Medication use amongst older Australians: Analysis of the Australian Longitudinal Study of Ageing (ALSA) data

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Director, Flinders Centre for Ageing Studies
Medication Use

• Other speakers have presented some of the general issues concerning use of medicines by older adults

• Aim of this Presentation:
  – Snapshot of medication use among local sample – ALSA
  – Prescription, OTC, CAM
  – Some implications, e.g., for falls
Australian Longitudinal Study of Ageing (ALSA)

A population-based panel for exploring the complexity of normative ageing

Baseline: 1992, N= 2087; 565 couples equal men & women
88% Australian or UK born

2014 - Wave 13 (N = 94) 75% Women

Now - ‘oldest-old’, >85 years, M = 89.7
January 2014: 1,806 (86%) deaths

Gary Andrews
2 May 1938 – 18 May 2006

Flinders University
inspiring achievement
Mode of interview and number of participants over time in the ALSA

1992: Cohort establishment
Wave 1 face-to-face interview
n = 2,087

1993: Wave 2 telephone interview
n = 1,779

1994: Wave 3 face-to-face interview
n = 1,679

1995: Wave 4 telephone interview
n = 1,504

1998: Wave 5 telephone interview
n = 1,171

2000: Wave 6 face-to-face interview
n = 791

2003: Wave 7 face-to-face interview
n = 487

2005: Wave 8 telephone interview
n = 348

2007: Wave 9 face-to-face interview
n = 213

2008: Wave 10 face-to-face interview
n = 198

2010: Wave 11 face-to-face interview
n = 168

2013: Wave 12 face-to-face interview
n = 111

38 deceased SW1 91.3% response fraction
210 deceased SW1 93.1% response fraction
316 deceased SW1 89.5% response fraction
623 deceased SW1 85.5% response fraction
926 deceased SW1 74.1% response fraction
1,218 deceased SW1 74.4% response fraction
1,401 deceased SW1 84.9% response fraction
1,498 deceased SW1 78.6% response fraction
1,589 deceased SW1 94.3% response fraction
1,663 deceased SW1 92.8% response fraction
1,756 deceased SW1 95.7% response fraction

SW1 = Since Wave 1
Methods

• **Quantitative Approach**
  – Home Interview
  – Clinical Assessment
  – Self-complete Questionnaires

• **Qualitative Approach**
  – Open-ended Question after Clinical Assessment
    • *What are your hopes and fears for your/the future?*
  – Specific Sub-studies: Sleep, Widowhood, Resilience
1994 W3: Age 80
Interviews & Assessments at Participant’s Home

2010 W11
Age 95

2013 W12:
Age 99

(Female – 482)
Data Acquisition

- W1, W6, W9: Asked to present all drug containers; recorded dose, reason for script, duration taken
- W3: Asked about changes to medication usage and containers
- W7+: Data from HIC/PBS

- Mixture of methods mixed blessing
Bio-Psych-Social Approach

• Psychological: Affect, Cognition, Morale

• Social: Networks, Living Arrangements, Participation, Marital Status, Work History

• Functional: Activities, Falls, Mobility

• BIO...
Bio-Psycho-Social Approach

- Self-reported health: ‘poor’ – ‘excellent’
- [Medication Use]
- Morbidity (baseline) arthritis most common, then CVD, hypertension, GI disease, ‘mental health problems’ (mostly with others)
- Mortality (1992 +14 years) – increased by 25% if 3-4 diseases vs 80% >5, cf. none
Caughey et al. (2010)

Survival Probability

Time (years)

No Chronic disease
1 Chronic disease
2 Chronic diseases
3-4 Chronic diseases
≥ 5 Chronic diseases

<table>
<thead>
<tr>
<th></th>
<th>HR</th>
<th>95% CI</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 Chronic disease</td>
<td>1.0</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1 Chronic disease</td>
<td>1.07</td>
<td>0.89-1.29</td>
<td>0.48</td>
</tr>
<tr>
<td>2 Chronic diseases</td>
<td>1.14</td>
<td>0.95-1.36</td>
<td>0.26</td>
</tr>
<tr>
<td>3-4 Chronic diseases</td>
<td>1.25</td>
<td>1.05-1.49</td>
<td>0.01</td>
</tr>
<tr>
<td>≥ 5 Chronic diseases</td>
<td>1.80</td>
<td>1.47-2.19</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>
Median Survival Time & Distribution, Given Baseline Morbidity

- no chronic diseases 10.4 years (12%)
- 1 - 10.2 (23%)
- 2 - 9.6 (24%)
- 3-4 - 8.9 (28%)
- ≥5 - 6.4 (13%)

(adjusted for age, gender, residential status).
By implication ...

