Using Data Analytics to Manage Population Health Services

April 10, 2015
Scott W. Goodspeed, DHA, FACHE
Agenda

I. Analytics and Publically Available Data to Manage Population Health: CDC and CHIS

II. Analytics and Claims Data to Manage Population Health

III. Hot Spotting with Claims Data: Camden Coalition of Healthcare Providers Case Study

IV. Chronic Illness and Population Health Priorities

V. Action Planning and Next Steps
• On March 10, 2015 the CDC released the updated Community Health Status Indicators (CHSI) online tool that produces public health profiles for all 3,143 counties in the United States.
• Each profile includes key indicators of health outcomes, which describes the population health status of a county and factors that have the potential to influence health outcomes, such as health care access and quality, health behaviors, social factors, and the physical environment.
• The online application includes updated peer county groups, health status indicators, a summary comparison page, and U.S. Census tract data and indicators for sub-populations (age groups, sex, and race/ethnicity) to identify potential health disparities.

• In this new version of CHSI, all indicators are benchmarked against those of peer counties, the median of all U.S. counties, and Healthy People 2020 targets.
Organizations conducting community health assessments can use CHSI data to:

- Assess community health status and identify disparities;
- Promote a shared understanding of the wide range of factors that can influence health; and
- Mobilize multi-sector partnerships to work together to improve population health.

To access CHSI, visit [http://wwwn.cdc.gov/communityhealth](http://wwwn.cdc.gov/communityhealth)
The indicator initiatives reviewed included, but were not limited to, the following:

- **The County Health Rankings and Roadmaps** (www.countyhealthrankings.org)
- **United Health Foundation’s America’s Health Rankings** (www.americashealthrankings.org)
- **State of the USA Health Indicators** (www.stateoftheusa.org)
- **The Health Indicator’s Warehouse** (www.healthindicators.gov)
- **Canadian Index of Wellness** (www.atkinsonfoundation.ca)
- **Healthy People 2020** (www.healthypeople.gov)
- **National Prevention strategy** (www.surgeongeneral.gov/initiatives/prevention/strategy/report.pdf)
- **Annie E. Casey Foundation’s KIDS COUNT** (datacenter.kidscount.org)
CHSI 2015 Indicator Organization

CHSI 2015 indicators are organized in categories adapted from a population health framework originally developed in 1990 by Evans and Stoddart.

Evans and Stoddart Framework of Determinants of Health

A population health framework can be used to promote healthy communities by emphasizing the upstream social factors and physical environments that can be modified to positively influence health behaviors. It can also be used to help shift attention from treating sick people to addressing the upstream health associated factors to prevent the development of diseases and health disparities and promote wellbeing.

The CHSI 2015 category of health outcomes includes specific indicators of mortality and morbidity, which represent the aggregate disease burden in a community.

The CHSI 2015 indicators that have the potential to influence health outcomes include health care access and quality, health behaviors, social factors and physical environments.

CHSI 2015 does not include a category of genetic endowment because genetic factors are not typically modifiable.
CHSI 2015 Features

- **Summary Comparison Report** – provides an "at a glance" summary of how your county compares with peer counties on the full set of primary indicator. Indicators are presented as Better, Moderate, or Worse in comparison with their peer counties. Peer county values for each indicator were ranked and then divided into quartiles. These comparisons, while visually helpful, do not necessarily represent statistically significant differences between counties (See "Helpful Hints" below).

![Quartile Illustration]

**Indicators in the Better category (green circle) fall into the most favorable quartile compared to peers.**

**Indicators in the Moderate category (yellow diamond) fall into the middle two quartiles.**

**Indicators in the Worse category (red square) fall into the most unfavorable quartile.**
• **Distribution Display** – bar charts allowing users to visually compare indicators for the selected county to those of its peer counties. The display also shows median values for all U.S. counties and *Healthy People 2020* targets, where applicable.

• **Show Peer Counties** feature (bottom of the Distribution display) – allows users to examine maps of the geographic distributions of each group of peer county categorized indicators.

• **Indicator Downloads** – indicator values for each group of peer counties can be downloaded for further examination and analysis. For indicators that are based on estimated values, this feature also allows users to examine the estimate and the associated margin of error (confidence interval). Larger margins of error suggest less reliability; smaller margins of error suggest greater reliability.

• **Indicator Description** – each CHSI 2015 indicator is accompanied by information describing the significance (importance) of the indicator, source and years of the data, methodology for creating the indicator, and important limitations, where applicable.

• **Populations** – allows users to compare an indicator value for the entire population of a county with sub-populations defined by sex, age groups, and race/ethnicity, where data are available. This feature can be used to assist with identifying potential health disparities that may warrant further attention.

• **Census Tract Maps** – help identify vulnerable populations and potential health disparities by examining the geographic distribution of select social factor indicators within a county (by census tract), where data are available.
Rockingham County, NH

The following Summary Comparison Report provides an “at a glance” summary of how the selected county compares with peer counties on the full set of Primary Indicators. Peer county values for each indicator were ranked and then divided into quartiles.

