

# Communication strategies for improving public awareness on appropriate antibiotic use: Bridging a vital gap for action on antibiotic resistance

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## ABSTRACT

Antimicrobial resistance (AMR) is now a global public health issue and is projected to affect the longevity of people and increase health expenditure of countries. Its impact is going to be higher in low-middle income countries as the healthcare systems are suboptimal and ill-equipped to deal with the issue. As antibiotic misuse is the primary driver for AMR, there is an acute need to create awareness among general public regarding antibiotic misuse. This calls for a comprehensive communication strategy, which takes into account the various drivers of AMR and the solutions associated with it. In the short term, the focus of communication strategies can be on raising awareness in specific interest groups. It can help in channeling limited resources to achieve specific objectives for raising awareness among these groups, thereby improving the chances of behavior change. The general public can be targeted at a later stage or as a second phase with definite strategies and messages. But, it is erroneous to assume that a higher level of awareness will translate into a positive change in behavior. We propose that behavior change is the final fruit of a long and dynamic process. This process should rest on four pillars: adequate awareness, robust regulatory environment, emotional or material incentives, and an enabling social structure. Unless all these domains are satisfactorily addressed, the communication strategy will not be able to bring about a discernible change in behavior in terms of antibiotic use.

**Keywords:** Antibiotics, antimicrobial resistance, behavioral change, communication, health system

## Antibiotic Resistance as a Global Health Issue

Antimicrobial resistance (AMR) has emerged as one of the most difficult public health issues of the 21<sup>st</sup> century and is threatening to offset all our achievements in controlling communicable diseases. An accurate quantification of the impact of the problem may be difficult due to its complex nature and effect on diverse domains.<sup>[1]</sup> There are studies that demonstrate the impact of AMR on hospitalized patients showing a significant increase in hospital mortality, healthcare expenditure, and length of

hospital stay.<sup>[2,3]</sup> The impact of AMR in low and middle income countries (LMIC) may become much higher than high income countries. Some studies have indicated that drug-resistant infections cause around 19,000 additional deaths in Thailand alone.<sup>[4]</sup> Some other projections have hypothesized that 58,000 deaths in India may be a result of drug-resistant organisms, which produce Extended Spectrum Beta Lactamase enzymes.<sup>[5]</sup> Antibiotic resistance, conservatively calculated, causes >500,000 deaths every year.<sup>[6]</sup> The healthcare costs associated with AMR are also difficult to estimate, but there has been report that currently it results in a total economic burden of USD 55 Billion in United States alone - USD 20 Billion in direct healthcare costs and USD 35 Billion in lost productivity.<sup>[7]</sup> All these factors make it essential

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Received: 30-03-2019 Revised: 31-03-2019 Accepted: 19-04-2019

### Access this article online

#### Quick Response Code:



**Website:**  
www.jfmpc.com

**DOI:**  
10.4103/jfmpc.jfmpc\_263\_19

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**How to cite this article:** Mathew P, Sivaraman S, Chandy S. Communication strategies for improving public awareness on appropriate antibiotic use: Bridging a vital gap for action on antibiotic resistance. J Family Med Prim Care 2019;8:1867-71.

that we invest time and resources to the study the drivers and impact of AMR and also devise sustainable solutions to the issue.

