

# Engaging secondary level hospitals in India for antibiotic stewardship

## – Approach and reflections

In 2018 ReAct engaged and assisted a number of hospitals in India to initiate work on antibiotic stewardship. The hospitals were predominantly rural, secondary level centers. Educational sessions in combination with interactive discussions and decision-making among participants, followed by hands-on work, were used to sensitize professionals working at the hospitals towards stewardship. This case study describes the approach and summarizes the main lessons learned in the process.

### Key takeaways

- A workshop discussion forum worked well and is a fairly low-cost way to provide training and inspire exchanges and engagement.
- An open participatory process provided an environment for participants to discuss challenges and together with experts decide feasible interventions to implement. This was appreciated and ensured active ownership.
- Although knowledgeable about the problem of antibiotic resistance and willingness to do something, many participants expressed they did not know where to start. Many secondary centers would likely benefit from external support for stewardship.
- There is a need to identify and support champions within hospitals. In this project, junior doctors, microbiologists and pharmacists came together to discuss barriers and possibilities to stewardship in secondary level care settings. Although faced with many barriers, they were enthusiastic and able to initiate actions in their hospitals.
- This project would not have been possible to carry out without support from external experts.

## Perspective

Antibiotic stewardship efforts in healthcare aim to improve and measure how antibiotics are used. The purpose is to achieve best possible outcomes for patients and minimize adverse events. Another aspect is to reduce the antibiotic pressure on bacteria that leads to antibiotic resistance. Stewardship interventions can focus on for example what and when antibiotics are used, the dose, route of administration and duration of therapy.

Most current recommendations for stewardship are developed from a high-income country perspective and for facilities with certain infrastructure. Full-scale antibiotic stewardship programs require for example knowledge of local resistance patterns, monitoring of prescribing practice and assessment of the impact on clinical outcomes. Most interventions are neither feasible nor sustainable in low-resource settings at the moment, as they do not consider the on-ground challenges and barriers. Overall, there is scarce information on what interventions are suitable in LMIC settings and what approach to take.

To achieve an overall improvement of antibiotic use it is important to involve all levels of health care in stewardship efforts. In India, secondary level hospitals play a critical role in providing healthcare services to the community, but few actively implement any antibiotic stewardship measures. Implementing a sustainable and effective antibiotic stewardship program in secondary level hospitals in LMICs has numerous challenges, and is very context dependent. It is important to tailor stewardship initiatives to the unique possibilities and limitations faced by these hospitals.

## Approach for engaging secondary level hospitals

The project was led by ReAct Asia Pacific and participants were recruited through their network. The goal was to provide training on antibiotic resistance and antibiotic stewardship concepts, and encourage and assist implementation of stewardship measures in Indian secondary-level hospitals.

A three-day workshop for staff from participating hospitals\* was organized together with the Infectious Diseases Training and Research Centre at the Christian Medical College (CMC) Vellore in India. Participants were primarily general physicians, pharmacists and microbiologists. Stewardship experts from CMC Vellore and ReAct led educational sessions on the benefits of antibiotic stewardship programs in optimizing antibiotic use and containing resistance. The various components of antibiotic stewardship programs

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\*9 hospitals (6 secondary level hospitals)

were presented together with possible outcome indicators to monitor, strategies for implementation, and relevant clinical cases. The training also covered the importance of surveillance and audits for hospital-acquired infections, and strategies to prevent and control infections. Participants in turn presented the existing facilities and spoke about challenges they were facing in their workplace.

### **Description of participating secondary hospitals (2018)**

All participating secondary hospitals were managed by faith-based organizations. Size of the facilities ranged from 30-200 beds for in-patients, and around 200 to 10000 outpatients per month.

