Social Determinants of Health: Contributions to health equity and promising clinical interventions

Sarah Wiehe, MD, MPH

Nursing Leadership Forum
August 29, 2019
Overview

• Define (briefly) social determinants of health
• Review (briefly) the evidence of how the social determinants of health relate to health outcomes
• Recognize the disparities in social determinants of health as they relate to place and race/ethnicity as a primary driver of health inequity
• Discuss how social determinants of health is being addressed in a clinical setting and what is happening locally in this arena
“Social determinants of health is an abstract term, but for millions of Americans, it is a very tangible, frightening challenge: How can someone manage diabetes if they are constantly worrying about how they’re going to afford their meals each week? How can a mother with an asthmatic son really improve his health if it’s their living environment that’s driving his condition? This can feel like a frustrating, almost fruitless position for a healthcare provider, who understands what is driving the health conditions they’re trying to treat, who wants to help, but can’t simply write a prescription for healthy meals, a new home, or clean air.”

Alex M. Azar II, Secretary, Health and Human Services
November 14, 2018
Hatch Foundation for Civility and Solutions, Washington D.C.
Nurses poised to address social determinants of health and recognized as leaders in this emerging area.
DEFINITION: The social determinants of health are...

...the complex, integrated, and overlapping social structures and economic systems that are responsible for most health inequities. These social structures and economic systems include the social environment, physical environment, health services, and structural and societal factors. Social determinants of health are shaped by the distribution of money, power, and resources throughout local communities, nations, and the world.

So what are the social determinants of health?

• Life-enhancing resources, such as food supply, housing, economic and social relationships, transportation, education and health care, whose distribution across populations effectively determines length and quality of life.
EXAMPLES include...

**Economic Stability**
- Employment
- Food insecurity
- Housing instability
- Poverty

**Education**
- Early childhood education and development
- Enrollment in higher education
- High school graduation
- Language and literacy

**Social and Community Context**
- Civic participation
- Discrimination
- Incarceration
- Social cohesion

**Health and Health Care**
- Access to health care
- Access to primary care
- Health literacy

**Neighborhood and Built Environment**
- Access to healthy foods
- Crime and violence
- Environmental conditions
- Quality of housing

Healthy People 2020 Overarching Goals

• Attain high-quality, longer lives free of preventable disease, disability, injury, and premature death

• **Achieve health equity, eliminate disparities, and improve the health of all groups**

• **Create social and physical environments that promote good health for all**

• Promote quality of life, healthy development, and healthy behaviors across all life stages
WHY do they matter?

50% of health outcomes result from the social determinants of health.
The health impact pyramid

Social determinants of health co-occur

- Connectivity of SDOH mentions in a diabetes forum (among patient groups)
- Nearly every determinant had connectivity with the other 5

Bridging gaps to build healthy communities: Opportunities to better address social determinants to improve health. Anthem Public Policy Institute and Quid. May 2019.
Health and social care spending as a percent of GDP, 2011
Mismatch between drivers of health and spending

Federal activity relating to SDOH

1. Making Patients into Empowered Consumers
   - ONC – MyHealth-e Data
   - ACF – Workforce training
   - CCIIO – Plan Flexibilities
   - CMS – Medicaid Flexibility
   - HRSA – Federally Qualified Health Centers

2. Paying for Outcomes
   - CDO – September 2018 Integration Report
   - CMS – Medicaid Flexibility
   - OASH – NAM Convening
   - Deputy Secretary – Barriers
   - SIPPRA
   - CMMI – Accountable Health Communities
   - CMMI – Integrated Care for Kids (InCK) Model
   - CMS MA Part D Rule
   - CMS Call Letter

3. Making Providers into Accountable Navigators
   - SIPPRA Implementation (115th Congress Public Law 123)
   - Deputy Secretary – Addressing Barriers to Coordinated Care RFI
   - CMS (Medicare) – 2018 Part C Rule
   - Community Health Needs Assessment (CHNA)
   - CMMI – AHCs
   - ASPE – Social Risk Models RFI

4. Preventing Disease Before it Occurs or Progresses
   - CMS (Medicare) – April 2018 Call Letter and Clarifications
   - CMMI – Integrated Care for Kids (InCK) Model
   - CMMI – Accountable Health Communities
   - OASH – NAM Convening
   - OASH – Developing Healthy People 2030
   - CDO – Hackathon in Austin, Texas ??
   - OSG – RFI and 2019 Report
   - CMS – Medicaid Flexibility
   - CDC – HI-5
   - NIH – Precision Medicine Initiative
Related constructs: Differentiating social determinants and social needs

Why do social determinants of health matter?

