Community-Based Population Health Research: A Report from the Field

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1889 Jefferson Center  
for Population Health
Learning Objectives

• Describe two innovative models for population health research centers

• List three benefits of partnering with a University when establishing a population health center

• Characterize challenges associated with the development of community-engaged and health system embedded, population health research centers
Population Health and the Learning Health Approach

Knowing

• Characterizing the groups of people we serve

Learning

• What are the needs of our populations?
• What are the recommended best practices for addressing health, wellness, and prevention?

Doing

• Developing relevant strategies and interventions to improve the quality of care and outcomes for our populations in partnership with health care consumers, communities, providers, health care organizations, payers and others

Learning some more

• Assessing what is working, why it is working, what didn’t work and how to remove barriers to success...refine and continue the work
Who are we?

Main Line Health Center for Population Health Research

1889 Jefferson Center for Population Health
Conemaugh Health System (CHS) established a philanthropic arm – Conemaugh Health Foundation

Duke LifePoint Healthcare acquired CHS – became for-profit

Executive Director hired, opened the 1889 Jefferson Center for Population Health

1889 Foundation announced partnership and 5-year commitment of $7.5M to Thomas Jefferson University to establish 1889 Jefferson Center for Population Health

- Selected team
- 120+ community interviews
- Hub for PA PUBH 3.0

- Strategic plan
- RFP

- Foundation received $110M from hospital sale
- Became independent Community Health & Wellness Foundation
- Renamed 1889 Foundation, Inc.
Priorities

- Diabetes
- Obesity & inactivity
- Tobacco (drug & alcohol)
- Mental Health
Strategic Direction

Community

- Physical & Mental Health Orgs.
- Grassroots Coalitions
- Government
- Economic Development
- Nonprofits
- Education
- Businesses
- Transportation

Healthy Communities
### County Demographics 2016

<table>
<thead>
<tr>
<th>Variable</th>
<th>Cambria</th>
<th>Somerset</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>134,700</td>
<td>75,000</td>
</tr>
<tr>
<td>Male</td>
<td>49%</td>
<td>52%</td>
</tr>
<tr>
<td>Female</td>
<td>51%</td>
<td>48%</td>
</tr>
<tr>
<td>% Poverty</td>
<td>15.6%</td>
<td>14.1%</td>
</tr>
<tr>
<td>Median Income</td>
<td>$43,614</td>
<td>$43,938</td>
</tr>
<tr>
<td>Population Density sq/mile</td>
<td>200</td>
<td>70</td>
</tr>
<tr>
<td>Health Systems</td>
<td>3 for-profit</td>
<td>1 nonprofit</td>
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</table>

https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk
https://www.census.gov/data/tools/demo/saipe/saipe.html?s_appName=saipe&map_yearSelector=2016&map_geoSelector=aa_c&s_state=42&s_county=42021,42111&menu=grid_proxy
What are we doing at 1889 Jefferson?
Mountains we are climbing 1889 Jefferson

• Partnerships with community organizations
  • For-profit hospital
• Transforming silos to collaboration—changing culture and territorial conflicts
• ‘Kid in the candy shop’ syndrome—selecting the focus
• Staffing challenges
• External matching funds to 1889 Foundation funding
• Frequent target of funding requests
• Focus: data vs. community story
About our Health System – Main Line Health

- Founded in 1985, Main Line Health® is a not-for-profit health system serving portions of Philadelphia and its western suburbs.

- Four of the region’s most respected acute care hospitals—Lankenau Medical Center, Bryn Mawr Hospital, Paoli Hospital and Riddle Hospital

- Bryn Mawr Rehabilitation Hospital

- Mirmont Treatment Center for drug and alcohol recovery

- Main Line Health Centers including primary care doctors, specialists, laboratory, radiology, rehabilitation and other outpatient services

- Lankenau Institute for Medical Research, a non-profit biomedical research organization
The Center for Population Health Research in the Main Line Health System

