72 NRP **Antimicrobial Resistance**
National Research Programme

NATIONAL RESEARCH PROGRAMME: ANTIMICROBIAL RESISTANCE

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Swiss National Science Foundation

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Antimicrobial Resistance
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TACKLING AMR WITH A ONE HEALTH APPROACH

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72 NRP **Antimicrobial Resistance**
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ROUTES AND RESERVOIRS OF AMR-DETERMINANTS & ONE HEALTH AMR-SURVEILLANCE

FASTER DIAGNOSTICS AND NEW THERAPEUTIC APPROACHES

OPTIMIZED USE OF ANTIBIOTICS AND BEHAVIOR CHANGES

THREE THEMATIC AREAS

Swiss National Science Foundation

https://www.nfp72.ch/en/OdKdigE5p7yKb8Mu/page/findings

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OPTIMIZED USE OF ANTIBIOTICS AND BEHAVIOR CHANGES

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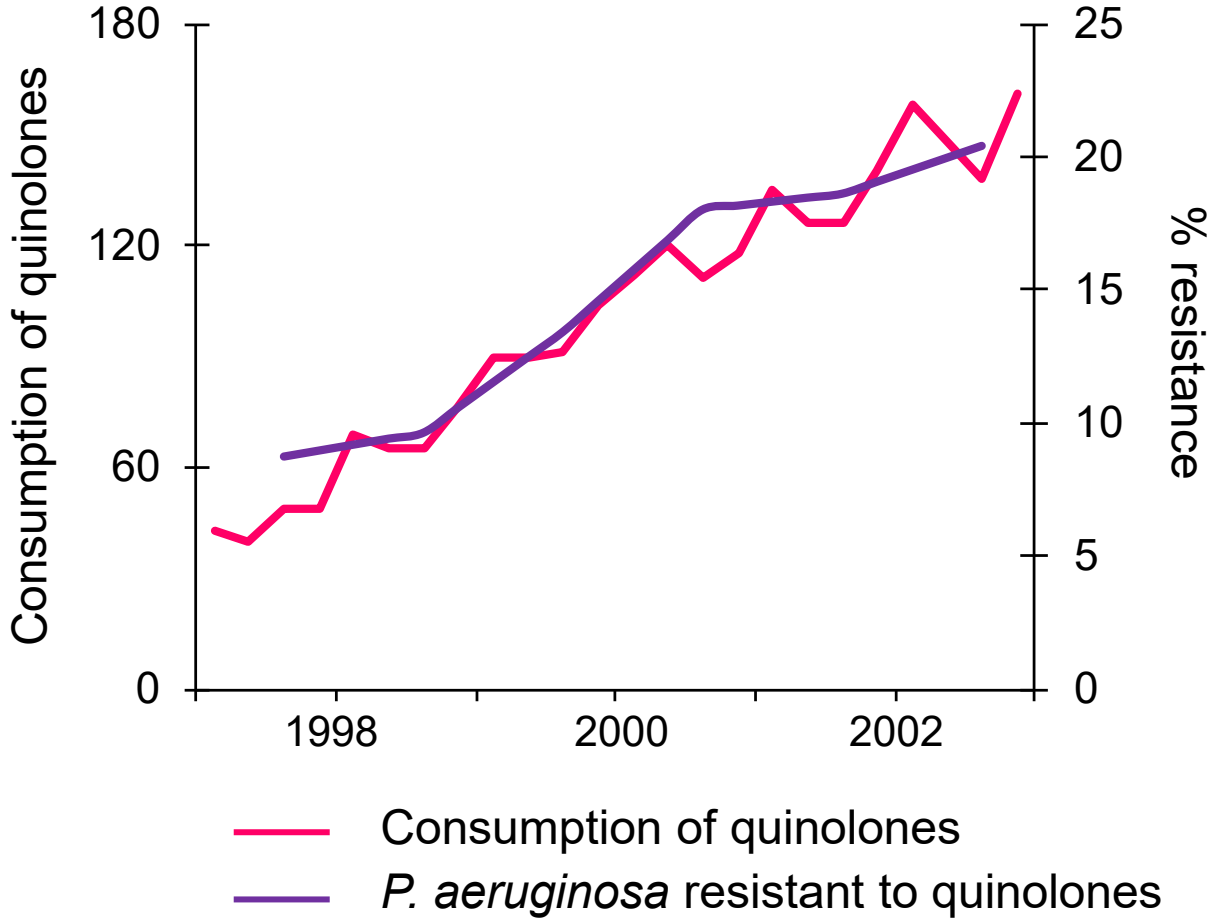
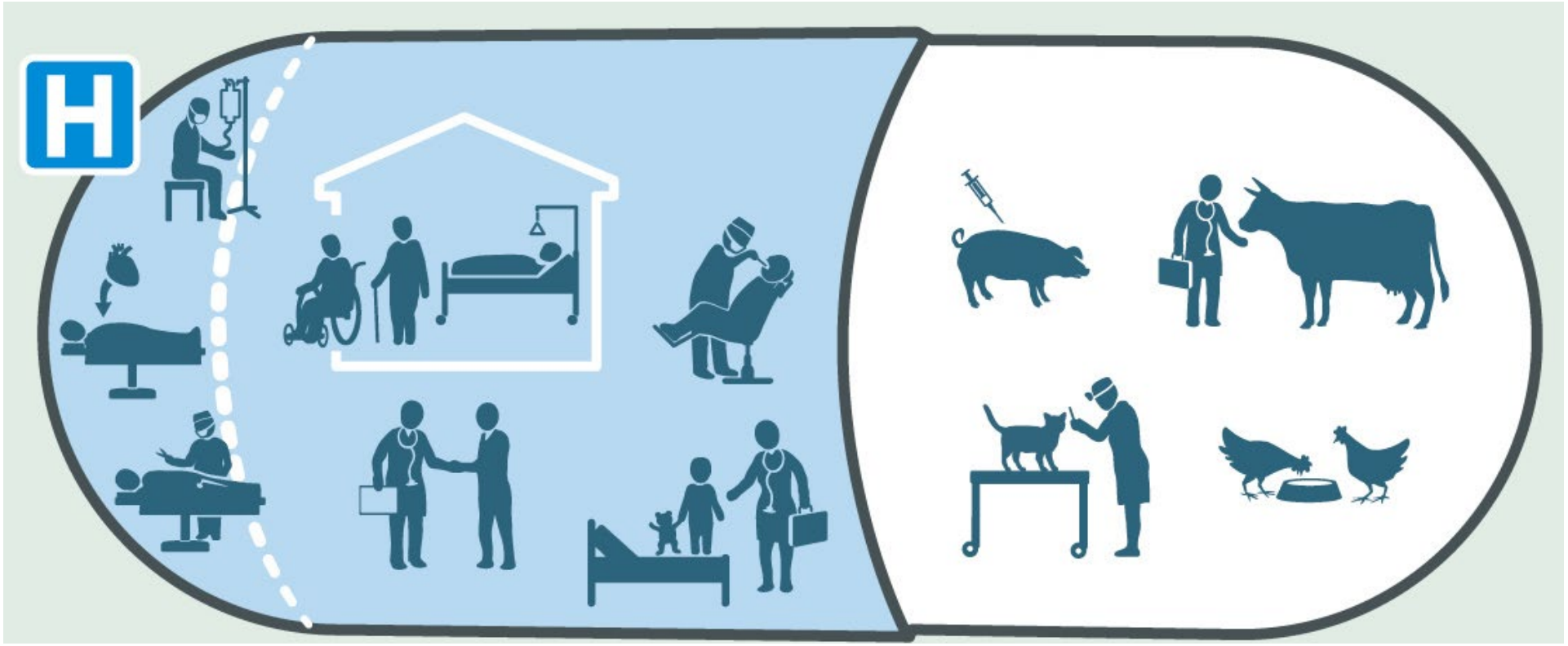
Direct link between antibiotic consumption and resistance

