

The importance of primary care in curbing antibiotic resistance

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Conflict of interest disclosure



ERS

EUROPEAN RESPIRATORY SOCIETY
INTERNATIONAL CONGRESS 2023
MILAN Italy, 9-13 September

☐ I have no real or perceived conflicts of interest that relate to this presentation.

☒ I have the following real or perceived conflicts of interest that relate to this presentation:

Affiliation / Financial interest	Commercial company
Grants/research support:	International Society of Infectious Diseases/Pfizer Global Medical Grants: Antimicrobial Stewardship in Africa and Middle East Research Grant 2020
Honoraria or consultation fees:	MINDGAP. Expert Working Group, European Network for Antibiotic Stewardship at the Point of Care (ENASPOC) for which consulting fees are paid by MindGAP to Oxford University Innovation Ltd.
Participation in a company sponsored bureau:	
Stock shareholder:	
Spouse / partner:	
Other support / potential conflict of interest:	Charities. Council member, British Society of Antimicrobial Chemotherapy), Trustee AMR Narrative

A large elephant is the central focus of the image, shown from the side and slightly from behind. It has thick, wrinkled grey skin and a long, dark trunk that hangs down. A small tusk is visible on its right side. The elephant is standing on a dry, yellowish-brown savanna floor. In the background, there is a flat landscape with some sparse green grass and a hazy horizon under a grey, overcast sky.

Who am I?

Background relevant to primary care

Impact of antimicrobial resistance

Context and challenges faced by frontline clinicians

Community interventions

Final reflections

1. Include primary care in any approach to optimise prescribing and curb antimicrobial resistance.
2. Understanding the context and prescribing culture is key for successful interventions
3. Need to better identify patients who might benefit from an antibiotic in primary care



Who am I?





Radcliffe Primary Care building, Oxford



Bromley-by-Centre, London



My Journey

An aerial photograph of the Okavango Delta in Botswana. The image shows a vast, intricate network of winding channels, known as hippo channels, which are filled with water and surrounded by dense, lush green vegetation. The channels meander through the landscape, creating a complex pattern of water and land. The overall scene is a testament to the natural beauty and ecological richness of the delta.

Hippo channels, Okavango Delta, Botswana

HIV/AIDS epidemic in South Africa

Research interests: optimise treatment
for common infections



Primary Care : a delicate ecosystem



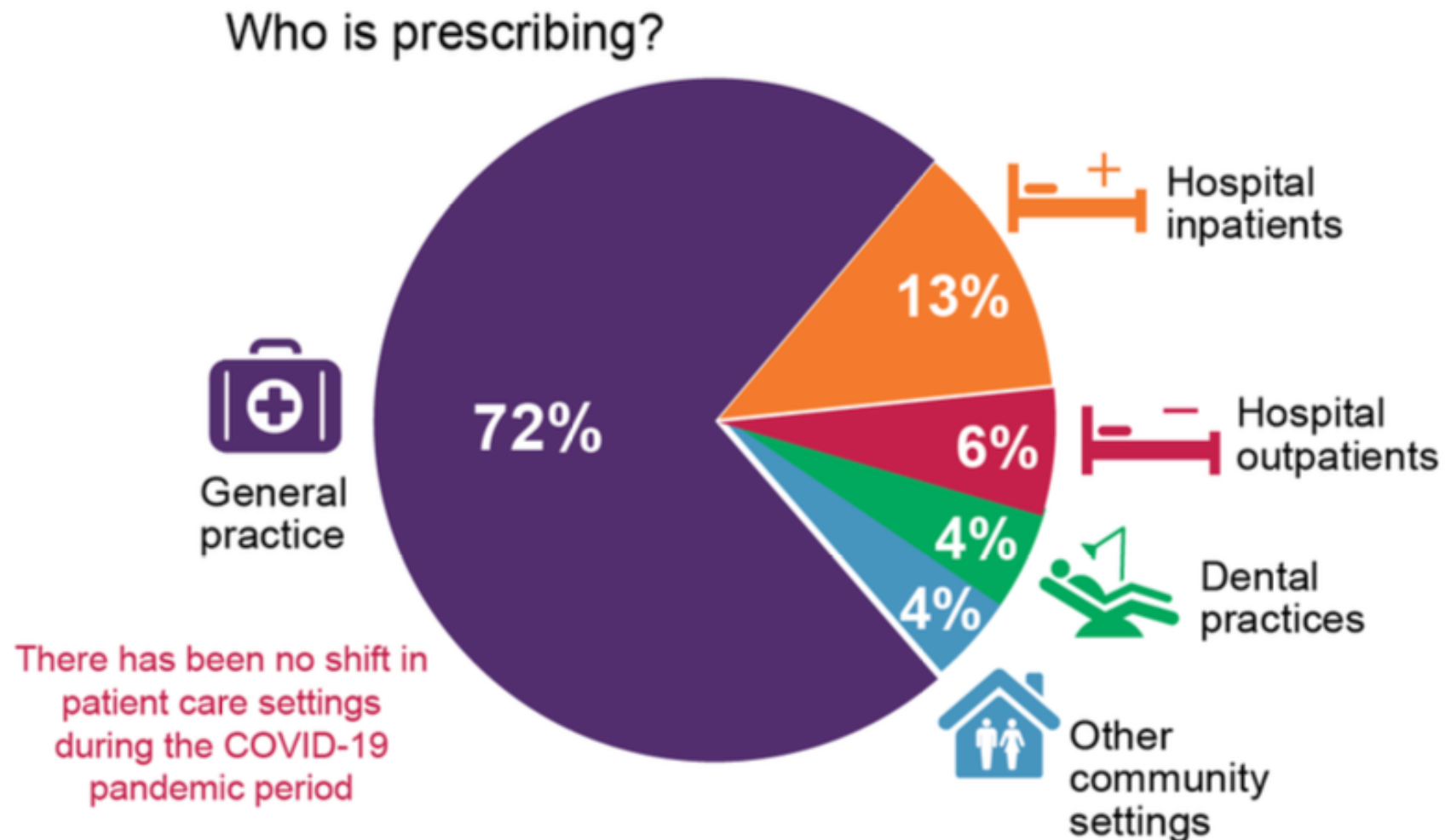
Wolves of Yellowstone

<https://earthjustice.org/feature/infographic-wolves-keep-yellowstone-in-the-balance> .

