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Introduction and Aims

Medication-related problems are a significant contributor to hospital readmissions¹. A substantial proportion of these **medication-related readmissions (MRRs)** are preventable, and they are associated with increased morbidity, mortality and healthcare costs^{2,3}.

The **objectives** of this study were to:

- assess the **extent** to which 30-day readmissions are medication-related and potentially preventable in a Swiss university hospital,
- examine the **patterns** of the identified potentially preventable MRRs, and
- develop a **prediction model** to flag patients for potentially preventable MRRs.

Methods

Retrospective analysis of **500 30-day readmissions** for their medication-relatedness and preventability of patients:

- Aged **65 years or older**
- Discharged from the **General Internal Medicine Department (KAIM)** of the University Hospital of Bern
- Readmitted within **30 days** to any department of the University Hospital of Bern

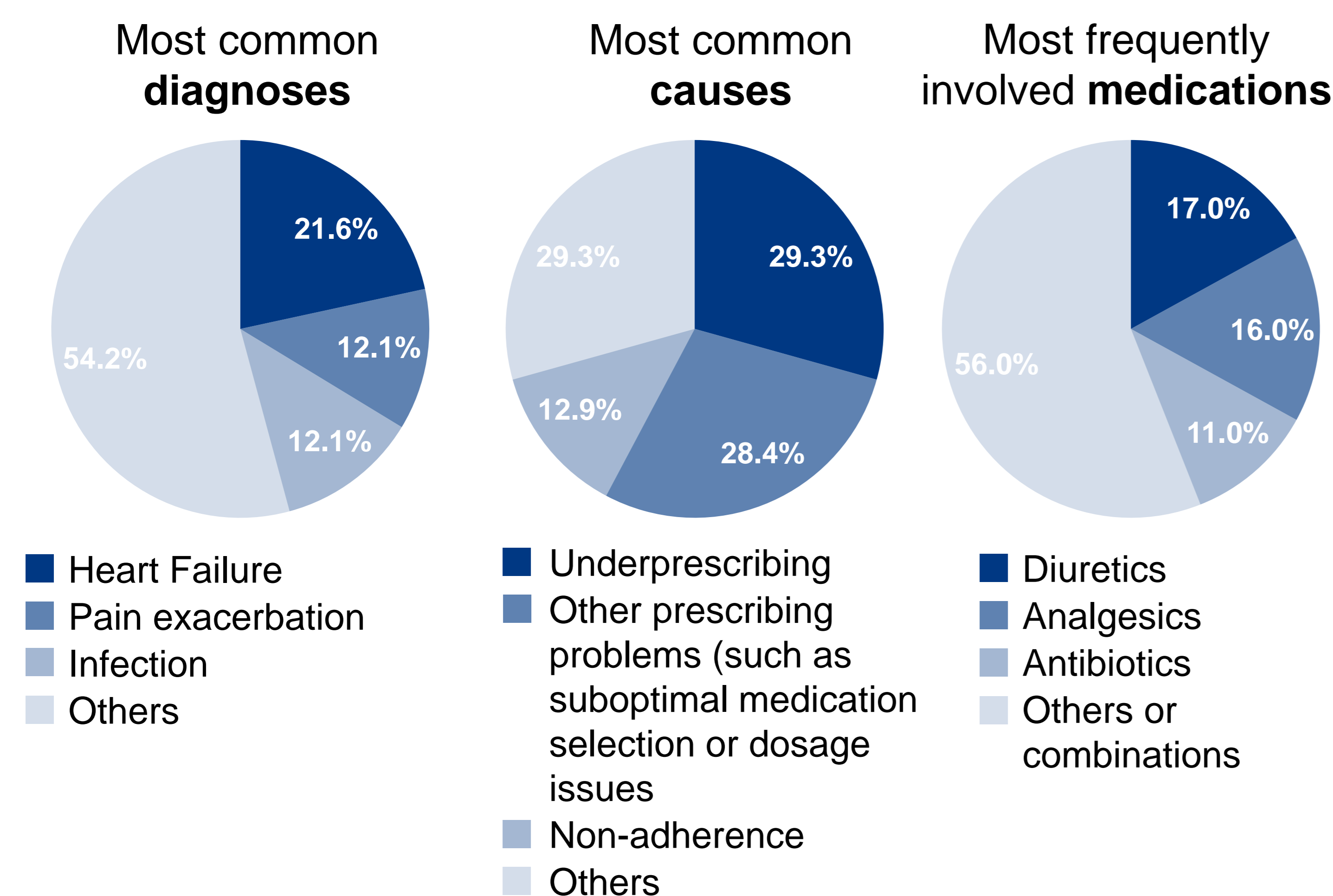
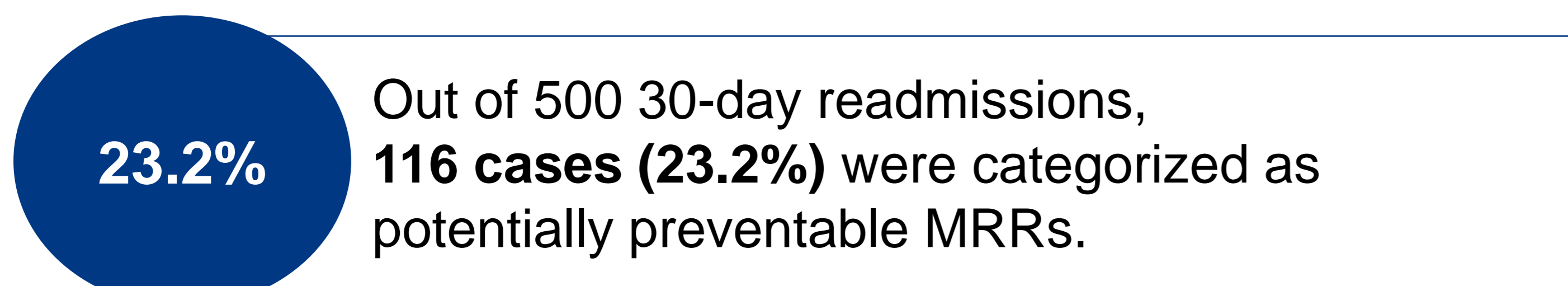
The categorization into medication-related (using the AT-HARM10 tool) and preventable was independently done by **two pharmacists**. A **physician** resolved disagreements between them.

