

Introduction

Therapeutic drug monitoring (TDM) of beta-lactams in critically ill patients is recommended by SFAR/SFPT 2019 guidelines [1]

Non-documented infection :

→ **Recommended Therapeutic Range (RTR)**: target of *total* plasma beta-lactam concentration specific for each molecule

Documented infection :

→ **Minimal Inhibitory Concentration (MIC)**: target of *free* plasma beta-lactam concentration between **4 - 8 times MIC**

Objectives

- Describe** the frequency of possible beta-lactams TDM based on MIC values.
- Compare** dose adjustment propositions when TDM was based on RTR- over MIC- in real-life settings.

Material & Methods



Patients treated with **beta-lactams in critical care units**



From **May 2022 to July 2022**



Grenoble Alpes University Hospital

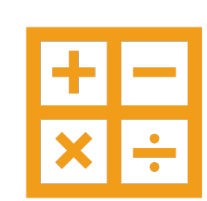


Demographic, biological and pharmacological data **prospectively** collected from medical records



We **developed** a **Liquid Chromatography - Mass spectrometry** method for the quantification of 7 beta-lactams (**validated** following **FDA guidelines**):

→ Electrospray ionization-triple quadrupole mass spectrometry in combination with selected reaction monitoring detection in the positive ionization mode



Comparison of RTR-based and MIC-based TDM :

→ Same conclusion : **Concordance**

→ Different conclusion : **Discrepancy**

Results



70 patients (age: 60 (35-78) years, 71% of men) were included.

165 beta-lactams plasma concentrations were measured in all patients.



A MIC value was obtained for **33% of patients**.