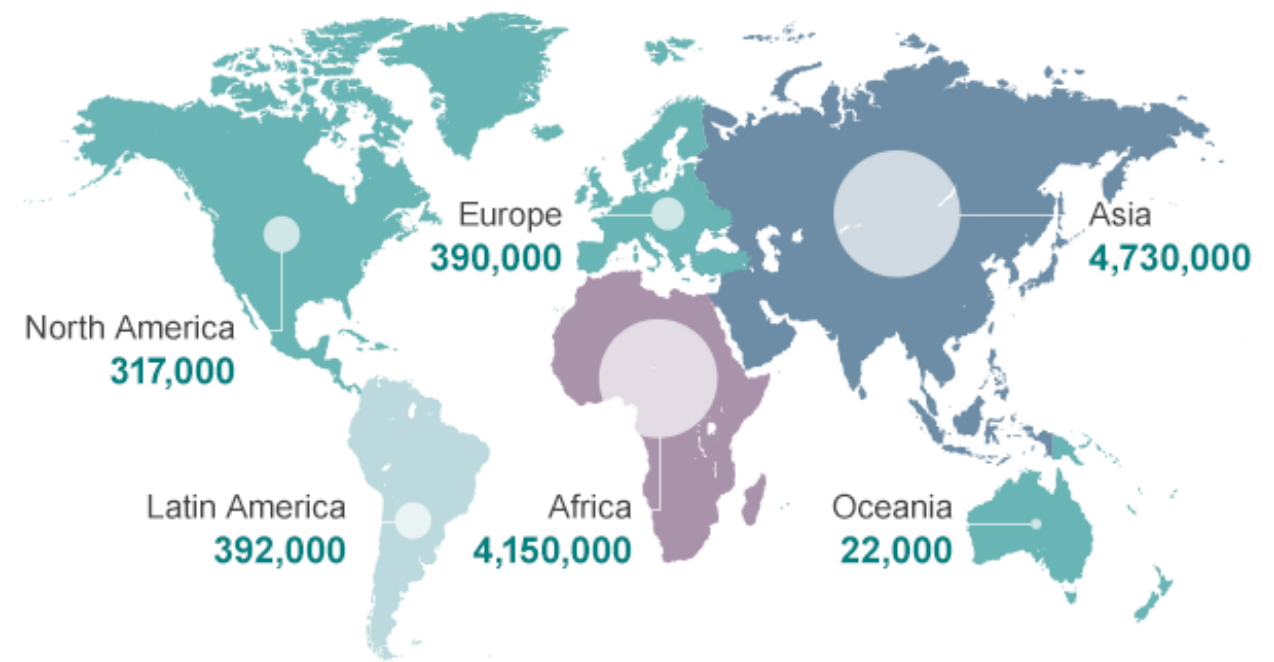


The Great Wildebeest Migration, Tanzania

Total antibiotic consumption by prescriber setting as proportion of overall prescribing, England 2020



Global threat of Antimicrobial Resistance (AMR)



Source: Review on Antimicrobial Resistance 2014



Impact of AMR in Primary Care



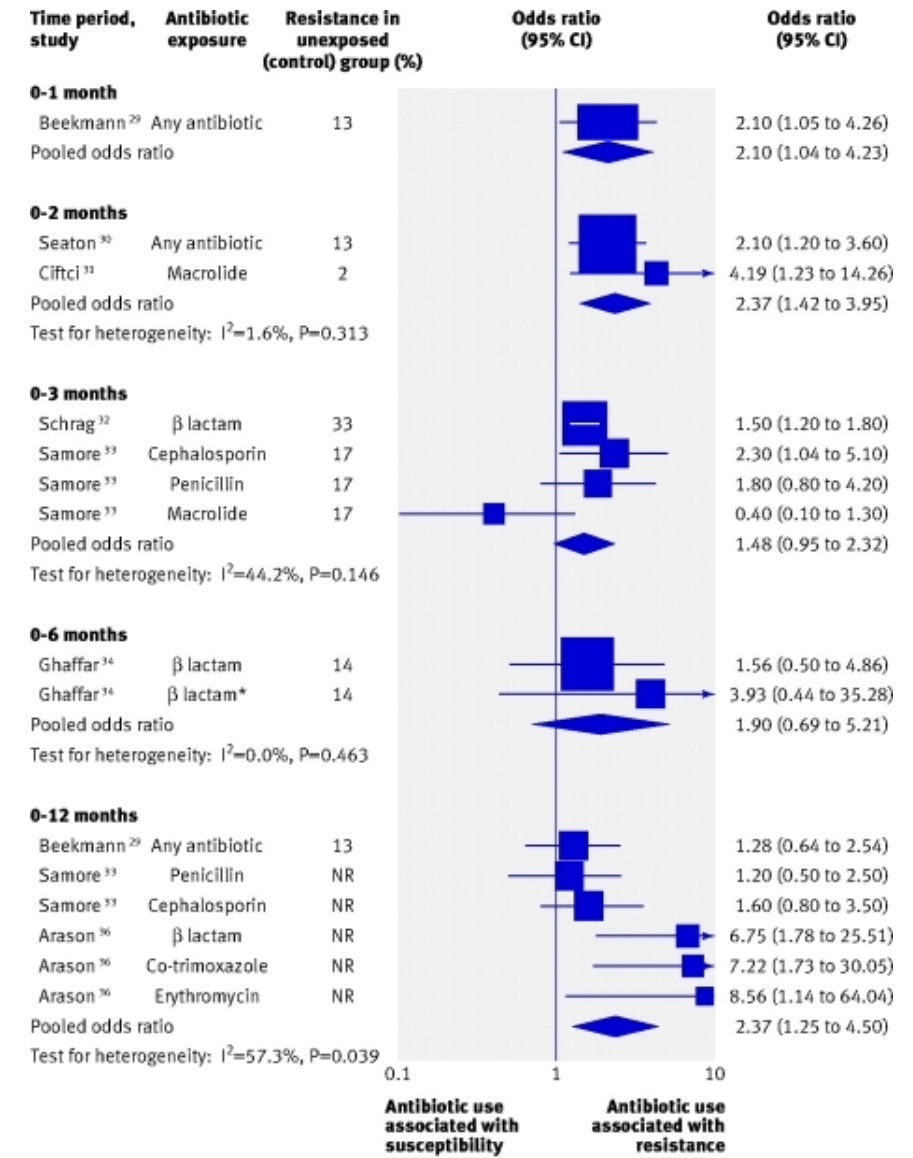
ANTIBIOTIC PRESCRIBING & AMR

RECAP

Antibiotic use is the main driver for carriage of antibiotic-resistant bacteria.

