

# Potentially Inappropriate Medication in Geriatric Oncological Patients

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## 1 Introduction

**Potentially inappropriate medication (PIMs)** are medications with an **unfavourable risk-benefit ratio** in geriatric patients aged  $\geq 65$  years.<sup>1</sup> This population is particularly vulnerable to polypharmacy, which in turn increases the risk of PIMs.<sup>2,3</sup> **Screening tools** are currently used in clinical practice to detect prescribed PIMs and help optimize drug therapies in geriatric patients.

We aimed to assess the **risk of rehospitalisation and death associated with PIMs** detected by any screening tool in geriatric/geriatric cancer patients in the literature and in real life as well as to determine the **prevalence of PIMs** in geriatric cancer patients.

## 2 Methods

- Systematic review with meta-analysis** investigating the association of  $\geq 1$  prescribed PIM with rehospitalisation and death within three months in patients aged  $\geq 65$  years detected by any screening tool.
- Observational study** to assess whether this association also applied to oncological patients aged  $\geq 70$  years at the Department of Medical Oncology and Hematology of the University Hospital of Zurich: determination of PIM prevalences detected by Beers (2023),<sup>4</sup> STOPP (v3),<sup>5</sup> and Priscus (2.0)<sup>6</sup> (**Figure 1**).

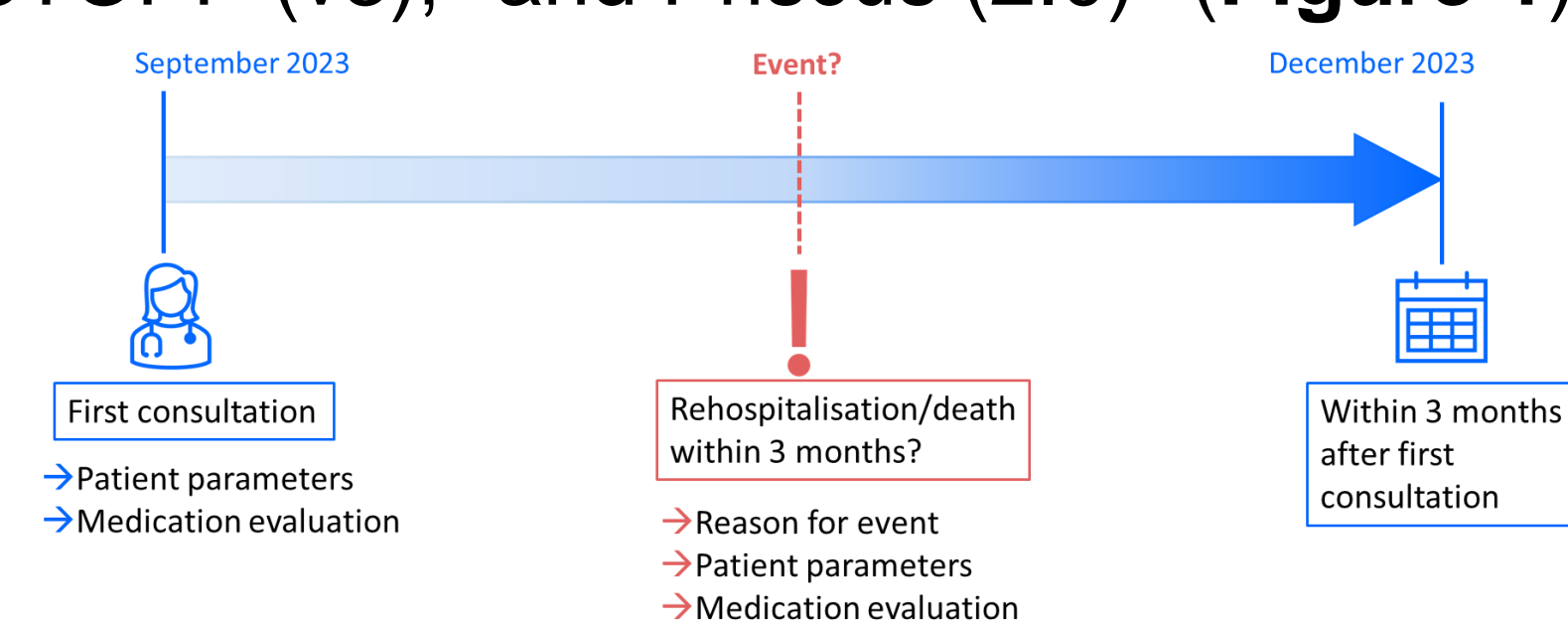


Figure 1: Methodology of our observational study.

