Objective

To investigate the relationship between medication prescribing, medication review and adverse drug events.
Background

› Management of chronic conditions, particularly multimorbidity is an increasing problem for Australian general practitioners
› Polypharmacy is a consequence of managing patients with multiple chronic diseases
› Polypharmacy causes increased risk of adverse drug effects
› Regular medication review may reduce polypharmacy and the incidence of adverse drug events

Research hypotheses

1. Polypharmacy is common in general practice patients
2. Multiple prescribers are associated with more polypharmacy
3. Medication review may reduce polypharmacy and adverse events
4. Patients on multiple medications have a higher incidence of adverse drug events
5. Adverse drug events may cause significant morbidity and hospitalisation
Research questions

1. What proportion of general practice patients regularly take medication?
2. How many medications are prescribed for continual use?
3. How many doctors prescribed continual medications in the previous 6 months?
4. What proportion practice patients had a medication review in the preceding 6 months and who carried out the review?

5. What proportion of patients had an adverse drug event (ADE) in the preceding 6 months?
6. What is the severity of the ADEs experienced by general practice patients?
7. What proportion of patients with an ADE attended or were admitted to hospital?
8. Does polypharmacy increase the incidence of ADEs?
**BEACH Methods**

**BEACH** – Bettering the Evaluation And Care of Health

Paper based, cross-sectional data collection
National GP random sample (drawn by DoH)
1,000 GPs per year
20 per week x 50 weeks a year
100 consecutive encounters per GP
All types of encounters included
National data for 100,000 encounter records p.a.

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**SAND methods**

Supplementary Analysis of Nominated Data

Sub-studies of health aspects which may not have been managed at the visit.

30 consecutive patients from 100 GPs over a 5 week ‘block’ – 3,000 patients

In four ‘blocks’ between August 2014 and March 2015, 390 GPs recorded 11,477 patient responses to questions about medications, medicine review and adverse drug events
Severity of the event:

- **Mild**: a reaction of limited duration which may or may not require further treatment; minimum impact on daily activities.

- **Moderate**: a reaction of longer duration or which requires further treatment; limits daily activities.

- **Severe**: a reaction of any duration which results in hospitalisations and or long term limitations of daily activities.

ADE severity definitions provided to the GPs
Sample

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of GPs</td>
<td>390</td>
</tr>
<tr>
<td>Number of encounters</td>
<td>11,545</td>
</tr>
<tr>
<td>Patients with at least one continual medication</td>
<td>7,578</td>
</tr>
<tr>
<td>Percentage of Patients with at least one continual medication</td>
<td>66.0 (95% CI: 63.6–68.4)</td>
</tr>
</tbody>
</table>

Distribution of continual medicines (95% CI)

Average number of regular medications = 3.1  Range 0-30  \( n = 11,471 \)
**Age specific rate of medications (95% CI)**

- **Number of medications**
  - Age group: 25-44, 45-64, 65-74, 75+
  - Number of medications: 0, 1, 2, 3, 4, 5, 6, 7

**Number of prescribers (95% CI)**

- **Percent of patients**
  - Number of prescribers: no prescribers, 1 prescriber, 2 prescribers, 3+ prescribers
  - Percent of patients: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50
Medication reviews (95% CI)

Percent of patients

Number continuing meds

Family Medicine Research Centre

ADEs and polypharmacy (95% CI)

Rate of ADEs in last 6 months

Number continuing meds

Family Medicine Research Centre
Age/sex distribution of meds and ADEs

<table>
<thead>
<tr>
<th>Variable</th>
<th>Average number meds</th>
<th>95% CI</th>
<th>Age/sex specific rate of ADEs</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15–24</td>
<td>1.3</td>
<td>1.1–1.4</td>
<td>7.8</td>
<td>5.6–9.9</td>
</tr>
<tr>
<td>25–44</td>
<td>1.6</td>
<td>1.4–1.7</td>
<td>11.0</td>
<td>9.1–12.8</td>
</tr>
<tr>
<td>45–64</td>
<td>3.1</td>
<td>2.9–3.3</td>
<td>11.1</td>
<td>9.6–12.7</td>
</tr>
<tr>
<td>65–74</td>
<td>4.9</td>
<td>4.6–5.2</td>
<td>11.1</td>
<td>9.1–13.1</td>
</tr>
<tr>
<td>75+</td>
<td>6.1</td>
<td>5.7–6.5</td>
<td>14.4</td>
<td>12.3–16.6</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>3.2</td>
<td>3.0–3.4</td>
<td>11.5</td>
<td>10.3–12.6</td>
</tr>
<tr>
<td>Male</td>
<td>3.0</td>
<td>2.8–3.2</td>
<td>10.9</td>
<td>9.5–12.3</td>
</tr>
</tbody>
</table>

Age specific rate of ADEs in patients on at least one continuing medication (95% CI)
### ADE severity

<table>
<thead>
<tr>
<th>Severity</th>
<th>%</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild</td>
<td>62.4</td>
<td>58.5–66.3</td>
</tr>
<tr>
<td>Moderate</td>
<td>28.3</td>
<td>24.9–31.8</td>
</tr>
<tr>
<td>Severe</td>
<td>9.3</td>
<td>6.8–11.8</td>
</tr>
</tbody>
</table>

No relationship between patient age and severity of ADEs

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### Hospital attendance or admission of patients with an ADE by number of continuing medications

<table>
<thead>
<tr>
<th>Number continuing meds</th>
<th>Rate of hospitalisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 med</td>
<td>10</td>
</tr>
<tr>
<td>2-4 meds</td>
<td>5</td>
</tr>
<tr>
<td>5-9 meds</td>
<td>10</td>
</tr>
<tr>
<td>10+ meds</td>
<td>25</td>
</tr>
</tbody>
</table>
Summary of findings

› Almost two thirds of patients presenting to GPs are on regular medication. Average number of meds = 3.1 and 7.6% are on 10 or more meds
› The number of continuing medications taken increases with age
› About 70% of patients have had a medication review in the preceding 6 months, 97% involved their GP.
› Over 11% of patients have experienced an adverse drug events in the six months prior to presentation to a GP
› The frequency of ADEs is directly related to numbers of medications but not directly related to patient age. 18% of patients on 10+ meds had an ADE in the preceding 6 months
› A third of ADEs cause significant morbidity and one in 10 results in hospital care. 20% of patients on 10+ meds required hospital care for their ADE
Many thanks to the GPs

BEACH 2014-15

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Continuing medications and adverse drug events in Australia general practice patients

A BEACH SAND study
in collaboration with the National Health Performance Authority

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