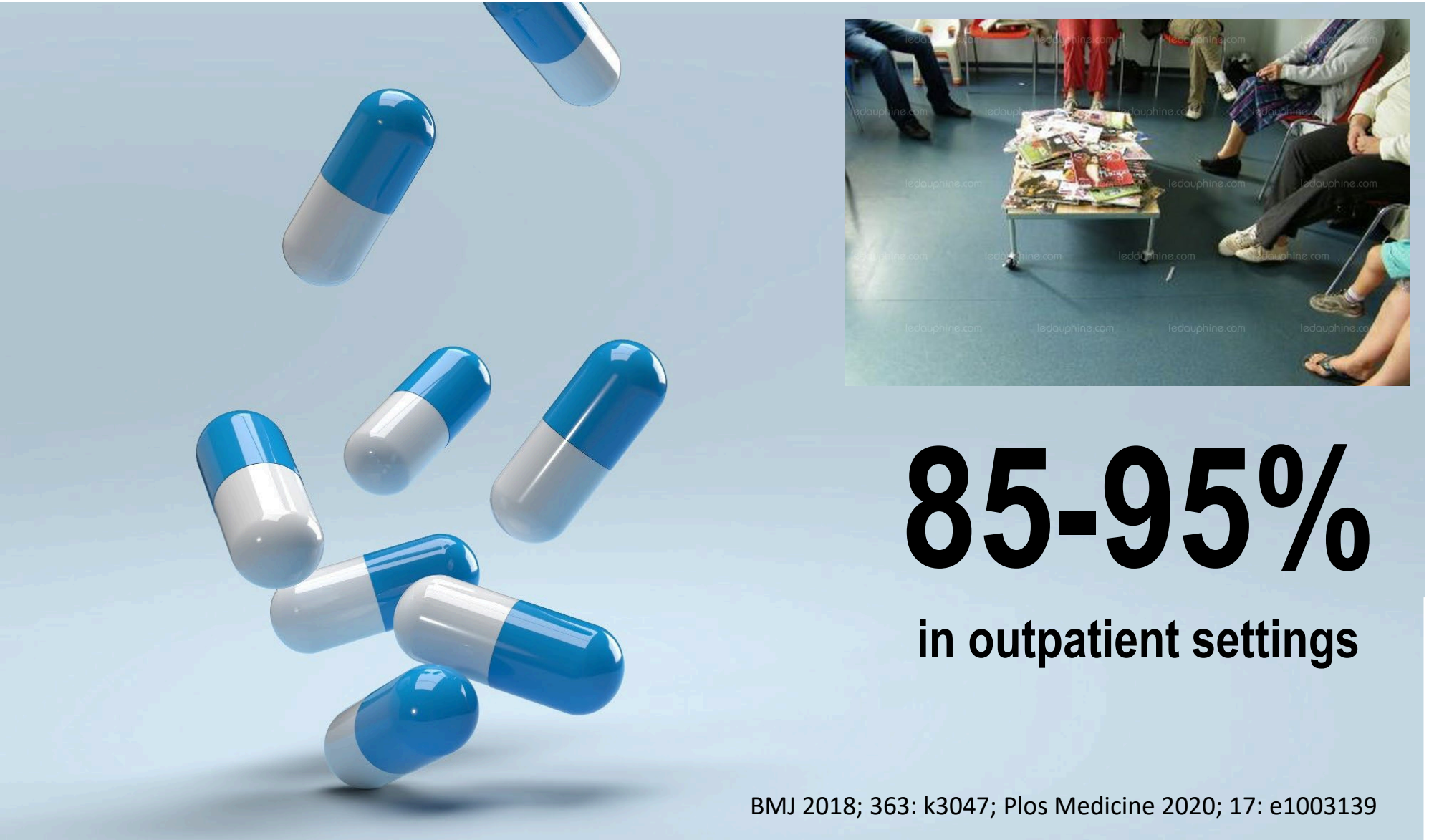


Ray, Clin Infect Dis 2005

Consumption of antibiotics



Consumption of antibiotics in human medicine



85-95%

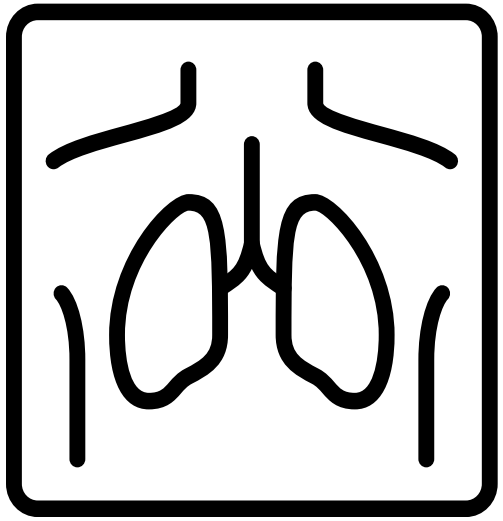
in outpatient settings

BMJ 2018; 363: k3047; Plos Medicine 2020; 17: e1003139