## 3 Results (meta-analysis)

- Eight studies were included for the analysis of the outcome rehospitalisation and six for the outcome mortality.
- Statistically significant association of  $\geq 1$  PIMs and **rehospitalisation** in geriatric patients compared to no PIMs within 3 months (**Figure 2**).
- No significant association between PIMs and **mortality**.

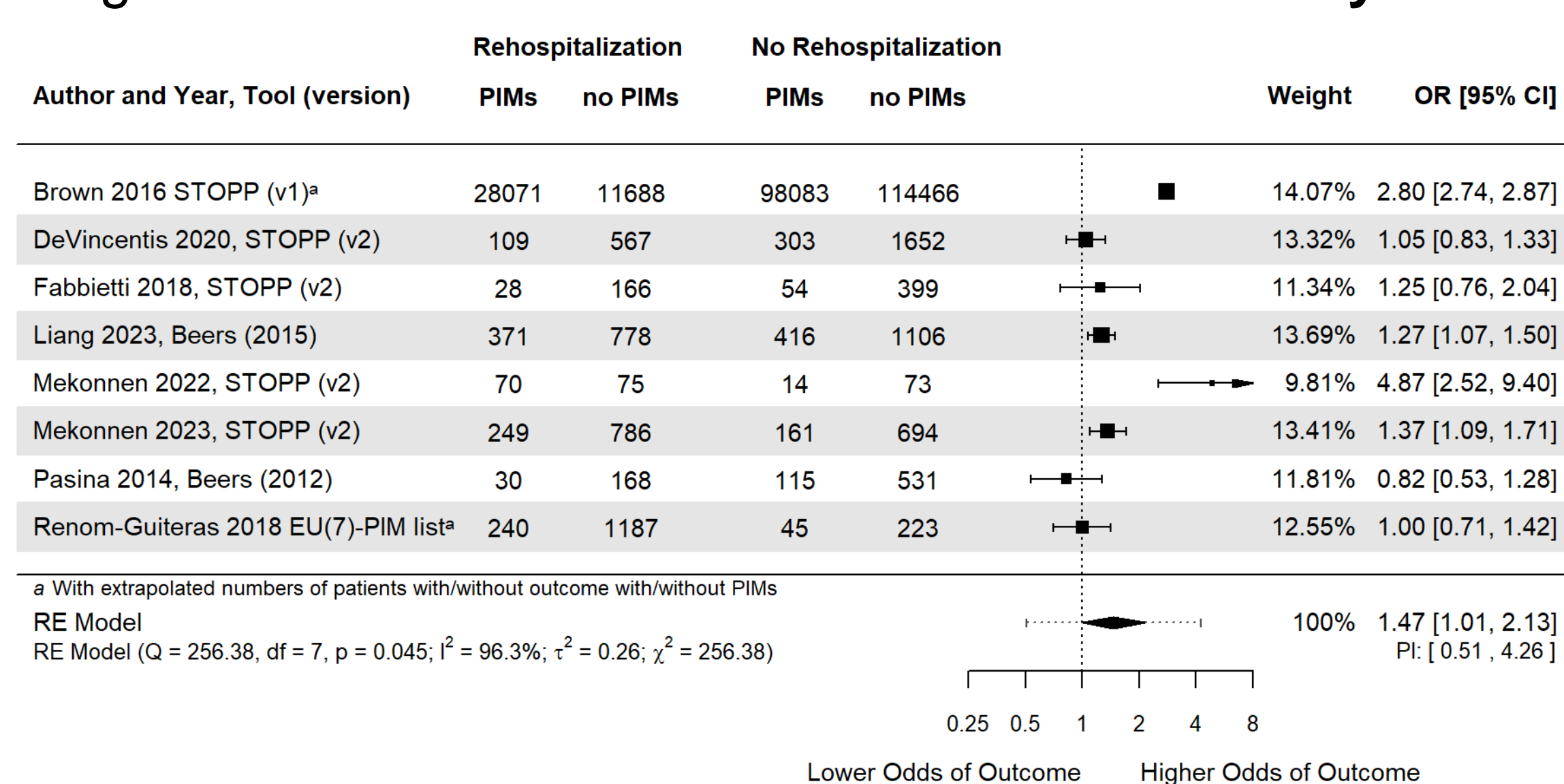


Figure 2: Forest-plot of outcome rehospitalisation within three months

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## 3 Results (observational study)

- Screening of 112 patients and inclusion of 87 patients
- Prevalence of prescription of PIMs in total: 45.98% (40/87)
- PIM prevalences: 28.74% (Beers), 13.79% (STOPP), and 33.33% (Priscus) (**Figure 3**).

