



INTRODUCTION

BACKGROUND

- Medication use increases with aging populations and therefore leads to greater **exposure to potentially inappropriate medications (PIM)**
- The **Beers Criteria** identify medications where **risks outweigh benefits** in **Patients aged 65 and older** [1]
- Beers Criteria include among other medication groups:
 - antihypertensive medication**
 - antidiabetics agents**
 - antidepressants** [1]

OBJECTIVES

- In the primary analysis, we hypothesized **that preoperative prescription of PIM** is associated with an increased risk of **postoperative complications**

METHODS

SETTING AND STUDY POPULATION

- 171,875 patients** aged ≥ 65 undergoing non-cardiac, non-transplant surgery at BIDMC between 2010 and 2024 (**Figure 1**)

EXPOSURE

- the **presence of at least one PIM prescription** (restricting to antihypertensive medication, antidiabetic agents and antidepressants) according to Beers Criteria (**Table 1**)

OUTCOMES

- The primary outcome was a **composite of mortality, hospital readmission and major postoperative complications** within 30 postoperative days [2]

STATISTICAL ANALYSIS

- Multivariable **logistic regression** analysis **adjusted** for several factors (**Table 2**)

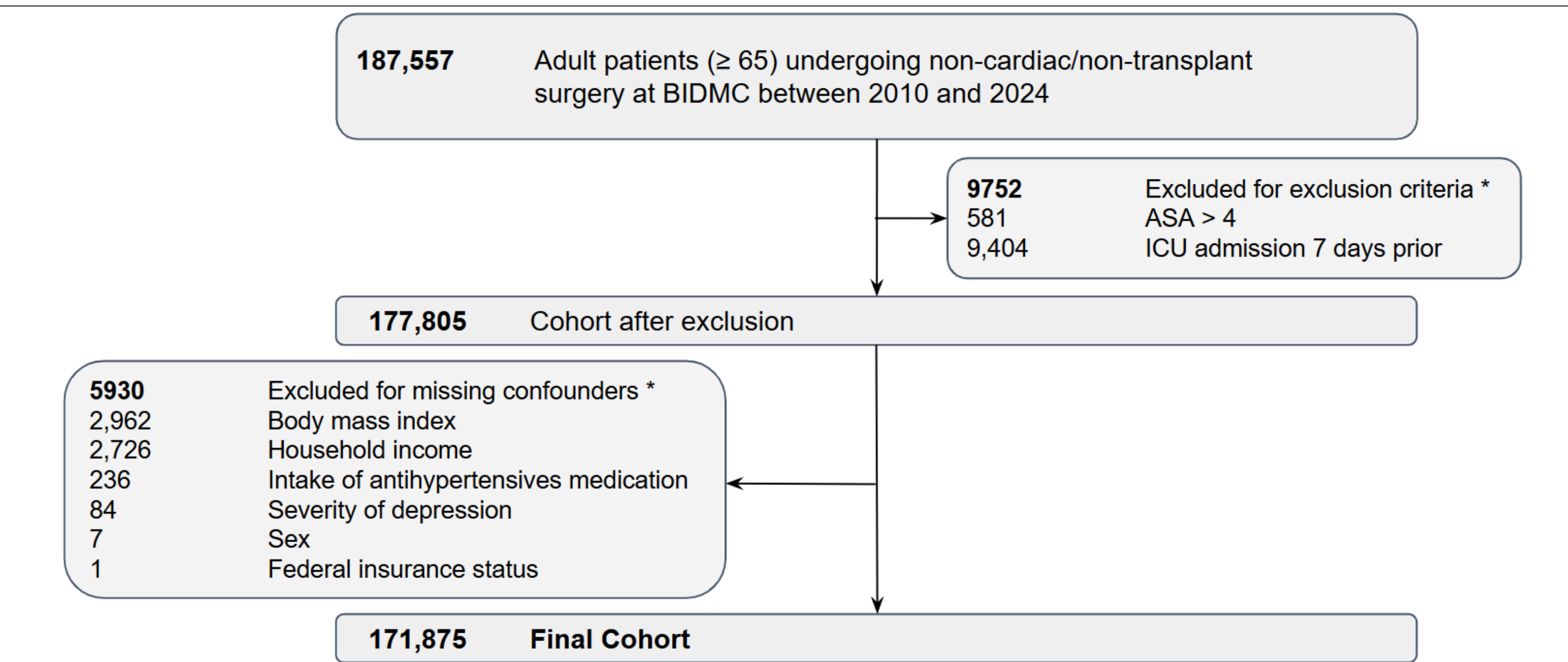
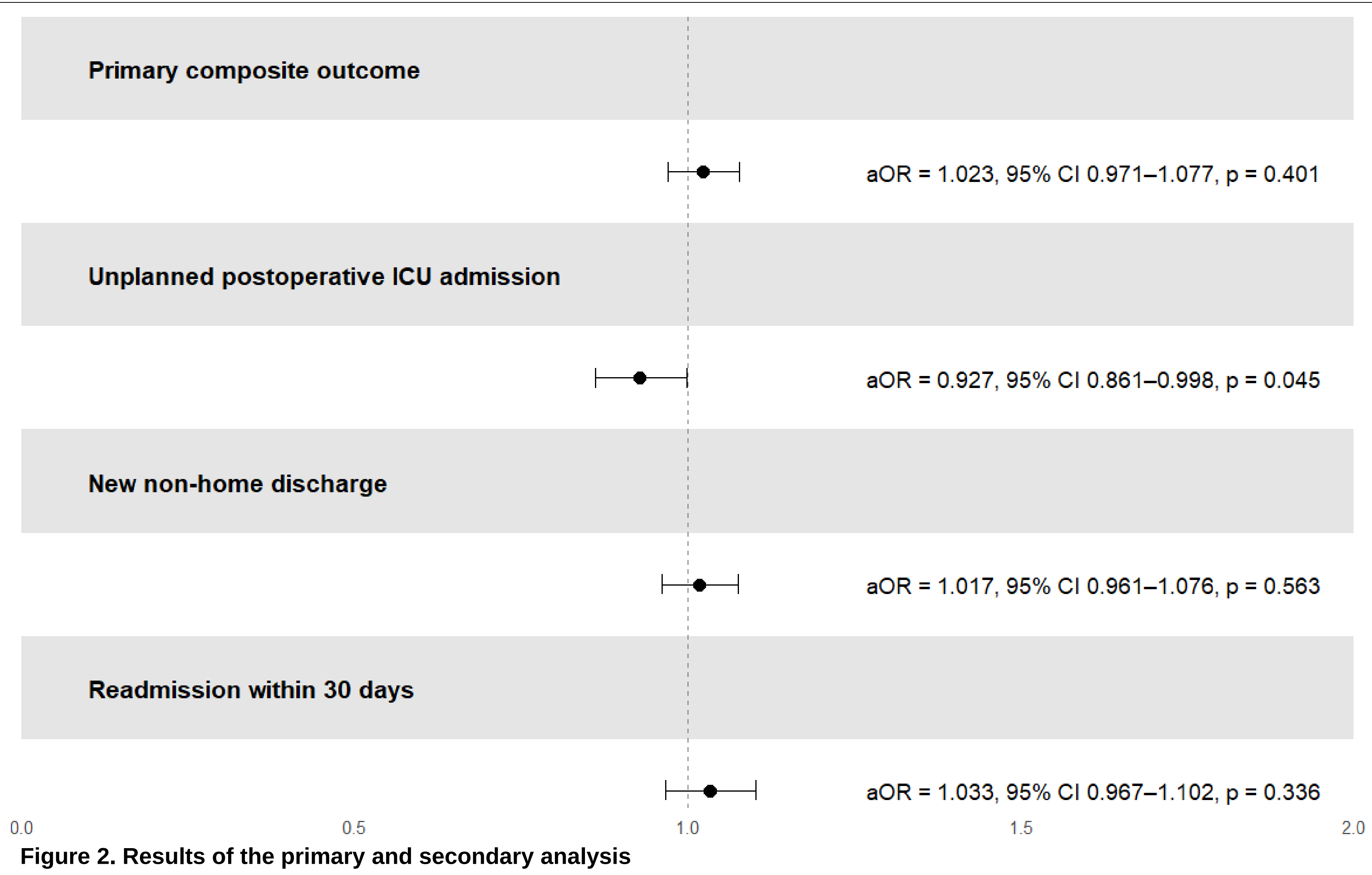


