The Promise of Big Data
Plenary 1

NAPCRG PBRN Conference 2014

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Faculty/Presenter Disclosure

• Faculty: Rick Glazier

• Relationships with commercial interests:
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  – Other: none
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Potential for conflict(s) of interest:

– Rick Glazier has received N/A from N/A
– N/A a product that will be discussed in this program: N/A
Mitigating Potential Bias

- Mitigation N/A
Scenario

A network of clinics has established systems for regular:

- surveys of patient experience
- EMR extracts of access and quality of care
- administrative data profiles comparing them to the province
- priority setting based on this information

Last year they used this information to:

- achieve 70% of visits on the day preferred by their patients
- double the number of people with smoking cessation support
- increase continuity of care by 30%
- demonstrate a 25% reduction in antibiotic use through a randomized trial of delayed prescriptions for respiratory infections
Scenario

• Is this true for your practice setting?
  • conduct surveys of patient experience
  • extract EMR data
  • receive administrative data profiles
  • use data to set priorities

• Last year did you:
  • use practice-based data to improve care?
  • receive feedback about how you compare with others?
  • participate in practice-based research?
Building Primary Care Measures
...from scratch

• Primary care in Canada has little tradition of:
  – routine measures
  – reporting
  – accountability

• But it does have:
  – single payer systems
  – good capture of physician billings
  – ability to link data across health sectors in many provinces
  – a push towards organized groups and accountability
  – increasing data at the regional level

• Practice-level measurement especially limited
Measurement Frameworks
For Systems and Practices

• National - CIHI
  – 105 indictors in 2006
  – 30 policy, 30 provider in 2012
  – surveys, EMR, admin data

• BC
  – diabetes, heart failure care reported

• ON
  – PCPM framework, Quality Agenda

Pan-Canadian Primary Health Care Indicator Update Report, 2012
http://www.cihi.ca/CIHI-ext-portal/internet/EN/TabbedContent/types+of+care/primary+health/cihi006583
http://www.primaryhealthcarebc.ca/resource_performance_report.html
Measurement Frameworks – Ontario

Primary Care Performance Measurement Framework
(Ontario Primary Care Performance Measurement Steering Committee, June 2013)

Access
- Extent of (avoidance) emergency department, walk-in clinic, urgent care centre use
- "Integration"
- Access to a regular primary care provider
- Access to an interprofessional primary care team
- Timely access at regular place of care
- Access to after-hours care (telephone and in-person)
- Access to a non-face-to-face care (e.g., telephone, email, etc.)
- Access to home visits for target populations

Integration
- Information sharing across the continuum of care including patients and family caregivers
- "Integration"
- Care coordination with other health and community care providers and services
- "Efficiency and Patient-Centredness"
- Time to referred appointment with medical/surgical specialist or other specialists/services
- "Access"
- Hospital admissions and readmissions
- "Effectiveness"
- Follow-up with regular primary care provider post hospital discharge
- "Efficiency"
- Waiting time for community services

Efficiency
- Per capita health care cost
- "Primary care, specialist care, hospital care, diagnostic, pharmaceutical, long-term care, community care"
- "Support for family caregivers"
- "Unnecessary duplication of diagnostic test/imaging"
- Implementation and meaningful use of Electronic Medical Record/Health Records
- "Integration"
- Self management support and collaboration with patients and families
- "Patient-Centredness and Effectiveness"
- Shared decision-making
- "Patient-Centredness"
- "Effectiveness"
- Chronic disease screening (e.g., cancer, diabetes, hypertension, asthma, depression, dementia)
- "Effectiveness"
- Prenatal care