Characteristics	Total n = 87 n(%) or mean $\pm$ SD	0 PIMs n = 47 n(%) or mean $\pm$ SD	$\geq 1$ PIMs n = 40 n(%) or mean $\pm$ SD	P-value
Age (years)	78.24 $\pm$ 5.22	77.40 $\pm$ 4.79	79.23 $\pm$ 5.58	0.110
Male	60 (68.97%)	34 (72.34%)	26 (65.00%)	
Female	27 (31.03%)	13 (27.66%)	14 (35.00%)	0.614
Number of co-morbidities	6.21 $\pm$ 3.25	6.09 $\pm$ 3.26	6.35 $\pm$ 3.27	0.710
Number of medications	6.97 $\pm$ 4.30	5.26 $\pm$ 3.51	8.98 $\pm$ 4.31	<0.001*
Polypharmacy ( $\geq 5$ medications)	63 (72.41%)	29 (61.70%)	34 (85.00%)	0.029*
<b>PIM tools:</b>				
Number of any PIMs	40 (45.98%)	n.a.	40 (100.00%)	
Number of Beers (2023) PIMs	25 (28.74%)	n.a.	25 (62.50%)	
Number of STOPP (v3) PIMs	12 (13.79%)	n.a.	12 (30.00%)	
Number of Priscus (2.0) PIMs	29 (33.33%)	n.a.	29 (72.50%)	
<b>Outcomes:</b>				
Rehospitalisation	17 (19.54%)	4 (8.51%)	13 (32.50%)	0.011*
Death	2 (2.30%)	0 (0.00%)	2 (5.00%)	0.405

Figure 3: Patient characteristics of included population.

- PIM exposure according to any tool, especially to STOPP, significantly associated with **rehospitalisation** within three months, but not with **death** (**Figure 4**).

Outcome	Unadjusted		Adjusted <sup>a</sup>	
$\geq 1$ PIMs of:	OR (95% CI)	P-value	OR (95% CI)	P-value
<b>Rehospitalisation within 3 months:</b>				
Any criteria	<b>5.18 (1.53-17.53)</b>	0.008*	1.09 (0.97-1.22)	0.153
Beers	2.77 (0.92-8.31)	0.688	1.01 (0.90-1.12)	0.907
STOPP	<b>3.75 (1.02-13.80)</b>	0.047*	1.26 (0.90-1.77)	0.174
Priscus	1.11 (0.37-3.39)	0.848	1.10 (0.97-1.25)	0.137
<b>Death within 3 months:</b>				
Any criteria	>1000 (0.00-n.a.)	0.997	1.03 (0.00-n.a.)	1.000
Beers	2.54 (0.15-42.29)	0.516	20.53 (0.00-n.a.)	0.998
STOPP	6.73 (0.39-115.58)	0.189	20.29 (0.00-n.a.)	0.997
Priscus	>1000 (0.00-n.a.)	0.996	1.03 (0.00-n.a.)	1.000

Abbreviations: CI = Confidence Interval, OR = Odds Ratio, PIM = Potentially Inappropriate Medication, STOPP = Screening Tool of Older People's Prescriptions.  
<sup>a</sup>Adjusted OR for age and number of co-morbidities.  
\* Statistically significant on a 95% CI level.

Figure 4: Odds Ratio (OR) of outcomes rehospitalisation and death.

## 4 Conclusion and Implications

Our findings indicate that even a single prescribed PIM, particularly PIMs defined by STOPP criteria, leads to **increased odds of rehospitalisation within three months** in geriatric patients, regardless of cancer diagnosis. We suggest the implementation of PIM tools in the medication evaluation of all patients aged  $\geq 70$  years to make prescribers aware of PIMs and enable drug therapy optimisation.

