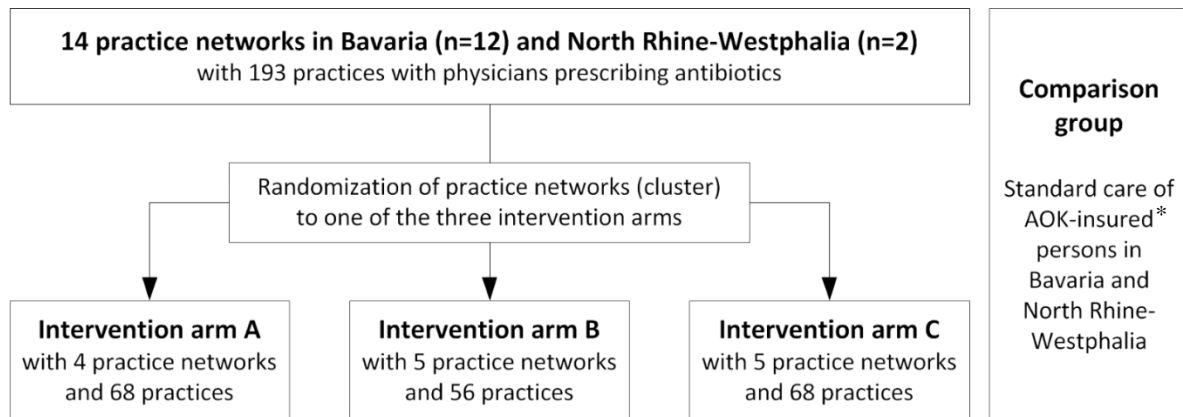


## Additional file 1

### Study design

#### 1. ARena study design



\*AOK is a large statutory health insurance provider in Germany

**Figure 1:** ARena study design with three intervention arms and comparison group

Published in: Kamradt M, Kaufmann-Kolle P, Andres E, Brand T, Klingenberg A, Glassen K et al. Sustainable reduction of antibiotic-induced antimicrobial resistance (ARena) in German ambulatory care: study protocol of a cluster randomised trial. *Implement Sci* 2018; 13(1):23.

#### 2. Implementation strategy and intervention components

The three intervention arms in ARena focused on

- guideline-oriented care, information and education (standard set of intervention components in intervention arms I, II, and III)
- involvement of practice team (intervention arm II only)
- interdisciplinary, cross-sectoral cooperation, software-based decision support (intervention arm III only)

##### **Standard set of implementation components (arms I, II, and III):**

Targeting physicians: E-learning on communication with patients, quality circles with data-based feedback, performance-based additional bonus compensation;

Targeting patients: educational information material (poster, leaflets)

Public information campaigns using print, TV, radio, and social media

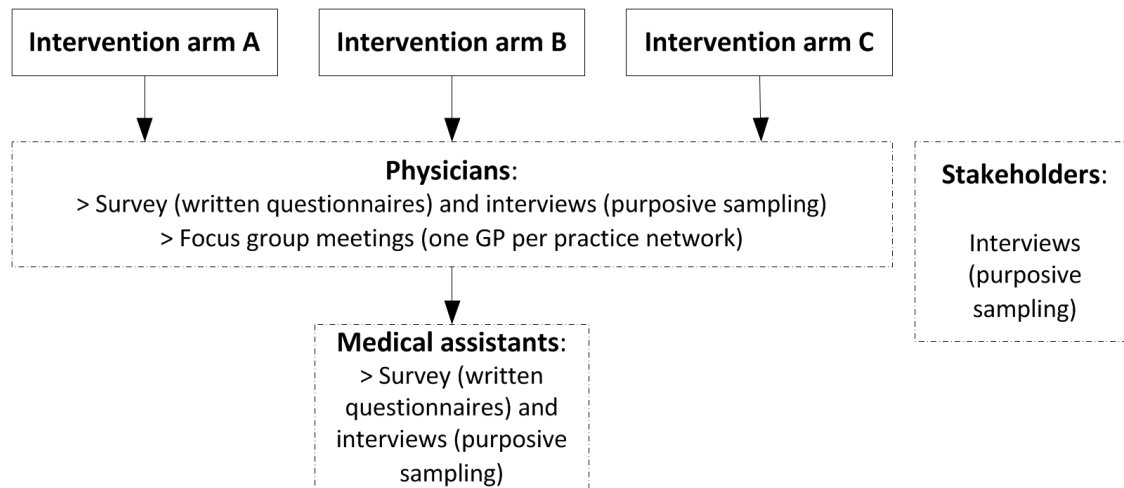
##### **Add-on in arm II only:**

Targeting practice team/MAs: E-learning on communication with patients, quality circles with data-based feedback; tablet pcs to provide educational content to patients in waiting areas

**Add-on in arm III only:**

Targeting physicians: Interdisciplinary, cross sectoral quality circles, software-based decision support integrated into administrative practice software

**3. Process evaluation design**



**Figure 2:** Process evaluation design of the ARena study

Published in: Kamradt M, Kaufmann-Kolle P, Andres E, Brand T, Klingenberg A, Glassen K et al. Sustainable reduction of antibiotic-induced antimicrobial resistance (ARena) in German ambulatory care: study protocol of a cluster randomised trial. *Implement Sci* 2018; 13(1):23.