Effectiveness
- Management of chronic conditions including people with mental health and addictions and multiple chronic conditions
- "System level priority"
- "System & Practice level priority"
- "Practice level priority"
- "Efficiency"
- "Primary care and population health"
- "Integrated care"
- "Patient-Centredness"
- "Effectiveness"
- "Safety"
- "Privacy and confidentiality"
- "Appropriate Resources"
- "Funds received by primary care practices (by category)
- Human resources availability, composition (skills mix) and optimized scope of practice
- "Healthy work environment and safety"
- "Funding and use of electronic systems to link with other settings (integration)"
- "Practice improvement and planning"
- "Human resources training and professional development, including patient- and family-centric care"
- "Provider remuneration methods"
- "Total cost of care (efficiency)"
- "Availability of information technology systems"
- "Information technology investment and expenditure"
- "Provider satisfaction (employee engagement culture)"

Legend
- = Also relevant to mentioned domain
- = Measurement area for future consideration
- = System level priority
- = System & Practice level priority
- = Practice level priority

Equity

Equity is a cross cutting domain and will be assessed in relation to a variety of economic and social variables such as income, education, gender, urban/rural location, age, sexual orientation/identity, language, immigration, ethno-cultural identity and Aboriginal status.

http://www.hqontario.ca/public-reporting/primary-care
Framework for Primary Care Organizations

http://intqhc.oxfordjournals.org/content/20/5/308.full.pdf+html
Practice Level Data

- **Surveys**
  - organizations, providers, patients, communities

- **Administrative data**
  - groups and providers

- **Clinical data**
  - electronic medical records (EMR)

- Each has its role*

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Practice Surveys

• Patient experiences
  - methods recently reviewed*
  - mandated in some primary care settings
  - local (e.g. ON) or centralized (e.g. UK)

• Not yet standardized
  - sampling and sample size
  - questions
  - analysis and reporting

*Wong ST, Haggerty J. Measuring patient experiences in primary health care: a review and classification of items and scales used in publicly available questionnaires. CHSPR 2013
http://www.chspr.ubc.ca/sites/default/files/publication_files/Patient%20experiences%20in%20PHC%202013_0.pdf
### Practice Survey – Example

**Monthly Survey by E-mail**

#### Question 7:
When you see your physician or nurse practitioner, how often do they or someone else in the office give you an opportunity to ask questions about recommended treatment?

<table>
<thead>
<tr>
<th>Response</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>68.2%</td>
<td>105</td>
</tr>
<tr>
<td>Often</td>
<td>18.2%</td>
<td>28</td>
</tr>
<tr>
<td>Sometimes</td>
<td>3.9%</td>
<td>6</td>
</tr>
<tr>
<td>Rarely</td>
<td>2.6%</td>
<td>4</td>
</tr>
<tr>
<td>Never</td>
<td>1.9%</td>
<td>3</td>
</tr>
<tr>
<td>It depends on who I see and/or what I am there for</td>
<td>5.2%</td>
<td>8</td>
</tr>
<tr>
<td>Decline to answer</td>
<td>0.0%</td>
<td>0</td>
</tr>
</tbody>
</table>

#### Question 9:
When you see your physician or nurse practitioner, how often do they or someone else in the office involve you as much as you want to be in decisions about your care and treatment?

<table>
<thead>
<tr>
<th>Response</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>64.5%</td>
<td>98</td>
</tr>
<tr>
<td>Often</td>
<td>19.1%</td>
<td>29</td>
</tr>
<tr>
<td>Sometimes</td>
<td>11.8%</td>
<td>18</td>
</tr>
<tr>
<td>Rarely</td>
<td>2.0%</td>
<td>3</td>
</tr>
<tr>
<td>Never</td>
<td>0.7%</td>
<td>1</td>
</tr>
<tr>
<td>It depends on who I see and/or what I am there for</td>
<td>1.3%</td>
<td>2</td>
</tr>
<tr>
<td>Decline to answer</td>
<td>0.7%</td>
<td>1</td>
</tr>
</tbody>
</table>
Practice Level Administrative Data
Example from Health Quality Ontario – ICES Initiative

Rate of emergency department visits per 1,000 patients

Percentage of patients with diabetes with at least one retinal examination within the past 24 months

*Adjusted for age, sex, and morbidity
DS=data suppressed, physician group size <6
Practice Level EMR Data

