Panel - Social and Behavioral Determinants of Health: Fundamental Informatics Challenges for Enriching Health IT Systems

Session Number: S85

Daniel J. Vreeman, PT, DPT, MS
Christopher J. Alban, MD, MBA
Jon Puro, MPA:HA
1. Current and Future Perspectives on Social Determinants of Health (SDH) in HIT from the Office of the National Coordinator (ONC):
   Presenter: Dan Vreeman (standing in for Albert Taylor)

2. Representing SDH content in vocabulary standards
   Presenter: Dan Vreeman

3. Implementing IOM Recommendations within the EMR
   Presenter: Christopher Alban

4. Primary Care Experience with SDH from an IT perspective
   Presenter: Jon Puro
Primary Care Experience with SDH from an IT perspective

Jon Puro
OCHIN, Inc.
Twitter: #AMIA2017
Disclosure

I and my spouse/partner have no relevant relationships with commercial interests to disclose.
Agenda

- Brief overview of PCORnet (2 min)
- Introduction to the ADVANCE network (3 min)
- Discussion of Social Determinants of Health research within ADVANCE (15 min)
  - Geocoding and geospatial data
  - Integrating patient-level SDH into primary care
PCORnet®: the National Patient-Centered Clinical Research Network

An innovative initiative funded by the Patient-Centered Outcomes Research Institute (PCORI), PCORnet is a large, highly representative, national patient-centered clinical research network.

Our vision is to support a learning U.S. health care system and to enable large-scale clinical research conducted with enhanced quality and efficiency.

Our mission is to enable people to make informed health care decisions by efficiently conducting clinical research relevant to their needs.
PCORnet® embodies a “network of networks” that harnesses the power of partnerships
PPRNs

ABOUT Patient Powered Research Network (ABOUT Network)
University of South Florida

Arthritis patient Partnership with comparative Effectiveness Researchers (AR-PoWER PPRN)
Global Healthy Living Foundation

CCFA Partners Patient Powered Research Network
Crohn’s and Colitis Foundation

Collaborative Patient-Centered Rare Epilepsy Network (REN)
Epilepsy Foundation

Community and Patient-Partnered Research Network
University of California Los Angeles

Community-Engaged Network for All (CENA)
Genetic Alliance, Inc.

COPD Patient Powered Research Network
COPD Foundation

DuchenneConnect Registry Network
Parent Project Muscular Dystrophy

Health eHeart Alliance
University of California, San Francisco (UCSF)

ImproveCareNow: A Learning Health System for Children with Crohn’s Disease and Ulcerative Colitis
Cincinnati Children’s Hospital Medical Center

Interactive Autism Network
Kennedy Krieger Institute

Mood Patient-Powered Research Network
Massachusetts General Hospital

Multiple Sclerosis Patient-Powered Research Network
Accelerated Cure Project for Multiple Sclerosis

National Alzheimer’s and Dementia Patient and Caregiver-Powered Research Network
Mayo Clinic

NephCure Kidney International
Arbor Research Collaborative for Health

Patients, Advocates and Rheumatology Teams Network for Research and Service (PARTNERS)
Duke University

Phelan-McDermid Syndrome Data Network
Phelan-McDermid Syndrome Foundation

PI Patient Research Connection: PI-CONNECT
Immune Deficiency Foundation

Population Research in Identity and Disparities for Equality Patient-Powered Research Network (PRIDEnet)
University of California San Francisco

Vasculitis Patient Powered Research Network
University of Pennsylvania
HPRNs

HealthCore (a subsidiary of Anthem)

Humana – Comprehensive Health Insights (CHI; a subsidiary of Humana Pharmacy Solutions)
Resulting in a national evidence system with unparalleled research readiness

PCORnet represents:

~128 million patients

who have had a medical encounter in the past 5 years

*some individuals may have visited more than one Network Partner and would be counted more than once
A community of research that unites data from patients, clinicians, and systems
PCORnet® Common Data Model domains

- Based on FDA Sentinel Common Data Model
- Licensed under Creative Commons (open-access, use, and share)
- Designed to promote multi-site, patient-centered research
- Allows for interoperability

PCORnet Common Data Model Domains, v3.0 and v3.1

- **DEMOGRAPHIC**
  Demographics record the direct attributes of individual patients.