<table>
<thead>
<tr>
<th>Mortality</th>
<th>Better (most favorable quartile)</th>
<th>Moderate (middle two quartiles)</th>
<th>Worse (least favorable quartile)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Motor vehicle deaths Stroke deaths</td>
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**Rockingham County, NH**

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### Morbidity
- Alzheimer's diseases/dementia
- Gonorrhea
- Older adult asthma
- Preterm births
- Adult diabetes
- Adult obesity
- Adult overall health status
- HIV
- Cancer
- Older adult depression
- Syphilis

### Health Care Access and Quality
- Older adult preventable hospitalizations
- Primary care provider access
- Uninsured
- Cost barrier to care

### Health Behaviors
- Adult binge drinking
- Adult female routine pap tests
- Adult physical inactivity
- Adult smoking
- Teen Births
# Rockingham County, NH

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## Social Factors

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<tbody>
<tr>
<td>Children in single-parent households</td>
<td>Inadequate social support</td>
<td>High housing costs</td>
</tr>
<tr>
<td>On time high school graduation</td>
<td>Poverty</td>
<td></td>
</tr>
<tr>
<td>Unemployment</td>
<td>Violent crime</td>
<td></td>
</tr>
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</table>

## Physical Environment

<table>
<thead>
<tr>
<th>Annual average PM2.5 concentration</th>
<th>Drinking water violations</th>
<th>Access to parks</th>
</tr>
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<td>Living near highways</td>
<td>Limited access to healthy food</td>
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- Cancer
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- Syphilis
Mortality

Diabetes deaths (rate per 100,000 persons)

The age adjusted diabetes death rate for Rockingham County, NH is:

15.3 (per 100,000)
Morbidity

**Adult diabetes (percent)**

The percent of adults living with diagnosed diabetes for Rockingham County, NH is:

![6.5%](image)

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<tr>
<th>Distribution</th>
<th>Description</th>
<th>Populations</th>
<th>Census Tracts</th>
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<tbody>
<tr>
<td><img src="image" alt="Graph Image" /></td>
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<td><img src="image" alt="Graph Image" /></td>
</tr>
</tbody>
</table>

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**US Median: 8.1**

**Show peer counties**
Health Behaviors

**Adult smoking (percent)**

The percent of adults who report smoking cigarettes in Rockingham County, NH is:

16.1 %

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**Distribution**

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</table>

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**Bar Chart**

- Green: Better
- Yellow: Moderate
- Red: Worse

- US Median: 21.7
- Healthy People 2020 Target: 12

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**Show peer counties**
The percent of adults who did not see a doctor due to cost in Rockingham County, NH is:

9.8%
Morbidity

Adult obesity (percent)

The percentage of adult obesity for Rockingham County, NH is:

24.7 %
Analytics and Claims Data

• All-payer claims databases (APCDs) offer policy-makers and stakeholders access to the information they need to evaluate the cost and quality of healthcare in their states. Currently, more than 30 states have implemented, are implementing, or have an interest in forming, an APCD

APCD Issue Briefs

- The Basics of All-Payer Claims Databases: A Primer for States
  [http://www.rwjf.org/content/dam/farm/reports/issue_briefs/2014/rwjf409988](http://www.rwjf.org/content/dam/farm/reports/issue_briefs/2014/rwjf409988)

- Realizing the Potential of All-Payer Claims Databases: Creating the Reporting Plan
  [http://www.rwjf.org/content/dam/farm/reports/issue_briefs/2014/rwjf409989](http://www.rwjf.org/content/dam/farm/reports/issue_briefs/2014/rwjf409989)
Analytics and Claims Data

2014 APCD State Progress Map
(as of March)

Support for this webinar is provided through a grant from the Robert Wood Johnson Foundation’s State Health and Value Strategies Program.
## Typically Included Information

<table>
<thead>
<tr>
<th>Information Typically Collected in an APCD</th>
<th>Data Elements Typically Not Included in an APCD</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Encrypted SSN or member identification number</td>
<td>• Services provided to uninsured</td>
</tr>
<tr>
<td>• Type of product (HMO, POS, indemnity, etc.)</td>
<td>• Denied claims</td>
</tr>
<tr>
<td>• Type of contract (single person, family, etc.)</td>
<td>• Workers’ compensation claims</td>
</tr>
<tr>
<td>• Patient demographics (DOB, gender, ZIP code)</td>
<td>• Premium information</td>
</tr>
<tr>
<td>• Diagnosis, procedure, and NDC codes</td>
<td>• Capitation fees</td>
</tr>
<tr>
<td>• Information on service provider</td>
<td>• Administrative fees</td>
</tr>
<tr>
<td>• Prescribing physician</td>
<td>• Back end settlement amounts</td>
</tr>
<tr>
<td>• Health plan payments</td>
<td>• Referrals</td>
</tr>
<tr>
<td>• Member payment responsibility</td>
<td>• Test results from lab work, imaging, etc.</td>
</tr>
<tr>
<td>• Type and date of bill paid</td>
<td>• Provider affiliation with group practice</td>
</tr>
<tr>
<td>• Facility type</td>
<td>• Provider networks</td>
</tr>
<tr>
<td>• Revenue codes</td>
<td></td>
</tr>
<tr>
<td>• Service dates</td>
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Camden Coalition of Healthcare Providers

• The mission of CCHP is to improve the health of all Camden residents by increasing the capacity, quality, and accessibility of the city’s healthcare delivery system.