Resistance can persist for up to 12m

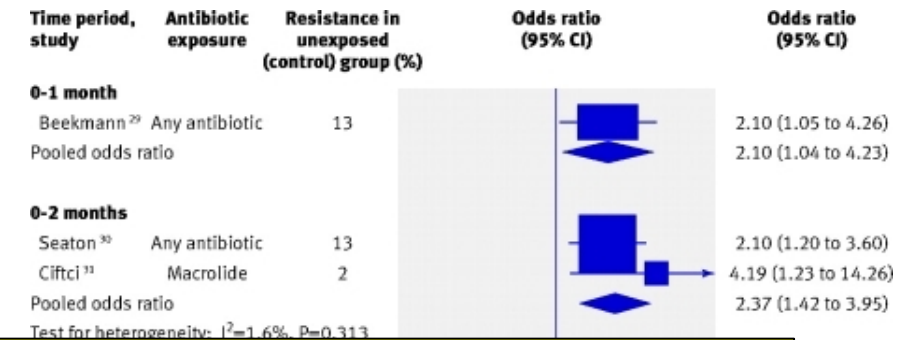
Development of resistance associated with the number and duration of antibiotic courses.



* β lactam plus another antibiotic. NR=not reported

ANTIBIOTIC PRESCRIBING & AMR

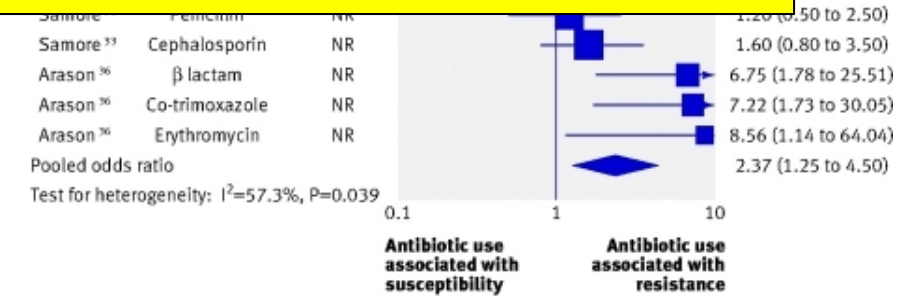
RECAP



But what is the impact of AMR in primary care?

How do patients in the community respond to resistant bacteria when they become sick?

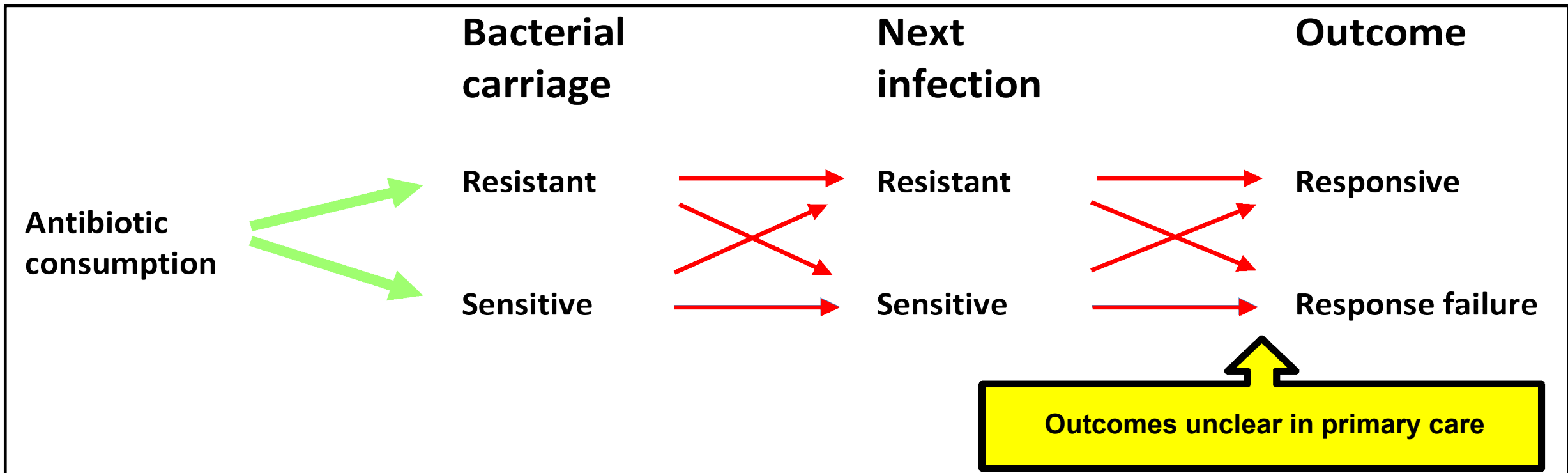
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EVIDENCE ABOUT AMR IMPACT IN PRIMARY CARE

Assessments of such outcomes are lacking



“Antibiotic resistance has worse implications for patients’ illness burden in the community and may also impact on workload in primary care.”

