Adventures at
Better Health Partnership

Learning as a Community (aided by Electronic Health Records) to make an impact on the Health of Northeast Ohio’s Adults

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https://github.com/THOMASELOVE/adventures

Data Science

https://github.com/THOMASELOVE/adventures
Today’s Topics

1. The role of data science in informing researchers and the public about population health
2. Better Health Partnership’s Vision, Mission, and some insight into how it’s working in its 12th year
3. A few insights from Better Health’s data on adults with chronic illness
4. Some early Children’s Health Initiative findings

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Data Science

http://r4ds.had.co.nz
Grolemund and Wickham, R for Data Science

https://github.com/THOMASELOVE/adventures

FiveThirtyEight

35 Years Of American Death

More Americans Are Dying From Suicide, Drug Use And Diarrhea

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Vision and Mission

To Help Northeast Ohio Become a Healthier Place to Live and a Better Place to do Business

By creating a safe space for health care competitors to collaborate

Better Health Partnership

10 Years Ago

26,162 adults with diabetes

43 practices &

417 providers
Better Health Partnership

Now (2016-2017 data)

207,798 adults with chronic disease
80 practices & 844 providers, 9 systems

2016-17

Cancer Screening and Population Health measures on 205,418 adults ages 50-75

Children’s Health Initiative:
Report 2 (April 13 release) will include 255,837 children

https://github.com/THOMASELOVE/adventures

189 Primary Care and Pediatric Practices reporting to Better Health Partnership (April 2018)

In all, our new reports describe over 530,000 unique NE Ohio residents.

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Adult Data Collection

- Health Systems submit data that they have gathered from their electronic health records
- Data submission via a portal, every 6 months
- Overlapping 12-month periods
- Data Requests include
  - Elements
  - Public Reporting Standards
  - Timeline
  - Sample Submission Sheets

Data Elements at the patient level for...
- 44 Core measures
- Practice identifiers, Provider codes
- 6 specialized diabetes measures
- 16 specialized HBP measures
- 12 specialized HF measures
- Several appendices (ICD-10 codes, etc.)
- Geo-coded (address-based) assessments of education, income

“All systems have problems. Let’s honor the positives and address what we need to do better.”
- Harlan Krumholz, Yale @hmkyale

Data Elements Excerpt

<table>
<thead>
<tr>
<th>#</th>
<th>Variable</th>
<th>Name</th>
<th>Description / Codes</th>
<th>Comments / Business Rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-05</td>
<td>Does patient qualify for entry into Better Health reporting as a patient with diabetes in this reporting period?</td>
<td>QUALDM</td>
<td>See three qualifications at right. 0 = No, patient does not qualify for reporting as a diabetes patient. 1 = Yes, patient qualifies for reporting as a diabetes patient.</td>
<td>To qualify, patient must meet three criteria, specifically: [1] have a diabetes diagnosis (see Appendix 1 sheet for ICD-10 codes) on the problem list and [2] be within the ages of 18 and 75, inclusive, on the start date of the reporting period, and [3] have at least 2 primary care office visits on different days during the twelve-month reporting period.</td>
</tr>
<tr>
<td>C-06</td>
<td>Does patient have a diabetes diagnosis?</td>
<td>DMDIAG</td>
<td>See three qualifications at right. 0 = No. 1 = Yes, patient has a diabetes diagnosis (and at least one primary care visit in reporting period and is age 18+).</td>
<td>To qualify, patient must: [1] have a diabetes diagnosis on the problem list - see Appendix 1 sheet for ICD-10 codes. [2] be age 18 or older at the start of the reporting period. [3] have one or more primary care visits in reporting period. [Note: This includes all patients with QUALDM = 1, plus additional patients with diabetes, but who are older than 75 or who had only 1 primary care visit in the reporting period.]</td>
</tr>
</tbody>
</table>
Public Reporting Standards Excerpt

PUBLIC REPORTING STANDARDS FOR DIABETES
To qualify, patient must meet three criteria as outlined in data element C-05 (QUALDM), specifically: (1) have a diabetes diagnosis (see Appendix 1 sheet in data elements document for list of ICD9/10 codes) and (2) be within the ages of 18 and 75, inclusive, on the start date of the reporting period, and (3) have at least 2 primary care office visits on different days during the reporting period.

<table>
<thead>
<tr>
<th>Diabetes Care Standards</th>
<th>Data Elements</th>
<th>Numerator</th>
<th>Denominator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1C Done</td>
<td>C-05 (QUALDM)</td>
<td>A1C not missing</td>
<td>QUALDM</td>
<td>% of qualifying diabetes patients with at least one hemoglobin A1C value (within the range of 3.9% to 6.0%, inclusive) obtained during the reporting period.</td>
</tr>
<tr>
<td>Kidney Management</td>
<td>C-05 (QUALDM)</td>
<td>MALB not missing OR ACEARB = 1</td>
<td>QUALDM</td>
<td>% of qualifying diabetes patients with urine microalbumin or microalbumin/creatinine ratio screening or ACEARB prescription in reporting.</td>
</tr>
<tr>
<td>Eye Examination</td>
<td>C-05 (QUALDM)</td>
<td>EYEEX = 1</td>
<td>QUALDM</td>
<td>% of qualifying diabetes patients with documented eye exam (via result report or patient self report (health maintenance override) in reporting.</td>
</tr>
<tr>
<td>Pneumonia Vaccination</td>
<td>C-05 (QUALDM)</td>
<td>PNEUM23 = 1 or PNEUM13 = 1</td>
<td>QUALDM</td>
<td>% of qualifying diabetes patients with documented pneumococcal vaccination at any time between January 1, 1990 and the last date of the reporting period.</td>
</tr>
</tbody>
</table>