The most common indication

at least 1/3 inappropriate

Current diagnostic approach: Radiography

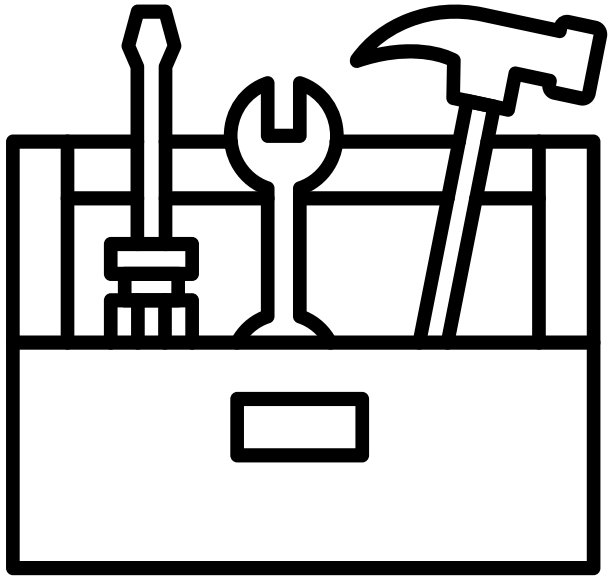


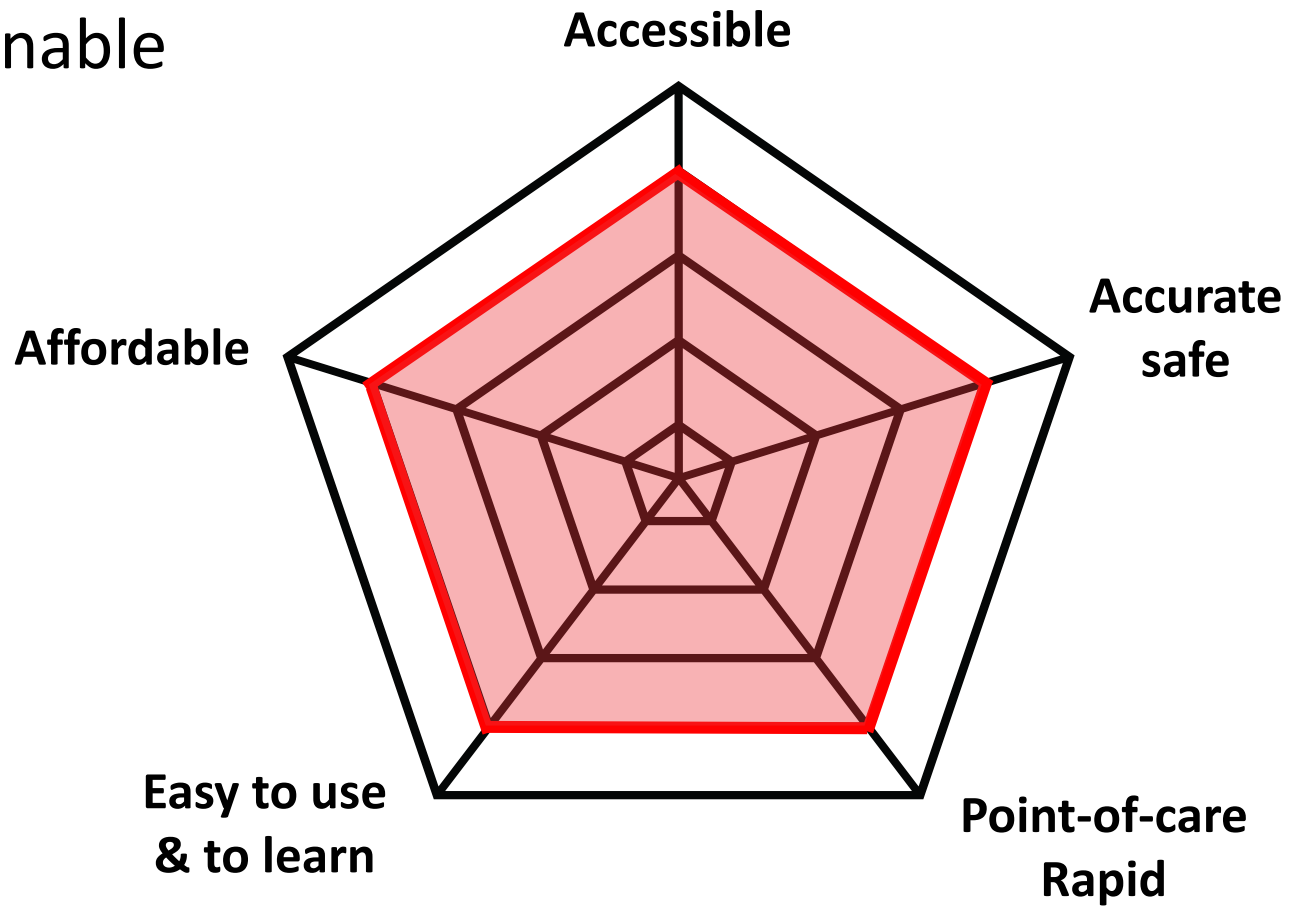
- Low diagnostic performance of chest Xray: Sensibility 69% - Specificity 85%
- Virtually absent at primary care level

