

GRANTEE HIGHLIGHT

The Aga Khan University

Age and gender inequity in antibiotic utilization: Impact of a multifaceted intervention based on an interactive dashboard and clinical decision support tool at a tertiary care center in a low-middle income country



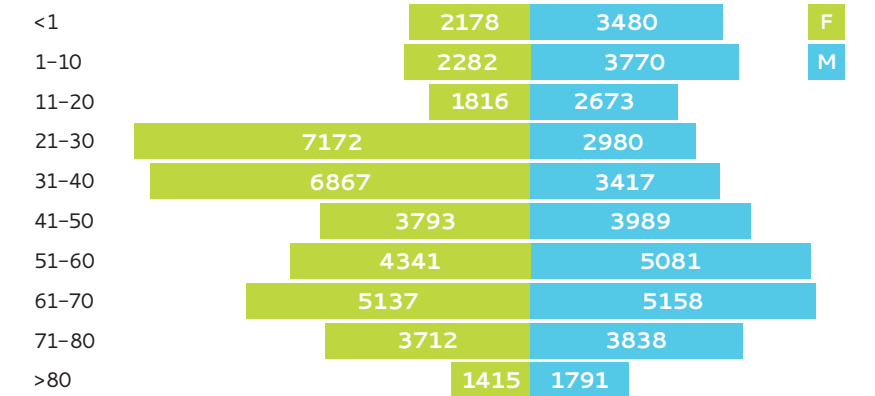
Our project aims to address inequities in antibiotic prescribing by age and gender at a large tertiary care hospital in Pakistan, through implementation of an interactive dashboard highlighting areas of concern and a clinical decision support tool to guide antibiotic selection. Our baseline surveillance data showed that children under 10 and women aged 20–40 received a higher proportion of inpatient antibiotic prescriptions compared to other groups from 2007–2019. Clinical decision support systems (CDSS) have demonstrated a reduction in medical errors and improvement in the quality of healthcare. However, the potential of this technology for improving antibiotic stewardship efforts, especially through an equity lens in resource-constrained settings, is largely unexplored. Our first intervention is an administration-level dashboard providing different stratified views to highlight areas exhibiting inequities in antibiotic prescriptions and their details. The second intervention targets areas of inequities utilizing a clinical decision support system,

assessed by pre- and post-CDSS-Implementation surveys. The intervention directly benefits our patients, particularly addressing inequities based on age and sex, by reducing their exposure to inappropriate antibiotics. It helps clinicians in their clinical decisions, promoting the optimal selection of antibiotic regimens, doses, and durations. Moreover, it indirectly benefits the community by reducing antimicrobial resistance. This pragmatic quasi-experimental pre-post study will evaluate changes in rates of antibiotic use measured by defined daily doses (DDD), types of antibiotics prescribed, and multi-drug-resistant organism rates before and after intervention implementation. Physician surveys pre/post-intervention allow for assessment of usability and impact. Hence, this multifaceted intervention has the potential to significantly reduce overall antibiotic consumption and address age/gender inequities in utilization. Successful implementation has the potential for significant public health impact by promoting appropriate antimicrobial use.

As the project enters the post-intervention surveillance phase, the impact is already significant with the development of the first-of-its-kind local antibiotic guidelines app PrescribePro available to all prescribing physicians in a resource-constrained setting to enhance adherence to guidelines as a crucial step toward optimizing patient outcomes. Notably, healthcare professionals utilizing the app have reported a substantial improvement in their knowledge and competence in prescribing antibiotics across diverse clinical scenarios. Some testimonials are as follows: A medicine physician remarked, "Today I made sure that guideline for cellulitis is followed in ED." A Cardiothoracic surgeon shared, "Superb app. Well done." Another physician commented, "It's so user-friendly especially with search bar." Additionally, preliminary data on patient-related outcomes indicate positive shifts in antibiotic prescription practices, suggesting a promising reduction in inappropriate antibiotic use. The most remarkable reduction has been observed in the utilization of Azithromycin with improvement in average DDDs/1000 patient-days from 63 to 36 in 2023. Hence, PrescribePro's role as a decision support system underscores its potential to address the challenge of antimicrobial resistance.



Antibiotic Prescriptions Stratified by Age and Gender



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