**¨Without antibiotics, I cannot treat” - prescribing practices in West Bengal, India: mixed methods study**

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**Introduction**Inappropriate antibiotic use is thought to be widespread, particularly in less well-regulated healthcare systems, and contributes to antimicrobial resistance. Patients may interact with both formal and informal healthcare providers in accessing primary healthcare, but the level of knowledge, attitudes, and practices (KAP) of both providers and patients in relation to appropriateness of prescribing has not been well documented in India.

**Methods**We aimed to use a mixed methods approach to explore the prescribing patterns of informal and formal healthcare providers in West Bardhaman district of West Bengal, India. We surveyed 384 participants using convenience sampling (96 allopathic doctors, 96 nurses, 96 informal providers, and 96 pharmacy shopkeepers) using a validated KAP questionnaire, adapted to the local context. In order to triangulate data, we also conducted 28, semi-structured, in-depth interviews with providers and community members. Qualitative data was analysed using the framework method in an inductive and deductive manner, while quantitative data was collated in Excel and analysed using SPSS. Questions used 5-point Likert scales, with maximum possible scores of 32, 45, and 20 in the knowledge, attitudes, and practice sections respectively, and a maximum total composite score of 97. We calculated a percent composite score across all categories by dividing the mean score with the maximum possible score, and used multivariate logistic regression analysis to estimate the odds of having a low composite score (<60) based on occupation by comparing allopathic doctors (referent category) with all other study participants, adjusted for age and gender.

**Ethics**This study was approved by the Ethics Committee of the Calcutta School of Tropical Medicine, Kolkata, India, and the MSF Ethics Review Board.  
**Results**We found substantial dissonance between knowledge and practice amongst allopathic doctors, who scored highest in questions assessing knowledge (77.3%) and attitudes (87.3%), but performed worst regarding practices (67.6%). Many doctors knew that antibiotics were not indicated for viral infections, but over 87% (n=82) reported prescribing them in this situation.

19 (6.6%) non-doctors (including eight informal health providers, 8.3%), three nurses (3.1%), and eight pharmacy workers (8.3%) received low overall composite scores for KAP, as compared to doctors (n=1; 1%; OR 10.4, 95% CI 5.4-20.0, p<0.01). Over 95% of informal health providers, nursing staff and pharmacy shopkeepers stated knowledge of antibiotics was important, even though none were legally permitted to prescribe. Only 42 (43.8%) doctors and 17 (17.7%) pharmacy shopkeepers correctly identified gentamicin as an antibiotic contraindicated in pregnancy. 30.8% (118) of all providers and 56 out of 96 (58%) of all informal providers described pharmaceutical company representatives as a major source of information about antibiotics. Healthcare providers described company representatives as having extensive networks, with informal providers reporting that attendance at antibiotic marketing conferences was common. Community members reported actively seeking “potent” medicines from providers, and frequent switching of providers if they perceived medications to be inadequate.

**Conclusion**Current initiatives aimed at tackling antimicrobial resistance in Asia focus on surveillance systems, regulation of antibiotic sales, and on national guidelines for use, but fail to take into account patient perceptions and the relationships between different providers and the role of pharmaceutical company representatives. We highlight ways in which pharmaceutical company representatives play roles in networking with informal providers.

**Conflicts of interest**None declared.

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Mohit Nair is a qualitative research manager with MSF, India, and holds a Master’s in Public Health from Harvard T.H. Chan School of Public Health. Previous work has focused on perceptions of care amongst advanced HIV patients in Bihar, drivers of antibiotic use in West Bengal, and quality of life for HIV-kala-azar patients in Bihar. Prior to joining MSF, Mohit was a consultant for Save the Children, in Laos, assessing gaps in primary healthcare and developing action plans for children with disabilities.