The **causes** and **medications involved** of the potentially preventable MRRs were analyzed.

A **prediction model** for potentially preventable MRRs was developed using additional data from **500 control patients** who were discharged from the same department but did not experience a potentially preventable MRR.

Results

Prevalence and Patterns



Prediction Model

The predictors included were selected based on a previously conducted systematic **literature search⁴** and **expert consensus⁵**:

1. Number of **medications** at hospital discharge
2. Number of **hospitalizations** within the past year
3. Number of medications at hospital discharge associated with potentially preventable MRRs (defined as **antithrombotics, opioids** and **sedatives**)
4. Number of diagnoses at hospital discharge associated with potentially preventable MRRs (defined as **heart failure, diabetes, chronic obstructive pulmonary disease (COPD)** and **chronic kidney disease**)

Table 1: Performance metrics of the prediction model

Brier Score	C-Statistic
0.177	0.714 (95%CI: 0.663-0.764)

Good accuracy:
Predicted probabilities are reasonably close to actual outcomes.

Moderate discrimination:
The model moderately distinguishes between patients with and without the outcome.

Future steps should include **external validation** to confirm the model's generalizability and ensure its reliability across different patient populations. Additionally, a **cost-effectiveness analysis** should be conducted.

Implications

- Preventable MRRs constitute a **significant portion** of hospital readmissions. **Pharmacists** are well-positioned to implement **targeted interventions** to reduce the risk of these preventable events.
- The developed prediction model is **user-friendly** and demonstrated **good overall accuracy** with **moderate discrimination**. It **differentiates** moderately between patients at high and low risk for preventable MRRs.

References

- [1] El Morabet et al., *JAGS*, 2018.
 [2] Dalleur et al., *J Patient Saf*, 2021. [4] Schönenberger et al., *BMC Health Serv Res*, 2023.
 [3] Frankl et al., *AMJMED*, 1991. [5] Schönenberger et al., *RSAP*, 2024.

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