic’s 2018 release
Epic’s 2018 Release

Integrated Health & Social Care Record
Primary care, acute care and social services will all share one “person centric” record

SOCIAL SERVICES LIVE OR INSTALLING TODAY

- Child & Family Services
- Elderly Care & Services
- Support for People with Disabilities
- Substance Abuse Treatment & Services
- Social Assistance
- Food Pharmacy
- School Health
- Group Homes for Disabled People
- Community Mental Health Services
- PACE Programs
SDOH Documentation in Epic

- Intimate Partners
- Alcohol Use
- Tobacco Use
- Social Isolation
- Financial Resources
- Environmental Conditions
- Food Insecurity
- Education
- Transportation Issues
- Family Situation

Find community resources
View previous recommendations

Intimate Partner Violence

<table>
<thead>
<tr>
<th>SEP 16 2017</th>
<th>Not At Risk</th>
</tr>
</thead>
</table>

Within the last year, have you been afraid of your partner or ex-partner?
No

Within the last year, have you been humiliated or emotionally abused in other ways by your partner or ex-partner?
No

Within the last year, have you been kicked, hit, slapped, or otherwise physically hurt by your partner or ex-partner?
No

Within the last year, have you been raped or forced to have any kind of sexual activity by your partner or ex-partner?
No
Prior to the Social Care module, SDOH was hidden in flowsheets and notes, was hard to understand, difficult to find, and non-actionable.

With highly graphical, easy to understand pictograms, SDOH will be readily visible and actionable.

Once Kerr implements the Social Care module, we will be able to easily share in a meaningful way the data it has been collecting and hoarding for years.
Population Health Management:

**Social Determinants of Health – Questions?**