- Represents a Partnership with Jefferson College of Population Health
- Joint steering committee of Main Line Health executive leadership and Jefferson leadership
- Significant study prior to the development of the center by an outside consultancy
- Dr. Norma Padron, Associate Director 2016
- Dr. Sharon Larson, Executive Director 2017
LMC Social Needs Survey: Taking Care of Home

MLH Acute Hospital

Difficulty with Taking Care of Home

- 16.2% -- UW-19151
- 16.7% -- Other
- 18.5% -- Suburban-LP
- 29.6% -- Other Phila County
- 30.9% -- UW-19131
- 34.6% -- UW-19139
- 40.7% -- UW-Other

Source: LMC Social Needs Survey V1 9-21-15
LMC Social Needs Survey: Personal Stress
MLH Acute Hospital

Difficulty with Personal Stress

- 38.6% -- UW-19131 & 19151
- 42.3% -- UW-Other
- 42.9% -- Suburban-LP
- 44.8% -- Other
- 53.6% -- Other Phila County
- 57.7% -- UW-19139

Source: LMC Social Needs Survey
V1 8-21-15
What are we doing at Main Line CPHR?

- Harm reduction among opioid substance abusers
- Depression care pathways
- Human trafficking— a project developed by a group of nurse residents
- Emergency department utilization
- Women’s heart health
- Cancer and the value of care coordination
- Promoting health professions among under represented minority students
- Building partnerships with clinicians and clinical departments
Mountains we are climbing CPHR

- New tools for research
- Identifying the silos and potential partners
- Partnerships with the clinical enterprise
- Data access
- Data development
- ‘Kid in the candy shop’ syndrome—Figuring out the questions
- Staffing
- Funding—internal and external
Meeting Challenges Through Population Health Science

Main Line Health Center for Population Health Research

1889 Jefferson Center for Population Health
Identifying Health Priorities

• Publically-reported disease prevalence data

• Community Health Needs Assessments

• Stakeholder engagement

• Priorities of average community residents?
Identifying Health Priorities

• Assess community-reported health priorities to inform our strategic plan
  • Surveys?
  • Focus groups?
  • Free Listing Interviews
    • Qualitative research method
    • Relatively easy to conduct, low response burden
    • Analysis less time-consuming than focus group, less extraneous data
    • Limitations: interpretation bias, response bias, selection bias, assumption that order of terms matters
Identifying Health Priorities

• Using Free Listing Interviews to Assess Community-Reported Health Priorities (n = 98)

- List the things that improve your health
- List the health problems that affect you
- List the things that make it hard for you to stay healthy

• Demographic data:
  - Year of birth
  - Gender
  - Race
  - Zip code
  - Health insurance status

• Analysis:
  - Group terms \( \rightarrow \) Domains
  - Saliency index

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s_j = \frac{l}{n} \left( \frac{r_j}{l} \right)
\]

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s_j = \frac{nr_j}{nl}
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Identifying Health Priorities

Salient Factors that Improve Health in adults under 65 versus 65+

ADULTS 18 to 64
- Sleep & Rest
- Exercise & Physical Activity
- Eating Healthy Food
- Healthcare & Health Services
- Smoking Cessation
- Stress Reduction & Relaxation

ADULTS 65+
- Medications & Medical Devices
Identifying Health Priorities

Salient Health Problems in adults under 65 versus 65+

**ADULTS 18 to 64**
- Weight, Activity, & Dietary Concerns
- Smoking
- Cancer
- Mental Health Conditions
  - Anxiety
- Asthma & Lung Disease
- Allergies

**ADULTS 65+**
- Cardiovascular Disease
- Spine & Joint Disease
- Diabetes
Salient Barriers to Health in adults under 65 versus 65+

- **ADULTS 18 to 64**
  - Weight, Activity, & Dietary Concerns
  - Occupational Concerns
  - Time constraints
  - Stress & Fatigue
  - Financial Constraints
  - Barriers to Healthcare
  - Smoking Cessation

- **ADULTS 65+**
  - Aging

- **Lack of Motivation**
Interim Summary

• Assessment of community-reported health priorities is important for informing a strategic plan
  • Focus future health interventions to address community needs and wants
  • Tailoring interventions to community preferences
  • Community buy-in
Leveraging large datasets for population health