Lancet Global Health 2021; 9: e1553; Resp Res 2014; Chest 2017; 151: 374

We need improved diagnostic tools to tackle inappropriate antibiotic use in primary care

- Diagnostic tools scalable and sustainable

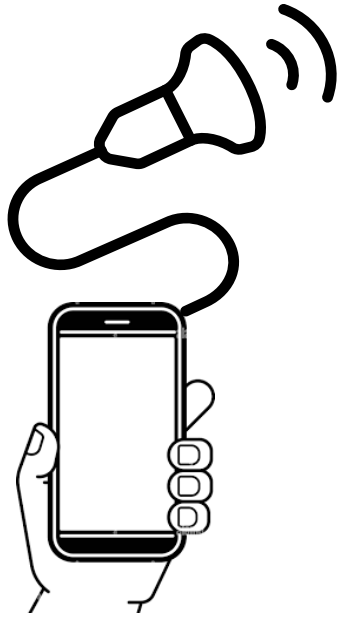




Diagnostic tools in primary care to reduce prescriptions

Biomarker
Procalcitonin

&



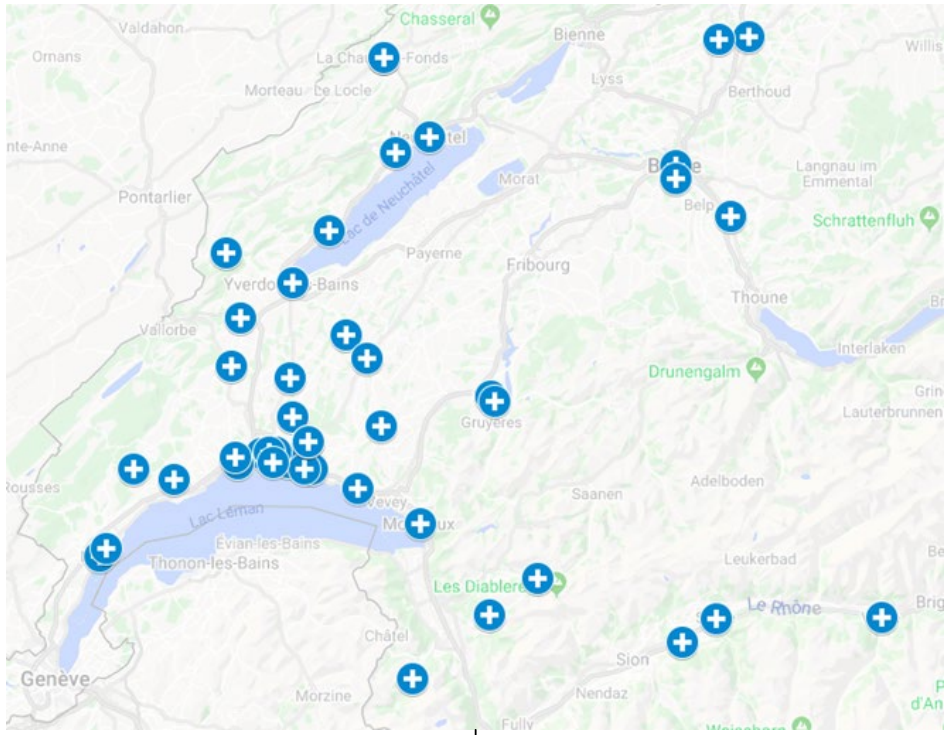
Radiology
Lung ultrasound

UltraPro

A clinical decision algorithm

Lhopitallier; Bristish Medical Journal 2021

60 general practitioners in Switzerland



Usual care

Procalcitonin

UltraPro

Lhopitallier; Bristish Medical Journal 2021

