Engaging communities to address antimicrobial resistance from a One Health perspective: Results from a cluster-randomised controlled trial in rural Bangladesh

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Introduction

- Antimicrobial resistance (AMR) is an urgent public health challenge, causing more deaths annually than malaria and HIV combined. Addressing AMR requires a One Health approach, encompassing human, animal and environmental health.
- The Medical Research Council (MRC)-funded COSTAR project evaluates the effectiveness of the Community Dialogue Approach (CDA) in improving community knowledge on antibiotic use and resistance in rural Bangladesh.
- This randomised controlled trial (RCT) builds on a previous MRC-funded feasibility study.

The study

- A two-arm, parallel-group, cluster-randomised controlled trial was conducted from September 2022 to January 2024, across 50 clusters (community clinic catchment areas) in Cumilla district, Bangladesh.
- Two primary outcomes were measured:
    - Community members' levels of appropriate knowledge about antibiotics, antibiotic resistance and appropriate antibiotic practices in relation to human health.
    - Appropriate knowledge about antibiotic usage in relation to animal health and the environment.
- Data collection: Cross-sectional household surveys were conducted with individual adults (n=2,160 at baseline; n=2,214 at endline), involving different participants at each time point.

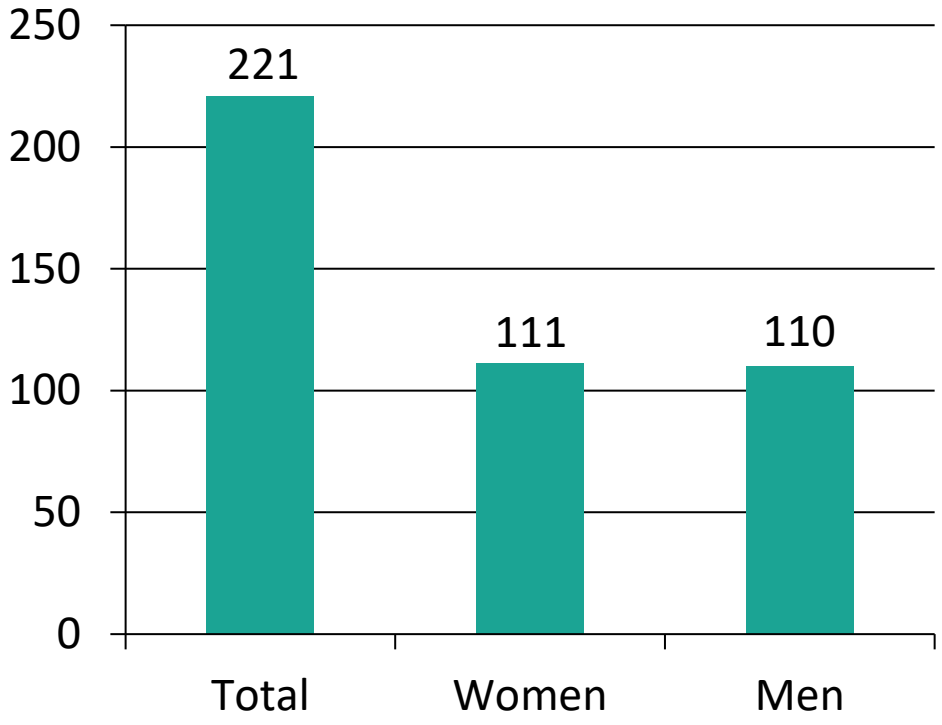
The intervention

- Integrated into existing health systems through planning, training and implementation.
- 11 structured dialogue sessions over 12 months, covering discussion, information sharing, action planning and review. Sessions led by peer-selected, trained community facilitators, given flipcharts, discussion guides and monitoring tools, supported by primary healthcare staff.
- Participants: Self-selected adult community members.
- Control group: No community engagement activities.