- the greater the number of co-morbid diseases

... the greater the number of medications

- so poly-pharmacy as much as poly-morbidity at play here...
- limitation
Medication Topics Covered

• Baseline: Overview of medication use

• Over Time: Use of OTC and CAMs

• Psychotropic drug use - relationship to falls and fractures
Baseline Overview

- 89% taking at least one medication
- Average: 3.2 medications (SD 2.4)
- ~25%: taking at least five medications
- One third using non-prescription and prescription combinations
- 20% - were non-prescription
Anatomical Chemical Therapeutic Classification (WHO)

• To code medications
• Groups according to organ or system on which they act
• Results for 1993 Version
  
  C = Cardiovascular System
  N = Nervous System
  A = Alimentary System and Metabolism
# 10 Most Common Medications

Baseline

<table>
<thead>
<tr>
<th>ATC code</th>
<th>Generic name</th>
<th>%</th>
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<tbody>
<tr>
<td>N02BA01</td>
<td>Aspirin</td>
<td>23</td>
</tr>
<tr>
<td>N02BE01</td>
<td>Paracetamol</td>
<td>15</td>
</tr>
<tr>
<td>C03CA01</td>
<td>Furosemide (diuretic)</td>
<td>14</td>
</tr>
<tr>
<td>C01AA05</td>
<td>Digoxin (cardiovascular)</td>
<td>9</td>
</tr>
<tr>
<td>C07AB03</td>
<td>Atenolol (beta blocker)</td>
<td>8</td>
</tr>
<tr>
<td>C03DB01</td>
<td>Amiloride (diuretic)</td>
<td>7</td>
</tr>
<tr>
<td>C01DA08</td>
<td>Isosorbide Dinitrate (vasodilator)</td>
<td>6</td>
</tr>
<tr>
<td>C02EA01</td>
<td>Antihypertensives</td>
<td>6</td>
</tr>
<tr>
<td>A02BA02</td>
<td>Ranitidine (ulcers)</td>
<td>5</td>
</tr>
<tr>
<td>C01DA02</td>
<td>Glyceryl trinitrate (angina)</td>
<td>5</td>
</tr>
</tbody>
</table>
With Ageing ...

- polypharmacy, multiple (co)morbid illnesses and physiological changes:
  - Can increase the risk of adverse drug reactions, hospitalizations, etc

- Use of OTC and CAMs is understudied in older adults, especially in Australia & over time
Non-prescription (self-) medications

- Over the Counter (OTC) Medicines
  - E.g., antacids, antihistamines

- Complementary and Alternative Medicines (CAM)
  - E.g., herbal and traditional medicines

- Estimates of 33% to 50% older people report using 1 or more

- ALSA – less usage

Goh, Vitry, Semple, Esterman, Luszcz 2009
## Self - Medication

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<tr>
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<tbody>
<tr>
<td>Wave 1</td>
<td>N = 2087</td>
<td>Wave 3</td>
<td>N =1679</td>
<td>Wave 6</td>
</tr>
<tr>
<td>CAM/OTC</td>
<td>404</td>
<td>460</td>
<td>140</td>
<td>173</td>
</tr>
<tr>
<td>OTC</td>
<td>268</td>
<td>278</td>
<td>79</td>
<td>83</td>
</tr>
<tr>
<td>CAM</td>
<td>180</td>
<td>241</td>
<td>71</td>
<td>118</td>
</tr>
</tbody>
</table>

- No obvious temporal trend or pattern of preferred use
- Overall about 10 – 35% use one or both

Goh, Vitry, Semple, Esterman, Luszcz 2009
Results:
Top classes of CAM and OTC drugs used

CAM
- Vitamins & minerals
- Herbal Medicines
- Nutritional Supplements

OTC
- Analgesics
- Laxatives
- Antithrombotic (low dose Aspirin)
Who Self-prescribes?

