Population Health Informatics & Delivering the ’Transforming Services Together’ programme

Luke Readman, CIO

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Collect-Share-Use
PUBLIC WATER PUMPS and CHOLERA DEATHS, London 1854
WEL Context

• Population
  – By 2031 additional 270,000

• Outcomes
  – Years Lost
  – Quality of life (long term conditions)
  – Appropriate care, acute → community ↔ home
  – Improve Experience

• Funding Gap
  – £128M for commissioners by 2018/19
  – £380M for providers
The IHI Triple Aim is a framework developed by the Institute for Healthcare Improvement that describes an approach to optimizing health system performance. It is IHI’s belief that new designs must be developed to simultaneously pursue three dimensions, which we call the “Triple Aim”:

1. Improving the patient experience of care (including quality and satisfaction);
2. Improving the health of populations; and
3. Reducing the per capita cost of health care.
Informatics Themes

• Single Systems
• Connectedness
• Big data
Number of chronic disorders by age-group
Requirement
Conduct a baseline review of all the systems in use and map this to the Population Health Informatics service we want to provide. [DN: started - list of 50 projects]

Current Activities
Collect-Share-Use
Demographics
Past medical history and procedures
Current active diagnoses/problem list
Medications
Allergies
Healthcare encounters (Past and Future)
Clinical letters – referral, hospital discharge and outpatient clinic letters as a minimum
Diagnostic test results - Laboratory results and radiology reports as a minimum
Radiology images
Care Plan
Social Care events
Physiological measurements-BP etc

Requirement
The scope will arise from the work to describe the gap between the future state and what is currently happening.
[DN will need to be described in some detail]
Sharing Usage
<table>
<thead>
<tr>
<th>Top 2% (by borough)</th>
<th>Tower Hamlets</th>
<th>Waltham Forest</th>
<th>Newham</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enrolled</td>
<td>5,831</td>
<td>1,800</td>
<td>6,446</td>
</tr>
</tbody>
</table>
Reasons for presentation to the Emergency Department

Presenting Problem
- Pain
- Shortness of breath
- Generally Unwell
- Fall
- Chest Pain
- Confusion
- Chest infection

56%
# Evidence Based Measures

## Acute myocardial infarction (AMI)
1. Aspirin at arrival
2. Aspirin prescribed at discharge
3. ACE or ARB for LVSD
4. Smoking cessation advice/counseling
5. Beta blocker at arrival
6. Beta blocker prescribed at discharge
7. Thrombolytic received within 30 minutes of hospital arrival
8. PCI received within 90 minutes of hospital arrival

## Community-acquired pneumonia (CAP)
1. Oxygenation assessment within 24 hours prior to or after hospital arrival
2. Initial antibiotic selection
3. Blood culture collected prior to first antibiotic administration
4. Antibiotic timing, first dose of antibiotics within six hours after hospital arrival
5. Smoking cessation advice/counseling

## Coronary artery bypass graft (CABG)
1. Aspirin prescribed at discharge
2. Prophylactic antibiotic received within one hour prior to surgical incision
3. Prophylactic antibiotic selection for surgical patients
4. Prophylactic antibiotics discontinued within 48 hours after surgery end time

## Hip and knee replacement
1. Prophylactic antibiotic received within one hour prior to surgical incision
2. Prophylactic antibiotic selection for surgical patients
3. Prophylactic antibiotics discontinued within 24 hours after surgery end time
4. Recommended Venous Thromboembolism prophylaxis ordered
5. Appropriate Venous Thromboembolism prophylaxis within 24 hours prior to surgery to 24 hours after surgery

## Heart failure (HF)
1. Left Ventricular Systolic (LVS) assessment
2. Detailed discharge instructions
3. ACEI or ARB for LVSD
4. Smoking cessation advice/counseling
Marathon not a sprint!

Rapid improvement, sustained

Steady improvement, sustained

Raised the bar with a new measure!

New condition

North West - Composite Quality Scores - over time

Collect-Share-Use
Reduced Mortality with Hospital Pay for Performance in England

Matt Sutton, Ph.D., Silviya Nikolova, Ph.D., Ruth Boarden, Ph.D., Helen Lester, M.D., Ruth McDonald, Ph.D., and Martin Roland, D.M.


Results

Risk-adjusted, absolute mortality for the conditions included in the pay-for-performance program decreased significantly, with an absolute reduction of 1.3 percentage points (95% confidence interval [CI], 0.4 to 2.1; P=0.006) and a relative reduction of 6%, equivalent to 890 fewer deaths (95% CI, 260 to 1,500) during the 18-month period. The largest reduction, for pneumonia, was significant (1.9 percentage points; 95% CI, 0.9 to 2.8; P<0.001), with nonsignificant reductions for acute myocardial infarction (0.6 percentage points; 95% CI, -0.4 to 1.7; P=0.23) and heart failure (0.6 percentage points; 95% CI, -0.6 to 1.8; P=0.30).