- **ENROLLMENT**
  Enrollment is a concept that defines a period of time during which a person is expected to have complete data capture. This concept is often insurance-based, but other methods of defining enrollment are possible.

- **ENCOUNTER**
  Encounters are interactions between patients and providers within the context of healthcare delivery.

- **DIAGNOSIS**
  Diagnosis codes indicate the results of diagnostic processes and medical coding within healthcare delivery. Data in this table are expected to be from healthcare-mediated processes and reimbursement drivers.

- **PROCEDURES**
  Procedure codes indicate the discreet medical interventions and diagnostic testing, such as surgical procedures and lab orders, delivered within a healthcare context.

- **VITAL**
  Vital signs (such as height, weight, and blood pressure) directly measure an individual’s current state of attributes.

- **LAB_RESULT_CM**
  Laboratory result Common Measures (CM) use specific types of quantitative and qualitative measurements from blood and other body specimens. The common measures are defined in the same way across all PCORnet networks, but this table can also include other types of lab results.

- **CONDITION**
  A condition represents a patient’s diagnosed and self-reported health conditions and diseases. The patient’s medical history and current state may both be represented.

- **PRO_CM**
  Patient-Reported Outcome (PRO) Common Measures (CM) are standardized measures that are defined in the same way across all PCORnet networks. Each measure is recorded at the individual item level: an individual question/statement, paired with its standardized response options.

- **DISPENSING**
  Outpatient pharmacy dispensing, such as prescriptions filled through a neighborhood pharmacy with a claim paid by an insurer. Outpatient dispensing may not be directly captured within healthcare systems.

- **PRESCRIBING**
  Provider orders for medication dispensing and/or administration. These orders may take place in any setting, including the inpatient or outpatient basis.

- **PCORNET_TRIAL**
  Patients who are enrolled in PCORnet clinical trials.

- **DEATH**
  Reported mortality information for patients.

- **DEATH_CAUSE**
  The individual causes associated with a reported death.

- **HARVEST**
  Attributes associated with the specific PCORnet datamart implementation, including data refreshes.
The Front Door is open…
take your research to the next level

Through PCORnet Front Door, we invite PCORnet researchers and other investigators, patient groups, health care organizations, clinicians or clinician groups, government and industry scientists, and sponsors to collaborate on important patient-centered clinical research studies.

Check it Out!
http://pcornet.org/frontdoor/
More information on PCORnet®

- Website: [www.pcornet.org](http://www.pcornet.org)
- PCORnet Commons: [http://pcornetcommons.org/](http://pcornetcommons.org/)
- Twitter: [@PCORnetwork](http://twitter.com/PCORnetwork)
- YouTube: [PCORI YouTube Playlist](http://youtube.com/PCORI)
- Vimeo: [PCORI Vimeo Playlist](http://vimeo.com/PCORI)
- PCORnet communications contact: [Jennifer.Cook@duke.edu](mailto:Jennifer.Cook@duke.edu)
ADVANCE: Accelerating Data Value Across A National Community Health Center Network
The OCHIN Mission

• OCHIN is a nonprofit health care innovation center designed to provide knowledge solutions that promote quality, affordable health care to all.

Our Strategy

• We provide innovative technology, research, and professional services to our customers and partners nationwide to build learning health centers.
Who Does OCHIN Serve?

OCHIN partners with over 400 organizations nationwide:

• With over 10,000 clinicians
• Serving over 20 Million patients
• Focused on the safety net
• 106 health centers and >600 clinics in 18 states on single instance of Epic
• Other services in add’l 14 states

Accelerating Data Value Across a National Community Health Center Network
OCHIN’s is Focused on Innovation and Transformation

**Technology**
- Best-of-breed technologies targeted to the needs of the safety net and health care transformation

**Research**
- Research focused on improving the health of underserved populations, enhancing quality of care and informing health policy

**Services**
- Professional services that range from clinic operational support to strategic planning

- Data Analytics
- Electronic Health Records
- Networking & Broadband
- Telehealth

- Chronic Pain & Opioids
- Diseased Affecting the Safety Net
- Health Equity & Health Policy
- Social Determinants of Health

- Billing
- Compliance & Security
- Consulting
- Staff Augmentation

Accelerating Data Value Across a National Community Health Center Network
ADVANCE clinical data research network (CDRN)

Integrate patient and community-level data into single management system

Develop electronic systems for collecting patient-reported data, recruiting participants