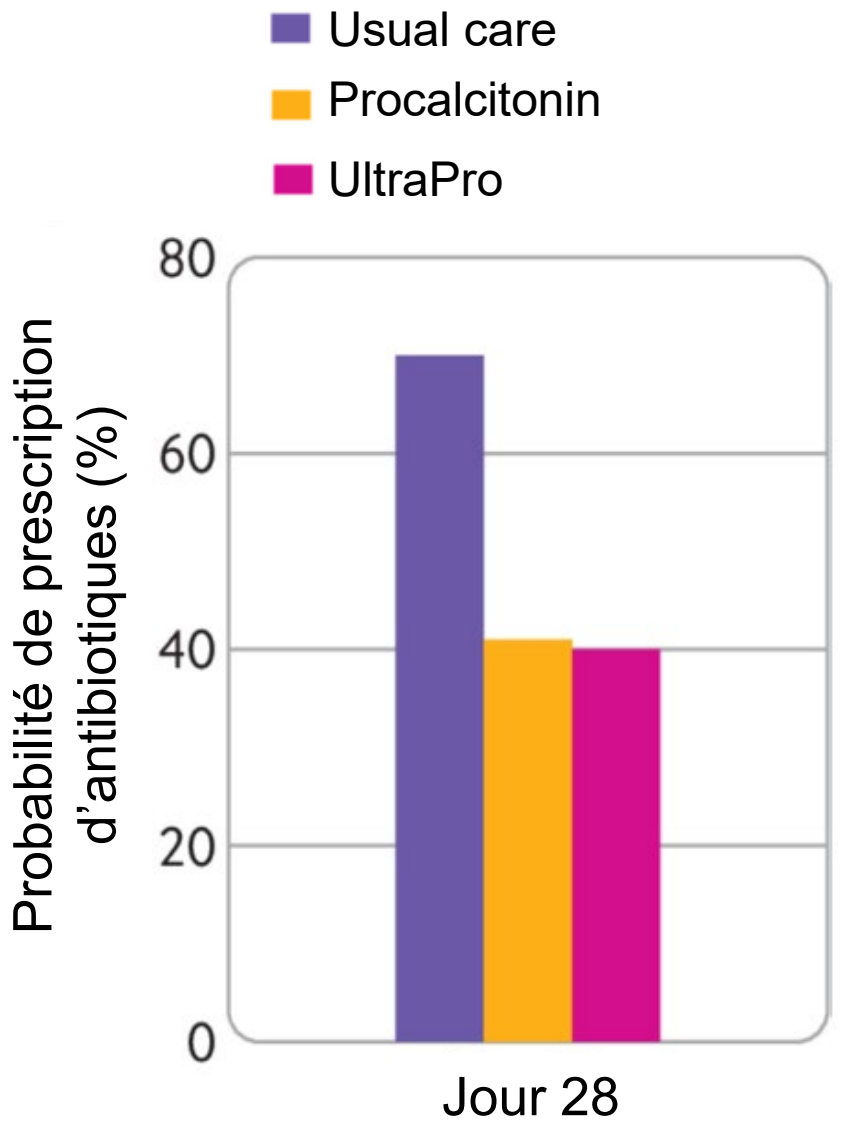
Antibiotic prescriptions

Reduction of one third in prescriptions with procalcitonin

Need to test 4 patients to avoid 1 antibiotic

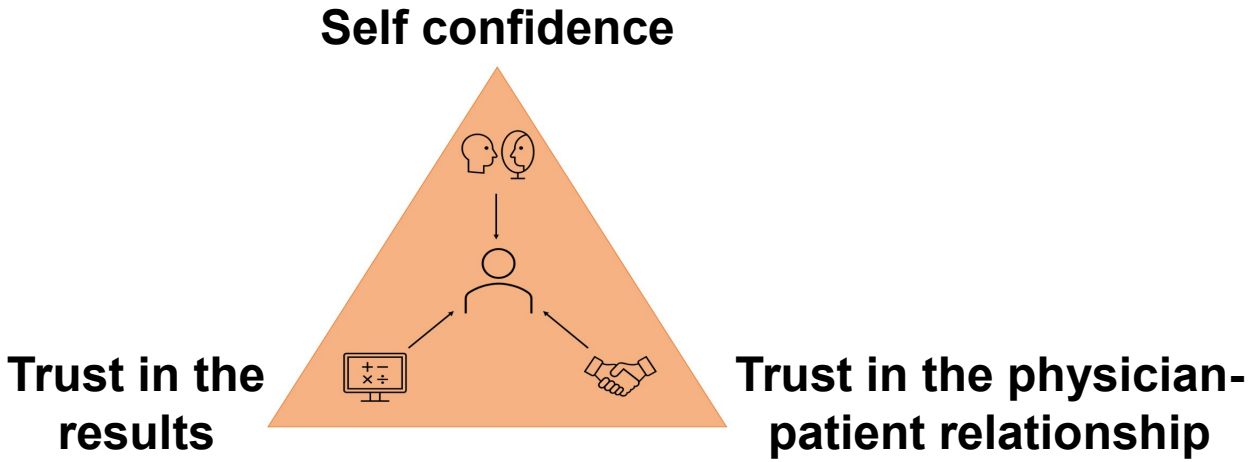
Same recovery rate in both group

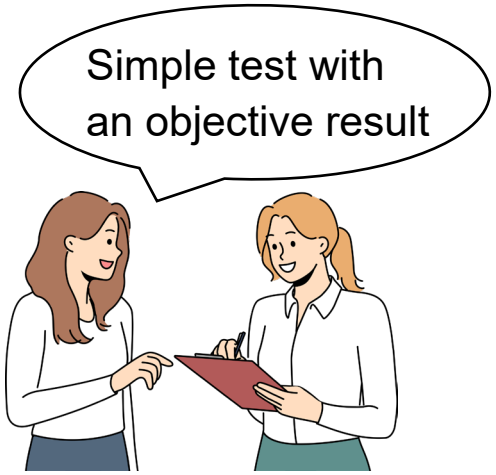
Similar cost between usual care and procalcitonin
2 Euros per percentage reduction in prescriptions



Lhopitallier; Bristish Medical Journal 2021
Cisco; under review

«Procalcitonin» feasible within 20 minutes in the practice





For a successful implementation

– Inclusion of procalcitonin in the local clinical guidelines