Table 1: Characteristics of Patients in 2016-2017 Report
Better Health’s 20th report (describing 2016-2017) includes 280,862 patients seen by 644 providers, in B

<table>
<thead>
<tr>
<th>Reporting Period: 2016-2017</th>
<th>Diabetes Patients</th>
<th>High Blood Pressure Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>55,541</td>
<td>194,742</td>
<td></td>
</tr>
<tr>
<td>73</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>742</td>
<td>813</td>
<td></td>
</tr>
</tbody>
</table>

Table: Characteristics of Patients in 2016-2017 Report

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Better Health Population</th>
<th>Range of Values Across Sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Age</td>
<td>60.5</td>
<td>51 - 66</td>
</tr>
<tr>
<td>% Female</td>
<td>43.2</td>
<td>2 - 70</td>
</tr>
<tr>
<td>% in City of Cleveland</td>
<td>34.2</td>
<td>0 - 93</td>
</tr>
<tr>
<td>% in Cuyahoga County</td>
<td>56.9</td>
<td>0 - 100</td>
</tr>
<tr>
<td>Median Household Income ($1000s)</td>
<td>47.3</td>
<td>25 - 78</td>
</tr>
<tr>
<td>High School Graduation Rate (%</td>
<td>86.7</td>
<td>74 - 94</td>
</tr>
<tr>
<td>% with Blood Pressure &gt; 140/90</td>
<td>77.6</td>
<td>57 - 90</td>
</tr>
<tr>
<td>% with Body-Mass Index &lt; 30</td>
<td>33.5</td>
<td>19 - 47</td>
</tr>
<tr>
<td>% No Smoking</td>
<td>76.9</td>
<td>32 - 95</td>
</tr>
</tbody>
</table>

### Achievement of HEDIS / NCQA Measures

**Better Health Partnership: 2016-17**

<table>
<thead>
<tr>
<th>High BP</th>
<th>All</th>
<th>Medicare</th>
<th>Commercial</th>
<th>Medicaid</th>
<th>Uninsured</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood Pressure Control</td>
<td>74</td>
<td>81</td>
<td>77</td>
<td>74</td>
<td>70</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Diabetes Measures</th>
<th>All</th>
<th>Medicare</th>
<th>Commercial</th>
<th>Medicaid</th>
<th>Uninsured</th>
</tr>
</thead>
<tbody>
<tr>
<td>BP below 140/90</td>
<td>78</td>
<td>77</td>
<td>78</td>
<td>80</td>
<td>77</td>
</tr>
<tr>
<td>Hemoglobin A1c testing</td>
<td>94</td>
<td>95</td>
<td>93</td>
<td>95</td>
<td>96</td>
</tr>
<tr>
<td>A1c control (&lt; 8%)</td>
<td>66</td>
<td>70</td>
<td>64</td>
<td>57</td>
<td>56</td>
</tr>
<tr>
<td>A1c control (&lt; 9%)</td>
<td>85</td>
<td>89</td>
<td>84</td>
<td>75</td>
<td>74</td>
</tr>
<tr>
<td>Eye Examination</td>
<td>66</td>
<td>72</td>
<td>63</td>
<td>56</td>
<td>50</td>
</tr>
<tr>
<td>Kidney Management</td>
<td>87</td>
<td>87</td>
<td>86</td>
<td>89</td>
<td>89</td>
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</tbody>
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<thead>
<tr>
<th>Cancer Screening</th>
<th>All</th>
<th>Medicare</th>
<th>Commercial</th>
<th>Medicaid</th>
<th>Uninsured</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorectal Cancer Screening</td>
<td>74</td>
<td>80</td>
<td>73</td>
<td>60</td>
<td>55</td>
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</tbody>
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### Better Health Partnership: 2016-17 vs. National HMO/PPO data, 2016

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Diabetes Care standard:
(1) Hemoglobin A1c checked
(2) Microalbumin screen or ACE/ARB
(3) Eye Examination
(4) Vaccination against Pneumonia
Diabetes Outcomes standard: Meet at least four of:
(1) Hemoglobin A1c < 8  (2) Blood Pressure < 140/90
(3) LDL < 100 or Statin  (4) BMI < 30   (5) Not using tobacco
High Blood Pressure Control
(most recent BP < 140/90)

Blood Pressure below 140/90
Patients with High Blood Pressure, 2011-present

% with BP < 140/90 by subgroup, since 2014

Better Health Partnership

Insurance groups
Comm.
Medicare
Medicaid
Unins.

By Race/Ethnicity
Hispanic
White
AA

By Income
High
Mid
Low

Place of Residence
Cuy Sub
Not Cuy
Cleve

By Education
High
Mid
Low

By Sex
F
M

Better Health Partnership Reporting Period
Improvement in BP < 140/90 rate over the past two years

Children’s Health Initiative

- Deploying our collaborative model of measurement
  - Initial focus on obesity, blood pressure and asthma.
  - Importance of non-medical determinants of health.
- Connecting clinicians with community resources
- Development of data elements, reporting processes, addressing privacy concerns

First Public Report included
- 151,749 children ages 2-18
- 601 primary care providers
- 88 practices in 5 systems
  - April 2016 – March 2017 data
  - Obesity and Blood Pressure

Second Public Report next week
- To include 255,837 kids
- 898 providers in 163 practices in 6 health systems
  - October 2016 – Sept 2017 data
  - Initial Results on Asthma

This Map Shows
96,054 kids in Cuyahoga County
44,303 kids in City of Cleveland

% Not Overweight
Oct 2016 – Sep 2017

80.1 - 90%
70.1 - 80%
60.1 - 70%
60% or less

% Not Overweight
Children Ages 2-18
Cuyahoga County: 67%
Summit County: 69%
Thank you!

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Slides and Resources from this Presentation are available at:
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