Strengthen infrastructure to support PCOR through community-academic partnerships and support FQHCs as learning health systems

Build FQHC network capacity to meet research regulatory requirements

Expand engagement of patients and clinicians in design, implementation, and interpretation of comparative effectiveness research
ADVANCE: Achieving a Truly National Footprint

Patient Distribution by Clinic’s State

- >3.8 Million Patients
- >10,000 PCPs
- >50 Researchers
- 24 States
- 321 Cities
- 124 Health Systems
- 1139 Clinic Sites
- >20 Academic Institutions
ADVANCE has the largest clinical data set on the safety net in the Nation

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Unique Patients</td>
<td>&gt;3.8 Million</td>
</tr>
<tr>
<td>% Female</td>
<td>56%</td>
</tr>
<tr>
<td>Race</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>65%</td>
</tr>
<tr>
<td>Black</td>
<td>20%</td>
</tr>
<tr>
<td>Asian</td>
<td>3%</td>
</tr>
<tr>
<td>American Indian/Alaska Native</td>
<td>1%</td>
</tr>
<tr>
<td>Not Collected/Unknown</td>
<td>4%</td>
</tr>
<tr>
<td>Spanish as Primary Language</td>
<td>20%</td>
</tr>
<tr>
<td>At or Below 100% of Poverty Level</td>
<td>52%</td>
</tr>
<tr>
<td>Federally Insured or uninsured</td>
<td>75%</td>
</tr>
</tbody>
</table>

- Diverse patient population, particularly in race/ethnicity
- Includes patients in both Medicaid and non-Medicaid expansion states
ADVANCE Research Data Warehouse (RDW) includes:

- Demographics (DOB, sex, race)
- Enrollment
- Encounter
- Diagnosis
- Labs
- Prescribing and Dispensing
- Death date and cause
- Vital Signs (height, weight, smoking)
- Condition (incl. Problem List)
- Patient Reported Outcomes

Plus additional data needed for research on the safety net:

- Federal Poverty Level (FPL)
- Household income & size
- Insurance status (incl. uninsured)
- Homeless status
- Migrant/seasonal worker status
- Veteran status
- Community Vital Signs

Accelerating Data Value Across a National Community Health Center Network
ADVANCE-ing Social Determinants of Health Research
“Community vital signs”: incorporating geocoded social determinants into electronic records to promote patient and population health

Andrew W Bazemore¹, Erika K Cottrell²,³, Rachel Gold²,⁴, Lauren S Hughes⁵, Robert L Phillips⁶, Heather Angier³, Timothy E Burdick³,⁷, Mark A Carrozza⁸, Jennifer E DeVoe²,³

ABSTRACT

Social determinants of health significantly impact morbidity and mortality; however, physicians lack ready access to this information in patient care and population management. Just as traditional vital signs give providers a biometric assessment of any patient, “community vital signs” (Community VS) can provide an aggregated overview of the social and environmental factors impacting patient health. Knowing Community VS could inform clinical recommendations for individual patients, facilitate referrals to community services, and expand understanding of factors impacting treatment adherence and health outcomes. This information could also help care teams target disease prevention initiatives and other health improvement efforts for clinic panels and populations. Given the proliferation of big data, geospatial technologies, and democratization of data, the time has come to integrate Community VS into the electronic health record (EHR). Here, the authors describe (i) historical precedent for this concept, (ii) opportunities to expand upon these historical foundations, and (iii) a novel approach to EHR integration.
Treat Acute Illness
Control Chronic Disease
Modify Risk Factors
Address Preventive Care

SDH Conceptual Model Developed by OCHIN Research

Step 1: Collect & Organize SDH Data
Community Vital Signs Data
Imported from public data sources about community-level information (e.g., U.S. Census) matched to patient address

Step 2: Present & Integrate SDH Data into Primary Care Workflows
Patient-Reported Data
Collected by asking patients direct questions about their individual circumstances (e.g., employment, education, housing)

Step 3: SDH Data Triggers Automated Support & Action
Panel Management
Population of Patients
Referrals to social services, medical specialists
Clinical Decision Support
Patient Engagement
Clinical & Social Services Coordination

