

LETTER TO THE EDITOR

Integrated activities and tools for an antimicrobial stewardship workshop in Kathmandu, Nepal

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Dear Editor,

Antimicrobial resistance (AMR) is an urgent global health threat, which requires a multidisciplinary approach [1]. The ‘One Health’ approach should be inclusive of partnerships with governmental ministries and nongovernmental organizations, as well as academic institutions, professional organizations, public and private health systems, and regional, national, and local leaders [2]. Antimicrobial stewardship (AMS) programs that emphasize appropriate prescribing, including post-prescription review and feedback programs, have been shown to reduce days of antimicrobial therapy in the World Health Organization (WHO) South-East Asia Region including Nepal [2–4]. Low- and middle-income countries (LMIC) face many challenges, including inadequate AMS policies and treatment guidelines, at both the national and healthcare facility (HCF) levels, resulting in a disproportionate impact of AMR in these areas [5]. To address this challenge, the WHO created a policy guidance and practical toolkit for the implementation of AMS programs in LMIC [6]. Our group was involved in the feasibility study of the WHO toolkit in Bhutan, the Federated States of Micronesia, Malawi, and Nepal [7]. The toolkit gives guidance on developing AMS programs beginning with (1) a situational assessment to identify the needed structural core elements at the national and HCF levels, (2) planning AMS programs, (3) performing AMS interventions, (4) assessing AMS programs, and (5) education and training [6]. We describe our experience and lessons

learned during the implementation of an education 2-day workshop based on the WHO toolkit.

Local setting

Multidrug resistant organisms have been documented in Nepal. Surveillance data from the Nepalese Ministry of Health and Population (MoHP) indicate that more than 50% of *Escherichia coli*, *Klebsiella pneumoniae*, and *Streptococcus pneumoniae* isolates are resistant to first-line antibiotics [8]. Nepal has a National Action Plan for AMR, which includes a national technical working group to combat AMR with a One Health approach. The Ministry of Agriculture and Livestock Development recently banned importation of feed enriched with antimicrobials [9]. The MoHP multisectoral committee has recognized the importance of AMR surveillance, prioritizing its development, and the further expansion of stewardship interventions and assessment. Through this crucial recognition and commitment at the level of leadership, HCFs are taking the steps needed to develop their own AMS programs.

The workshop was a collaboration among the Henry Ford Division of Infectious Diseases and Global Health Initiative (HFH, Detroit, Michigan, USA), Wayne State University School of Medicine/Center for Emerging Infectious Diseases (Detroit, Michigan, USA), the G.T.A. Foundation (GTA, Kathmandu, Nepal), and Kathmandu Model Hospital (KMH, Kathmandu, Nepal). HFH and GTA have partnered with WHO, MoHP, and other governmental agencies and hospital systems to adapt and

evaluate AMS programs in hospitals and communities in Nepal.

We recruited five local HCFs in Kathmandu, which identified a need for the implementation of AMS programs and agreed to serve and disseminate this information to other institutions. Two physician champions at each of these HCFs were selected by the institutional leadership. The hospitals were a range of acute care and tertiary centers, nongovernmental to governmental hospitals. The course took place on December 1 and 2, 2021 at no cost to the selected physician champions. To reduce access issues, physician champions were provided transportation to and from the conference location, as well as breakfast and lunch. Participation was voluntary and not incentivized.

Approach

The course agenda was created using the WHO toolkit to provide a general overview of the toolkit and AMS implementation (Supplementary file 1). The course was formatted into five overall sections: (1) situational assessment and ‘SWOT’ (strength, weaknesses, opportunities, and threats) analysis workshops; (2) description of emphasis and national plan from leadership; (3) basic concepts of antimicrobials, AMR, and infection prevention and control; (4) AMS implementation and metrics for assessment; and (5) basic concepts of syndromes of infectious diseases (available online following the training). Each day, a pre-test was given prior to the course content, which was then repeated at the end of the day to assess baseline knowledge and short-term retention of information provided in the modules.

The course included leadership members from the WHO and MoHP who emphasized the need for AMS programs to reduce AMR. The remaining lectures were delivered by providers from HFH, as well as a head administrator/local physician and clinical microbiologist from KMH. With the assistance of the local experts, information was incorporated regarding local rates of resistance, empiric stewardship guidelines, and working with the laboratory in forming antibiograms. In addition, a supplementary set of lectures on basic infectious disease concepts was provided via electronic-mail for a ‘virtual component’ and posted to the GTA Global Learning in Antimicrobial Resistance (GLAMR) educational website [10].