The hospitals had no staff fully trained in infectious diseases. In some hospitals there were specialized doctors (basic specialists) and part-time surgeons. Patient treatment was started mainly based on empirical diagnosis and clinical experience. None of these secondary hospitals had in-house capacity to culture bacteria, do susceptibility testing or ability to generate local antibiograms. They relied on external private labs for laboratory services, with 3-7 days turnaround time for culture tests depending on the specimen and the distance from the central processing lab. The hospitals did not have specific antibiotic policies in place, or formal hospital antibiotic stewardship or formal infection prevention and control committees. 1-2 staff, mostly nurses and potentially a doctor, were in charge of the overall infection prevention and control work. Two hospitals were working to obtain national accreditation. This means they were required to provide certain data, and had audits for healthcare-associated infections and hand hygiene.

## Deciding on interventions - an inclusive and consensus driven process

Common strategies for stewardship were presented together with the level of evidence and their overall pros and cons.<sup>1,2</sup> A sub-set of these were then considered for implementation at the hospitals, and the methodology and resources needed were discussed in detail:

- Didactic education
- Prospective audit with intervention and feedback
- Retrospective audits
- Formulary restriction with preauthorization
- Antibiotic de-escalation
- Parenteral (IV) to oral conversion
- Therapeutic drug monitoring (with feedback)
- Dose optimization
- Automatic stop orders and antibiotic time-outs (scheduled reassessment)
- Cascading microbiology susceptibility reporting
- Antibiograms and facility specific guidelines
- Stopping redundant cover/duplicate therapy
- Duration of therapy
- Disease-specific prescribing guidelines/algorithms and/or associated order forms
- Preventing treatment of non-infectious conditions.

The participants then decided which interventions to implement in consultation with the experts through a discussion and voting process. For inpatients, the participants agreed that de-escalation and stopping redundant cover (duplicate therapy) would be possible to carry out. Prospective audit and feedback was not considered feasible, and only two of the hospitals felt that pre-authorization would be an option. In the end, de-escalation was chosen as the final strategy based on available evidence and feasibility.

For outpatients, education and performing audits were considered possible. In the end it was decided to focus on audits for upper respiratory infection as there is currently no structure in place to drive education.

## Designing the stewardship intervention

Implementation was planned to be carried out over 6 months or until 100 outpatient encounters and 50 or more inpatient encounters were included. For inpatients, it was

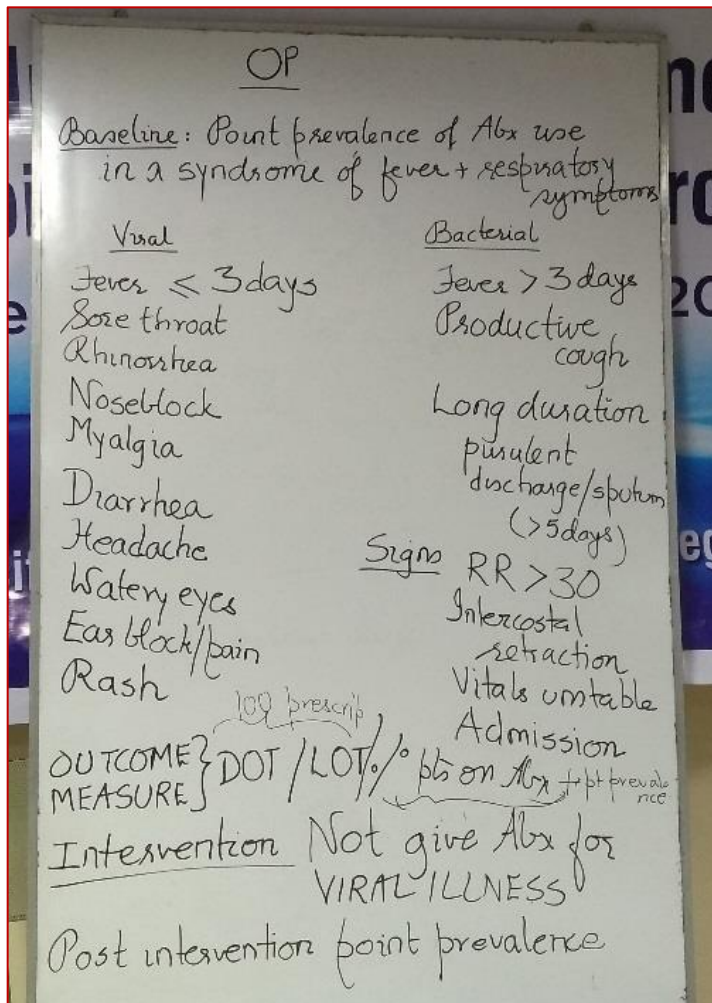
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<sup>1</sup>Davey P et al. Interventions to improve antibiotic prescribing practices for hospital inpatients. *Cochrane Database Syst Rev.* 2017;2.

