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Potentially inappropriate medicines and potential prescribing omissions in older people

Prevalence and association with healthcare use

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Outline

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- Objectives
- Study design
- Results
  - Part 1: Prevalence
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Potentially inappropriate prescriptions as determined by STOPP criteria

Criterion

Cardiovascular system

- Digoxin >125 µg per day with impaired renal function
- Thiazide diuretic with history of gout
- β-blocker with COPD
- Diltiazem or verapamil with NYHA class III or IV heart failure
- Calcium channel blockers with chronic constipation
- Dipyridamole as monotherapy for cardiovascular secondary prevention
- Aspirin with history of PUD without histamine H2 antagonist or PPI
- Aspirin ≥150 mg/day
- Aspirin with no history of coronary, cerebral or peripheral vascular symptoms or occlusive event[a]

Central nervous system

- TCA with dementia
- TCA with cardiac conductive abnormalities
- TCA with constipation
- TCA with prostatism or history of urinary retention
- Long-term, long-acting benzodiazepines
- Long-term neuroleptics in those with Parkinsonism
- Prolonged use of first generation antihistamines

Gastrointestinal system

- Diphenoxylate, loperamide or codeine phosphate for treatment of diarrhoea of unknown cause
- Diphenoxylate, loperamide or codeine phosphate for severe infective gastroenteritis, i.e. bloody diarrhoea, high fever or severe systemic toxicity
- PPI for peptic ulcer disease at full therapeutic dosage for > 8 weeks

Potentially inappropriate prescribing

Can be divided into:

- Overprescribing: the use of drugs where no clinical indication exists
- Misprescribing: the use of an indicated drug where the risks outweigh the benefits
- Underprescibing: the omission of clinically indicated medicines

Potentially inappropriate medicines (PIMs)

Potential prescribing omissions (PPOs)

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Objectives

In a cohort of community-dwelling older people:

- To compare the prevalence of potentially inappropriate prescribing (both PIMs and PPOs) using several screening tools
- To assess if the prevalence of potentially inappropriate prescribing changes over time
- To determine the association between PIMs and PPOs and healthcare use (hospital and GP visits)

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Study design

- Cohort study of TILDA participants aged ≥65 years (Wave 1 and 2)
- 2,051 TILDA participants with linked medication dispensing on GMS scheme from HSE-PCRS[1]
- Prevalence of PIMs and PPOs determined in 12 months preceding Wave 1 and 2 interviews
- PIMs assessed using STOPP, Beers' criteria, ACOVE indicators
- PPOs using START and ACOVE indicators
- Poisson regression models (with robust SEs) to determine association with healthcare use (Wave 1)

1. Richardson K, Kenny RA, Peklar J, Bennett K. Agreement between patient interview data on prescription medication use and pharmacy records in those aged older than 50 years varied by therapeutic group and reporting of indicated health conditions. J Clin Epidemiol. 2013 Nov;66(11):1308-16.

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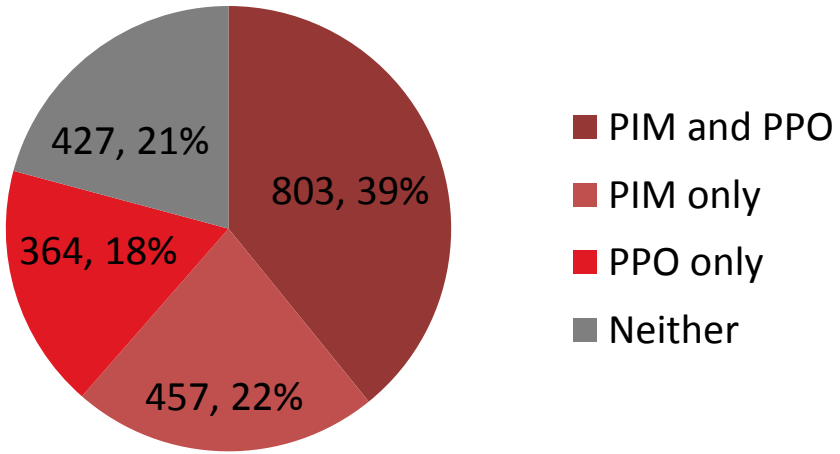
Results – baseline prevalence

- Prevalence of PIMs was between 19.8-52.7% depending on screening tool used (61.4% of study population with any PIM)
- PPO prevalence ranged from 43.6-44.8% (56.9% with any PPO)
- 2,963 PIMs and 2,515 PPOs identified



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Results – most prevalent indicators

PIMs

- Aspirin with no history of coronary, cerebral or peripheral arterial symptoms or occlusive arterial event (STOPP, 19.8%)
- Proton pump inhibitor for peptic ulcer disease at full therapeutic dosage for greater than 8 weeks (STOPP, 17.2%)
- Medication with strong anticholinergic effects (ACOVE, 11.9%)

PPOs

- Calcium and vitamin D supplement omission in patients with known osteoporosis (START and ACOVE, 14.7%)
- Antihypertensive therapy omission where systolic blood pressure is greater than 160mmHg (START, 13.6%)
- Omission of a laxative in an older person with persistent pain treated with opioids (ACOVE, 11.0%)