Figure 1. Study flow

Results

- 26,421 patients **(15.4%)** were exposed to PIM
- PIM presence was **not associated with the primary composite outcome (Figure 2)**
 $OR_{adj}, 1.02$; 95% CI, 0.97-1.08 and $ARD_{adj}, 0.2\%$; 95% CI, -0.2%-0.5%; $p=0.40$
- Secondary analysis:
 - **unplanned ICU admission** within 7 days postoperatively:
 $OR_{adj}, 0.93$; 95% CI, 0.86-1.00 and $ARD_{adj}, -0.3\%$; 95%CI -0.6% to -0.0%; $p=0.045$
 - **new non-home discharge**:
 $OR_{adj}, 1.02$; 95% CI, 0.96-1.08 and $ARD_{adj}, 0.1\%$; 95%CI -0.2% to 0.5%; $p=0.56$
 - **30-day readmission**:
 $OR_{adj}, 1.03$; 95% CI, 0.97-1.10 and $ARD_{adj}, 0.1\%$; 95%CI -0.2% to 0.4%; $p=0.34$



CONCLUSIONS

- While the **Beers Criteria** focus on **long-term risks** of PIMs, our findings show **no increased risks on short-term postoperative outcomes**.
- This **supports the safety of perioperative care** for patients on these medications, suggesting pre-anesthesia changes may be unnecessary.
- Future research should examine **additional medication classes** and **broader outcomes**.

Patients characteristics

Table 1. Distribution of appropriate and inappropriate antidiabetic agents, antidepressants and antihypertensive medication in the cohort (n=171,875).

	Antidiabetics	Antidepressants	Antihypertensives	Antidiabetics, Antidepressants or Antihypertensives
Patients without stated medication	132,173 (76.9 %)	120,764 (70.3 %)	57,698 (33.6 %)	37,283 (21.7 %)
Patients with stated medication	39,702 (23.1 %)	51,111 (29.7 %)	114,177 (66.4 %)	134,592 (78.3 %)
Appropriate medication according to Beers criteria	24,494 (61.7 %)	43,998 (86.1 %)	108,354 (94.9 %)	108,171 (80.4 %)
Inappropriate medication according to Beers criteria	15,208 (38.3 %)	7,113 (13.9 %)	5,823 (5.1 %)	26,421 (19.6 %)

Table 2. Patient characteristics and distribution of variables

	No presence of PIM (n=145,454)	Presence of PIM (n=26,421)	Absolute standardized difference
Patient demographics and comorbidities			
Age, years	74.1 $\pm$ 7.0	74.2 $\pm$ 6.8	0.019
Sex, female	76,214 (52.4%)	12,492 (47.3%)	0.102
BMI, kg/m2	27.5 $\pm$ 5.9	29.0 $\pm$ 6.3	0.242
ASA physical status classification			0.329
1	919 (0.6%)	32 (0.1%)	
2	50,841 (35.0%)	5,627 (21.3%)	
3	83,992 (57.7%)	18,095 (68.5%)	
4	9,702 (6.7%)	2,667 (10.1%)	
Elixhauser comorbidity score	11.6 $\pm$ 12.4	13.9 $\pm$ 13.3	0.180
History of drug abuse	2,004 (1.4%)	453 (1.7%)	0.027
History of tobacco abuse	61,727 (42.4%)	12,028 (45.5%)	0.062
History of alcohol abuse	8,310 (5.7%)	1,835 (6.9%)	0.051
History of congestive heart failure	27,975 (19.2%)	7,323 (27.7%)	0.201
History of cardiac arrhythmia	53,608 (36.9%)	10,574 (40.0%)	0.065
History of renal failure	26,332 (18.1%)	8,416 (31.9%)	0.322
History of peripheral vascular disease	27,738 (19.1%)	6,759 (25.6%)	0.157
History of stroke	9,083 (6.2%)	2,179 (8.2%)	0.077
History of liver disease	25,854 (17.8%)	5,564 (21.1%)	0.083
History of hypertension	88,129 (60.6%)	18,041 (68.3%)	0.161
History of depression	25,759 (17.7%)	6,176 (23.4%)	0.141
History of type 1 diabetes mellitus	2,012 (1.4%)	1,160 (4.4%)	0.180
History of type 2 diabetes mellitus	30,763 (21.1%)	16,907 (64.0%)	0.961
Use of antidepressant medication	38,637 (26.6%)	12,474 (47.2%)	0.438
Use of antidiabetic medication	22,135 (15.2%)	17,567 (66.5%)	1.222
Use of antihypertensive medication	92,247 (63.4%)	21,930 (83.0%)	0.453

Data are presented as n (%) or mean (standard deviation).

References

- [1] By the 2023 American Geriatrics Society Beers Criteria Update Expert Panel. J Am Geriatr Soc. 2023;71(7):2052-2081.
- [2] Jones, PM et al. JAMA vol. 319,2 (2018): 143-153.