- Population health dashboard
- Applications to understand social determinants of health and ED utilization
CPHR—Research and Data Products

Background:

- A strong system-wide agenda to address disparities
- The MLHS 2013 and 2015 CHNAs for each hospital
- 2015 Social Needs Survey
- Diversity, Respect and Inclusion Agenda

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Publicly Available Data Assets

- United States Census Bureau: N= 4,040,000
- Public Health Management Corporation: N= 13,300
- Centers for Disease Control and Prevention: N= 3,530,570
- County Health Rankings: County-Level
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Clinical Data Assets
- Main Line Health
How can publicly available data assets be aggregated and maintained a resource across the system?

Who would the users be?

What questions are relevant and to what groups across the system?
Our Process

Data gathering (csv, shp)

Data cleaning & Analysis

Prototype tool

Knowledge repositories

Aggregating Data and iterating design

Summarizing all relevant information

Prototypes, Interactive Visualizations

All-team access, lessons learned shared Reuse, reuse, reuse
Population Health Dashboard

Select one of these tabs:
- Interactive map
- Additional information Definitions and Evidence
  - Base from Academic Literature
  - View only zip codes whose income is in the selected range

Select one factor:
- Diabetes rate (%) - PHMC

Median household income in each county ($) :
- 14,807
- 219,228

Definition
Source: Public Health Management Corporation (2014-2016)
Percentage of respondents who answered “YES” to the following question: “Have you EVER been told by a doctor or other health professional that you have or had diabetes?”

Any relationship with cardiovascular diseases?
About half of all Americans (47%) have at least one of the three key risk factors for heart disease: high blood pressure, high cholesterol, and smoking. Here is an interesting article.

A large body of epidemiological and pathological data documents that diabetes is an independent risk factor for Cardiovascular Disease in both men and women.

Read more about it here.

Additional tabs for more details:
- About CPHR at MLHS
- FAQs
- Browse Data
- Help

https://cphratlimr.shinyapps.io/CPHR_PopulationHealthDashboard/
Population Health Dashboard

Legend. Colors may represent quintiles, bins or categories

Regions where MLH operates

Main Line Health Hospitals and centers

19002, Montgomery

County Health Ranking (RWJF) - Of 67
Health outcomes: 3
Health Factors: 1
Length of Life: 4
Clinical Care: 1
Soc-Eco factors: 1
Physical Environment: 22

Other factors
Total population (2014): 33,187
Median Household Income: $52,922
Unemployment rate (%): 9

RWJF Health scores for each county

When you select a Social determinant of health, this information changes

Planning Districts from Philadelphia Community Health Assessment

https://cphratlimr.shinyapps.io/CPHR_PopulationHealthDashboard/
Geographic Variation and Emergency Department Utilization in Southeastern Pennsylvania

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Saema Adeeb
Jennifer B. Mason

January 2018

Main Line Health
Center for Population Health Research
at the Lankenau Institute for Medical Research

100 East Lancaster Avenue, Wynnewood, Pennsylvania
Total SEPA ED Visits by County, 2012-2015

<table>
<thead>
<tr>
<th></th>
<th>Bucks</th>
<th>Chester</th>
<th>Delaware</th>
<th>Montgomery</th>
<th>Philadelphia</th>
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<tr>
<td>Visits to ED (2013-2014)</td>
<td>194,121</td>
<td>153,169</td>
<td>202,578</td>
<td>348,312</td>
<td>1,018,263</td>
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<tr>
<td>Visits to ED (2012-2013)</td>
<td>196,242</td>
<td>156,188</td>
<td>194,041</td>
<td>352,482</td>
<td>1,045,021</td>
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</tbody>
</table>

Data aggregated from PA Department of Health, Annual Hospital Questionnaire (2014-2015) [14]
Final Comments

- Models like ours at CPHR at other health systems and organizations
- Huge opportunities for multi-sectoral collaborations
- Need remains to disseminate lessons learned and iterate to design best practices to different settings