- Examined Demographics
- Do Age, Gender, Education, Income level or Self-rated Health affect OTC or CAM use?
  - OTC – no significant effects
  - CAM – more used by women and at younger ages (65-79 vs ≥ 80)
    - used for enhancement of general health, boosting of immune system
Psychotropic Rx and Falls

- Consequences or ‘side effects’
- >65 years:
  33% incidence of falls
  30% accompanied by fractures or other injuries
  if hospitalised, 50% die within 12 months
Risk factors for falling

- **environmental** (e.g., poor lighting, loose carpets, slippery flooring, lack of handrails)
- **intrinsic** (e.g., weak muscle strength or impairment in balance, gait, vision, or cognition)
- **extrinsic** such as use of *certain medicines* or polypharmacy
Method

• 1492 people: waves 1 (1992) and wave 3 (1994)
• ‘Persistent Users’: at both waves - 22% (325) vs non-users (1167) [others excluded (187)]
• Psychotropic medicines recorded
  – Antipsychotics – 13%
  – Anxiolytics - 31%
  – Hypnotics and sedatives – 12%
  – Antidepressants – 32%
• Confounders: e.g., gender, arthritis, cognition, depression, balance, gait, strength, other Rx
More Persistent Users

- female (61.5% vs. 46.6%)
- older (78.5 years vs. 77.1 years)
- living in residential aged care (9.2% vs. 2.6%)
- experiencing dizziness (41.5% vs. 20.1%)
- poorer mobility (23.7% vs. 12.5%)
- cognitive impairment (17.2% vs. 11.6%)
- arthritis (63.4% vs. 49.4%)
- cataract (53.4% vs. 23.2%)
- history of stroke or transient ischemic attack (16.6% vs. 8.6%)
• Number of **Falls** reported in 12 months previous to wave 3
  - 540 fell (36%)
  - 2.5 (6.3 S.D.) in non-users vs. 3.4 (9.9) in persistent users

• Gender modified Risk for Users:
  - **F** - IRR = 1.77; (95% CI = 1.54–2.05; p < 0.0001);
  - **M** - IRR = 1.03; (95% CI = 0.85–1.26; p = 0.72)
  - **F** - after **BMI** adjustment, IRR = 1.22
    (95% CI = 1.02–1.45; p < 0.015) underweight & obese
• Fractures in the previous 2 years
  persistent users (9.5% or 30)
  non-users (3.9% or 45)
• Gender again modified risk for Users:
  ➢ F IRR = 2.54; (CI = 1.57–4.11; p < 0.0001)
  ➢ M IRR = 0.66; (CI = 0.15–2.86; p = 0.584)
  ➢ F > BMI adjustment: IRR = 1.92
    (p < 0.015, CI = 1.13–3.24). [underweight]
• Despite some group differences between users and non-users:
  • Only additional effects attributable to
    – Gender: female users more falls + fractures
    – BMI:  > Falls if underweight or obese
             > Fractures if underweight
  • Persistent use of Psychotropic Drugs is significant risk factor for these older women
  • > frailty, osteoporosis, dosage/duration?
Outlook

• ‘Snapshot’ reveals that only limited attention has been given in ALSA to understanding medication use patterns or their implications

• Other domains suggest relatively ‘healthy’ sample, -> underestimate patterns in wider community of older adults
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(NILS/FCAS)

Dr Mydair Hunter
Acknowledgement

• Prof Andy Gilbert & Colleagues
  – Dr. Gillian Caughey
  – Prof Elizabeth Roughead
  – Dr. Agnes Vitry

• Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, Uni SA

• ARC/NHMRC – Ageing Well Ageing Productively Grant (AG –CIA)
Ageing Well

Thank You!