

De Rop Liselore<sup>1</sup>, De Burghgraeve Tine<sup>1</sup>, De Sutter An<sup>2</sup>, Buntinx Frank<sup>1,3</sup>, Verbakel Jan Y<sup>1,4</sup>

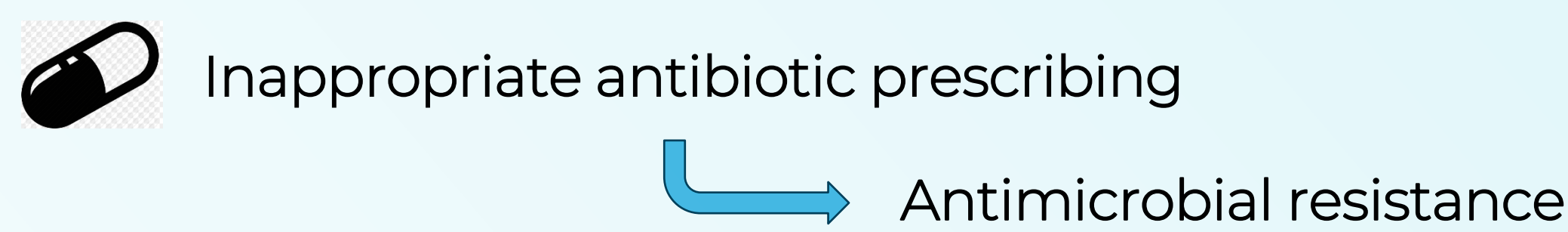
<sup>1</sup>EPI-Centre, Department of Public Health and Primary Care, KU Leuven, Leuven, Belgium, <sup>2</sup>Department of Family Practice and Primary Health Care, Ghent University, Ghent, Belgium, <sup>3</sup>Research Institute Caphri, Maastricht University, Maastricht, The Netherlands, <sup>4</sup>Nuffield Department of Primary Care Health Sciences, University of Oxford, Oxford, UK

## Introduction

1. Children frequently consult primary care with acute infections.
2. Serious infections are rare.

Differentiating serious from non-serious infections is challenging.

Diagnostic uncertainty



Adults: POC CRP test REDUCES antibiotic prescribing

Use in children: can POC CRP testing guide antibiotic prescribing in acute infections in children in primary care?

## Methodology

WHAT?

- Prospective observational study: POC CRP test levels and
  - Patient's characteristics (age and gender)
  - Healthcare setting
  - Preliminary diagnosis
  - Serious infection (= hospital admission >24h)
  - Antibiotic prescribing
- Descriptive statistics (median, interquartile range, ...)

WHO?

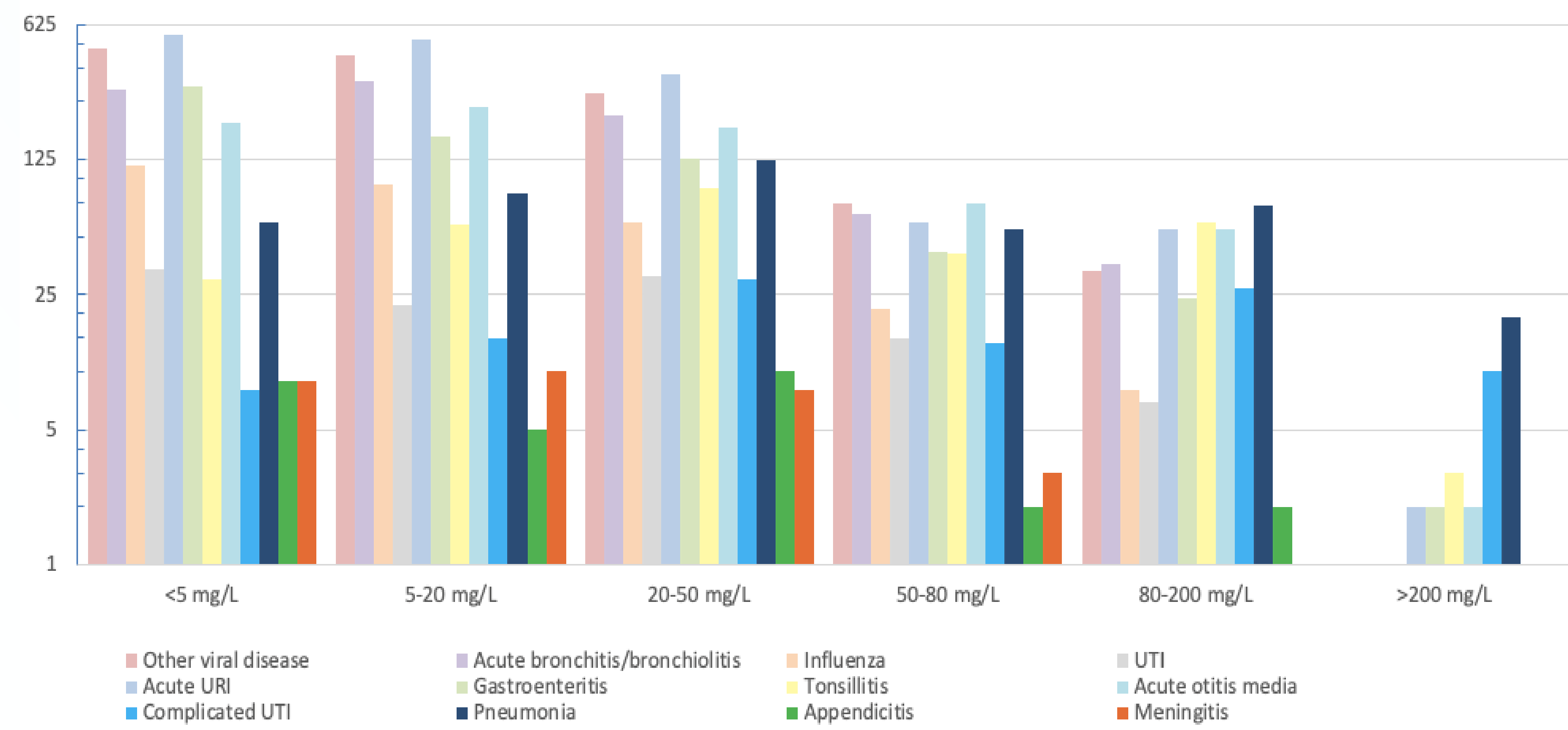
- Children 1 month to 16 years with an acute infection
- Ambulatory care in Belgium
  - General practice
  - Paediatric outpatient clinic
  - Emergency department