– Procalcitonin covered by insurance plans

– Confirm the effectiveness of procalcitonin when implemented on a large scale: Continuous monitoring of antibiotic prescriptions in primary care

Geis; BMJ Open 2023
Knüsli; Antibiotics 2023

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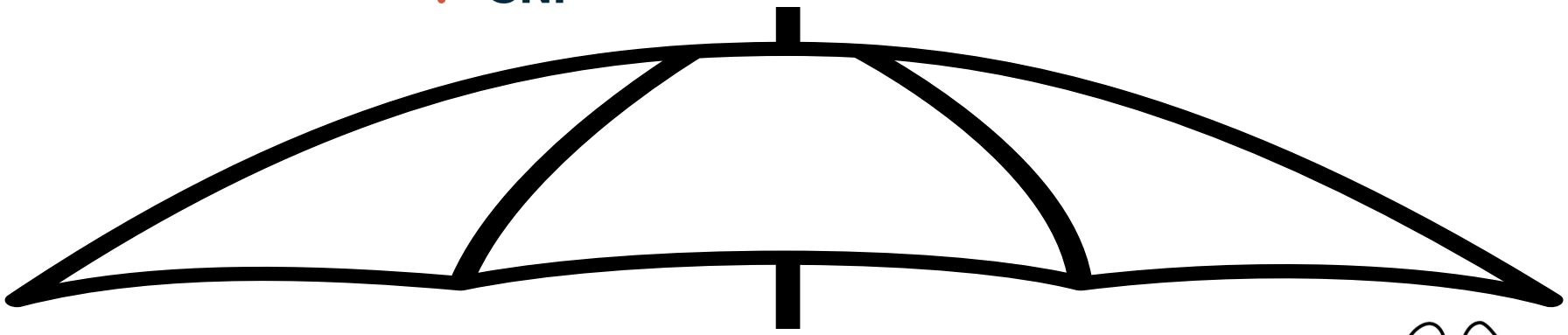


ImPro study

Implementation of point-of-care **Pro**calcitonin to reduce antibiotic prescription in Swiss primary care

SNF Project funding

ASAP

Antimicrobial **S**tewardship in **A**mbulatory care **P**latform

Swiss Confederation
Federal Department of Home Affairs FDHA
Federal Office of Public Health FOPH