Clinical Infectious Diseases

MAJOR ARTICLE



IDSA

Infectious Diseases Society of America



hiv medicine association

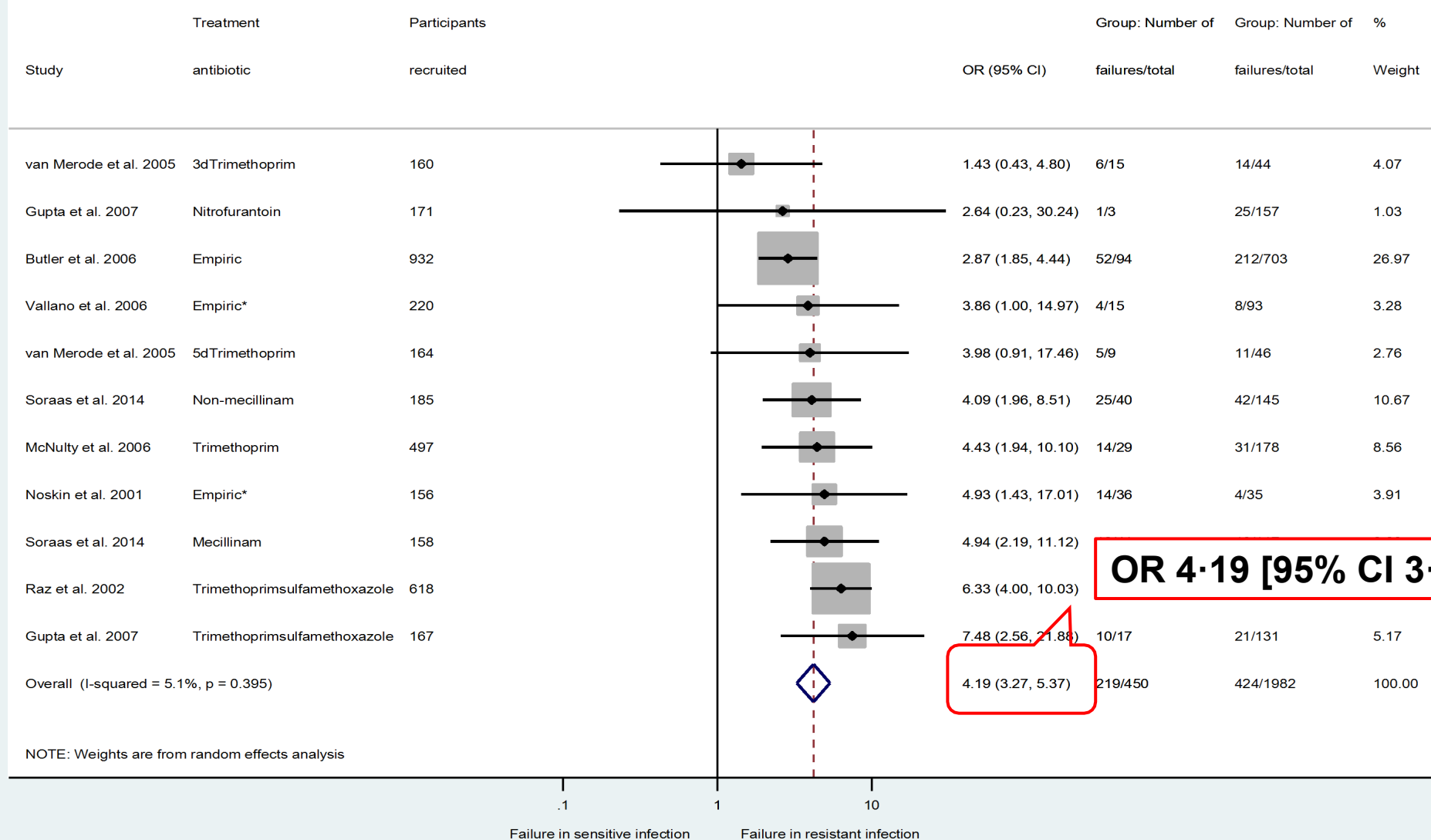


Implications of Antibiotic Resistance for Patients’ Recovery From Common Infections in the Community: A Systematic Review and Meta-analysis

Oliver van Hecke,¹ Kay Wang,¹ Joseph J. Lee,¹ Nia W. Roberts,² and Chris C. Butler¹

¹Nuffield Department of Primary Care Health Sciences, University of Oxford, and ²Bodleian Health Care Libraries, Knowledge Centre, Oxford, United Kingdom

Comparison between antibiotic-resistant and antibiotic-sensitive (*E.coli*) urinary tract infections in relation to “clinical response failure” (8 studies; 2,432 patients)



BURDEN OF AMR IN PRIMARY CARE

Affects patient recovery and healthcare use

Antibiotic resistance has worse implications for patients' illness burden in the community

Challenges the perception that patients in the community are at little additional risk

Better grasp of antibiotic resistance on tangible outcomes which matter to patients