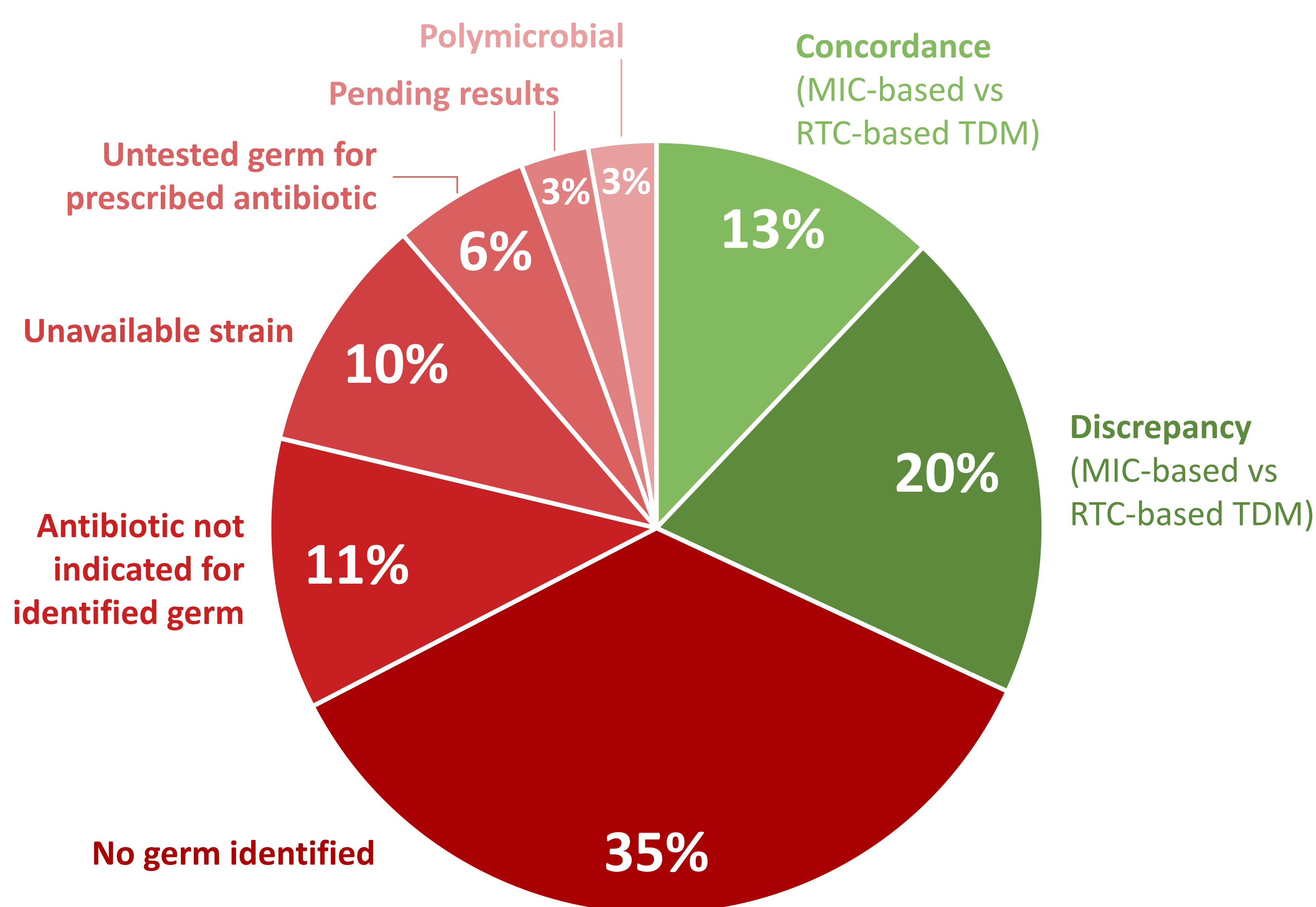


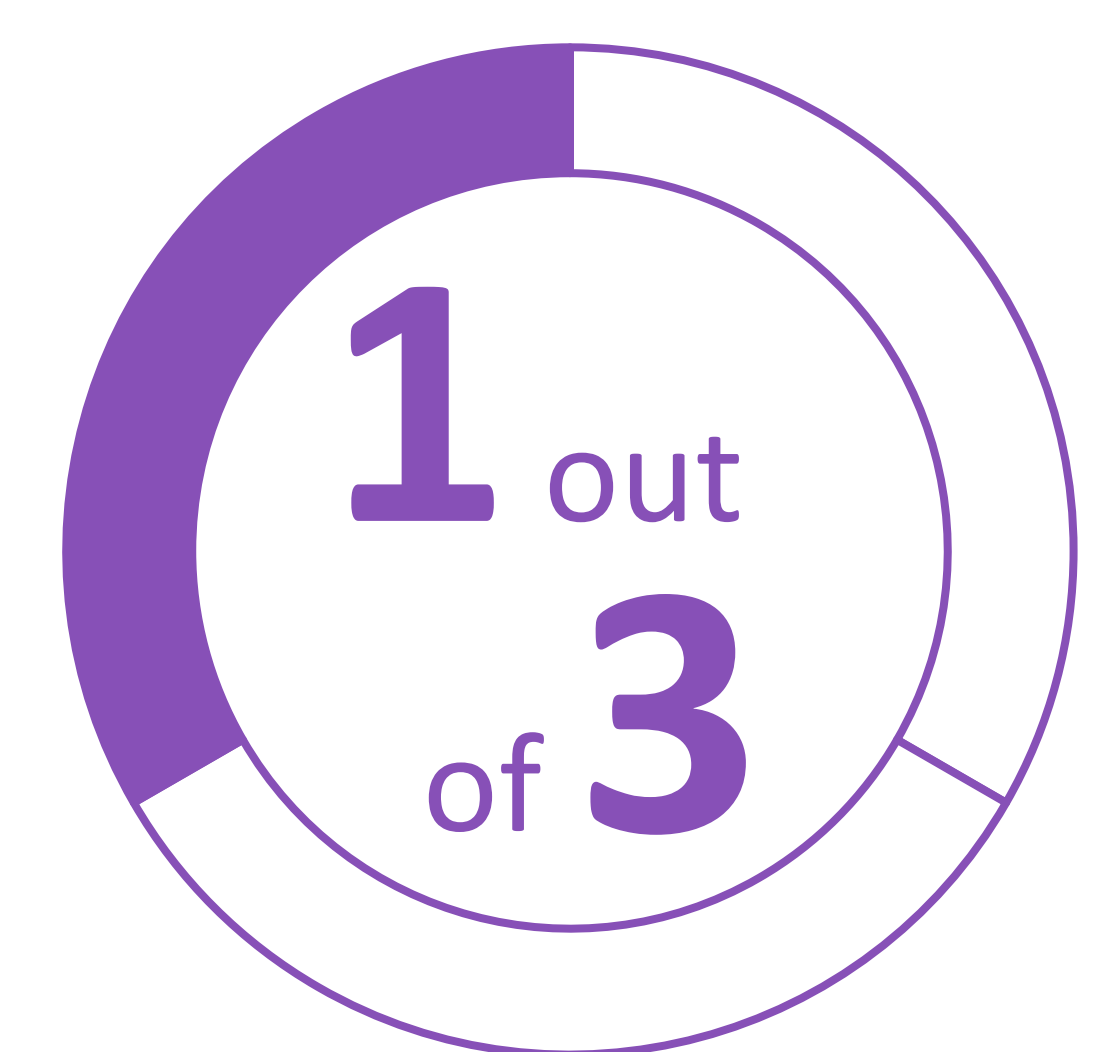
Figure 1. Distribution of MIC values sorted by cause of unavailability or by discrepancy between MIC and RTC-based TDM when MIC value was available.