Conclusions

The introduction of pay for performance in all NHS hospitals in one region of England was associated with a clinically significant reduction in mortality. As compared with a similar U.S. program, the U.K. program had larger bonuses and a greater investment by hospitals in quality-improvement activities. Further research is needed on how implementation of pay-for-performance programs influences their effects. (Funded by the NHS National Institute for Health Research.)
### Atrial Fibrillation (AF)

<table>
<thead>
<tr>
<th>QOF ID</th>
<th>NICE ID</th>
<th>Indicator wording</th>
<th>Changes</th>
<th>14/15 Points</th>
<th>14/15 Threshold</th>
<th>15/16 Points</th>
<th>15/16 Threshold</th>
<th>Indicator wording timeframe (months)</th>
<th>Business Rules timeframe (months)</th>
<th>Exception code timeframe (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AF001</td>
<td>AF001</td>
<td>The contractor establishes and maintains a register of patients with atrial fibrillation</td>
<td>NO CHANGE</td>
<td>5</td>
<td>-</td>
<td>5</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>AF005</td>
<td>NM45</td>
<td>In those patients with atrial fibrillation in whom there is a record of a CHADS2 score of 1 the percentage of patients who are currently treated with anti-coagulation therapy or anti-platelet therapy</td>
<td>Retired</td>
<td>6</td>
<td>57-97</td>
<td>-</td>
<td>-</td>
<td>12 (CURRENTLY TREATED) (drugs)</td>
<td>6 (CURRENTLY TREATED) (REG/ADIAG)</td>
<td>6 (REG/ADIAG)</td>
</tr>
<tr>
<td>AF004</td>
<td>NM46</td>
<td>In those patients with atrial fibrillation whose latest record of a CHADS2 score is greater than 1, the percentage of patients who are currently treated with anti-coagulation therapy</td>
<td>Replaced by NM82/AF007</td>
<td>6</td>
<td>40-70</td>
<td>-</td>
<td>-</td>
<td>6 (CURRENTLY TREATED) (drugs)</td>
<td>6 (REG/ADIAG)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>AF006</td>
<td>The percentage of patients with atrial fibrillation in whom stroke risk has been assessed using the CHA2DS2-VASc score risk stratification scoring system in the preceding 12 months (excluding those patients with a previous CHA2DS2 or CHA2DS2-VASc score of 2 or more)</td>
<td>New indicator</td>
<td>-</td>
<td>-</td>
<td>12</td>
<td>40-90</td>
<td>12</td>
<td>12 (REG/ADIAG)</td>
<td>12 (REG/ADIAG)</td>
</tr>
<tr>
<td></td>
<td>AF007</td>
<td>In those patients with atrial fibrillation with a record of a CHA2DS2-VASc score of 2 or more, the percentage of patients who are currently treated with anticoagulation drug therapy</td>
<td>Replacement</td>
<td>-</td>
<td>-</td>
<td>12</td>
<td>40-70</td>
<td>6 (CURRENTLY TREATED) (drugs)</td>
<td>6 (REG/ADIAG)</td>
<td>12 (REG/ADIAG)</td>
</tr>
</tbody>
</table>

### Secondary prevention of coronary heart disease (CHD)

<table>
<thead>
<tr>
<th>QOF ID</th>
<th>NICE ID</th>
<th>Indicator wording</th>
<th>Changes</th>
<th>14/15 Pts</th>
<th>14/15 TH</th>
<th>15/16 Pts</th>
<th>15/16 TH</th>
<th>Wdg t'frame</th>
<th>BR t'frame</th>
<th>ER t'frame</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHD001</td>
<td>CHD001</td>
<td>The contractor establishes and maintains a register of patients with coronary heart disease</td>
<td>NO CHANGE</td>
<td>4</td>
<td>-</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>CHD002</td>
<td>CHD002</td>
<td>The percentage of patients with coronary heart disease in whom the last blood pressure reading (measured in the preceding 12 months) is 150/00 mmHg or less</td>
<td>NO CHANGE</td>
<td>17</td>
<td>53-93</td>
<td>17</td>
<td>53-93</td>
<td>12</td>
<td>12</td>
<td>12 (REG/ADIAG)</td>
</tr>
<tr>
<td>CHD005</td>
<td>CHD005</td>
<td>The percentage of patients with coronary heart disease with a record in the preceding 12 months that asprin, an alternative anti-platelet therapy, or an anti-coagulant is being taken</td>
<td>NO CHANGE</td>
<td>7</td>
<td>56-96</td>
<td>7</td>
<td>56-96</td>
<td>12</td>
<td>12</td>
<td>12 (REG/ADIAG)</td>
</tr>
<tr>
<td>CHD007</td>
<td>CHD007</td>
<td>The percentage of patients with coronary heart disease who have had influenza immunisation in the preceding 1 August to 31 March</td>
<td>NO CHANGE</td>
<td>7</td>
<td>56-96</td>
<td>7</td>
<td>56-96</td>
<td>1 Aug to 31 Mar</td>
<td>1 Aug to 31 Mar</td>
<td>12 (REG/ADIAG)</td>
</tr>
<tr>
<td>CHD008</td>
<td>NM07</td>
<td>The percentage of patients with a history of myocardial infarction (on or after 1 April 2011) currently treated with an ACE-I (or ARB if ACE-I intolerant), aspirin or an alternative anti-platelet therapy, beta-blocker and statin</td>
<td>Retired</td>
<td>10</td>
<td>60-100</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Primary Care QOF** Collect-Share-Use
Requirement
Establish a framework to describe the timeliness of data requirements in the context of the services to be delivered.

Analytical Concept

- **Purpose**
  - Active analytics
  - View Only
  - Pilot Areas

- **Function**
  - Real Time
  - Batch (Infrequent/Monthly)

- **Maturity**
  - Speed of capability
  - Coverage (Geography & Settings)

- **Collect-Share-Use**
Requirement
To establish a common view agreed amongst all partner organisations of the future state of clinical service delivery and the role that informatics has in supporting EndeavourHealth, CEG, NECSU.
Active Shared Data

• Renal Failure
  – Forecast renal failure
  – Resolve delivery model
  – Daily frequency
  – Insight into the clinical system being used
Difficulties

• Technology
  – Infrastructure
  – Organisational EHR Maturity

• Human
  – Adoption
  – Resource
  – Priorities

• Governance
  – Consent
  – Sharing
  – Pseudonymisation

• Definition & Boundaries
  – Sharing Standards
  – SNOMED CT
  – Open Algorithms
Collect - Share - Use