Value-Based Health Care and the Role of Population Health Research

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Introductions
  A little bit about me
  The MLHS Center for Population Health Research at LIMR

Value-Based Health Care
  What we know about the determinants of health

The Role of Population Health Research to Achieve Value-Based Health Care
It is spring in McAllen, Texas. The morning sun is warm. The streets are lined with palm trees and pickup trucks. McAllen is in Hidalgo County, which has the lowest household income in the country, but it’s a border town, and a thriving foreign-trade zone has kept the unemployment rate below ten per cent. McAllen calls itself the Square Dance Capital of the World. “Lonesome Dove” was set around here.
Median Household Income ($)

- $14,897 - $ 47,722
- $47,722 - $ 65,769
- $65,769 - $ 77,491
- $77,491 - $
- 95,337
- $95,337 - $219,228
- Missing data
Our Mission

To advance the understanding of the fundamental domains of population health by being a research and education partner to Main Line Health to inform and assess initiatives to improve the health status and wellbeing in the communities we serve.
Value-Based Health Care
Value-Based Health Care

The core purpose of health care is value for patients.
Value-Based Health Care

Value in health care remains largely unmeasured and misunderstood.
Value of HC = Health Outcomes / Cost of HC
Value of HC = \frac{\text{Health Outcomes}}{\text{Cost of HC}}

The most powerful single lever for reducing cost is improving outcomes
$H = G + E + S + B$

Over 2400 Genome-wide Association Studies (GWAS)

Genome Variants

Environment Socioeconomics Healthcare

Behavior
$H = G + E + S + B$

Genome Variants

Environment Socioeconomics Healthcare

Geological Climate Pollution Epidemiological
Built Environment Behavior's
Immunizations
Fluoridation of Drinking Water
Control of Infectious Diseases
H = G + E + S + B

Genome Variants
Environment Socioeconomics Healthcare

Type 2 Diabetes
Heart Disease
Obesity
Life Expectancy

Behavior
Life expectancy vs. health expenditure over time (1970-2014)

Health spending measures the consumption of health care goods and services, including personal health care (curative care, rehabilitative care, long-term care, ancillary services and medical goods) and collective services (prevention and public health services as well as health administration), but excluding spending on investments. Shown is total health expenditure (financed by public and private sources).

Source: Kaiser Family Foundation analysis of National Health Expenditure (NHE) data from Centers for Medicare and Medicaid Services, Office of the Actuary, National Health Statistics Group

Peterson-Kaiser Health System Tracker
Selected Consumer Goods and Services

Value of HC = \frac{\text{Health Outcomes}}{\text{Cost of HC}}
Cost of HC = \sum_{\text{Episode}} P_i \times S_i

Since we cannot change prices easily we focus on distribution of services \((S_i)\) to achieve the outcomes of the “triple aim”.
Data & Tech Infrastructure
Care Model Redesign
Payment & Delivery

The Role of Population Health Research
The Role of Population Health Research

Genome Variants

Environment

Socioeconomics

Healthcare

Behavior

\[ H = G + E + S + B + HC \]
The Role of Population Health Research

Research Values for the Redesign of Data & Technology Infrastructure
Data & Technology Infrastructure

Hyperlocal
Interoperable | Multisectoral
Knowledge Asset Management
Longitudinal
Select one of these tabs

- Interactive map
- View only zip codes whose income is in the selected range
- Additional information Definitions and Evidence Base from Academic Literature

Select one factor

Median household income in each county (€):

14,897

Additional tabs for more details

- cphratlimr.shinyapps.io/population_health/
### Aggregated Data sources

<table>
<thead>
<tr>
<th>U.S. Census 2014</th>
</tr>
</thead>
</table>
| **Demographics**
  - Age, sex, density |
| **Economics**
  - Household income
  - Poverty level
  - Unemployment |
| **Education**
  - High school and college graduates |
| **Health insurance**
  - Uninsured people |
| **N= 4,040,000 respondents**
**On a zip code level** |

<table>
<thead>
<tr>
<th>Public Health Management Corporation 2014-2016</th>
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</thead>
</table>
| **Health**
  - Diabetes rate
  - Obesity
  - Hypertension
  - Mental health |
| **Behaviors**
  - Smoking
  - Fast food meals |
| **Built environment**
  - Access to parks |
| **N= 13,300 respondents**
**On an individual level** |

<table>
<thead>
<tr>
<th>Centers for Disease Control and Prevention 2013</th>
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</table>
| **Health**
  - Diabetes rate
  - Obesity |
| **Behaviors**
  - Leisure time, Physical inactivity |

<table>
<thead>
<tr>
<th>County Health Rankings 2015</th>
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</thead>
</table>
| **Health rankings**
  - Health outcomes
  - Health factors
  - Length of life
  - Clinical Care
  - Socio-Economic factors
  - Physical Environment |
| **Health scores**
**On a county level** |

*Note: The data sources and their respective categories are related to public health and demographics, with a focus on various health indicators such as diabetes rate, obesity, hypertension, and mental health. The data is collected at different levels: zip code, individual, and county.*
The Role of Population Health Research

T-2years

Care Model Redesign
Alternative Payments & Patients’ Perspective

Payment & Delivery Innovation
What’s Next for Population Health Research and Value-Based Health Care?
A closer look at the Delema G. Deaver Wellness Garden at Lankenau Medical Center
### Related topics

| Rank | Topic                                                                 | Rising  
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<thead>
<tr>
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<tbody>
<tr>
<td>1</td>
<td>Analytics - Topic</td>
<td>+2,200%</td>
</tr>
<tr>
<td>2</td>
<td>Accountable care organization - Topic</td>
<td>+550%</td>
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<tr>
<td>3</td>
<td>Mean - Topic</td>
<td>+250%</td>
</tr>
<tr>
<td>4</td>
<td>Patient Protection and Affordable Care Act - ...</td>
<td>+250%</td>
</tr>
<tr>
<td>5</td>
<td>World Health Day - Celebration</td>
<td>+180%</td>
</tr>
</tbody>
</table>

### Related queries

| Rank | Query                                                      | Rising  
<table>
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<tbody>
<tr>
<td>1</td>
<td>triple aim</td>
<td>Breakout</td>
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<tr>
<td>2</td>
<td>evolent health</td>
<td>Breakout</td>
</tr>
<tr>
<td>3</td>
<td>population health congress 2015</td>
<td>Breakout</td>
</tr>
<tr>
<td>4</td>
<td>aco</td>
<td>+1,100%</td>
</tr>
<tr>
<td>5</td>
<td>population health analytics</td>
<td>+750%</td>
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