• Housing insecurity linked to lead poisoning, respiratory conditions
• Food insecurity linked to hypertension, hyperlipidemia, overall poor physical and mental health
• Unemployment linked to overall poor health, heart disease, stroke

• Contributes to health equity!
County health rankings – a look at Indiana

Indiana county health determinants (blue) and health outcomes (green)
Lagged effects on county health outcomes rankings for 2012-2015 of increases in social services from 2008 to 2012

Regression effects adjusted for county’s health factors, population, state, and mean levels of expenditures; **p<0.05, ***p<0.01, ***p<0.001

Effects of health systems addressing social needs indicate success

• Montefiore: 300% ROI from social determinants investments

• Advocate Health Care (Chicago): enhanced nutrition care program including coupons for retail oral nutritional supplements → reduced healthcare costs by $3800/patient → $4.8 million in total savings and reduced readmission rates among target population

• UIC and Center for Housing and Health: referred homeless to the community agency and outreach worker to find stable housing → healthcare costs among participants fell 61% and ED utilization fell 35% and increased utilization of primary care

• MedStar Health and Denver Health Medical Center: transportation provided using ridesharing companies (e.g., Lyft, Uber)

What Montefiore’s 300% ROI from social determinants investments means for the future of other hospitals. 7/5/2018.  

Still a nascent field in terms of peer-reviewed research

- Recent review of the literature between 2000-2017 for US-based studies addressing at least 1 social or economic determinant of health and integrated within the medical care delivery system
  
  - Identified 67 studies of 37 programs
  
  - Wide variety in approaches and outcomes measured = most focused on the process (69%) or the determinant of health (48%) rather than health outcome (30%) or healthcare utilization cost (27%)
  
  - Findings related to health outcomes and/or healthcare utilization costs were mixed

Impact of social needs navigation on utilization

## Proportional change in total utilization

<table>
<thead>
<tr>
<th>Utilization by visit category</th>
<th>All patients ((n = 34,225))</th>
<th>Low-income area (^1) ((n = 4937))</th>
<th>Low-education area (^1) ((n = 3955))</th>
<th>Medicaid insurance ((n = 4059))</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Difference-in-differences estimate (95% CI)</td>
<td>(p) value</td>
<td>Difference-in-differences estimate (95% CI)</td>
<td>(p) value</td>
</tr>
<tr>
<td>Total utilization visit count</td>
<td>(-2.2% ((-4.5, 0.1)))</td>
<td>0.058</td>
<td>(-7.0% ((-11.9, -1.9)))</td>
<td>0.008</td>
</tr>
<tr>
<td>Within health system network total visit count</td>
<td>(-0.6% ((-3.5, 2.4)))</td>
<td>0.675</td>
<td>(-6.2% ((-10.4, -1.8)))</td>
<td>0.008</td>
</tr>
<tr>
<td>In-network emergency department visits</td>
<td>(-2.1% ((-6.5, 2.4)))</td>
<td>0.356</td>
<td>(-0.6% ((-6.7, 5.8)))</td>
<td>0.900</td>
</tr>
<tr>
<td>In-network inpatient visits</td>
<td>(-1.2% ((-6.2, 3.9)))</td>
<td>0.631</td>
<td>(-16.1% ((-22.9, -8.6)))</td>
<td>(&lt;)</td>
</tr>
<tr>
<td>In-network outpatient visits</td>
<td>(-2.1% ((-5.7, 6.0)))</td>
<td>0.356</td>
<td>(-3.6% ((-12.8, 6.7)))</td>
<td>0.500</td>
</tr>
<tr>
<td>Outside of network total visits</td>
<td>(-2.0% ((-6.8, 3.0)))</td>
<td>0.500</td>
<td>(-4.5% ((-15.9, 8.5)))</td>
<td>0.500</td>
</tr>
<tr>
<td>Out of network emergency department visits</td>
<td>1.8% ((-1.8, 5.6))</td>
<td>0.763</td>
<td>0.9% ((-9.4, 12.4))</td>
<td>0.900</td>
</tr>
<tr>
<td>Out of network inpatient visits</td>
<td>8.2% ((-2.5, 20.1))</td>
<td>0.500</td>
<td>(-5.5% ((-19.6, 11.1)))</td>
<td>0.500</td>
</tr>
<tr>
<td>Out of network outpatient visits</td>
<td>(-3.0% ((-10.6, 5.3)))</td>
<td>0.596</td>
<td>(-6.2% ((-24.0, 15.6)))</td>
<td>0.500</td>
</tr>
</tbody>
</table>