Point-of-Care
Individual Patient Care

## Community Vital Signs (CVS) Data

<table>
<thead>
<tr>
<th>Domain</th>
<th>Example Metric(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neighborhood Socioeconomic Composition</td>
<td>Income, education, poverty, occupation, &amp; unemployment</td>
</tr>
<tr>
<td>Neighborhood Race/Ethnic Composition</td>
<td>Race &amp; Ethnicity, residential segregation</td>
</tr>
<tr>
<td>Neighborhood Economic Conditions</td>
<td>Dependency Ratios, GINI income inequality, foreclosure rates, social vulnerability</td>
</tr>
<tr>
<td>Environmental Exposure</td>
<td>Age of housing, air quality, plumbing facilities, water quality</td>
</tr>
<tr>
<td>Built Environment</td>
<td>Land use, urban design</td>
</tr>
<tr>
<td>Neighborhood Resources</td>
<td>Access to healthy foods, food deserts, recreational facilities, urban/rural</td>
</tr>
<tr>
<td>Clinical Care (Medicare population)</td>
<td>Diabetes preventive care</td>
</tr>
<tr>
<td>Hospital Utilization (Medicare population)</td>
<td>Hospital readmissions, avoidable hospitalizations, ER visits</td>
</tr>
<tr>
<td>Preventive Care (Medicare population)</td>
<td>Annual visit to primary care physician, mammogram</td>
</tr>
</tbody>
</table>
Bottled Water for All, All the Time?
03/01/2016 | www.bmj.com

Research: Complexity of Primary Care Physician Office Visits Is Higher than for Subspecialist Physicians
02/27/2016

Patient-care Teams Include

Access to Care
Behavioral Health Integration
Health Geography
Medical Education

For the past ten years, family physician Douglas Kamerow has regularly published what he calls “evidence-informed commentaries” in the global medical journal The BMJ. Since 2014, Dr. Kamerow has been a senior scholar at the Robert Graham Center, and he has continued to write these short pieces, which are published on bmj.com and in the print journal. Topics range from clinical issues (doctors treating family members) to public
Robert Graham Center has a longstanding interest in contextualizing health using GIS

... And in linking clinical and population health data

- Street Addresses
- Streets/Rivers/Land Features
- Hospital/Medical Center/ Clinics
- Zip Codes/Counties
- Spatial Analysis – (i.e. travel times)
- Service Demand/Provider Density
Inform effective resource allocation to support the U.S. Primary Care ‘Safety Net’: www.UDS Mapper.org
Combine multisource geospatial data to create a Social Deprivation Index and allow better targeting of resources.
Geoenrichment API Workflow
Some of the ADVANCE CVS Data Sources

- Agency for Toxic Substances and Disease Registry (ATSDR)
- American Community Survey
- Centers for Disease Control Behavioral Risk Factor Surveillance Systems (BRFSS)
- CDC Environment Public Health Tracking Network
- CDC Vital Statistics
- Dartmouth Health Atlas
- Environmental Protection Agency
- HRSA Area Health Resources (AHRF)
- National Environment Public Health Tracking Atlas
- RWJ County Health Rankings
- U.S. Census
- USDA Food Atlas
- US Department of Housing & Urban Development, Neighborhood Stabilization Program
ADVANCE geocoding overview

• Initial load included all current and historic patient addresses for OCHIN patients (> 3.7 million addresses)

• Nearly 70 CVS variables at different geospatial levels currently integrated with patient and clinic addresses

• Geocodes and geospatial metrics updated quarterly

• Geocodes and geospatial metrics are loaded into secured database separate from PCORnet Common Data Model.
ADVANCE GIS tools

- **ArcGIS**: “A geographic information system (GIS) for working with maps and geographic information. It is used for creating and using maps, compiling geographic data, analyzing mapped information, sharing and discovering geographic information, using maps and geographic information in a range of applications, and managing geographic information in a database.” ([http://www.esri.com/arcgis/about-arcgis](http://www.esri.com/arcgis/about-arcgis))

- **QGIS**: “A user friendly Open Source Geographic Information System (GIS) licensed under the GNU General Public License. QGIS is an official project of the Open Source Geospatial Foundation (OSGeo). It runs on Linux, Unix, Mac OS X, Windows and Android and supports numerous vector, raster, and database formats and functionalities.” ([http://www.qgis.org/](http://www.qgis.org/))

- **SAS and R** for analysis
- **SQL and SSIS** for data integration and storage
Acuere is a real-time data aggregation tool with:

- **Easy-to-use** tools in a **user-friendly** interface
- One of the most **comprehensive data** sets available
- Community Vital Sign and **Social Determinants** of Health Data
- Hundreds of built-in **Quality Metrics** (PQRS, MU, UDS, HEDIS, NQF)
- Point of care and **population health** tools
- Tools informed by research
POSTGIS

- **PostGIS** is a spatial database extender for PostgreSQL object-relational database. It adds support for geographic objects allowing location queries to be run in SQL. ([http://postgis.net/](http://postgis.net/))
- PostGIS is very similar in functionality to SQL Server Spatial support, ESRI ArcSDE, Oracle Spatial, and DB2 spatial extender.
  - The latest release version now comes packaged with the PostgreSQL DBMS installs as an optional add-on. ([http://www.bostongis.com/PrinterFriendly.aspx?content_name=postgis_tutorial](http://www.bostongis.com/PrinterFriendly.aspx?content_name=postgis_tutorial))
  - PostGIS follows the Simple Features for SQL specification from the Open Geospatial Consortium (OGC).
Geo-Data Lessons Learned (1/4)

• Technology for geocoding addresses is getting more reliable, faster, easier to use, and more accessible.
  – Many systems now available: Esri ArcGIS, PostGIS, SAS, R, Google, Loquate, Geocodio, SmartyStreets, LocationIQ, etc.
  – Factors to consider: Accuracy, Address cleaning and standardizing capability, Reliability, Speed, Validation, Limitations of Use, Tech Support and Documentation, Price

• HIPAA rules apply when using external geocoding services like Google.
  – HIPAA requires Business Associates Agreement (BAA) for working with external, non-research geocoding providers or contractors when patient addresses are shared outside of a covered entity.
Geo-Data Lessons Learned (2/4)

• Different levels of geography are useful for different purposes (e.g., Census block, ZCTA, county).
  – Many sources of geospatial data are free; some are not.
  – Some geocoding systems are also “free”.
  – But geocoding, managing and maintaining geospatial metrics, and linking addresses to geospatial data takes time and expertise.
  – Census block is the smallest geographic unit used by the US Census, followed by Block Groups, then by Census Tracts.
  – Census Tract is the lowest level of geographic specificity available from the Census. The Census does not generally release block-level data because in areas with low population, individuals might be identifiable.
Geo-Data Lessons Learned (3/4)

- Data latency is an issue. Older geospatial data may not be useful for analyses of current conditions.
  - However, many neighborhood characteristics are slow-changing.
  - There are MANY geospatial metrics out there in the wild. The challenge is choosing which to use.
  - Some composite metrics are also available:
    - Example: Social Deprivation Index from Robert Graham Center – combines 9 geometrics into one
- There are code sets available for some geospatial metrics (in LOINC, SNOMED), but huge gaps still exist.
  - A broad set of geospatial metrics is still needed.
Geo-Data Lessons Learned (4/4)

• The value of geospatial data in the clinical setting for patient care is still TBD.
  – What is the relevance of a patient’s neighborhood to their clinical condition? “Your zip code is more relevant to your health than your genetic code.” True? Still TBD.
  – What variables are most useful to clinicians? Also still TBD. (Your answer may vary!)
  – Disease and vaccine surveillance systems are one important use of geospatial data for population health (e.g., ESP).
  – Composite metrics like the Social Deprivation Index (SDI) hold potential value for summarizing neighborhood characteristics.
Study: “Measures of Social Deprivation That Predict Health Care Access and Need within a Rational Area of Primary Care Service Delivery”

Danielle C. Butler, Stephen Petterson, Robert L. Phillips, and Andrew W. Bazemore

• Objective: To develop a measure of social deprivation that is associated with health care access and health outcomes at a novel geographic level, primary care service area.

• Study Design: Social deprivation variables were selected from literature review and international examples. Factor analysis was used. Correlation and multivariate analyses were conducted between index, health outcomes, and measures of health care access. The derived index was compared with poverty as a predictor of health outcomes.