- Data discipline issues
- Multiple vendor issues
- Challenging to run queries
- Provincial and national initiatives – measure and feed back
  - EMRALD
  - Canadian Primary Care Sentinel Surveillance Network (CPCSSN)
  - others
- Examples
  - HbA1c < 7.5%, BP control, Pap smears, flu shots, smoking cessation, obesity
### A. DEMOGRAPHICS (YCG)

<table>
<thead>
<tr>
<th>Indicators</th>
<th>CPCSSN</th>
<th>ON</th>
<th>NorTReN</th>
<th>Site</th>
<th>Sentinel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (mean years)</td>
<td>49.1</td>
<td>49.9</td>
<td>49.1</td>
<td>49.1</td>
<td>48.7</td>
</tr>
<tr>
<td>% paediatric (&lt;18 yrs)</td>
<td>5.7</td>
<td>5.2</td>
<td>5.0</td>
<td>3.4</td>
<td>3.8</td>
</tr>
<tr>
<td>% adult (18-65 yrs)</td>
<td>71.7</td>
<td>70.2</td>
<td>71.8</td>
<td>75.4</td>
<td>76.2</td>
</tr>
<tr>
<td>% geriatric (&gt;65 yrs)</td>
<td>22.6</td>
<td>24.6</td>
<td>23.2</td>
<td>21.2</td>
<td>20.0</td>
</tr>
<tr>
<td>Sex (% male)</td>
<td>40.2</td>
<td>38.8</td>
<td>35.8</td>
<td>36.1</td>
<td>21.9</td>
</tr>
<tr>
<td></td>
<td>247,288</td>
<td>99,201</td>
<td>62,903</td>
<td>1,808</td>
<td>795</td>
</tr>
</tbody>
</table>

### B. PREVALENCE (%)

<table>
<thead>
<tr>
<th>Conditions</th>
<th>CPCSSN</th>
<th>ON</th>
<th>NorTReN</th>
<th>Site</th>
<th>Sentinel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension</td>
<td>19.4</td>
<td>18.9</td>
<td>17.9</td>
<td>20.8</td>
<td>18.6</td>
</tr>
<tr>
<td>Diabetes</td>
<td>8.4</td>
<td>8.6</td>
<td>7.6</td>
<td>9.5</td>
<td>10.4</td>
</tr>
<tr>
<td>Depression</td>
<td>13.5</td>
<td>12.4</td>
<td>12.4</td>
<td>13.1</td>
<td>10.4</td>
</tr>
<tr>
<td>COPD</td>
<td>3.2</td>
<td>3.0</td>
<td>2.4</td>
<td>1.8</td>
<td>2.5</td>
</tr>
<tr>
<td>Osteoarthritis</td>
<td>10.1</td>
<td>10.8</td>
<td>10.7</td>
<td>8.2</td>
<td>7.9</td>
</tr>
<tr>
<td>Parkinson's</td>
<td>0.3</td>
<td>0.4</td>
<td>0.3</td>
<td>0.3</td>
<td>0.2</td>
</tr>
<tr>
<td>Epilepsy</td>
<td>0.8</td>
<td>0.8</td>
<td>0.7</td>
<td>0.8</td>
<td>0.8</td>
</tr>
<tr>
<td>Dementia</td>
<td>1.7</td>
<td>1.8</td>
<td>1.8</td>
<td>1.5</td>
<td>1.2</td>
</tr>
<tr>
<td>N (YCG, UCF)</td>
<td>306,817</td>
<td>119,750</td>
<td>76,030</td>
<td>2,257</td>
<td>950</td>
</tr>
</tbody>
</table>