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Results from another social service referral program on change in total expenditures by patient subgroup

<table>
<thead>
<tr>
<th>Subgroups</th>
<th>n</th>
<th>12 months pre-referral Mean</th>
<th>12 months post-referral Mean</th>
<th>Change (post–pre) Mean diff.</th>
<th>Percent change (change/pre-referral)</th>
<th>SE</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Medicare Advantage</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All needs were met</td>
<td>740</td>
<td>$16,978</td>
<td>$18,652</td>
<td>$1674</td>
<td>9.8%</td>
<td>$950</td>
<td>0.08</td>
</tr>
<tr>
<td>No needs were met</td>
<td>905</td>
<td>$16,757</td>
<td>$17,842</td>
<td>$1085</td>
<td>6.5%</td>
<td>$1125</td>
<td>0.33</td>
</tr>
<tr>
<td>Between group difference</td>
<td>221</td>
<td>$221</td>
<td>$810</td>
<td>$589</td>
<td>3.3%</td>
<td>$1473</td>
<td>0.67</td>
</tr>
<tr>
<td><strong>Medicaid Managed Care</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All needs were met</td>
<td>781</td>
<td>$29,784</td>
<td>$23,130</td>
<td>$−6653</td>
<td>−22.3%</td>
<td>$1093</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>No needs were met</td>
<td>292</td>
<td>$19,140</td>
<td>$15,128</td>
<td>$−4012</td>
<td>−20.9%</td>
<td>$1435</td>
<td>0.005</td>
</tr>
<tr>
<td>Between group difference</td>
<td>10,644</td>
<td>$10,644</td>
<td>$8,002</td>
<td>$−2,641</td>
<td>−1.4%</td>
<td>$1804</td>
<td>0.14</td>
</tr>
<tr>
<td><strong>Identified as High Risk</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All needs were met</td>
<td>875</td>
<td>$31,050</td>
<td>$26,080</td>
<td>$−4,969</td>
<td>−16%</td>
<td>$876</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>No needs were met</td>
<td>518</td>
<td>$24,702</td>
<td>$22,867</td>
<td>$−1,835</td>
<td>−7.4%</td>
<td>$1572</td>
<td>0.24</td>
</tr>
<tr>
<td>Between group difference</td>
<td>$6347</td>
<td>$3213</td>
<td>$3134</td>
<td>−8.6%</td>
<td></td>
<td>$1893</td>
<td>0.10</td>
</tr>
<tr>
<td><strong>Not Identified as High Risk</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All needs were met</td>
<td>646</td>
<td>$13,400</td>
<td>$14,005</td>
<td>$605</td>
<td>−4.5%</td>
<td>$964</td>
<td>0.53</td>
</tr>
<tr>
<td>No needs were met</td>
<td>679</td>
<td>$11,720</td>
<td>$12,842</td>
<td>$1122</td>
<td>−9.5%</td>
<td>$1095</td>
<td>0.31</td>
</tr>
<tr>
<td>Between group difference</td>
<td>$1680</td>
<td>$1163</td>
<td>$516</td>
<td>−5.0%</td>
<td></td>
<td>$1459</td>
<td>0.72</td>
</tr>
</tbody>
</table>

*Mean and standard error (SE) were obtained from the generalized estimating equation model. Model adjusts for age, sex, race/ethnicity, state of residence, metropolitan status, and comorbidity.

How does this relate to health outcomes here?
OBJECTIVE:
To characterize the health outcomes and upstream health determinants of Indianapolis’ 99 community-defined neighborhoods and to inform communities to approach and with whom we could partner to improve health equity in Marion County and beyond.
Not uniform even within Marion County...
Team

Karen Comer The Polis Center
Joe Gibson Marion County Public Health Department
Troy Hege The Westvale Group
Brenda Hudson Indiana CTSI
Lauren Magee Doctoral student
Kristin Norris IUPUI Office of Community Engagement
Amanda Raftery Regenstrief Institute
Tess Weathers IUPUI Fairbanks School of Public Health
Sarah Wiehe Indiana CTSI
Vulnerability Indices

- Identified indices that reflect social determinants of health components based on the Kaiser Family Foundation rubric:

<table>
<thead>
<tr>
<th>Economic Stability</th>
<th>Neighborhood and Physical Environment</th>
<th>Education</th>
<th>Food</th>
<th>Community and Social Context</th>
<th>Health Care System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employment</td>
<td>Housing</td>
<td>Literacy</td>
<td>Hunger</td>
<td>Social integration</td>
<td>Health coverage</td>
</tr>
<tr>
<td>Income</td>
<td>Transportation</td>
<td>Language</td>
<td>Access to healthy options</td>
<td>Support systems</td>
<td></td>
</tr>
<tr>
<td>Expenses</td>
<td>Safety</td>
<td>Early childhood education</td>
<td>Social integration</td>
<td>Provider availability</td>
<td></td>
</tr>
<tr>
<td>Debt</td>
<td>Parks</td>
<td>Vocational training</td>
<td>Community engagement</td>
<td>Provider linguistic and cultural competency</td>
<td></td>
</tr>
<tr>
<td>Medical bills</td>
<td>Playgrounds</td>
<td>Higher education</td>
<td>Discrimination</td>
<td>Quality of care</td>
<td></td>
</tr>
<tr>
<td>Support</td>
<td>Walkability</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Health Outcomes: Mortality, Morbidity, Life Expectancy, Health Care Expenditures, Health Status, Functional Limitations
Vulnerability Indices

• Primary indices selected were:

<table>
<thead>
<tr>
<th>Kaiser Family Foundation domain</th>
<th>Social Vulnerability Index</th>
<th>GINI Coefficient</th>
<th>Dissimilarity Index</th>
<th>Healthcare Access</th>
<th>Crime Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECONOMIC STABILITY</td>
<td>employment, poverty/income</td>
<td>income inequality</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEIGHBORHOOD &amp; PHYSICAL ENVIRONMENT</td>
<td>housing, transportation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDUCATION</td>
<td>higher education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FOOD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMMUNITY &amp; SOCIAL CONTEXT</td>
<td>language, household</td>
<td>discrimination</td>
<td>property &amp; violent crime</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>composition, disability</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HEALTH CARE SYSTEM</td>
<td></td>
<td>uninsured</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Index of Neighborhood Change**: Change of neighborhood over time

Other more comprehensive indices to be included as time/resources allow: Child Opportunity Index, Index of Social Health, Health Equity Index, Segregation Index
Social vulnerability index

Data source: American Community Survey, 2015-2016
Health Measures

- Life Expectancy (Vital Records)
- Infant Mortality (Vital Records)

**Adult health behaviors and outcomes:**
- Smoking (INPC & MCPHD Survey)
- Obesity (INPC & MCPHD Survey)
- Asthma (INPC)
- Drug overdoses (EMS)
- Sexually transmitted infections (MCPHD)
- Type II diabetes (INPC)
- Cancer incidence (Cancer registry)
- Cancer mortality (Vital Records)
- Hypertension (INPC)
- Arthritis (INPC)
- Diabetes (INPC)
- Kidney disease/dialysis (INPC)
- Cardiovascular mortality (Vital records)
- Dementia/Alzheimer’s Disease (INPC)
- Mental health – self-reported (MCPHD Survey)
- Mental health diagnoses (INPC)
- Substance misuse diagnoses (INPC)
- Suicide attempts (INPC)
- Suicides (Vital records)
- Nonfatal shooting victims/homicides (INPC, vital records)

**Pediatric health behaviors and outcomes:**
- Obesity (INPC)
- Injury (INPC)
- Asthma (INPC)
- Lead exposure (MCPHD & INPC)
- Sexually transmitted infections (MCPHD)
- Mental health diagnoses (INPC)
- Substance misuse diagnoses (INPC)
- Drug overdoses (EMS)
- Suicide attempts (INPC)
- Suicides (Vital records)
- Nonfatal shooting victims/homicides (INPC, vital records)
Health Measures

• Mortality Rate under 40 years of age (Vital Records)

• Life expectancy at 40 years of age (Vital Records)

• Adult health information used in health calculation:
  • Diabetes diagnosis (INPC/IUH EDW)
  • Cancer diagnosis (INPC/IUH EDW)
  • Chronic Obstructive Pulmonary Disease diagnosis (INPC/IUH EDW)
  • Cardiovascular disease diagnosis (INPC/IUH EDW)

• Pediatric health information used in health calculation:
  • Asthma diagnosis (INPC/IUH EDW)
  • Lead level >5 mcg/dL (MCPHD & INPC/IUH EDW)
Criteria for neighborhood selection

1. Calculate composite health z score based on a weighted calculation of the following 4 items:
   a. Life expectancy over 40 years z score (weighted x 2)
   b. Mortality rate under 40 years z score (weighted x 2)
   c. Aggregate z scores of 2 child health conditions: asthma prevalence, lead exposure >5 mcg/dL
   d. Aggregate z scores of 4 adult health conditions: diabetes, cancer (all types), cardiovascular disease & COPD

