

# Exploring test accuracy of faecal calprotectin for IBD using primary care electronic health records

Karoline Freeman<sup>1</sup>, Ronan Ryan<sup>2</sup>, Sian Taylor-Phillips<sup>1,3</sup>, Brian H. Willis<sup>3</sup>, Aileen Clarke<sup>1</sup>

<sup>1</sup>Warwick Medical School, University of Warwick, Coventry, UK

<sup>2</sup>Devon, UK

<sup>3</sup>Institute of Applied Health Research, University of Birmingham, Birmingham, UK

## Background

Test accuracy measures for primary care are often derived from small, heterogeneous studies suffering from differential verification bias.

## Aim

To explore the potential of using routine primary care data to derive test accuracy estimates of faecal calprotectin (FC) testing for inflammatory bowel disease (IBD) compared to conventional and tailored meta-analyses of published test accuracy studies.

## Methods

FC tests in adult patients with no previous IBD diagnosis from 2006-2016 were extracted from THIN. Multiple tests, tests without numeric results, with missing units or units other than µg/g were excluded. The reference standard was a coded record of IBD diagnosis or disease specific medication at three follow-up times. Sensitivity analyses explored assumptions on test exclusions, reference standard and patient selection. Results were compared to pooled estimates of sensitivity and specificity using conventional and tailored meta-analysis of studies from a recent systematic review.

## Results

7084/17466 FC tests were included. 4570 FC tests had no subsequent diagnosis recorded. Longer follow-up had no impact on the number of IBD diagnoses. The main methodological issues were 1) missing test results, 2) missing variables including indication for testing, test/laboratory information and results from secondary care testing, 3) misclassification of disease using clinical codes, 4) the inability to confirm absence of disease. Study assumptions had a greater impact on specificity than sensitivity. Sensitivity and specificity were similar to pooled estimates from meta-analyses (Table1). The test positive rate was higher but IBD prevalence in FC tested patients was similar in routine data and published studies of similar settings.

Outcome	THIN (95% CI)	Conventional MA (14 studies) (95% CI)	Tailored MA (7 studies) (95% CI)
Sensitivity (95% CI)	0.93 (0.89 to 0.96)	0.94 (0.90 to 0.97)	0.97 (0.81 to 0.996)
Specificity (95% CI)	0.61 (0.6 to 0.63)	0.67 (0.57 to 0.76)	0.68 (0.64 to 0.72)

Table 1 Sensitivity and specificity of FC testing using three methods

## Conclusions

Test performance measures using routine data need to be interpreted with caution considering study limitations. Triangulation of tailored meta-analysis and routine data may provide evidence sufficient to support decision making.

## Keywords

Electronic health records, test accuracy, tailored meta-analysis