### C. CHRONIC CONDITIONS (%)

<table>
<thead>
<tr>
<th>Conditions</th>
<th>CPCSSN</th>
<th>ON</th>
<th>NorTReN</th>
<th>Site</th>
<th>Sentinel</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>62.6</td>
<td>62.5</td>
<td>64.1</td>
<td>64.7</td>
<td>62.1</td>
</tr>
<tr>
<td>1 Condition</td>
<td>22.9</td>
<td>23.5</td>
<td>22.6</td>
<td>20.2</td>
<td>22.2</td>
</tr>
<tr>
<td>2 Conditions</td>
<td>10.1</td>
<td>10.0</td>
<td>9.6</td>
<td>10.4</td>
<td>10.7</td>
</tr>
<tr>
<td>3 Conditions</td>
<td>3.4</td>
<td>3.1</td>
<td>2.9</td>
<td>3.7</td>
<td>3.7</td>
</tr>
<tr>
<td>4 Conditions</td>
<td>0.8</td>
<td>0.7</td>
<td>0.7</td>
<td>0.8</td>
<td>0.9</td>
</tr>
<tr>
<td>5 Conditions</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.2</td>
<td>0.3</td>
</tr>
<tr>
<td>6 Conditions</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>7 Conditions</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>8 Conditions</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>N (YCG, UCF)</td>
<td>306,817</td>
<td>119,750</td>
<td>76,030</td>
<td>2,257</td>
<td>950</td>
</tr>
</tbody>
</table>

### D. INDICATORS

#### D1. HYPERTENSION

- Total with HTN (n): 59,485
- HTN with BP (n): 56,788
- % systolic BP <140: 70.3
- % diastolic BP <90: 88.1
- Missing (n): 2,697

#### D2. DIABETES

- Total with DM (n): 25,736
- DM with HbA1C (n): 21,244
- % HbA1C <7: 53.5
- % HbA1C 7-8: 26.0
- % HbA1C >8: 20.6
- Missing (n): 4,492

- Total with DM (n): 24,245
- % systolic BP <130: 49.3
- % diastolic BP <80: 63.9
- Missing (n): 1,491

#### D3. COPD

- Total with COPD (n): 9,890
  - % LDL <2: 43.2
  - Missing (n): 4,451
## Bringing it Together: Compare Measures Across Groups

<table>
<thead>
<tr>
<th>Measure</th>
<th>Source</th>
<th>Clinic A</th>
<th>Clinic B</th>
<th>Clinic C</th>
<th>Clinic D</th>
<th>Clinic E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Were you satisfied with the choice of day for your last appointment?</td>
<td>patient survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did the doctor spend enough time with you?</td>
<td>patient survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What percentage of smokers were counselled in last year?</td>
<td>EMR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What percentage of patients on Coumadin have had an INR between 2-3 in the last two months?</td>
<td>EMR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How many ER visits occurred for minor problems?</td>
<td>administrative data</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What percentage of admitted Pts. were seen in office within 7 days of discharge?</td>
<td>administrative data</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Bringing it Together: Aggregate Across Measures

<table>
<thead>
<tr>
<th>FHT Name</th>
<th>Quality</th>
<th>Capacity</th>
<th>Cost/Patient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wittcott</td>
<td>659</td>
<td>53.6</td>
<td>$3394</td>
</tr>
<tr>
<td>Purcliffe</td>
<td>620</td>
<td>65.6</td>
<td>$3367</td>
</tr>
<tr>
<td>Shipdon</td>
<td>541</td>
<td>39.2</td>
<td>$4306</td>
</tr>
<tr>
<td>Ashbeth</td>
<td>620</td>
<td>29.9</td>
<td>$5591</td>
</tr>
<tr>
<td>Ipsbridge</td>
<td>354</td>
<td>61.9</td>
<td>$4063</td>
</tr>
<tr>
<td>Average</td>
<td>559</td>
<td>50.0</td>
<td>$4144</td>
</tr>
<tr>
<td>Target</td>
<td>TBD</td>
<td>&gt; 53</td>
<td>&lt; $3954</td>
</tr>
</tbody>
</table>

Bringing it Together: Return to Scenario

• What does the future look like?
  • conduct surveys of patient experience
  • extract EMR data
  • receive administrative data profiles
  • use data to set priorities

• This year will you:
  • use practice-based data to improve care?
  • receive feedback about how you compare with others?
  • participate in practice-based research?
Comments, Questions?