2. Identify the 25 neighborhoods with the highest composite health z score

3. Of these 25 neighborhoods, remove neighborhood with a social vulnerability score < 0 (least vulnerable 50%)
Findings from environmental scan and next steps

Neighborhoods with high social vulnerability and poor health outcomes
What are strategies to address SDH?
## IOM recommends SDOH in the electronic health record

<table>
<thead>
<tr>
<th>DOMAIN/MEASURE</th>
<th>MEASURE</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol use</td>
<td>3 questions</td>
<td>Screen and follow up</td>
</tr>
<tr>
<td>Race and ethnicity</td>
<td>2 questions</td>
<td>At entry</td>
</tr>
<tr>
<td>Residential address</td>
<td>1 question (geocoded)</td>
<td>Verify every visit</td>
</tr>
<tr>
<td>Tobacco use &amp; exposure</td>
<td>2 questions</td>
<td>Screen and follow up</td>
</tr>
<tr>
<td>Census tract-median income</td>
<td>1 question (geocoded)</td>
<td>Update on address change</td>
</tr>
<tr>
<td>Depression</td>
<td>2 questions</td>
<td>Screen and follow up</td>
</tr>
<tr>
<td>Education</td>
<td>2 questions</td>
<td>At entry</td>
</tr>
<tr>
<td>Financial resource strain</td>
<td>1 question</td>
<td>Screen and follow up</td>
</tr>
<tr>
<td>Intimate partner violence</td>
<td>4 questions</td>
<td>Screen and follow up</td>
</tr>
<tr>
<td>Physical activity</td>
<td>2 questions</td>
<td>Screen and follow up</td>
</tr>
<tr>
<td>Social connections &amp; social isolation</td>
<td>4 questions</td>
<td>Screen and follow up</td>
</tr>
<tr>
<td>Stress</td>
<td>1 question</td>
<td>Screen and follow up</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Social need</th>
<th>Technique to address it</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing</td>
<td>• Assess home safety</td>
</tr>
<tr>
<td></td>
<td>• Connect individuals to housekeeping services</td>
</tr>
<tr>
<td></td>
<td>• Connect individuals to pest extermination services</td>
</tr>
<tr>
<td></td>
<td>• Connect individuals to appliance repair services</td>
</tr>
<tr>
<td></td>
<td>• Assist individuals with legal needs related to housing, such as housing code violations and utility shutoffs</td>
</tr>
<tr>
<td>Food</td>
<td>• Connect individuals to food supports, such as the Supplemental Nutrition Assistance Program, a food bank, the Women, Infants and Children Program, and Meals on Wheels</td>
</tr>
<tr>
<td></td>
<td>• Connect individuals to a home care agency that can prepare meals</td>
</tr>
<tr>
<td></td>
<td>• Provide prescriptions for healthy foods</td>
</tr>
<tr>
<td>Public benefits</td>
<td>• Help individuals apply for Medicaid and overturn wrongful denials</td>
</tr>
<tr>
<td></td>
<td>• Help individuals apply for Social Security Disability Insurance and Supplemental Security Income, and overturn wrongful denials</td>
</tr>
<tr>
<td></td>
<td>• Provide counseling on available public benefits</td>
</tr>
<tr>
<td>Employment</td>
<td>• Offer workshops to improve professional qualifications</td>
</tr>
<tr>
<td>Task</td>
<td>Tools</td>
</tr>
<tr>
<td>---------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------</td>
</tr>
<tr>
<td>Starting a cross-sector Collaboration</td>
<td>Building a Culture of Health [RWJF]</td>
</tr>
<tr>
<td></td>
<td>Community Pathways Hub: Quick Start Guide [AHRQ]</td>
</tr>
<tr>
<td></td>
<td>County Health Rankings and Roadmaps Action Center [CHR&amp;R]</td>
</tr>
<tr>
<td>Creating a Business Case to connect SDOH with healthcare costs</td>
<td>ROI of Addressing SDOH Calculator [Unite US]</td>
</tr>
<tr>
<td></td>
<td>ROI for Social Services Calculator [Commonwealth Fund]</td>
</tr>
<tr>
<td></td>
<td>ASTHO ROI Calculator [ASTHO]</td>
</tr>
<tr>
<td>Using Facilitated Networks to to Catalogue Community Resources and Track Referrals</td>
<td>Social Intervention Research and Evaluation Network [SIREN]</td>
</tr>
<tr>
<td></td>
<td>Program to Analyze, Record, and Track Networks to Enhance Relationships [PARTNER]</td>
</tr>
<tr>
<td></td>
<td>Partnership Assessment Tool for Health [PATH]</td>
</tr>
<tr>
<td>Crafting and disseminating a message to appeal to potential stakeholders</td>
<td>Community Toolbox [Toolkits]</td>
</tr>
<tr>
<td></td>
<td>Practical Playbook [deBeaumont] or Navigating the Dissemination of New Findings [AboutHealth]</td>
</tr>
<tr>
<td></td>
<td>Prepare Workshop [Health Leads Social Needs 101] or A New Way to Talk about SDOH [RWJF]</td>
</tr>
<tr>
<td>Selecting and adapting SDOH strategy</td>
<td>SDOH A Quick Reference Guide for Planners [ASTHO]</td>
</tr>
<tr>
<td></td>
<td>Communities Joined in Action [CJIA]</td>
</tr>
<tr>
<td></td>
<td>Health Begins or Dissemination and Implementation Models [D&amp;I.org]</td>
</tr>
<tr>
<td>Identifying Evidence-based Strategies and Interventions</td>
<td>PolicyLink</td>
</tr>
<tr>
<td></td>
<td>What Works for Health [WW4H and CHR&amp;R]</td>
</tr>
<tr>
<td></td>
<td>AVIA or Advisory Board</td>
</tr>
<tr>
<td>Financing Models for SDOH</td>
<td>Community Benefit Insight [CACHE] or Bridging for Health [GHPC]</td>
</tr>
<tr>
<td></td>
<td>Financing Models to Promote Health and Social Service Integration [Center for Healthcare Strategies]</td>
</tr>
<tr>
<td></td>
<td>Emerging Financial Vehicles and Payment Mechanism [CDC Health Policy Series] or Investing in Social Services for Health</td>
</tr>
<tr>
<td>Visualizing Connection between SDOH and Outcomes</td>
<td>Broadstreet Health or Community Commons</td>
</tr>
<tr>
<td></td>
<td>PolicyMap - Opportunity Index or Community Need Index</td>
</tr>
<tr>
<td></td>
<td>RWJF Data Across Sectors for Health [AllinData or DASH]</td>
</tr>
<tr>
<td>Leveraging Existing Resources to Expand Community Capacity</td>
<td>211</td>
</tr>
<tr>
<td></td>
<td>100 Million Lives - Moving Healthcare Upstream - Plan4Health - Build Healthy Places</td>
</tr>
<tr>
<td></td>
<td>Anchor Mission Playbook [Anchor Mission Network] or Asset-based Community Development [ABCD]</td>
</tr>
</tbody>
</table>
Some local examples...
In 2017:

- The US’ Infant Mortality was 5.8 per 1,000 births
- Indiana’s Infant Mortality was 7.3 per 1,000 births
- African-American infants are 2.6 times more likely to die than White infants in Indiana
- Of the 602 Indiana infant deaths, 170 in the Central Region
In these 6 zip codes in Marion County, 41 babies (on average) die each year; Almost one baby per week.

988 zip codes in Indiana have the highest infant mortality rate; 6 are in Marion County.

### Infant Mortality Rates by Zip Code

<table>
<thead>
<tr>
<th>Zip Code</th>
<th>County</th>
<th>Births</th>
<th>Deaths</th>
<th>Infant Mortality Rate (IMR)</th>
<th>White IMR</th>
<th>Black IMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>46312</td>
<td>Lake</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>46953</td>
<td>Grant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>46806</td>
<td>Allen</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>46324</td>
<td>Lake</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>46226</td>
<td>Marion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>46229</td>
<td>Marion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>46218</td>
<td>Marion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>47302</td>
<td>Delaware</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>46205</td>
<td>Marion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>46805</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>46203</td>
<td>Marion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>46201</td>
<td>Marion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>47374</td>
<td>Wayne</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Black babies 2-4 times more likely to die than White babies.
WeCare: Impact on risk factors for infant mortality and birth outcomes in Central Indiana (PI: Litzelman)

- **Health Coaching**: Community Health Workers hired from the local community

- **Tailored mHealth educational messaging** for the 5 targeted indicators
  - Social Determinants of Health: The Basics (food, housing, heat)
  - Bi-directional secure messaging system; dashboard for data capture

- **WeCare Plus**
  - Adds fathers and first responders
  - Expands We Care to include other FQHCs in Marion Co.
Current sites

Current WeCare clinic locations
1. Raphael HC
2. EH Blackburn
3. EH Cottage Corner
4. EH Forest Manor
5. EH North Arlington
6. EH Westside
7. EH Pecar
8. EH West 38th Street
9. EH Grassy Creek
10. EH Outpatient Care Clinic