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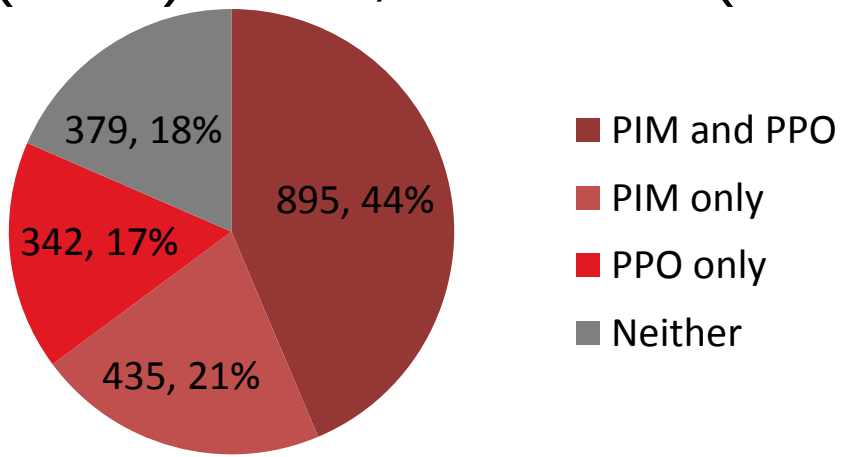
Results – follow-up prevalence

Prevalence significantly increased ($p<0.05$)

- PIM prevalence was 22.0-56.1% depending on screening tool used (64.8% of study population with any PIM)
- PPO prevalence was 46.3-49.3% depending on screening tool used (60.3% with any PPO)
- 3,378 PIMs (+415) and 2,805 PPOs (+290) identified



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Results – change in indicator prevalence

Highly significant ($p<0.0001$) increases in prevalence of:

- Prescription of proton pump inhibitors for >8 weeks (STOPP, 17.2 to 21.9%)
- Prescription of contraindicated medicines in dementia (Beers, 0.3 to 1.3%)
- Omission of warfarin in atrial fibrillation (START, 7.5 to 9.5%)
- Omission of osteoporosis treatment for females (ACOVE, 9.1 to 12.1%)

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Results – hospital visits

- A&E visits or inpatient admissions
- 26% reported a hospital visit in previous 12 months at baseline interview
- 1 visit: 12.5%, 2 visits: 7.4%, 3 visits: 2.3%, ≥4 visits: 3.8%
- Separate multivariate poisson regression models for each screening tool adjusting for:
  - Sex (54% female)
  - Age (mean [SD] = 74.8 [6.2] years)
  - SES/education (31% secondary, 17% tertiary)
  - No. of chronic conditions (mean [SD] = 2.4 [1.6])
  - No. of medicines (mean [SD] = 4.1 [2.9])
  - Private health insurance status (43%)

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Results – hospital visits

- Regardless of tool used, PIM exposure and PPO exposure independently associated with hospital visits

	Hospital visits	
	Unadjusted IRR (95% CI)	Adjusted IRR (95% CI)
Number of STOPP PIMs	1.35 (1.27-1.44)**	1.24 (1.15-1.35)**
Sex (female)	0.92 (0.71-1.18)	0.78 (0.61-0.99)*
Age (in years)	0.99 (0.97-1.02)	0.99 (0.96-1.01)
Level of education	1.03 (0.88-1.21)	1.08 (0.91-1.28)
Number of repeat drug classes	1.14 (1.10-1.18)**	1.05 (0.99-1.13)
Number of chronic conditions	1.25 (1.16-1.36)**	1.12 (0.99-1.27)
Private health insurance	0.87 (0.68-1.10)	0.89 (0.68-1.16)

** $p < 0.001$ * $p < 0.05$

Results – GP visits

- 96.2% reported a GP visit (median: 4, IQR: 2-6 visits)
- Regardless of PIM tool used, PIM exposure independently associated with GP visits
- ACOVE PPO exposure also associated

	GP visits	
	Unadjusted IRR (95% CI)	Adjusted IRR (95% CI)
Number of STOPP PIMs	1.16 (1.13-1.20)**	1.08 (1.04-1.12)**
Sex (female)	0.97 (0.87-1.08)	0.90 (0.82-0.99)*
Age (in years)	1.01 (0.99-1.02)	1.0 (0.99-1.01)
Level of education	0.91 (0.85-0.98)*	0.96 (0.90-1.03)
Number of repeat drug classes	1.09 (1.07-1.11)**	1.05 (1.02-1.08)*
Number of chronic conditions	1.15 (1.10-1.21)**	1.07 (1.0-1.15)*
Private health insurance	0.82 (0.74-0.90)**	0.87 (0.79-0.95)*

** $p < 0.001$ * $p < 0.05$

Conclusions

- Prevalence of PIMs and PPOs in this cohort is high regardless of screening tool used
- Often PIMs and PPOs occur together
  - Improving prescribing quality not just about prescribing fewer medicines
- Prevalence in this cohort increases with time
  - Importance of medicines review as people get older
- PIM exposure and PPO exposure associated with GP and hospital visits

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Further research

- Longitudinal analysis to determine if PIM exposure and PPO exposure predicts future healthcare use, falls, functional decline, declining QoL
- To develop an economic model of the impact of potentially inappropriate prescribing
  - using Discrete Event Simulation

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