PLUS-IS-LESS STUDY

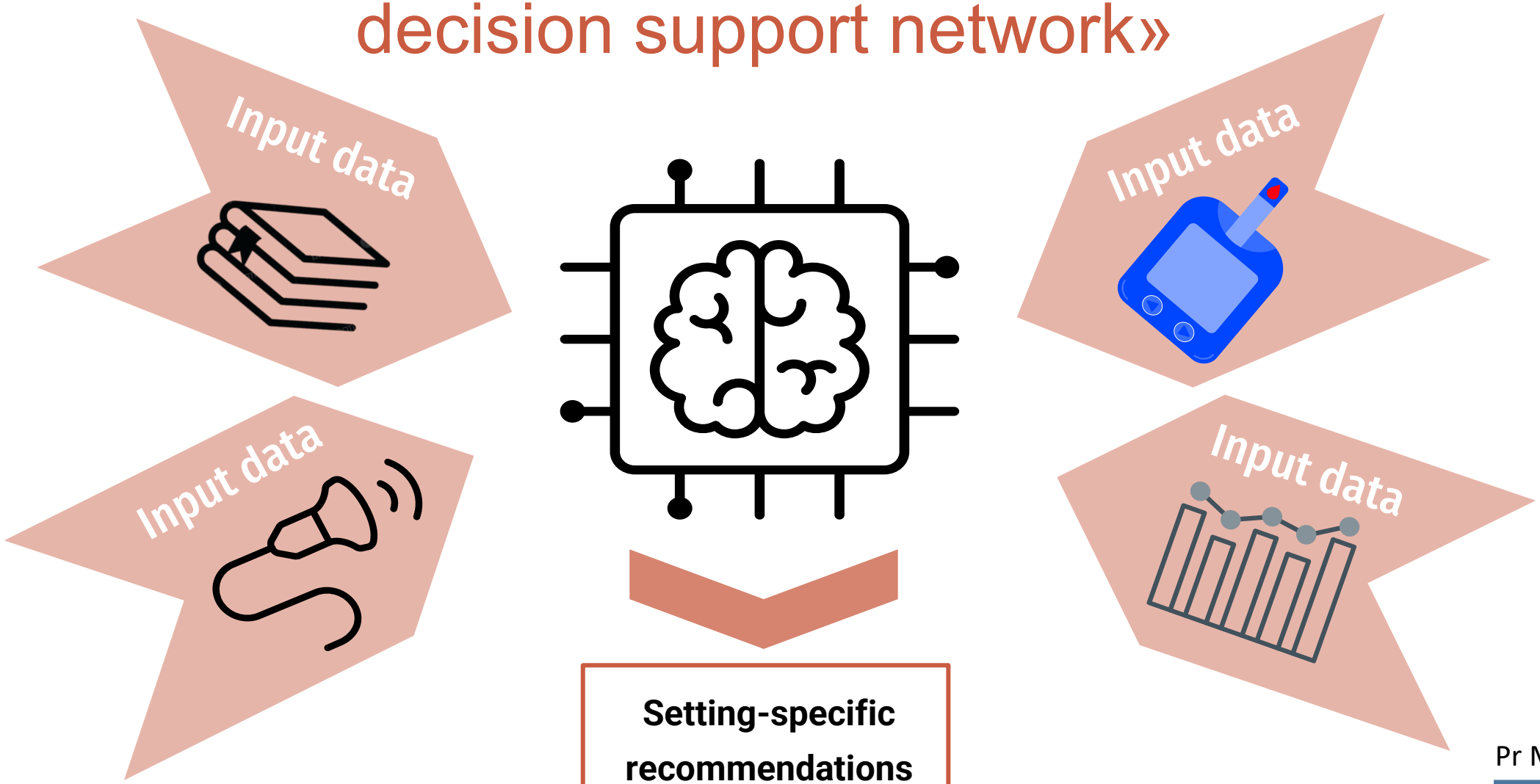
Procalcitonin and **L**ung **U**ltra**S**onography based antibiotics in **L**ower r**ES**piratory tract infections in **S**wiss Emergency Department

SNF

Investigator Initiated Clinical Trials (IICT) 2021

SNF NRP 72 – Antimicrobial Resistance

Using data to build a «multimodal multi-task digital decision support network»



Setting-specific recommendations on antibiotics

Pr M-A Hartley

Yale

EPFL

https://arxiv.org/abs/2311.16079

To slow down the development of resistance through research
We have to make an impactful use of research data

We need support from stakeholders to transition from evidence to implementation

- To facilitate the reimbursement of new evidence-based tests
- To support continuous monitoring of antibiotic prescription in primary care

We can exploit the One Health principle by transferring experience in one area to the other

- New diagnostic tools developed in human medicine can be adapted to veterinary medicine
- The experience on monitoring of antimicrobial prescribing in veterinary medicine can be translated to human medicine

We can use innovative AI models to utilize data effectively in the fight against AMR

- Multimodal models can offer customized recommendations that align with specific settings and real-time epidemiological trends….and democratize access to validated guidance

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eureka

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