<sup>2</sup>US Department of Health and Human Services, CDC. *The Core Elements of Hospital Antibiotic Stewardship Programs.* 2014.

decided that doctors should try to send blood cultures for testing, and then de-escalate antibiotic treatment if deemed appropriate based on culture results and/or clinical findings. The treating doctor should note down if the patient was suitable for de-escalation, reasons if de-escalation was not done, as well as patient condition on discharge.

For outpatients it was agreed to target non-complex cases of upper respiratory infections. To support implementation, a simple clinical algorithm to differentiate viral from bacterial infections was co-designed with the participants, supported by earlier literature<sup>3</sup>). It also specified to not give antibiotics for viral illness (see Image 1). A form was created for the treating doctors where they should record if they gave an antibiotic or not, name of antibiotic, dose, number of days of treatment, as well as reasons if antibiotics were given contrary to recommendations.



**Image 1.** Clinical algorithm to distinguish between diseases caused by bacteria and viruses, and when to give antibiotics.

<sup>3</sup>Partly adapted (and modified to an Indian setting) from: Wong DM et al. Guidelines for the Use of Antibiotics in Acute Upper Respiratory Infections. Am Fam Physician 2006;74(6).

After the workshop, the participants sought administration approval to implement the stewardship interventions in their hospitals. The project proposal was also reviewed and approved by the Institutional Review Board (IRB) at CMC Vellore. A program officer was appointed at each hospital to be a contact point and drive the process. Also, a Whatsapp group was formed to facilitate communication and information sharing among the participating hospitals. The role of ReAct in implementation was to provide support through email and telephone calls and help analyze the data. Detailed results from implementation and in-depth interviews will be published separately.

### **Follow-up workshop**

After implementation, a second workshop was held to follow up on progress, and for sharing experiences and advice between participants and external experts. A feedback questionnaire was filled in by each of the workshop participants. This covered for example what changes were brought about in the hospitals after the initial workshop, what challenges to implement antibiotic stewardship the hospitals experienced, and if they planned to continue stewardship after the project ended. In-depth interviews were also held with appointed program officers at selected hospitals.

## **Reflections and lessons learned**

Overall, reflections from workshop participants and observations from ReAct Asia Pacific indicate positive results of the project in terms of raising the profile of antibiotic resistance and sensitizing staff in the participating hospitals towards stewardship. Several hospitals\* were able to implement stewardship measures in outpatients and inpatients. Many of them expressed willingness to continue stewardship work after the project finished. Also, one hospital was able to introduce new guidelines for common conditions and another had formed an antibiotic stewardship committee.

### **Participatory process**

During the initial workshop, a large variety of possible stewardship interventions were presented to the participants to allow reflections on what would be possible in their facilities. The format of the workshop provided a participatory platform to discuss each facility's unique challenges and involvement in designing the interventions without imposing views and suggesting best practices. This approach was appreciated and received positive feedback.

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*\*2 hospitals dropped out after the initial workshop and one midway as the involved program officer got transferred. 6 hospitals completed the implementation phase, of which 4 were secondary level centers.*

## Forum for knowledge sharing

Antibiotic stewardship has previously not been covered specifically in the medical curriculum in India. In this project, educational sessions on stewardship were provided, as well as an arena for exchanging experiences and discussions on ways to improve practices. Participants were able to discuss their stewardship work with the experts from ReAct and CMC Vellore, and were provided feedback and suggestions for how to think also when things are not going according to plan. A challenge here is that many of the hospitals have only a few doctors working for them, and it is thus difficult allowing them time for attending educational activities.