HOW?

- Point-of-care CRP test



Distribution diagnoses by point of care CRP range



Graph 1: Distribution of frequency of diagnoses by point-of-care CRP range. X-axis displays 5 different point-of-care CRP ranges. Y-axis displays the frequency of the diagnoses on a logarithmic scale. CRP: C-reactive protein, URI: upper respiratory infection, UTI: urinary tract infection.

## Conclusion

Higher median POC CRP in serious infections



Serious infections in lower POC CRP ranges



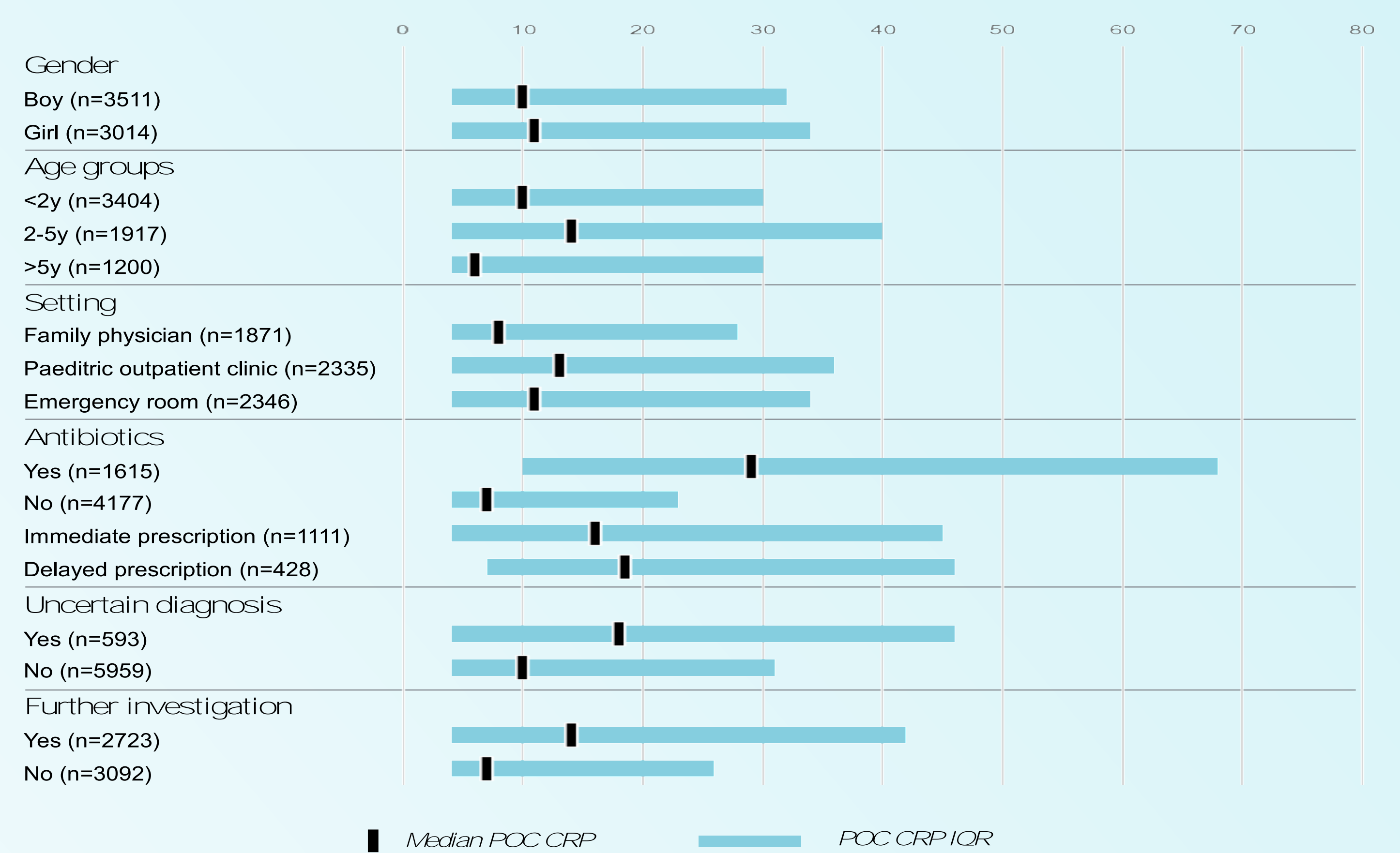
As a standalone tool low POC CRP cannot safely rule out a serious infection and seems insufficient to guide antibiotic prescribing and prevent antimicrobial resistance. Potential of POC CRP in assessing serious infections when integrated in a clinical decision rule?