• A core value of CCHP is to be data-driven.
Camden Coalition of Healthcare Providers
Hotspotting:
a data driven process for the timely identification of extreme patterns in a defined region of the healthcare system used to guide targeted intervention and follow up to better address patient needs, reshape ineffective utilization, and reduce cost.

Camden Coalition of Healthcare Providers
Why Claims Data?

“Building a Citywide, All-Payer, Hospital Claims Database to Improve Health Care Delivery”
Kennen Gross PhD, MPH, Jeffrey C. Brenner, MD, Aaron Truchil, MS, Ernest M. Post, MD, and Amy Henderson Riley, MA CHES
Claims Data
Population Health

**The Camden Cost Curve**

- 10% of patients = 74% of receipts
- 1% of patients = 30% of receipts

**Camden Coalition of Healthcare Providers**
Population Health

Several buildings (e.g.) annually generate $1-$3 million in hospital costs.

6% of city blocks account for 18% of patients and 37% of receipts.

Spatial Analysis of Camden Hospital Costs

January 2005 – June 2012

Camden Coalition of Healthcare Providers
Population Health

Who are Camden’s High Inpatient Utilizers?

Avg. age: 57
>5 chronic conditions
~1% of population

2011 AVERAGES:
4.5 ED, 5.3 INP
54 days in hospital
$673k charges
$73,143 receipts

Top Diagnoses
- Respiratory Abnormality
- Chest Pain
- Abdominal Pain
- Septicemia

Acute Renal Failure
Urinary Tract Infection
Pneumonia
Chronic Systolic Heart Failure

Camden Coalition of Healthcare Providers
Population Health

- 2+ hospitalizations in 6 months
- 2 or more chronic conditions
- 5+ outpatient medications
- Indicators of social instability

Camden Coalition of Healthcare Providers
Hot Spotting
Chronic Illness in America

• More than 125 million Americans suffer from one or more chronic illnesses and 40 million are limited by them.
• Despite annual spending of nearly $1 trillion and significant advances in care, one half or more of patients still don’t receive appropriate care.
• Gaps in quality care lead to thousands of avoidable deaths each year.
• Best practices could avoid an estimated 41 million sick days and more than $11 billion annually in lost productivity.
• Patients and families increasingly recognize the defects in their care.
• Chronic diseases and conditions, such as heart disease, stroke, cancer, diabetes, obesity, and arthritis, are among the most common, costly, and preventable of all health problems.
## Number of Chronic Conditions per Medicare Beneficiary

<table>
<thead>
<tr>
<th>Number of Conditions</th>
<th>Percent of Beneficiaries</th>
<th>Percent of Expenditures</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>18</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>19</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>21</td>
<td>11</td>
</tr>
<tr>
<td>3</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>4</td>
<td>12</td>
<td>21 (63%)</td>
</tr>
<tr>
<td>5</td>
<td>7</td>
<td>18</td>
</tr>
<tr>
<td>6</td>
<td>3</td>
<td>13</td>
</tr>
<tr>
<td>7+</td>
<td>2</td>
<td>14</td>
</tr>
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</table>
• Seven of the top 10 causes of death in 2010 were chronic diseases. Two of these chronic diseases—heart disease and cancer—together accounted for nearly 48% of all deaths.

• Obesity is a serious health concern. During 2009–2010, more than one-third of adults, or about 78 million people, were obese (defined as body mass index [BMI] ≥30 kg/m²). Nearly one of five youths aged 2–19 years was obese (BMI ≥95th percentile).

• Arthritis is the most common cause of disability. Of the 53 million adults with a doctor diagnosis of arthritis, more than 22 million say arthritis causes them to have trouble with their usual activities.

• Diabetes is the leading cause of kidney failure, lower limb amputations other than those caused by injury, and new cases of blindness among adults.
Who Are Our High Risk Patients?

High Risk Cohorts

- ASQ-3 below cutoff in >1 area
- ACE Score >6
- Addiction Risk assessment >8
- hgba1c > 9
- RAF Score > 3
- Positive Surprise Question

Hospitalization and/or Frequent ED Use

Source: MPHC
Action Planning and Next Steps

1. Operations Improvement
   - Quality, patient safety and financial
2. Primary care network alignment
3. Population health analytics and improvement initiatives
   - Ten-year insurance of covered lives
   - High risk, high cost patients
   - Free 20-minute consultation
4. Integration of population health into the hospital strategic plan
5. Participants can sign up for a free, 30-minute Population Health consultation using the Population Health checklist