Context and prescribing culture

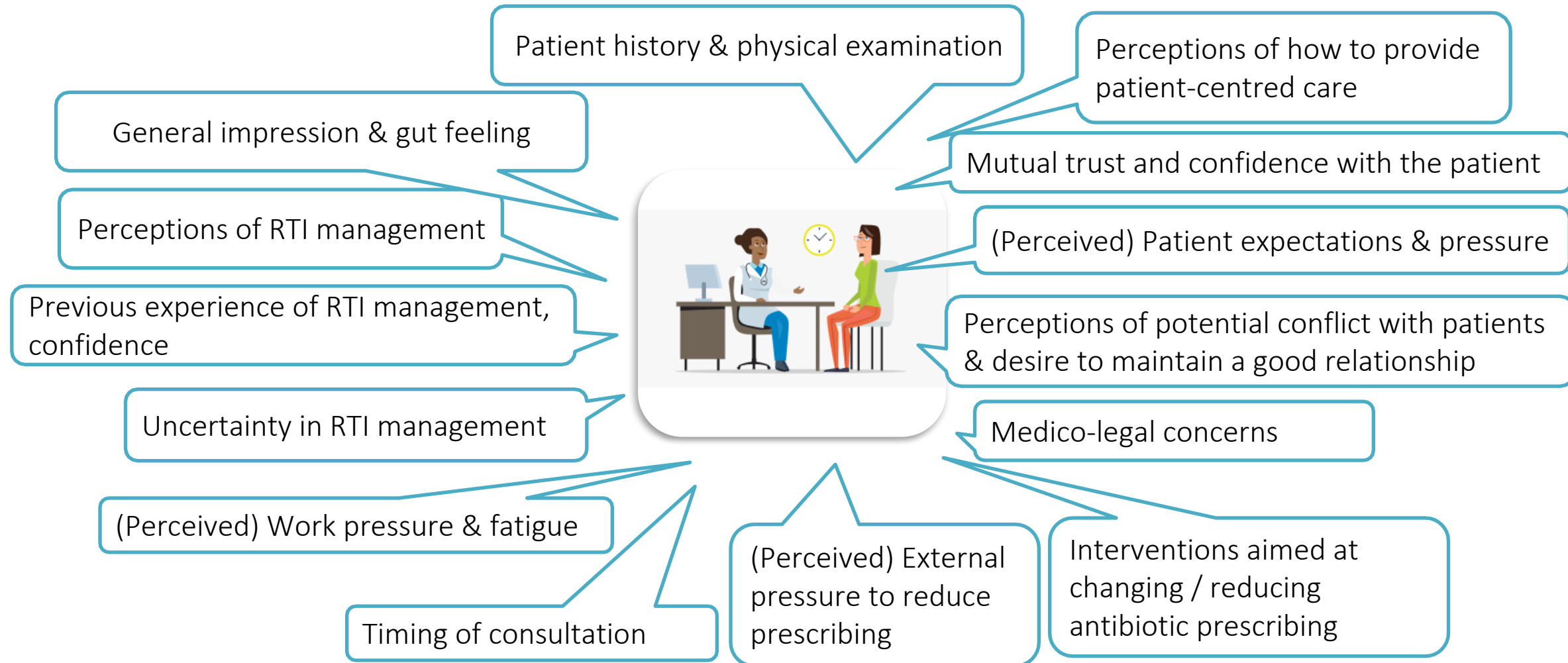


Gugulethu Township, South Africa

Decision-making
is complex



What influences antibiotic prescribing for acute respiratory tract infections (RTI) in primary care?

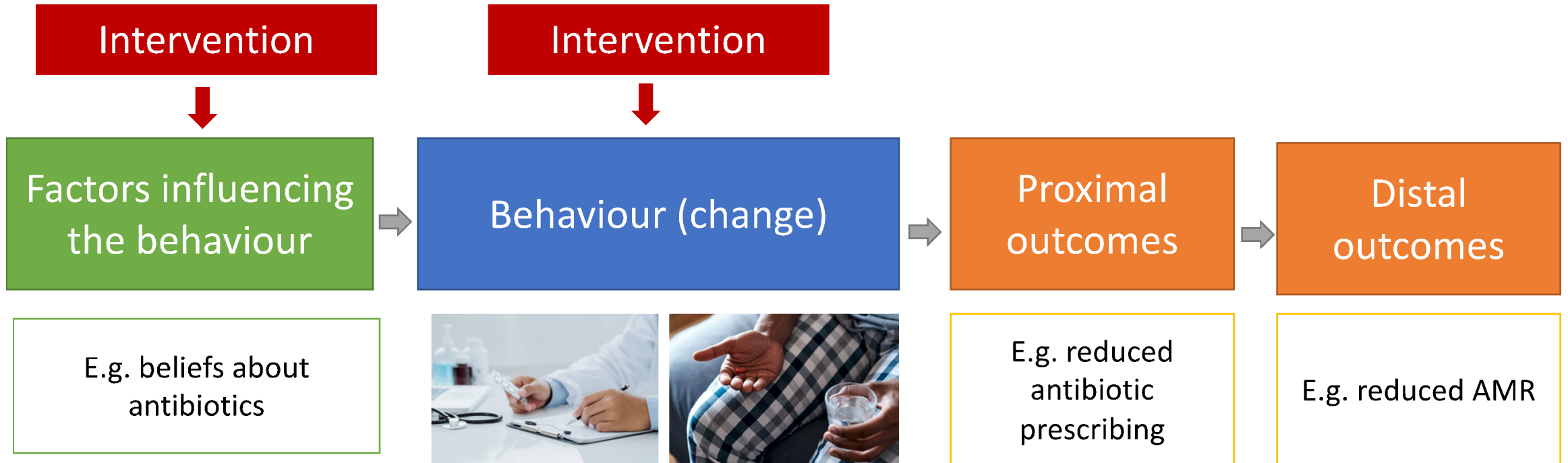


Antibiotic prescribing
is a complex
behaviour



What influences antibiotic prescribing/use?

Why consider this question?





Point-of-carE Testing for Infections (PETRI Study)



‘Point-of-care testing for common infection syndromes may only affect a proportion of antibiotic prescribing ...*[because of social determinants of health that override any guideline prescribing]*.’

BMJ Open **Introducing new point-of-care tests for common infections in publicly funded clinics in South Africa: a qualitative study with primary care clinicians**

