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Using Primary Care Data for Public Health, Epidemiology and Research

http://www1.imperial.ac.uk/medicine/people/a.majeed/
Learning objectives

• What is primary care
• What data do primary care teams collect
• Advantages & disadvantages of electronic primary care records
• Use of aggregated data
• Identifiable v. anonymised data
Outline of talk

• Why is primary care data needed?
• What data are available
• Examples uses of primary care data for public health, epidemiology & research
Why is primary care data needed?

• Help clinicians provide care
• Plan health services & monitor targets
• Measure clinical performance
• Measure health service utilisation
• Public health surveillance
• Monitor inequalities
• Health services research, clinical epidemiology, & clinical trials
Data collected in primary care

• Collected through day to day clinical work of family practitioners, primary care physicians, nurses and other professionals

• Additional data sent electronically to practices or added to medical records by primary care staff

• In UK & many other countries, available in computerised format from many practices
<table>
<thead>
<tr>
<th>Date</th>
<th>Item</th>
<th>Details</th>
<th>Status</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>04-Nov-2006</td>
<td>Diabetic monitoring</td>
<td>QOF Target less than 7.0</td>
<td>QOF</td>
<td>Run Template</td>
</tr>
<tr>
<td>18-Nov-2009</td>
<td>Last HbA1c = 8.6</td>
<td>Last Cholesterol 05-Jun-2008. Needed every 1...</td>
<td>QOF</td>
<td>Run Template</td>
</tr>
<tr>
<td>18-Nov-2009</td>
<td>Cholesterol Needed</td>
<td>Hypertension Diabetes Mellitus</td>
<td>QOF</td>
<td>Run Template</td>
</tr>
<tr>
<td>18-Nov-2009</td>
<td>Patient on QOF Registers</td>
<td>Patient has Diabetes. Target BP = 145/80</td>
<td>QOF</td>
<td>Run Template</td>
</tr>
<tr>
<td>18-Nov-2009</td>
<td>Latest BP 180/90. Consider Lowering</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-Sep-2010</td>
<td>Medication review</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Appointments**

| Date       | Appointment - Rawdon                          | BURNS, Robert (Dr) at 20-Nov-2009 15:50 : S.             | Default  |                |

**Tasks**

<table>
<thead>
<tr>
<th>Date</th>
<th>Pending Referral Letter</th>
<th>EMIS PCT Clinical Assessment Service</th>
<th></th>
<th>Open</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-Nov-2009</td>
<td>Test Request Awaiting Sample</td>
<td>Venous blood specimen - Biochemistry,Haemat...</td>
<td></td>
<td>Open</td>
</tr>
</tbody>
</table>

**Test Requests**

<table>
<thead>
<tr>
<th>Date</th>
<th>Test request : Electrolytes</th>
<th>Lab Order Reference: 4-D820XX-B</th>
<th>Awaiting Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-Nov-2009</td>
<td>Test request : Full Blood Count</td>
<td>Lab Order Reference: 4-D820XX-H</td>
<td>Awaiting Sample</td>
</tr>
</tbody>
</table>
Strengths of primary care data

• Population based
• Most contacts with health services take place in primary care
• Information on most aspects of care (morbidity, investigations, treatment, outcomes & utilisation)
• Increasingly available for analysis in computerised format
Weaknesses of primary care data

- Often comes from volunteer practices & hence may not be representative
- Quality & completeness of data recording varies widely
- Lack of socio-economic & ethnic data
- Multiple clinical systems, not currently linked to hospital systems
- Can be difficult & expensive to access
Information contained

• Clinical diagnoses: diabetes, pneumonia etc.
• Coded using Read codes in the UK (ICPC, ICD in other countries)
• Preventive care: screening, smoking status, immunisations, health checks
• Prescribing data: for drugs issues by GPs
• Laboratory data: lipids, glucose, renal function etc.
• Demographic data: Date of birth, ethnicity etc.
Risk prediction models

• Used to predict risk of an individual developing a disease
• Allow examination of distribution of population risk factors for a disease
• Most common use is for cardiovascular risk disease estimation
• Also developed for other diseases: diabetes, cancer, fractures
• Use a range of factors to calculate risk
• Allow for risk stratification of individuals and populations
Distribution of cardiovascular risk in England

![Maps showing distribution of cardiovascular risk in England](image)

*Figure 1: Prevalence of high risk status by PCT, using a) the QRISK2 b) the JBS2 risk score, in the 40-74 year old population in England*
Clinical epidemiology: blood pressure and mortality in people with diabetes
Pharmaco-epidemiology: aspirin use and colorectal cancer

<table>
<thead>
<tr>
<th>Exposure</th>
<th>(N of cases)</th>
<th>OR (95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 1 year</td>
<td>(417)</td>
<td>1.12 (0.99 to 1.26)</td>
</tr>
<tr>
<td>1 to 3 years</td>
<td>(380)</td>
<td>0.97 (0.85 to 1.11)</td>
</tr>
<tr>
<td>4 to 6 years</td>
<td>(378)</td>
<td>0.96 (0.84 to 1.10)</td>
</tr>
<tr>
<td>7 to 9 years</td>
<td>(233)</td>
<td>0.87 (0.73 to 1.02)</td>
</tr>
<tr>
<td>10 to 14 years</td>
<td>(164)</td>
<td>0.81 (0.66 to 0.98)</td>
</tr>
</tbody>
</table>

Odds ratios and 95% CI are adjusted for deprivation, smoking, BMI, comorbidities, use of medication
Reference group: No use of aspirin in 2 to 15 years prior the index date
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Linkage with other data

- Hospital Episode Statistics
- Office for National Statistics Mortality Records
- Cancer registration data
- National Audits (e.g. MINAP)
- National linkage (e.g. CPRD, Clinical Practice Research Datalink)
- Local linkage (e.g. WSIC, Whole Systems Integrated Care)
Issues to consider

• Access to data now more restricted
• Financial costs of access
• Hardware and software for analysis
• Information governance policies
• Work with an established research group (e.g. primary care, public health, epidemiology, surgery, medicine, NHLI)