Additional locations
1. HN West
2. HN Martindale
3. EH Women’s Center

- top 6 highest risk zip codes
- next 7 highest risk zip codes
Total number of participants: 1775

Data as of 12/31/2018

Study Participants: Demographics

Age
- <18: 4%
- >35: 9%
- 18-25: 26%
- 26-30: 46%

Race
- White: 56%
- Black: 16%
- Hispanic: 13%

Campaign
- Pregnant: 86%
- Postpartum: 8%
- Childbearing Age: 5%

Health Centers
- Eskenazi: 49%
- HealthNet: 36%
- Raphael: 15%
- Shepherd: 1%

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- Childbearing Age: 5%

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- Eskenazi: 49%
- HealthNet: 36%
- Raphael: 15%
- Shepherd: 1%
Health behaviors (baseline vs. current)

- **Nutrition**: (122/134) fewer skipped meals in last week (9%)

- **WIC**: (600/762) Eligible enrolled in WIC (79%)

- **Safe Sleep**: (1528/1734) more sleeping on back (21%), (1403/1760) more sleeping alone (20%)
Health behaviors (baseline vs. current)

**Smoking**
(299/309) reduction/cessation
(4%)

**Substance Abuse**
(221/235) reduction/cessation
(6%)

**Mental Health + PHQ-9/GAD-7**
(206/274) improvement
(25%)
Impact on infant mortality rates in Marion County

<table>
<thead>
<tr>
<th></th>
<th>All IMR</th>
<th>White IMR</th>
<th>Black IMR</th>
<th>LBW** (&lt;2500 G)</th>
</tr>
</thead>
<tbody>
<tr>
<td>State*</td>
<td>7.5</td>
<td>6.4</td>
<td>14.4</td>
<td>8.2%</td>
</tr>
<tr>
<td>Central Region*</td>
<td>7.4</td>
<td>5.5</td>
<td>14.3</td>
<td>8.1%</td>
</tr>
<tr>
<td>Marion County*</td>
<td>8.7</td>
<td>5.6</td>
<td>14.4</td>
<td>9.2%</td>
</tr>
<tr>
<td>WeCare</td>
<td>5.8</td>
<td>2.7</td>
<td>8.1</td>
<td>12.8%</td>
</tr>
</tbody>
</table>

*Source: 2016 ISDH Infant Mortality Rate and LBW Data **Low Birth Weight
Improving Infant Mortality Through Social Determinants of Health
Kohl’s Caring for Our Kids (PI: Swigonski)

• Ivy Tech providing CDA training
• Developmentally appropriate toys
• Enhance early brain development
• Parents can go back to school

• United Way improve the buildings that house child care
• First Responders awareness

• BOI provides business planning & access to loans
• More businesses in community
• Child Care providers can earn a more as they move up the PTQ
• Parents can go to work

• Hub for parenting info & social interaction
• Connects families to services
• Connects care providers to services

• Infants safe environment and safe sleep is modeled
• If families have a safe place for their babies, they can go to work or school. They are more likely to space their pregnancies, lowering the risk for preterm birth
Association between receipt of wraparound services and various patient factors with use of health care in the following year

<table>
<thead>
<tr>
<th></th>
<th>Hospitalizations</th>
<th>ED visits</th>
<th>Nonemergent ED visits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receipt of any wraparound service in prior year</td>
<td>–0.07****</td>
<td>–0.05****</td>
<td>–0.04*</td>
</tr>
<tr>
<td>Severity score</td>
<td>0.66****</td>
<td>0.52****</td>
<td>0.49****</td>
</tr>
<tr>
<td>Mean annual utilization</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outpatient visits</td>
<td>0.01****</td>
<td>0.01****</td>
<td>0.01****</td>
</tr>
<tr>
<td>Specialist visits</td>
<td>0.03****</td>
<td>0.01***</td>
<td>0.01</td>
</tr>
<tr>
<td>Emergency department visits</td>
<td>0.01****</td>
<td>—†</td>
<td>—†</td>
</tr>
<tr>
<td>Hospitalizations</td>
<td>—†</td>
<td>0.03****</td>
<td>0.01</td>
</tr>
</tbody>
</table>

* p < 0.10  ** p < 0.05  *** p < 0.01  **** p < 0.001

Monon Collaborative work

A singular, neutrally-managed utility model based on aligned and shared investment and service delivery would be far better than the alternative