## A need for context-specific, feasible recommendations

Although many of the participants were knowledgeable about the issue of antibiotic resistance and potential adverse effects of antibiotic use, and some hospitals expressed that they had a wish to initiate stewardship programs, they did not know how and where to start. There is thus a need to present simple, low-cost recommendations of interventions and examples of indicators that could work in these settings as a first step, building of course on available resources, ongoing work and knowledge.<sup>4,5</sup> There is also a need to involve and empower hospital managers to facilitate action.

## Guidance and support

This project was possible only because of support and engagement of experts from different departments within CMC Vellore, especially the infectious diseases department. Many secondary level hospitals would likely benefit from continuous guidance from outside experts that allows a step wise scaling up of stewardship (and infection prevention and control) activities that consider the on-ground challenges such as lack of trained personnel or in-house laboratory capacity. Providing such a “hand-holding” set-up may be a good option, especially for smaller hospitals with lower potential in terms of human resources.

## Reflections on project duration and implementation

In terms of time for the different components of the project; allow a couple of months for obtaining ethics and administrative committee approvals. Also, the implementation period of 6 months was on the lower side, and made it difficult to fully evaluate sustainability and the long-term changes.

Provision for recruiting a part-time person or simple incentives to the implementing staff could have increased the robustness of the implementation process. On the other hand, it could have affected the sustainability of the project in long term, as such

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<sup>4</sup> Cox JA et al. Antibiotic stewardship in low- and middle-income countries: the same but different? *Clin Microbiol Infect.* 2017;23(11).

<sup>5</sup> Van Dijk C et al. Antibiotic stewardship interventions in hospitals in low-and middle-income countries: a systematic review. *Bull World Health Organ* 2018;96.



funded exercises tend to fold up once the fund flows stop. Some hospitals were in the process of obtaining accreditation. Once completed, this could help to create some of the structures needed for implementation of stewardship, although they may not be sufficient for robust antibiotic stewardship programs.

Ideally, formal base line data on antibiotic use should have been collected before implementation started. However, this was not possible given available resources and on the ground realities within the hospitals (such as no electronic charts, and with practices generally not well-documented). Even though a formal baseline study was not done, qualitative information on antibiotic use, types of antibiotics prescribed, and drivers of antibiotic misuse was collected through the workshop and personal interaction with the participants. Hopefully, this data will serve as a baseline to work from for these hospitals.

### **What is needed to sustain or expand efforts?**

In hierarchical societies and structures, there is a need to convince the leaders and prescribers about the necessity of antibiotic stewardship in order to enable implementation efforts. This project specifically focused on sensitizing professionals early on in their careers. The participating people were able to contribute to the workshop and were actively engaged throughout the workshop. The group was also representative of the secondary level hospitals across India, with resource constraints and capacity issues. Encouragingly, the majority were enthusiastic and managed to carry through implementation of stewardship measures at their hospitals.

Although successful in initiating stewardship efforts, the participants also experienced challenges. Without established systems for antimicrobial stewardship and lack of personnel support for data collection, the program officers had a tough time during the implementation process. In some cases resistance from more senior doctors was experienced. One particular concern is that participating physicians had to work overtime for this project, and it was therefore not so easy to carry out.

In hindsight, the project could have benefited from having better buy-in from top-level management or hospital administration early in the process. For stewardship efforts to be sustainable in any setting, staff time and support must be allocated for education and implementation.

Last but not least, the need for champions in each hospital was expressed by all interviewed program officers. Connecting champions and building awareness among health professionals as well as using existing professional networks can be envisioned as a way to deliver continued education, empower champions and encourage further action on antibiotic resistance.