• Principal Findings: Our social deprivation index is positively associated with poor access and poor health outcomes. This pattern holds in multivariate analyses controlling for other measures of access. A multidimensional measure of deprivation is more strongly associated with health outcomes than a measure of poverty alone.
The Impact of Patient Complexity on Hemoglobin A1c Control in Diabetic Patients

*Patient-Centered Outcomes Research Institute (PCORI) Award (HSD-1603-34987)*
Study Team

**ADVANCE CDRN**
- Erika Cottrell, PhD, MPP
- Katie Dambrun, MPH
- Jean O’Malley, MPH
- Thuy Le, MPH
- Jon Puro, MPA
- Jennifer E. DeVoe, MD, Dphil
- Abby Sears, MHA, MBA

**OneFlorida CDRN**
- Hongzhi Xu, PhD, MPH, MS
- Jaclyn M. Hall, PHD
- Sweta Tewary, PhD
- Deepa Ranka, MS

**External Advisors**
- Mary Charlson, MD
- Andrew Bazemore, MD, MPH
Health Systems Demonstration Project:  
*The Impact of Patient Complexity on Healthcare Performance*

- Most population management systems do not account for **patient complexity and prevalence of influential SDH** when assessing quality of care.

- In this project, we will explore the impact of adding data on social complexity to validated measures of clinical comorbidity – and whether accounting for social complexity accounts for variation in health care utilization and quality of care.

**Engage**  
**September 2016**  
**Analyze**  
**August 2017**  
**Disseminate**
Project Aims

• **Aim 1:** Engage patients and clinicians to identify the community-level SDH domains that are critical to test in a model predicting health care utilization and engage health systems leaders to identify the quality of care measures (outcomes) of greatest interest.

• **Aim 2:** Assess whether clinic level summaries of patients’ clinical comorbidity and community-level SDH correlate with variability in clinic-level preventive quality of care measures and rates of ED visits, avoidable hospitalizations, and other select primary quality measures.

• **Aim 3:** Engage stakeholders to identify how clinic level measures of comorbidity and social complexity are useful to health system leaders, clinicians, and patients in managing population health, resources, and decision-making, delivering quality clinical care, improving treatment adherence and health.
How can we assess patient clinical complexity?

- We used the **Charlson Comorbidity Index**, a validated measure of clinical complexity
- The Charlson Comorbidity Index was supplemented with a variable assessing Mental and Behavioral Health disorders as these conditions have been shown to add to models of the association of clinic complexity with health care utilization.


How can we assess patient social complexity?

• As a proxy, we can use community-level SDH data that describes the physical, economic, social and demographic characteristics of the neighborhoods and communities where patients live.

• For these analyses we used the **Social Deprivation Index Score**.
  – The Social Deprivation Index that weights several characteristics and combines them in a single score to estimate the social vulnerability of a community.
  – The National Percentile rank of the SDI is the SDI Score.
Phase 2. Analysis

Demographic adjustment:

Outcome = age + gender

Clinical adjustment:

Outcome = age + gender + Charlson score + MHBH variable

Clinical and social adjustment:

Outcome = age + gender + Charlson score + MHBH + SDI

Note: Data availability varied between cohorts, outcome variables were assessed by cohort whenever possible.
Phase 2. Analysis: Social Complexity in OCHIN Primary Care Patients

<table>
<thead>
<tr>
<th>Socioeconomic Variables: OCHIN Patient Community Values Compared to National Distribution</th>
<th>Least Vulnerable Quartile (%)</th>
<th>Most Vulnerable Quartile (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Deprivation Index Score</td>
<td>7.8</td>
<td>49.0</td>
</tr>
<tr>
<td>%Population below Federal Poverty Level</td>
<td>7.0</td>
<td>43.6</td>
</tr>
<tr>
<td>%Below 200% Federal Poverty Level</td>
<td>7.3</td>
<td>43.7</td>
</tr>
<tr>
<td>%Unemployed</td>
<td>9.1</td>
<td>43.1</td>
</tr>
<tr>
<td>%College Graduates</td>
<td>15.9</td>
<td>31.6</td>
</tr>
<tr>
<td>%Managerial/Professional Employment</td>
<td>14.3</td>
<td>37.2</td>
</tr>
<tr>
<td>%Households with no vehicle</td>
<td>12.1</td>
<td>42.8</td>
</tr>
<tr>
<td>Median Household Income</td>
<td>9.3</td>
<td>40.7</td>
</tr>
</tbody>
</table>

%Patients in Extreme Quartiles of National Distribution

<table>
<thead>
<tr>
<th>Least Vulnerable Quartile (%)</th>
<th>Most Vulnerable Quartile (%)</th>
</tr>
</thead>
</table>
Key Findings

• Charlson categories were associated with poor glucose control in DM among OCHIN patients.