Oliver van Hecke,¹ Chris Butler,^{1,2} Marc Mendelson,³ Sarah Tonkin-Crine^{1,2}



PETRI STUDY

UNEXPECTED FINDINGS

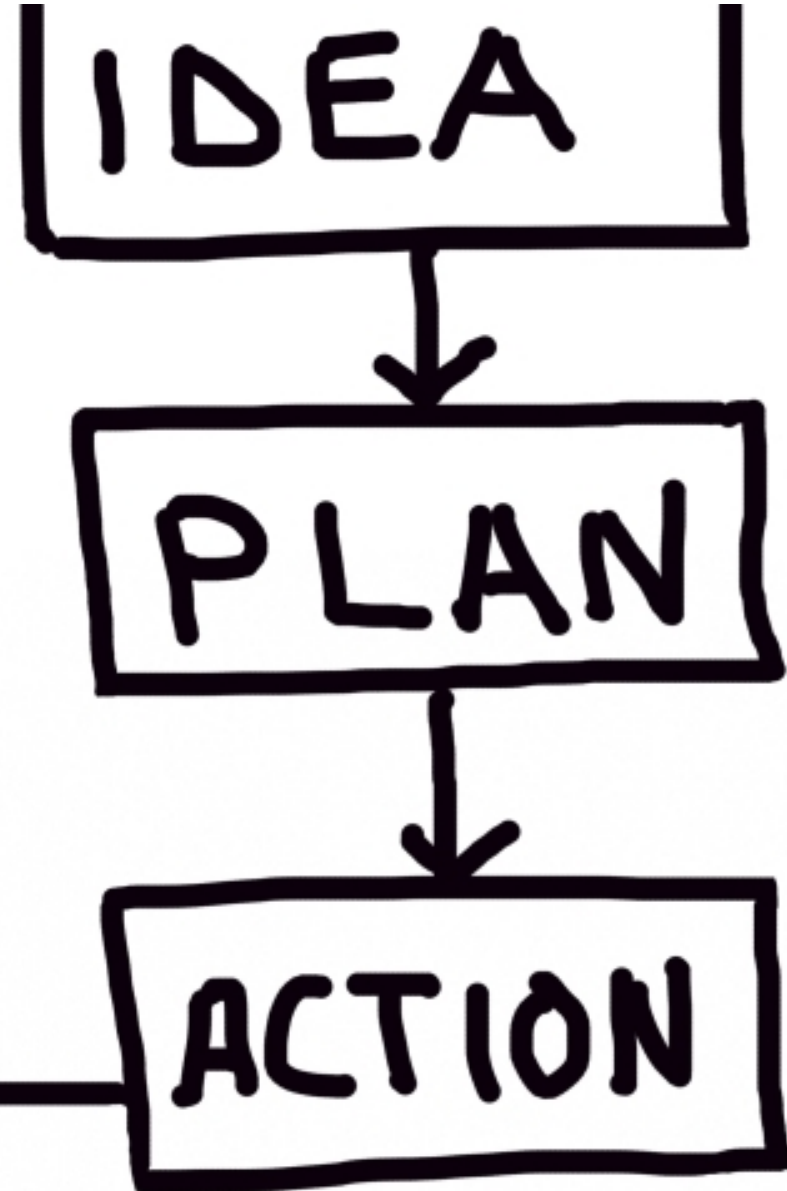


Observations in clinic

- long patient queues,
- lengthy travel to clinics visits,
- patient flow
- no booked appointments
- short clinical encounters,
- time constraints,
- paper-based records,
- scant record-keeping
- limited team dissemination



Interventions



ANTIMICROBIAL STEWARDSHIP

IN A NUTSHELL

“An organisational or healthcare system-wide approach to promoting and monitoring judicious use of antimicrobials to preserve their future effectiveness.”

“A systematic approach to optimising the www.nice.org.uk/guidance/ng15 appropriate use of all antimicrobials to improve patient outcome and limit emergence of resistant pathogens whilst ensuring patient safety.

THE RIGHT ~~ANTIBIOTIC~~ TREATMENT
FOR THE RIGHT PATIENT,
AT THE RIGHT TIME,
WITH THE RIGHT DOSE,
AND THE RIGHT ROUTE,
CAUSING THE LEAST HARM TO
THE PATIENT AND FUTURE PATIENTS

Adapted from <http://www.cdc.gov/getsmart/healthcare/inpatient-stewardship>

COMMUNITY INTERVENTIONS TO OPTIMISE ANTIBIOTIC PRESCRIBING

KNOW AND TARGET YOUR AUDIENCE

Table 1: Community interventions to optimise antibiotic-prescribing and use

	Intervention	Target
<i>During the consultation</i>	Education (guidelines, outreach visits, educational materials); Computerised decision support tools; Educational meetings; Audit and feedback; Financial incentives; Point-of-care tests (POCTs)	Clinician-focused
	Enhanced communication training; Shared-decision making; Delayed prescribing strategies; Patient educational materials	Clinician and patient-focused
<i>Outside the consultation</i>	National antibiotic awareness campaigns	Public

COMMUNITY INTERVENTIONS TO OPTIMISE ANTIBIOTIC PRESCRIBING

Overview

Tonkin-Crine S. Cochrane Database Syst Rev.
2017 Sep 7;9(9)

Smedemark SA. Cochrane Database Syst Rev.
2022 Oct 17;10(10)



Cochrane Database of Systematic Reviews

Clinician-targeted interventions to influence antibiotic prescribing behaviour for acute respiratory infections in primary care: an overview of systematic reviews (Review)

Tonkin-Crine SKG, Tan PS, van Hecke O, Wang K, Roberts NW, McCullough A, Hansen MP, Butler CC, Del Mar CB



Cochrane Database of Systematic Reviews

Biomarkers as point-of-care tests to guide prescription of antibiotics in people with acute respiratory infections in primary care (Review)

