

Title: Antimicrobial resistance and workplace environments in Nepal: Combining ethnography and cross-sectional design

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Background: Antimicrobial resistance (AMR) refers to the development and transmission of cell immunity to antimicrobial medicines. Projections based on current AMR trends predict 10 million annual deaths caused by common AMR infections annually, making these the most common cause of death.

Understanding the microbiological dynamics of development and transmission of AMR is essential but insufficient to address the problem. AMR is driven by over- and underuse of antimicrobials and excess presence of antimicrobials in the environment, whether used for human, animal or plant health (One Health) or due to uncontrolled waste from e.g., hospitals and pharmaceutical production. South Asia is a key region for production of both antibiotics and AMR.

The complex nature of these dynamics requires innovative interdisciplinary approaches spanning the social and natural sciences.

Methods: Eight workplaces representing different industries in India and Nepal have been selected. 125 workers are recruited from each site for a detailed survey (N=1000). 800 will provide stool samples for drug sensibility testing and whole genome sequencing of drug-resistant strains of *E.coli* and *K. pneumoniae*. 200 will be followed over a period of up to six months, mapping social life and health-related behaviour, using an ethnographic approach.

Results: Preliminary findings from a tea estate (Figure 1) and a steel factory (Figure 2) in Nepal are compared. Whereas tea workers encounter potentially hazardous substances while using fertilizers and pesticides, for steel workers the risk of injuries is high. The work environment gives rise to distinct health profiles with different treatment profiles, including use of antibiotics. This highlights specific work environments as potential drivers of AMR.

Conclusion: Development and spread of AMR in workplaces have been largely overlooked by global health research and AMR interventions so far. This ongoing study shows, why workplaces are important sites of interventions attempting to reduce AMR. Furthermore, the project develops new ways of collaborating across anthropology and microbiology, a promising path for global health research in the future.



Figure 1: Tea gardens, Nepal

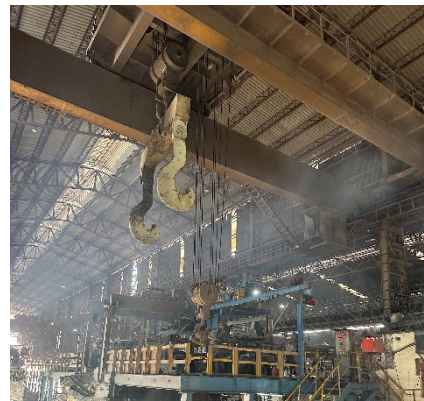


Figure 2: Steel plant, Nepal