Coming soon: ARON study



## Results

Patient's characteristics and POC CRP



Graph 2: Median POC CRP and IQR for different patient's characteristics, including gender, age groups, and healthcare setting, antibiotic prescribing, uncertain diagnosis and further investigation. CRP: C-reactive protein, IQR: interquartile range, N: number, POC: point-of-care, y: years.

8,280 acute infections in children analysed:

- 6,552 cases with POC CRP values
- Median patient age: 1.98 years (IQR 0.97 to 4.17)
- Setting: 37% general practice, 33% paediatric out-patient clinic, and 30% ED

A total of 131 different preliminary diagnoses

1. Acute upper airway infection (n=1,536)
2. Other viral disease (n=1,284)
3. Acute bronchitis/bronchiolitis (n=918)
4. Acute otitis media/myringitis (n=741)
5. Gastroenteritis presumed infection (n=654)

The median POC CRP over all infectious episodes was 10 mg/L (IQR <5-29)

- Children below five years of age had a higher median POC CRP
- Setting: GP (8 mg/dL, IQR <5-24), paediatric outpatient clinic (13 mg/dL, IQR <5-32) and ED (11 mg/dL, IQR <5-30)

In 513 patients (6.2%) a serious infection was diagnosed

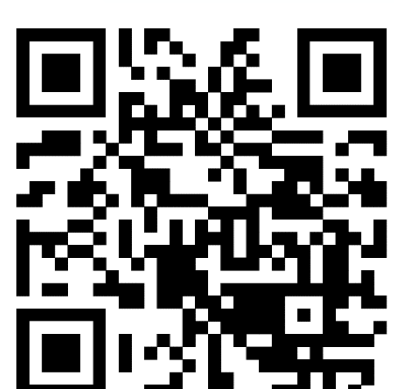
- Median CRP in serious infections: 21 mg/L (IQR 6-63.5)
- 10 mg/L (IQR <5-27) non-serious infections

  1. Pneumonia (n=164): median CRP of 48 mg/L (IQR 13-113)
  2. Gastroenteritis with dehydration (n=162): median CRP 9.5 mg/L, IQR <5-30
  3. Complicated urinary tract infection (n=58): median CRP 54.5 mg/L, IQR 22-127

Antibiotics were prescribed in 28% (n=2030) of cases, with a delayed prescription in 29% (n=601) of them. When antibiotics were prescribed, median CRP level was 29 mg/L (IQR 10-58) compared to 7 mg/L (IQR <5-19) when they were not prescribed.

## Acknowledgements

This report was written on behalf of the ERNIE 2 collaboration. The principal ERNIE 2 investigators are: Bert Aertgeerts, Dominique Bullens, Frank Buntinx, Frans De Baets, Tine De Burghgraeve, Karin Decaestecker, Katrien De Schynkel, An de Sutter, Marieke Lemiengre, Karl Logghe, Jasmine Leus, Luc Pattyn, Marc Raes, Lut Van den Berghe, Christel Van Geet, and Jan Verbakel.



De Rop L, De Burghgraeve T, De Sutter A, Buntinx F, Verbakel JY. Point-of-care C-reactive protein test results in acute infections in children in primary care: an observational study. *BMC Pediatr.* 2022 Nov 4;22(1):633