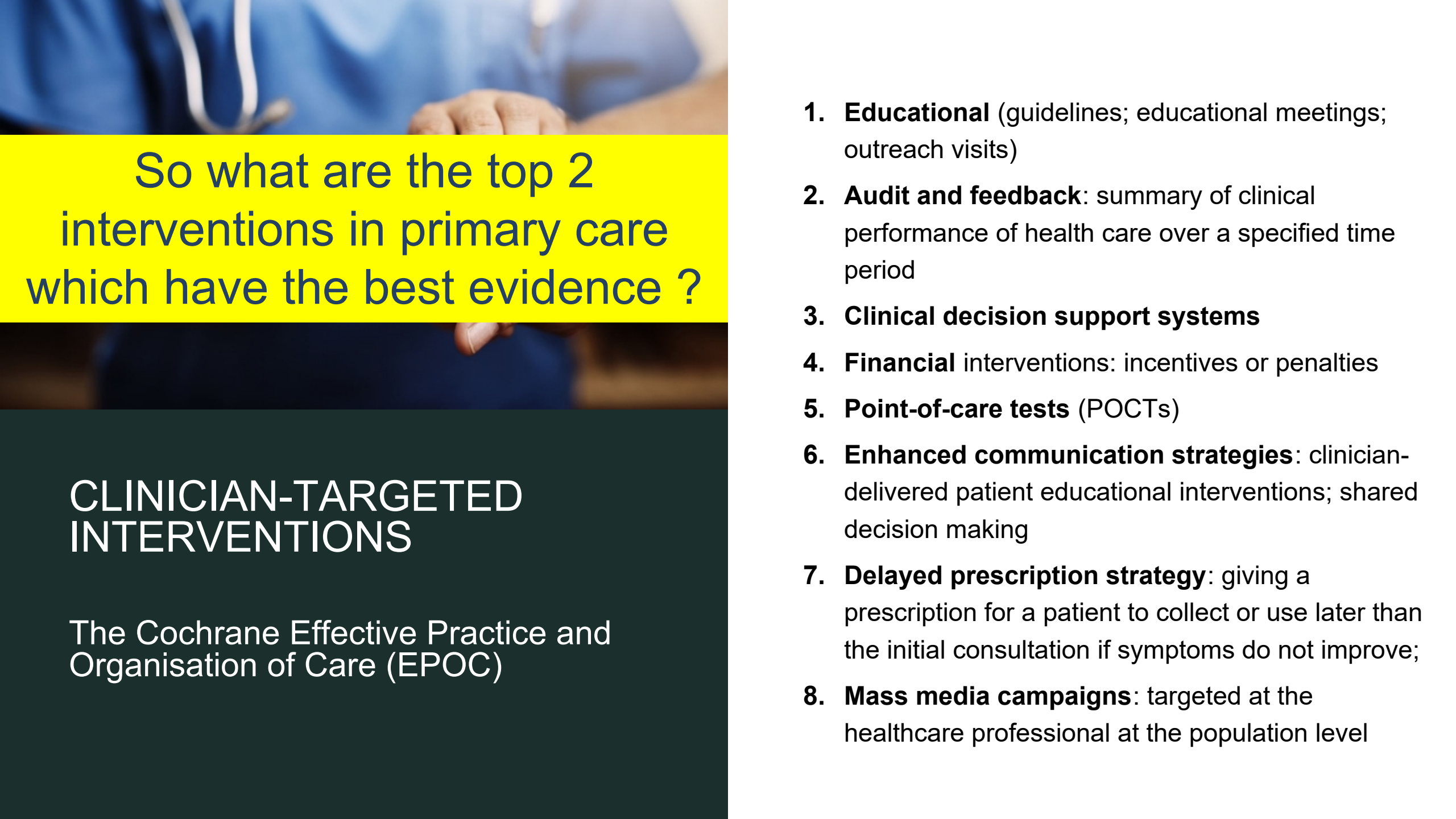
Smedemark SA, Aabenhus R, Llor C, Fournaise A, Olsen O, Jørgensen KJ



CLINICIAN-TARGETED INTERVENTIONS

The Cochrane Effective Practice and Organisation of Care (EPOC)

1. **Educational** (guidelines; educational meetings; outreach visits)
2. **Audit and feedback**: summary of clinical performance of health care over a specified time period
3. **Clinical decision support systems**
4. **Financial** interventions: incentives or penalties
5. **Point-of-care tests** (POCTs)
6. **Enhanced communication strategies**: clinician-delivered patient educational interventions; shared decision making
7. **Delayed prescription strategy**: giving a prescription for a patient to collect or use later than the initial consultation if symptoms do not improve;
8. **Mass media campaigns**: targeted at the healthcare professional at the population level



So what are the top 2
interventions in primary care
which have the best evidence ?

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CLINICIAN-TARGETED INTERVENTIONS

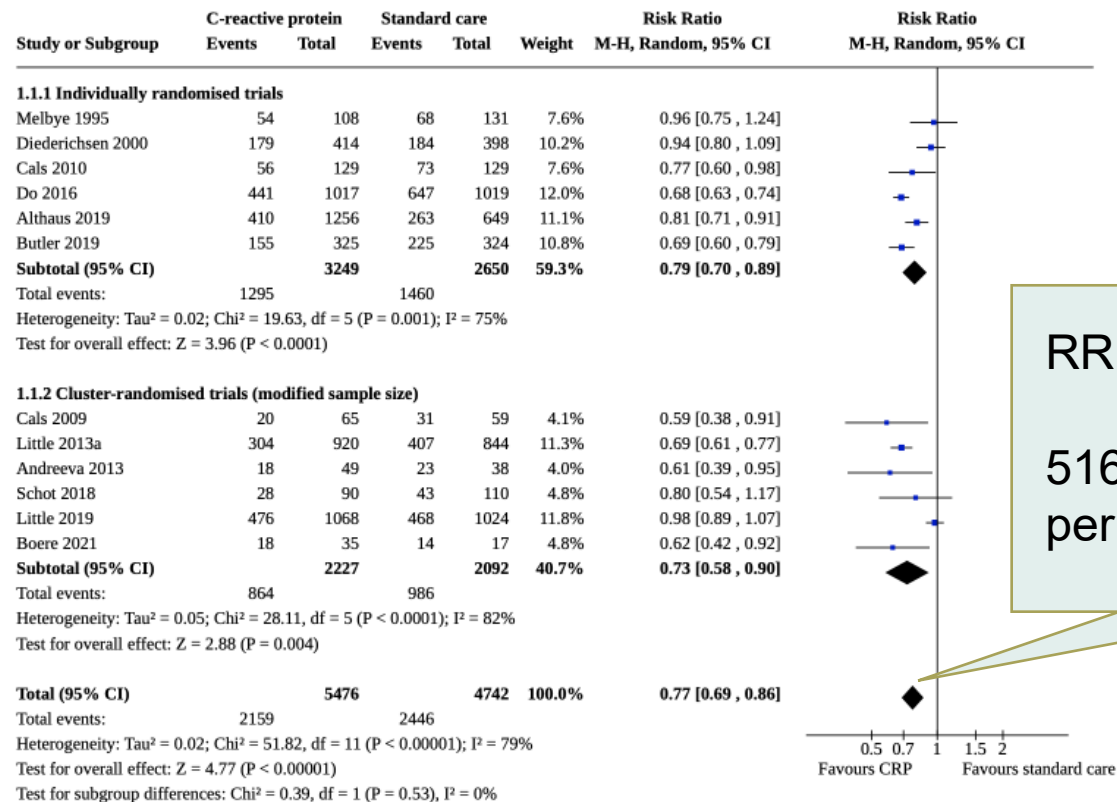
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CRP POCT

Antibiotic prescription at index consultation (Smedemark et al. 2022)

