Ambulatory sensitive hospitalisations in New Zealand, 2001-2009

COMPASS Colloquium
August 2013

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Overview

- Ambulatory sensitive hospitalisations
- Research Questions
- Methods
- Results
- Conclusions
Ambulatory Sensitive Hospitalisations (ASH)

- Some hospitalisations thought to be preventable by timely and effective primary health care
  - Ambulatory Sensitive Hospitalisations (ASH)
  - Ambulatory Care Sensitive Hospitalisations (ACSH)
  - Avoidable Hospitalisations (AH)

- ASH often used as measure of primary health care effectiveness
  - Better primary health care -> lower ASH
<table>
<thead>
<tr>
<th>Ambulatory Sensitive Hospitalisations (ASH)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Atlas of Avoidable Hospitalizations in Australia list</strong></td>
</tr>
<tr>
<td><strong>Chronic ASH</strong></td>
</tr>
<tr>
<td>Diabetes complications, nutritional deficiencies, iron deficiency anaemia, hypertension, congestive heart failure, angina, COPD, asthma</td>
</tr>
<tr>
<td><strong>Acute ASH</strong></td>
</tr>
<tr>
<td>Dehydration &amp; gastroenteritis, convulsions/epilepsy, ear nose and throat infections, perforated ulcer, ruptured appendix, pyelonephritis, pelvic inflammatory disease, cellulitis, gangrene</td>
</tr>
<tr>
<td><strong>Vaccine preventable ASH</strong></td>
</tr>
<tr>
<td>Influenza and pneumonia, other vaccine preventable</td>
</tr>
</tbody>
</table>
Ambulatory Sensitive Hospitalisations (ASH)

- Access to primary health care associated with ASH
  - Self-rated better access -> lower ASH
  - Physician supply -> lower ASH
  - High number of health care visits -> lower ASH
  - Greater travel time to primary health care provider -> higher ASH

- Ethnic and socio-economic inequalities in ASH, and suggestion this partly due to inequalities in access
NZ Context

- Restructuring of NZ primary health care following Primary Health Care Strategy in 2001
  - Establishment of Primary Health Organisations (PHO) to oversee planning and delivery of primary health care services
  - Funding increased, and changed from fee-for-service at practice level to capitation funding at PHO level
  - As a result, fees reduced; consultation rates increased; unmet need reduced; inequalities in access reduced (proportion Māori visiting GP below national average in 2001; at national average in 2006)
Research Questions

Given NZ has experienced an intervention to improve primary health access, and disparities in primary health care access...
  - With some success

- Have ASH rates reduced since 2001?
- Have ASH inequalities reduced since 2001?
Methods

- NMDS data 2001-9
- ASH (Chronic, Acute, Vaccine-preventable) indicators developed
  - 1st edition of ICD-10AM used across all years
- Merged with population counts for
  - DHB (21) by year (9), sex (2), 5-yr age band (19), ethnicity (3: Māori, Pacific, non-Māori/non-Pacific) & deprivation quintile (5)
    - $21 \times 9 \times 2 \times 19 \times 3 \times 5 = 107730$ (potential) cells
  - Allows measure of “number of ASH events” for every person in NZ for a particular year
- Cannot assess health need; rurality
Methods

- Number of ASH events regressed against year, deprivation, ethnicity, sex, age, DHB, readmission rate, length of stay rate
  - Separately by ASH subtype
  - Negative binomial regression models
- Time trends assessed
- Deprivation effect assessed
  - Time trends assessed
- Ethnicity effect assessed
  - Time trends assessed
## Results I: Time series by ASH type

