Reducing emergency admissions: are we on the right track?

Martin Roland
Professor of Health Services Research
University of Cambridge
What not to do ........ and what to do

• What not to do: five common misconceptions about emergency admissions

• What to do
Five common misconceptions

• Overestimating the importance of frequent fliers
• Forgetting about regression to the mean
• Assuming interventions are beneficial
• Ignoring supply induced demand
• Forgetting about random variation
What not to do ....... and what to do

1. Overestimating the importance of ‘frequent fliers’
Overestimating the importance of ‘frequent fliers’

Population average for emergency admissions
63/1000

Very high relative risk 0-0.5%

Case management
Emergency admissions = 18.6 x average
1170/1000 people (9.3% of total emergency admissions)

High relative risk 0.5-5%

Disease management
Emergency admissions = 5.5 x average
346/1000 (24.8% of total)

Moderate relative risk 5-20%

Supported self care
Emergency admissions = 1.7 x average
107/1000 (25.5% of total)

Low relative risk 20-100%

Prevention and wellness promotion
Emergency admissions = 0.5 x average
32/1000 (40% of total)
Percentage reduction in admissions in each risk group required to meet targets for reducing emergency admissions

<table>
<thead>
<tr>
<th>Target overall reduction (%)</th>
<th>Very high risk (0.5% of population)</th>
<th>High risk (0.5-5% of population)</th>
<th>Moderate risk (6-20% of population)</th>
<th>Low risk (80% of population)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10.8</td>
<td>4.0</td>
<td>3.9</td>
<td>2.5</td>
</tr>
<tr>
<td>2</td>
<td>21.5</td>
<td>8.1</td>
<td>7.8</td>
<td>5.0</td>
</tr>
<tr>
<td>3</td>
<td>32.3</td>
<td>12.1</td>
<td>11.8</td>
<td>7.5</td>
</tr>
<tr>
<td>4</td>
<td>43.0</td>
<td>16.2</td>
<td>15.7</td>
<td>10.0</td>
</tr>
<tr>
<td>5</td>
<td>53.8</td>
<td>20.2</td>
<td>19.6</td>
<td>12.5</td>
</tr>
<tr>
<td>10</td>
<td>107.5</td>
<td>40.4</td>
<td>39.2</td>
<td>25.0</td>
</tr>
</tbody>
</table>
What not to do …….. and what to do

2. Forgetting about regression to the mean
Forgetting about regression to the mean

What not to do .......... and what to do

3. Assuming all interventions are beneficial

Aims included

• Reduced emergency admissions
• Better co-ordinated care
• Greater patient involvement of patients in decisions about their care

- Staff thought care had improved
- Patients said they were less likely to be able to see a doctor of nurse of their choice and felt less involved in decisions about their care
- Emergency admissions increased by 9%
- Small net reduction in costs (reduced elective admissions and outpatient referrals)

What not to do …….. and what to do

3. Ignoring supply induced demand

• NHS Direct

• NHS walk-in centres

• ‘New workers’ of many sorts…
It’s much easier to improve quality than reduce cost

Systematic review of interventions to improve coordination in healthcare

<table>
<thead>
<tr>
<th>% of studies with a positive outcome for health</th>
<th>% of studies with positive outcome for patient experience</th>
<th>% of studies which showed reduction in cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>55.4%</td>
<td>45.2%</td>
<td>17.9%</td>
</tr>
</tbody>
</table>

Forgetting about random variation due to chance

“A bad day”
Variation due to chance (more correctly a Poisson distribution)
Variation in number of referrals or admissions that would occur if variation was due solely to chance

<table>
<thead>
<tr>
<th>Expected no of events</th>
<th>50%</th>
<th>10%</th>
<th>5%</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>2-6</td>
<td>2-9</td>
<td>1-9</td>
</tr>
<tr>
<td>10</td>
<td>8-12</td>
<td>5-15</td>
<td>4-16</td>
</tr>
<tr>
<td>25</td>
<td>22-28</td>
<td>17-33</td>
<td>16-35</td>
</tr>
<tr>
<td>50</td>
<td>45-54</td>
<td>38-61</td>
<td>37-64</td>
</tr>
<tr>
<td>100</td>
<td>93-106</td>
<td>84-116</td>
<td>81-120</td>
</tr>
<tr>
<td>200</td>
<td>190-209</td>
<td>177-223</td>
<td>173-228</td>
</tr>
<tr>
<td>500</td>
<td>485-515</td>
<td>463-536</td>
<td>457-544</td>
</tr>
<tr>
<td>1000</td>
<td>979-1021</td>
<td>948-1052</td>
<td>939-1062</td>
</tr>
</tbody>
</table>
What not to do ........ and what to do

• What not to do: five common misconceptions about emergency admissions

• What to do
• *Don’t assume that reductions in admissions in a high risk group are due to your intervention* - evaluate your intervention against changes in overall patterns of admission or using a control group
• *Don’t assume there is a correct level of admission or referral to hospital* - clinical audit makes numbers meaningful and should be used to identify where there are problems in care
• Don’t assume that fewer admissions or referrals are necessarily better - doctors with low rates of specialist use may be a danger to their patients, just as high referrers may be wasting resources. Use clinical audit to bring meaning to crude rates of referral or admission
• Be cautious about using data for short time periods or referrals to single specialties - random fluctuations may account for much of the apparent variation in provider performance when numbers are small. Use the table in the BMJ paper to assess how much variation might be due to chance

• Remind everyone who will listen that change is usually slower than people expect (or at least hope for)
• *Choose interventions that are evidence based* – e.g. from systematic reviews (Purdy et al 2012)

• However, bear in mind that context is important. Carefully shaping the way an intervention is introduced may increase its effectiveness, and don’t forget that most changes can have unexpected consequences too.

Purdy et al 2012.
www.bristol.ac.uk/primaryhealthcare/docs/projects/unplannedadmissions.pdf
## What do systematic reviews tell us?

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case management</td>
<td>Overall no effect except for heart failure</td>
</tr>
<tr>
<td>Specialist clinics</td>
<td>Overall no effect except for heart failure</td>
</tr>
<tr>
<td>Care pathways and guidelines</td>
<td>No effect, but limited evidence</td>
</tr>
<tr>
<td>Medication review</td>
<td>No effect, but limited evidence</td>
</tr>
<tr>
<td>Education and self management</td>
<td>Weak evidence for heart failure</td>
</tr>
<tr>
<td>Exercise and rehabilitation</td>
<td>Effective in COPD</td>
</tr>
<tr>
<td>Telemedicine</td>
<td>Possible effect on heart disease, diabetes, hypertension and older people</td>
</tr>
<tr>
<td>Hospital at home</td>
<td>Increased readmissions</td>
</tr>
</tbody>
</table>

Purdy et al 2012.  
[www.bristol.ac.uk/primaryhealthcare/docs/projects/unplannedadmissions.pdf](http://www.bristol.ac.uk/primaryhealthcare/docs/projects/unplannedadmissions.pdf)
Patient recognises a problem

GP surgery

Out of hours centre

Patient arrives in A&E

Patient needs admission

Patient doesn’t need admission

Patient admitted

Availability of appointments
Opening hours
Continuity of care

Triage expertise

Patient behaviour

Community support
Transport
‘Too late’