During the workshop, ‘breakout sessions’ included an emphasis on HCF situational assessments using the WHO Integrated Policy Guidance on AMS Activities [11] and a SWOT analysis for each respective HCF’s capacity to implement AMS programs. Participants were encouraged to describe and compare their SWOT analyses to support exchange of information and feedback across HCFs. At

the completion of the course, written and verbal feedback was encouraged to provide the organizers and presenters with input on content and presentation.

The participants will meet virtually with the facilitators every 3 months for the next 2 years for ongoing technical support and follow-up. During each meeting, facility-based situational assessments will be reviewed using the WHO policy guidance and toolkit checklists. Data will be collected on metrics including days of therapy over patient days (including percentages of AWARE antimicrobials used), redundant therapy events, total duration per antimicrobial admission, de-escalation efforts, adherence to local guidelines and protocols, drug-resistant infection rates, adverse drug events, and appropriateness of antimicrobial prescription. Stewardship interventions will be reviewed for their potential to be feasibly implemented, sustainable, and appropriate based on the capacity at each facility. We will assess the output and results of the chosen metrics to guide further program development. We will provide guidance on prioritizing AMS activities, and stratifying interventions and assessments based on local resources.

Following the 2-year period, in collaboration with GTA, each participant is asked to disseminate the course content and their own experience building an AMS program with five other local hospitals in Kathmandu. With this, the workshop has continued sustainability within the region and would be projected to help implement stewardship programs in up to 25 different facilities in the first 3 years.

Relevant changes

Nine of ten participants took the workshop evaluation survey. Written feedback for the course was overall positive (Supplementary file 2). The majority of respondents agreed or strongly agreed that the training content was tailored to their needs and would have a long-term impact in their practices at work. Respondents reported a need for more community advocacy, campaigning, and awareness of AMR. Importantly, we received feedback that the expectation of the HCF administrators was that the AMS team would implement the AMS program with continued 100% obligation to their clinical time as well. We additionally received feedback that the breakout session on SWOT analysis was very useful and engaging and preferred to the lecture format. Finally, we received feedback that laboratory capacity was minimal and may not be feasible to create antibiograms, thus making formation of HCF-based prescribing guidelines difficult.

Lessons learnt

The course was comprehensive for key aspects of building an AMS program from the participants’ perspective.

Box 1. Summary of lessons learnt

1. Strong leadership support at the national and senior facility management levels is needed for successful implementation.
2. Breakout sessions with more participant engagement were felt to be better suited than a lecture format.
3. Using healthcare worker champions (including nurses and pharmacists) in place of only physician champions would help improve the course by forming an AMS team at the outset of the course.
4. Involving local physicians, microbiologists, and pharmacists is needed to create course content that can be focused to the region of interest.
5. A method and plan for ongoing technical assistance will promote the development of effective programs, where metrics and output can routinely be evaluated.

Efforts were made to reduce logistical barriers for the participants to attend the course safely and at little to no cost. A major strength of this course was the strong national leadership and engagement from the local MoHP and WHO representatives. Furthermore, we incorporated the expertise of local physicians and microbiologists who were able to create content that was region-specific. The breakout session was well received, as participants were encouraged to discuss their own institutions' strengths and weaknesses with one another, building on one another's potentials and opportunities for program implementation, and facilitating guidance for steps moving forward.

Due to time constraints, the emphasis on facility-level situational analysis was not prioritized. This will be highlighted in the quarterly virtual meetings. In future workshops, this will take place as a breakout session on day 1, with a separate session on SWOT analysis on day 2. In addition, there was concern expressed that laboratory capacity may be insufficient for program implementation. This would need to be verified through situational assessments with individual facilities. Conducting point prevalent surveys, routine surveillance of susceptibility patterns, and facility-specific antibiogram data are important components.

Other feedback included that the burden of implementing an AMS program would be too great when combined with the additional work as a physician. Dedicated financial support and training opportunities from leadership along with technical expertise are necessary to promote effective AMS program implementation. In future workshops, we would clarify and define individual responsibilities of the AMS team and recruit two to three healthcare worker champions per facility, including physicians, pharmacists, and registered nurses, with descriptions of roles for each personnel involved. This would help to address each HCF's responsibility and create a core AMS team from program inception.

To our knowledge, our group is the first to devise a 2-day course, which utilizes the WHO toolkit to address

the need for AMS implementation in LMIC, followed by ongoing technical assistance. Our key lessons learned are summarized in Box 1. The course materials will be made available for dissemination through the WHO to maximize potential impact in other regions.

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