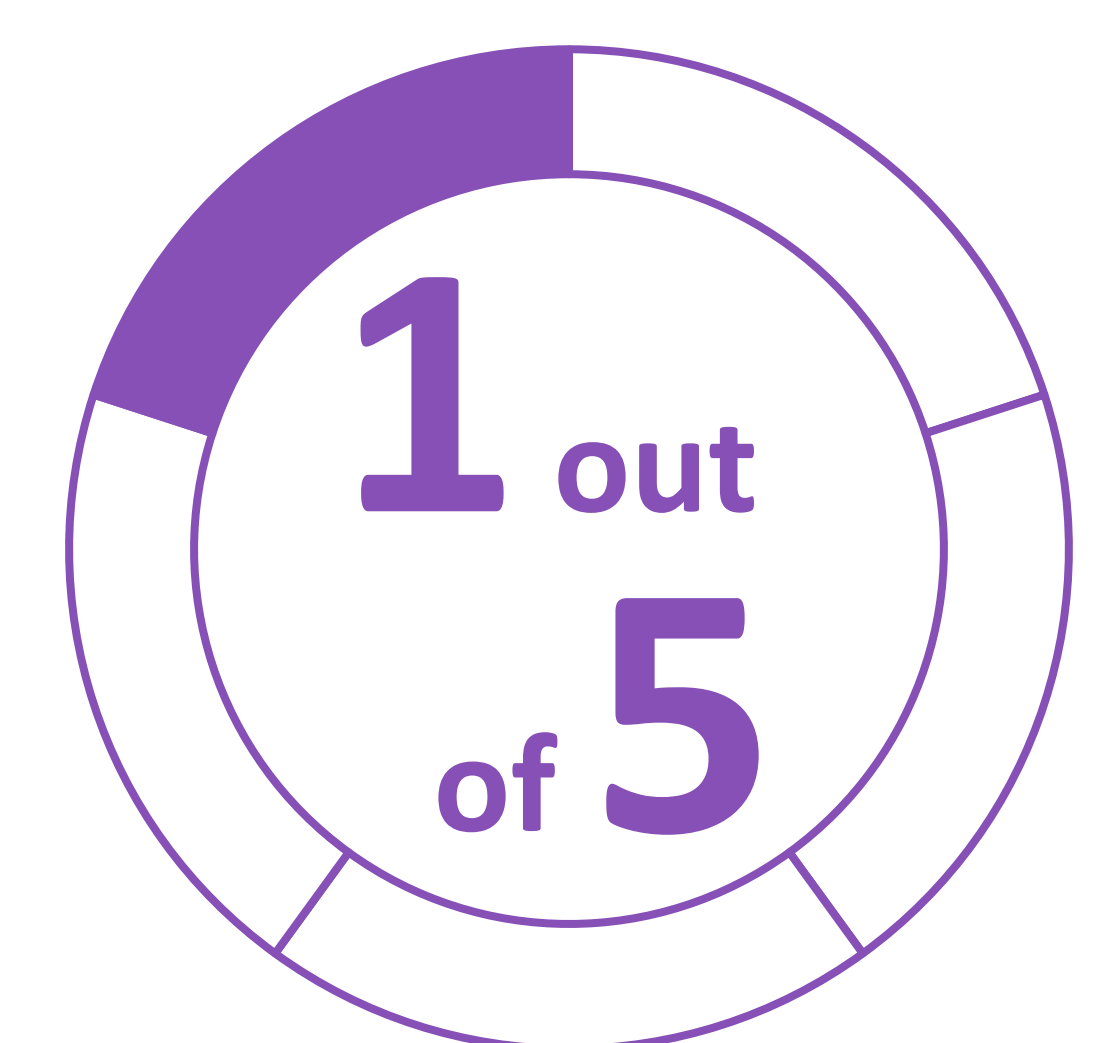
Discrepancies: MIC-based TDM suggested to **maintain or decrease** the dose while **RTR** data suggested to **increase** the dose in **41% of the cases**.

Discussion - Conclusion

RTR-based TDM ensures **antibacterial efficacy** while **MIC-based TDM** would prevent **unnecessary high doses**



Patients **eligible** for MIC-based TDM (**1 out of 2** with improvements)



Patients could benefit from **improved dose adjustment** using MIC-based TDM