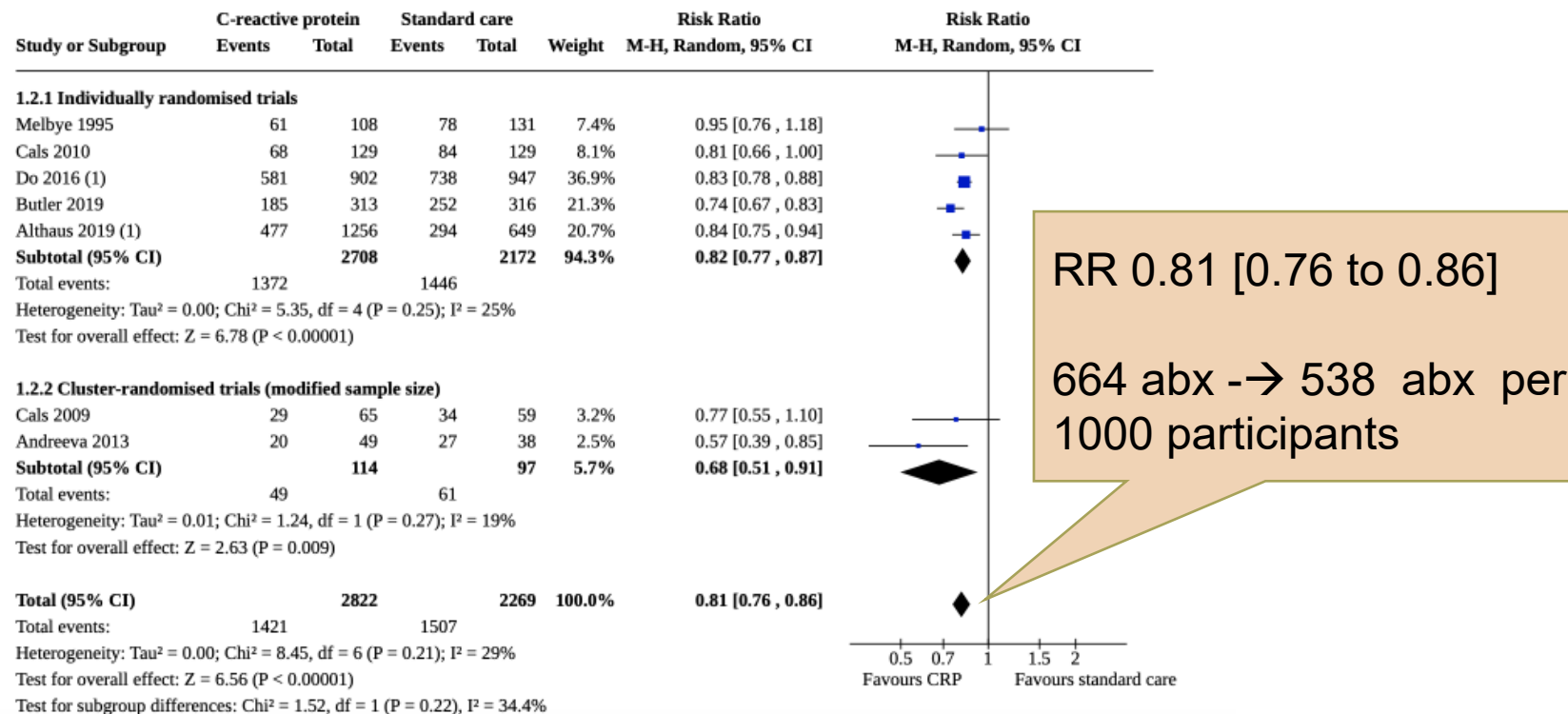
Figure 4. Forest plot of comparison: 1 C-reactive protein - antibiotic prescribing: all trials, outcome: 1.1 C-reactive protein - antibiotics prescribed at index consultation. All trials (cluster-RCTs with modified sample size).



CRP POCT

Antibiotic prescription within 28 days (Smedemark et al. 2022)

Figure 5. Forest plot of comparison: 1 C-reactive protein - antibiotic prescribing: all trials, outcome: 1.2 C-reactive protein - antibiotics prescribed within 28 days (cluster-RCTs with modified sample size).



ENHANCED COMMUNICATION STRATEGIES

GRACE INTRO trial

Communication training (RR=0.72 CI, 0.45-0.99) but not CRP training, remained successful for reducing prescribing for lower RTIs (RR=0.76; 95% CI, 0.47-1.06)

Both interventions remained successful for reducing prescribing for upper RTIs (RR=0.60; 95% CI, 0.37-0.94, and RR=0.58; 95% CI, 0.36-0.92, respectively).

Antibiotic Prescribing for Acute Respiratory Tract Infections 12 Months After Communication and CRP Training: A Randomized Trial

Little P, et al. GRACE consortium. Antibiotic Prescribing for Acute Respiratory Tract Infections 12 Months After Communication and CRP Training: A Randomized Trial. Ann Fam Med. 2019

Reflections



Final thoughts



Invest in 'fit for purpose' rapid diagnostic tests or testing novel decision support tools

Quality indicators focusing on the diagnostic process, rather than antibiotic prescribing rate

Reframe AMR into impactful campaigns

Summary

1. Include primary care in any approach to optimise prescribing and curb antimicrobial resistance.
2. Context and prescribing culture is under researched especially in resource-poor healthcare settings.
3. Need to better identify patients who might benefit from an antibiotic in primary care



List of references



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Thank you for your attention.



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Additional Slides



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SYSTEMATIC REVIEW AND META-ANALYSIS

SELECTION CRITERIA

Included studies

Study design: observational (cohort or case–control) or RCT study (2000 onwards)

Participants: patients in the community with respiratory (RTI), urine (UTI) or skin infections

Indicator: laboratory-confirmed antibiotic-resistant infection (*to prescribed antibiotic)

Comparator: antibiotic-sensitive infection

Outcome:

- 1° outcome = “clinical response failure”
- 2° outcome = re-consultation, further antibiotic prescriptions, symptom duration, symptom severity

Excluded studies: hospital inpatient settings, hospital-acquired infections, highly-specific patient groups (e.g. cystic fibrosis)

Comparison between antibiotic-resistant and antibiotic-sensitive (*Spneumoniae*) community-acquired pneumonia in relation to “response failure” (5 studies; 916 patients)