- **Agency 1 – Unite Us**
  - United Way
  - FSSA
  - IU Health
  - Community Health Network
  - One platform
  - More holistic view of the SDOH space
  - Better insights for CBOs and individuals
  - Lower Cost per Sponsor
  - One platform per CBO

- **Agency 2 - NowPow**
  - United Way
  - Community Health Network
  - IU Health
  - Anthem/MCEs
  - Multiple platforms
  - Institutional view of the SDOH space
  - Limited view for CBOs and individuals
  - Higher cost per sponsor
  - Multiple platforms (burden) per CBO

- **Agency 3 - Aunt Bertha**
Assessment of a community resource referral intervention

TABLE 2—Estimated Intervention Effects (Intervention Group Minus Control Group) on Mean Short Form-12 Mental Component Score and Physical Component Score at 1 Week, 1 Month, and 3 Months: Chicago, IL, December 2015–December 2016

<table>
<thead>
<tr>
<th></th>
<th>Model 1, b (95% CI)</th>
<th>Model 2, b (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mental component score</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 wk</td>
<td>0.25 (1.65, 2.13)</td>
<td>0.18 (-1.73, 2.08)</td>
</tr>
<tr>
<td>1 mo</td>
<td>-0.07 (-2.01, 1.87)</td>
<td>-0.17 (-2.10, 1.76)</td>
</tr>
<tr>
<td>3 mo</td>
<td>-0.98 (-2.99, 1.02)</td>
<td>-1.03 (-3.02, 0.96)</td>
</tr>
<tr>
<td>Overall</td>
<td>-0.27 (-1.82, 1.29)</td>
<td>-0.34 (-1.89, 1.21)</td>
</tr>
<tr>
<td>Physical component score</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 wk</td>
<td>-0.58 (-2.07, 0.91)</td>
<td>-0.34 (-1.83, 1.16)</td>
</tr>
<tr>
<td>1 mo</td>
<td>0.25 (-1.32, 1.82)</td>
<td>0.46 (-1.10, 2.02)</td>
</tr>
<tr>
<td>3 mo</td>
<td>0.40 (-1.18, 1.99)</td>
<td>0.59 (-0.98, 2.16)</td>
</tr>
<tr>
<td>Overall</td>
<td>0.02 (-1.17, 1.22)</td>
<td>0.24 (-0.95, 1.43)</td>
</tr>
</tbody>
</table>

Note. CI = confidence interval. Based on mixed effects linear regression models including data from all completed follow-up time points. Model 1 was adjusted for baseline mental or physical component score, location where the intervention was received (primary care clinic or emergency department), age (decades), gender, education, race, and ethnicity.

Free Athletic Equipment
Offered by: Youth Sports Help

Resource Description
This group gives free sports gear to kids who want to play sports. You can get baseball gloves, tennis rackets, or other sports equipment. This program can help if your child or a child in your care wants to join youth sports and cannot afford the equipment.

Target Population: Low income families, families with children

Eligibility:
1. Your child must qualify for the Free Lunch Program at school
2. Each of your children is only allowed to take a piece of equipment once a year

Referral Needed? No

How to Access this Service:
Go to 165 Center Street in Jamaica Plain on Saturday between 10:00 am and 5:00 pm
Once there, tell an employee what sport you need equipment for -- like baseball or hockey. They will help make sure your child gets the right size.

Materials to Bring: Materials to bring: You need to bring something that shows a youth sports league is about to have sign-ups, like a flyer or brochure. Anything that shows the date of the sign-ups will help.

(617) 872-3060, (773) 555-5555
Website

165 Center Street
Jamaica Plain, MA 02130

Directions: Car / Transit

Hours of Operation: Saturday 10:00 am - 5:00 pm

Languages Spoken: English

Contact Instructions: Call within hours of operation

Transportation: Take the Orange Line to Green Street

Other Notes: Your child has to sign-up for the sport that you said they would. The group does check if your child actually joined the sport.

Internal Notes: You might want to recommend families for year-round sports programs through the Park District or after-school programs.
Bottom line

• Social determinants of health are...
  • life-enhancing resources, such as food supply, housing, economic and social relationships, transportation, education and health care, whose distribution across populations effectively determines length and quality of life
  • unequally distributed by income, race/ethnicity, and geography and contribute to health equity
  • highly correlated with nearly every health indicator

• Interventions addressing social determinants are showing promising results in terms of increased connections to social services, decreased healthcare costs, and improved health outcomes

• Lots going on here in Indiana so join in the effort (and let me know if you need pointers on how to do so!)
Questions?

Contact info:
Sarah Wiehe, MD, MPH
317.278.0552
swiehe@iu.edu