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>Chronic</th>
<th>Acute</th>
<th>Vaccine preventable</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>67234 (13.2)</td>
<td>45188 (8.9)</td>
<td>30665 (6.0)</td>
<td>2470 (0.49)</td>
</tr>
<tr>
<td>2002</td>
<td>71125 (14.1)</td>
<td>48500 (9.6)</td>
<td>31556 (6.3)</td>
<td>2283 (0.45)</td>
</tr>
<tr>
<td>2003</td>
<td>72171 (14.3)</td>
<td>49790 (9.9)</td>
<td>32065 (6.4)</td>
<td>2162 (0.43)</td>
</tr>
<tr>
<td>2004</td>
<td>73952 (14.6)</td>
<td>51117 (10.1)</td>
<td>33463 (6.6)</td>
<td>1988 (0.39)</td>
</tr>
<tr>
<td>2005</td>
<td>73577 (14.5)</td>
<td>51158 (10.1)</td>
<td>32505 (6.4)</td>
<td>2027 (0.40)</td>
</tr>
<tr>
<td>2006</td>
<td>77335 (14.8)</td>
<td>53696 (10.3)</td>
<td>34661 (6.6)</td>
<td>2060 (0.39)</td>
</tr>
<tr>
<td>2007</td>
<td>79261 (14.8)</td>
<td>54756 (10.3)</td>
<td>35899 (6.7)</td>
<td>2111 (0.40)</td>
</tr>
<tr>
<td>2008</td>
<td>81167 (14.8)</td>
<td>55451 (10.1)</td>
<td>37580 (6.9)</td>
<td>2257 (0.41)</td>
</tr>
<tr>
<td>2009</td>
<td>86076 (15.1)</td>
<td>59248 (10.4)</td>
<td>38957 (6.9)</td>
<td>4174 (0.73)</td>
</tr>
<tr>
<td>Δ 2001-9</td>
<td>11.0%</td>
<td>13.7%</td>
<td>10.2%</td>
<td>46.5%</td>
</tr>
</tbody>
</table>
Results II: Person-level time series

Chronic

Acute

Vaccine preventable

Incidence

Prevalance
Results II: Person-level time series

- **Chronic**: Rate (per 1000) showing an increase from 2003 to 2004 with a peak of 1.47.
- **Acute**: Rate (per 1000) with an increase from 2001 to 2002 reaching a peak of 1.16.
- **Vaccine preventable**
  - Incidence: Showing a sharp increase from 2007 onwards, with a peak of 1.21.
  - Prevalance: Fluctuating with a noticeable increase post-2007.
## ASH Results III: Equity models

<table>
<thead>
<tr>
<th></th>
<th>A. Chronic</th>
<th>B. Acute</th>
<th>C. Vaccine preventable</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Incidence per 1000</td>
<td>IRR (95% CI)</td>
<td>Incidence per 1000</td>
</tr>
<tr>
<td><strong>Deprivation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 (least deprived)</td>
<td>7.7</td>
<td>--</td>
<td>6.1</td>
</tr>
<tr>
<td>2</td>
<td>9.6</td>
<td>1.25 (1.23-1.27)</td>
<td>7.0</td>
</tr>
<tr>
<td>3</td>
<td>12.5</td>
<td>1.62 (1.60-1.65)</td>
<td>8.7</td>
</tr>
<tr>
<td>4</td>
<td>17.0</td>
<td>2.22 (2.18-2.25)</td>
<td>11.3</td>
</tr>
<tr>
<td>5 (most deprived)</td>
<td>22.1</td>
<td>2.88 (2.84-2.92)</td>
<td>14.7</td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Maori, Non-Pacific</td>
<td>7.3</td>
<td>--</td>
<td>7.3</td>
</tr>
<tr>
<td>Māori</td>
<td>16.7</td>
<td>2.30 (2.27-2.32)</td>
<td>10.4</td>
</tr>
<tr>
<td>Pacific</td>
<td>17.3</td>
<td>2.38 (2.34-2.42)</td>
<td>9.9</td>
</tr>
</tbody>
</table>
ASH Results IV: Deprivation effect 2001-9

Chronic

Acute

Vaccine preventable

Incidence (per 1000)

2001 2002 2003 2004 2005 2006 2007 2008 2009
ASH Results V: Ethnicity effect 2001-9

Chronic

Incidence (per 1000)

2001 2002 2003 2004 2005 2006 2007 2008 2009

Acute

Incidence (per 1000)

2001 2002 2003 2004 2005 2006 2007 2008 2009

Vaccine preventable

incidence (per 1000)

2001 2002 2003 2004 2005 2006 2007 2008 2009

Pacific

Maori

Non-Maori, Non-Pacific
ASH Paper - Conclusions

- ASH rates largely stable over time
  - Downward trend to 2008 for vaccine preventable ASH
- Strong ethnic and deprivation gradients
- Deprivation disparities increased 2001-2009 for chronic and acute ASH
- Ethnic disparities also increased 2001-2009, though not as markedly
ASH Paper - Conclusions

- Contrary to access hypothesis

- Policy that (successfully) improved access did not reduce ASH and did not decrease disparities

- Interventions to improve access will not necessarily reduce ASH rates
  - Access may not be the most important determinant of ASH.