

# Antibiotic prophylaxis as a response to a meningococcal meningitis outbreak

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## Introduction

Vaccine supply against newly-emerged serogroup C meningococcus is limited. New epidemic response strategies are therefore needed in the African meningitis belt. We conducted a three-arm, open-label cluster-randomized trial of single-dose ciprofloxacin prophylaxis as an epidemic response. (ClinicalTrials.gov number NCT02724046).

## Methods

Villages notifying a suspected meningitis case were randomly assigned (1:1:1) to standard care, single-dose oral ciprofloxacin for household contacts <24h after case notification, or village-wide distribution of ciprofloxacin <72h after first case notification. Dosing was age-based and directly-observed. The primary outcome was the overall attack rate (AR) after inclusion of the village. A random sample of 400 participants in 20 villages was enrolled to describe any changes in fecal carriage prevalence of ciprofloxacin-resistant Enterobacteriaceae before and after intervention.

## Results

Between April 22 and May 18, 2017, 49 villages (total population 71 308) were included and randomly assigned; 17 to the control arm, 17 to household prophylaxis, and 15 to village-wide prophylaxis.

A total of 248 cases were notified. The AR were 451 per 100 000 persons in the control arm; 386 per 100 000 persons in the household prophylaxis arm ( $p=0.68$ ); and 190 per 100 000 persons in the village-wide prophylaxis arm ( $p=0.032$ ). After controlling for whether the village was included after the first rainfall, the adjusted AR ratio between the village-wide prophylaxis arm and the control arm was 0.40 ([0.19–0.87],  $p=0.022$ ). Baseline carriage prevalence of ciprofloxacin-resistant Enterobacteriaceae was 95% in the control arm and the village-wide prophylaxis arm and did not change post-intervention.

## Conclusions

Village-wide distribution of single-dose oral ciprofloxacin within 72 hours of case notification reduced overall meningitis AR. This novel strategy is promising as a meningitis epidemic response. Further studies should be carried out in different settings to confirm effectiveness and duration of protection and to investigate the impact on antimicrobial resistance.

New strategies for meningococcal meningitis outbreak response are needed. Village-wide ciprofloxacin prophylaxis is promising but needs further study.