

# Effectiveness and implementation of point-of-care procalcitonin embedded in a multifaceted implementation strategy to reduce antibiotic prescription in Swiss primary care: the ImpPro hybrid trial

## 1. Summary of the research plan

The development of antimicrobial resistance is associated with antibiotic prescription, which occurs mainly in the outpatient sector. In Swiss primary care, almost half of antibiotics are prescribed for acute respiratory infections. While various antimicrobial stewardship interventions have been shown effective to reduce antibiotic prescription in primary care, their implementation remains a challenge. Among such interventions, a recent study showed a large decrease in antibiotics for lower respiratory tract infections with the use of point-of-care procalcitonin test (POC-PCT) in Swiss primary care. There is a critical need to demonstrate how such an innovation can be adopted and implemented in Swiss primary care practices, and how it ultimately reduces antibiotic prescription.

To decrease overall antibiotic prescription in Swiss primary care, our objective is to understand whether an enhanced implementation strategy increases the uptake of POC-PCT and how this reduces antibiotic prescription in Swiss primary care practices. We hypothesize that an enhanced support for such an innovation leads to increased adoption by physicians and a rapid decrease in antibiotic prescriptions.

Aim 1 will define the exact components of the enhanced implementation strategy of POC-PCT based on current evidence on antimicrobial stewardship. Context analysis and interviews with key stakeholders and users will define the exact components of the enhanced strategy.

Aim 2 will develop the tools needed to document antibiotic prescription for ARI episodes. Predefined anonymised fields from electronic medical files will be extracted semi-automatically to a specific web interface. The collected data will fuel an individualized dashboard providing physicians individualized feedback about their prescription

Aim 3 will compare both the implementation success and the effectiveness of POC-PCT between physicians of quality circles exposed to an enhanced implementation strategy (intervention group) and those exposed to standard care (control group). We will conduct a cluster-randomized trial in a hybrid type II effectiveness-implementation design, with quality circles as the unit of randomisation, and compare test adoption, implementation fidelity, costs, and antibiotic prescription for ARI.

The proposed trial will confirm the effectiveness of POC PCT when implemented on a large scale and identify the most appropriate implementation strategy. This trial will also establish an innovative and easy-to-use way to collect antibiotic prescription data and provide individualized feedback in Swiss primary care.