• **Increasing SDI score and decreasing median household income** had a small but significant association with **poor outcomes for ED utilization and HbA1c control in diabetics**.
%Diabetics in Poor Control by Clinical Complexity

**OCHIN Patients, Adjusted for Patient Age and Gender**

<table>
<thead>
<tr>
<th>Charlson Score</th>
<th>Adjusted % Diabetics in Poor Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1</td>
<td>15.7</td>
</tr>
<tr>
<td>2-3</td>
<td>19.8</td>
</tr>
<tr>
<td>4-7</td>
<td>18.6</td>
</tr>
<tr>
<td>8 or more</td>
<td>18.2</td>
</tr>
</tbody>
</table>
Adjustment for Social Complexity

%OCHIN Diabetics in Poor Control (HbA1c>9)
within age and sex adjusted Charlson category: 2-3

<table>
<thead>
<tr>
<th>Social Complexity Adjustment</th>
<th>Adjusted % Diabetics in Poor Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>19.8</td>
</tr>
<tr>
<td>SDI 84 (OCHIN Mean)</td>
<td>19.6</td>
</tr>
<tr>
<td>SDI 50 (US Mean)</td>
<td>17.7</td>
</tr>
</tbody>
</table>
Visit the ADVANCE website!

The new ADVANCE website: www.advancecollaborative.org

The website features the most up-to-date ADVANCE information.
The ADVANCE Front Door

**Purpose:** To work with investigators at the pre-proposal or exploratory stage of research and to initiate the approval process for new study ideas

- Facilitate data requests for proposal feasibility and prep-to-research
- Provide assistance with scientific review and consultation on proposed studies through the Scientific Steering Committee

**Timeline Expectation**

- Proposal Development: ~60-90 days (Proposal vetting, Engagement of our stakeholder groups, approval, including prep-to-research data work)
- Prep-to-Research data work: ~30 days
ADVANCE network contact List

- Jon Puro, ADVANCE PI, puroj@ochin.org

- Jen DeVoe, ADVANCE Co-PI, devoej@ohsu.edu

- Vance Bauer, VP of Research and ADVANCE Director, bauerv@ochin.org

- Lewis Raynor, Health Disparities CRG PI, raynorl@ochin.org

- Jee Oakley, ADVANCE Project Manager, oakleyj@ochin.org

- Molly Krancari, ADVANCE Science Manager, krancarim@ochin.org
Questions?
Discussion Questions

A. What are the top three benefits and challenges for the inclusion of SDH domains and measures in EHRs?

B. How can the health informatics community leverage the lessons learned from prior EHR development efforts to help accelerate the development, deployment and integration of SDH standards?

C. What are appropriate ways to address IP issues that result from using SDH measures?

D. What can AMIA do to assist with the integration of SDH into clinical care?
MCQ #1

During a follow up visit for a child recently seen in the local emergency department for an asthma exacerbation, you ask her mother a set of screening questions about housing problems and other social needs and discover that the family recently moved into low-income housing infested with both rodents and cockroaches. You provide referrals to the city’s public housing inspection services and to a local exterminator. These screening questions and referrals to inspection and exterminator services can best be considered which of the following:

a) Population risk assessment
b) Primary prevention
c) Secondary prevention
d) Treatment of disease
MCQ #1 Answer

a) Population risk assessment
b) Primary prevention
c) **Secondary prevention**
d) Treatment of disease

Explanation: Secondary prevention consists of "early diagnosis and prompt treatment" to contain the disease or to prevent worsening. Although building inspection and extermination services are not clinical interventions, correcting housing infestation or other insufficiency has been shown to improve outcomes in asthmatics or those with other respiratory illnesses. Because the screening and intervention were performed at the patient encounter level, they are not considered population risk assessments. Primary prevention takes place prior to the initial onset of a disease, and treatment of disease, also considered tertiary prevention, is to provide relief of symptoms where definitive treatment is not possible.

• The Urban Institute. Proven Health Interventions in which People without Medical Training Can Play a Key Role:

• Options for Faith- and Community-Based Organizations
Many factors affect health outcomes. Some are related to the quality of the care provided; others are due to patient compliance with care, their genetic predisposition to a certain disease or treatment. Another category of factors are termed social, psychological, and behavioral determinants of health. Each factor may be evaluated and interventions tailored to maximize outcomes.