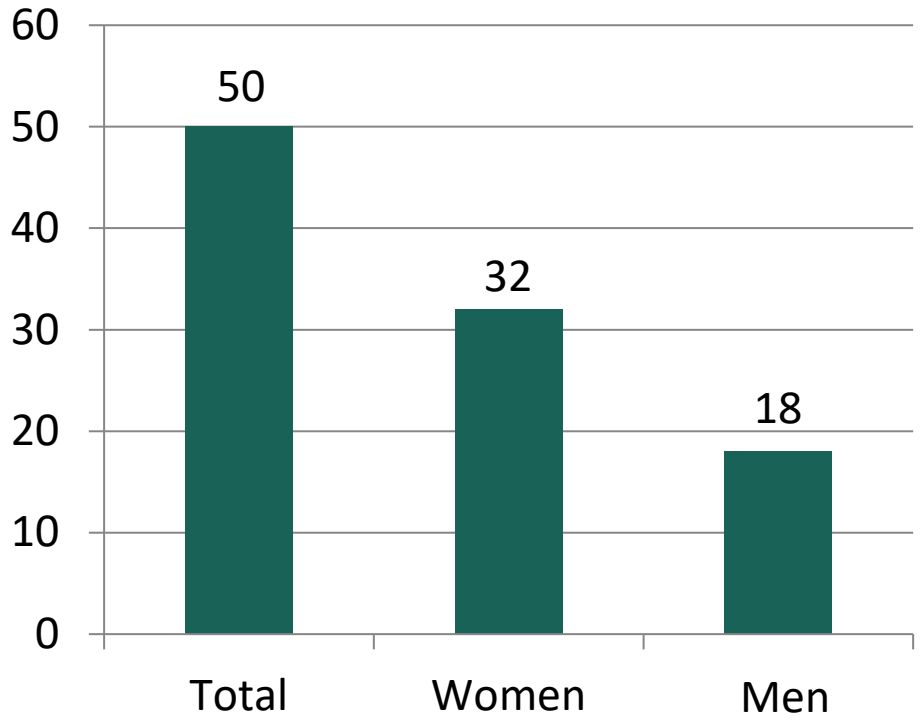
Results

People trained

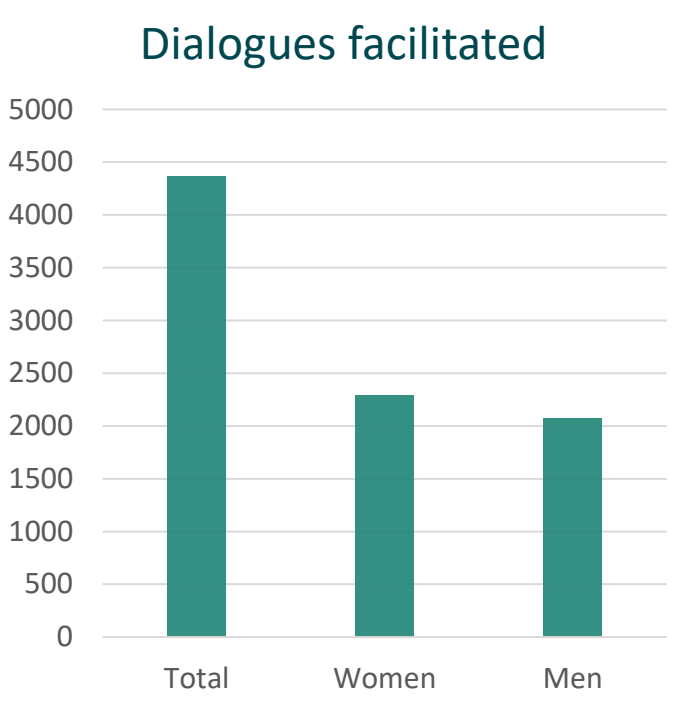
Community dialogue facilitators trained

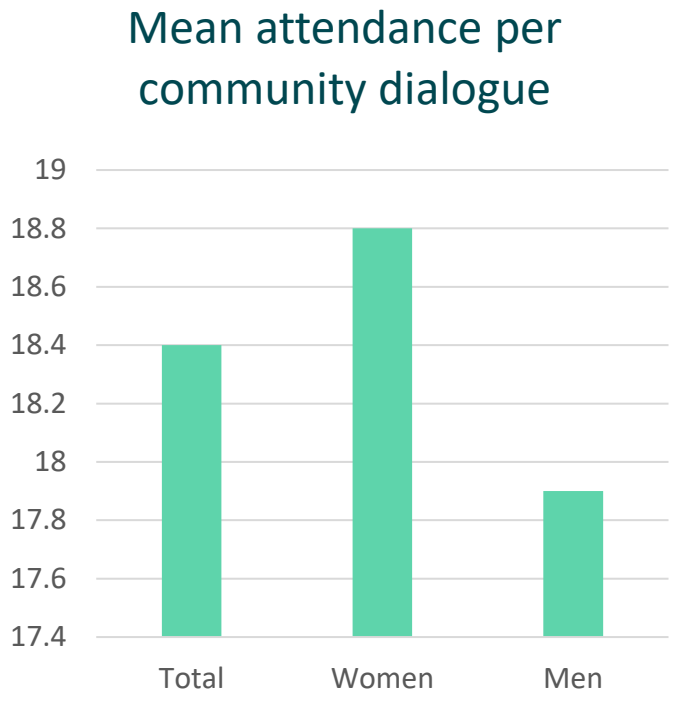


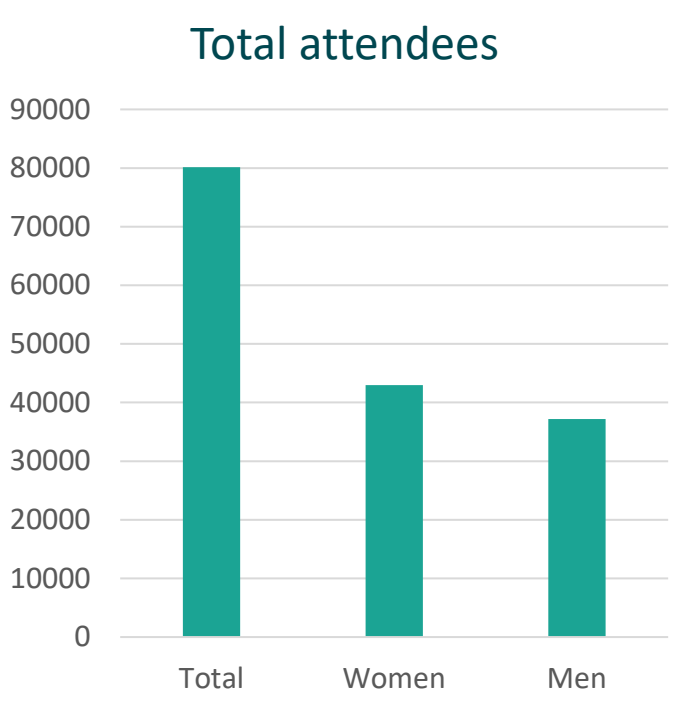
Supervisors trained



Dialogues and attendees







Key findings

Outcome	Baseline intervention (%)	Baseline control (%)	Endline intervention (%)	Endline control (%)	Difference in change (intervention-control)	95% CI (%)	p-value
Knowledge on antibiotics, antibiotic resistance and antibiotic usage for human health (25 items)	34	36	50	33	+16.0	9.0–22.0	<0.001
Knowledge on antibiotic usage for animal health and antibiotic-related environmental considerations (20 items)	56	57	46	33	+12.0	5.0–19.0	<0.001

Key findings

Characteristic	Endline	
	Intervention	Control
Aware of health-related community gatherings	51% (95% CI: 39–62)	2% (95% CI: 1–3)
Attended at least one community dialogue	45% (95% CI: 33–56)	1% (95% CI: 0.5–2)
Attended at least six sessions	14% (95% CI: 10–19)	0.01% (95% CI: 0–0.4)

Discussion

- This trial provides the first experimental evidence that the CDA can improve community knowledge on antibiotics and resistance from a One Health perspective.
- Improvements were greater for human health knowledge than for animal or environmental topics, underscoring the need to adapt content and delivery methods in these areas. Further analysis of the data is ongoing.
- CDAs could be applied to other community-driven public health issues, implemented through district-level staff.
- Forthcoming analyses include the process evaluation and costing studies.

Strengths of the study

- There was high implementation fidelity (E.g., most of what was planned was implemented).
- Large sample size improved statistical power and representativeness of the results.
- The trial was embedded within and owned by Bangladesh's health system structures.
- Robust cluster sampling approach ensured a representative sample of community members across a large geographical area, with the only eligibility criterion being age 18 years or older.
- Very high response rates at both baseline (2,160/2,187; 98.8 percent) and endline (2,214/2,228; 99.4 percent) minimised selection bias in the results.

Challenges to and limitations of the study

- We measured self-reported knowledge and practices, rather than objective measures of behaviour.
- Disruptions in funding and the COVID-19 pandemic delayed the project start, while political unrest led to the cancellation of some field monitoring visits.
- The intervention was demand-focused; a proposed follow-up study will include One Health (human and animal) antimicrobial providers.

Recommendations

- In the current resource-constrained environment, evaluate the feasibility and impact of a lighter version of the CDA with fewer dialogue sessions or simplified materials to determine whether impact can be maintained at lower cost.
- In future studies, use simplified data collection tools designed for low-literacy groups to better capture quantitative data.
- Embed interventions within local structures such as community clinics, involving district-level staff and communities directly in planning and delivery to enhance sustainability and scalability.
- Sustain community engagement over an extended period to monitor community-wide behavioural changes.

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