Which of the following is considered a social determinant of health?

a) A patient does not do the physical therapy exercises recommended following knee replacement surgery.
b) A woman whose sister and mother both have the BRCA1 gene and developed breast cancer.
c) A patient who works as a delivery driver reports inconsistent seatbelt use and frequent use of his cell phone while driving in a truck which does not have hands-free calling capabilities.
d) Parents can’t afford to buy fresh fruits and vegetables for their three children, one of which has juvenile diabetes, so they consume mainly fast food.
e) A man with worsening diabetes and hypertension reports consuming six or more alcoholic drinks on most Friday and Saturday nights, and sometimes on Sunday afternoon.
a) A patient does not do the physical therapy exercises recommended following knee replacement surgery.

b) A woman whose sister and mother both have the BRCA1 gene and developed breast cancer.

c) A patient who works as a delivery driver reports inconsistent seatbelt use and frequent use of his cell phone while driving in a truck which does not have hands-free calling capabilities.

d) Parents can’t afford to buy fresh fruits and vegetables for their three children, one of which has juvenile diabetes, so they consume mainly fast food.

e) A man with worsening diabetes and hypertension reports consuming six or more alcoholic drinks on most Friday and Saturday nights, and sometimes on Sunday afternoon.

Explanation: Only answer D represents a social determinant of health, which the CDC defines as “conditions in the places where people live, learn, work, and play that affect a wide range of health risks and outcomes.” This example is a form food insecurity, and it can affect outcomes for conditions such as diabetes. The other examples include patient compliance, genetics and behaviors, although these need to be individually addressed as well to maximize health and health outcomes.

Learn more at https://sirenetwork.ucsf.edu/tools-resources.
A researcher in the United States has implemented methods to geocode and link patient addresses to neighborhood-level metrics, including data from the US Census. She wants to use the lowest level of geography available from the US Census. Which of the following does she choose?:

a) County  
b) Zip Code Tabulation Area (ZCTA)  
c) Census tract  
d) Census block group
a) County
b) Zip Code Tabulation Area (ZCTA)
c) Census tract

d) **Census block group**

**Explanation:** The US Census stores and shares data at various levels of geographic specificity. The census block group is the lowest level of geographic specificity that is shared with outside parties; the US Census generally does not share block-level data because, since it is so small, in areas with low populations individuals may be identifiable. Also, census blocks are not considered “stable” in that the boundaries change often. Therefore, the US Census Bureau generally shares data only at the next highest level, the Census block group.

**Citations:**


US Census Bureau [Internet]. Washington, DC: “Geographic Overview”. Available from: [https://www2.census.gov/geo/pdfs/reference/GARM/Ch2GARM.pdf](https://www2.census.gov/geo/pdfs/reference/GARM/Ch2GARM.pdf)
A health center located in the United States is interested in geocoding patient addresses in order to better support patient outreach and referral efforts, however, they have limited Information Technology expertise in-house to do this work. As such, they would like to contract with an external organization (also located in the United States) to perform this geocoding work for them. The external organization would receive the patient identifiers and addresses from the health center, geocode those addresses, then return the geocodes with the patient identifiers to the health center. They would not be doing any research with the data, only providing geocoding services. Which of the following is the most appropriate regulatory agreement for sharing patient addresses with this external entity?:

a) A business associate agreement (BAA)

b) A data use agreement (DUA)

c) A HIPAA agreement

d) A statement of work
MCQ #4 Answer

a) **A business associate agreement (BAA)**

b) A data use agreement (DUA)

c) A HIPAA agreement

d) A statement of work

**Explanation:** The third party organization will not be using the patient data for research. They will be handling PHI, but will only be providing a service to the researcher and not engaged in research themselves. Under HIPAA, “A ‘business associate’ is a person or entity, other than a member of the workforce of a covered entity, who performs functions or activities on behalf of, or provides certain services to, a covered entity that involve access by the business associate to protected health information. A ‘business associate’ also is a subcontractor that creates, receives, maintains, or transmits protected health information on behalf of another business associate.”

**Citation:**

AMIA is the professional home for more than 5,400 informatics professionals, representing frontline clinicians, researchers, public health experts and educators who bring meaning to data, manage information and generate new knowledge across the research and health care enterprise.
Thank you!

Email me at: puroj@ochin.org