## Misuse of Antibiotics as the Primary Driver of AMR

The misuse of antibiotics is documented from multiple sectors, and this is one of the main drivers of AMR. The excessive and often irrational use of antibiotics provides a selection pressure for the emergence of drug resistant strains of a micro-organism.<sup>[8]</sup> Antibiotics are often prescribed for trivial infections such as viral upper respiratory tract infection or uncomplicated diarrhea. In many developing countries, antibiotics are freely sold over the counter, without any medical advice or prescriptions.<sup>[9]</sup> Also, the right choice of antibiotics may not be prescribed to the patients, in the absence of effective diagnostic and culture facilities in many LMIC contexts.<sup>[10]</sup> Another dimension of this problem is the heavy use of antibiotics in food animal production. It has been reported that there is significant antibiotic use as growth promoters or for disease prophylaxis, in poultry and aquaculture sectors.<sup>[11]</sup> Antibiotics increase the “feed conversion efficiency” and negate the need to have robust biosecurity measures in farms, and therefore, its use may result in significant direct savings to the farmers.<sup>[12]</sup> Antibiotics, therefore, continue to be used in the absence of awareness among general public or significant pressure from consumer groups.<sup>[12]</sup> The misuse of antibiotics in the community may be a direct indicator of the poor regulatory framework and the level of awareness among the general public. Many doctors and veterinarians say that the pressure to prescribe antibiotics actually comes from their clients, as there is an erroneous perception among the general public about the utility of antibiotics in faster relief of health issues. Apart from having a more responsive regulatory system, there is an acute need to create awareness among general public regarding antibiotic misuse and AMR.

## Designing Communication Strategies for AMR

Public awareness messaging is a resource intensive process if we have to engage all the stakeholders. Even if we create an adequate level of awareness, there is no guarantee that it will result in any change in behavior among the stakeholders. In the short and medium term therefore, focusing on raising awareness in specific interest groups may be a potential high impact activity. It can help in channeling limited resources to achieve specific objectives for raising awareness among these groups, thereby improving the chances of behavior change.<sup>[13]</sup> The general public can be targeted at a later stage or as a second phase with definite strategies and messages. When targeting the general public in any region/country, a baseline level of awareness should be measured using standardized tools such as Eurobarometer 445 or the tool developed by World Health Organization.<sup>[14]</sup> This is needed since a number of public awareness campaigns have not got sustainable funding in developing countries, as they were not able to show a demonstrable increase in the level of awareness.<sup>[13]</sup>

The messaging should be clear and unambiguous. Communication professionals with previous experience in health issues should ideally be leading the activity and there should be an attempt to tailor it to the sociocultural sensitivities of each region/country. The focus should be on three to four key messages relevant to the country setting, rather than bombarding the recipients with huge volume of information.<sup>[15]</sup> The messaging can possibly be directed at areas such as use of antibiotics for simple ailments like upper respiratory tract infections, diarrhea, and simple wounds; antibiotic use in food animal production; and environmental contamination from hospitals and pharmaceutical factories.<sup>[15]</sup>

## Deciding Target Groups for Messaging

Users of antibiotics such as informal healthcare providers, nurse-practitioners, and small-scale farmers are often ignored in various campaigns to increase awareness about antibiotic misuse and AMR.<sup>[16]</sup> This can be a problem particularly in LMICs, as these groups generally outnumber the qualified medical practitioners or large-scale farmers. Raising awareness among school and college students can be a priority in all regions/countries. This can help in maximizing the impact of efforts/resources spends on the exercise of raising awareness. Basic modules on the human microbiome, issues regarding antibiotic use, rational drug use, and AMR can be incorporated into the curriculum of students, as well as the template of environmental stewardship and climate change taught to most students across the world.<sup>[17]</sup> The expertise and networks of civil society groups are often overlooked in the campaigns on antibiotic misuse and AMR. There should be an attempt to involve these groups in any activity/campaign aimed at improving awareness on AMR. Civil society groups may have a better reach and experience in advocacy-related domains and may help to complement the efforts of governmental agencies. There should also be an institutional mechanism to involve civil society at the region/country level.<sup>[18]</sup> Consumer groups and associations can play a pivotal role in increasing the awareness about antibiotic use in food animal production too. This will help to increase the demand for “antibiotic-smart” food and for farmers to adopt antibiotic-free farming especially in LMICs. Consumers willing to pay a premium for “antibiotic-smart” food can incentivise the farmers to adopt these sustainable practices in food production and thereby widen the net to other consumers too.<sup>[19]</sup>

## Leadership in Communication and Raising Awareness

Leadership and responsibilities in awareness activities should be clearly defined before initiation. Health ministries or departments should take the lead in this activity as antibiotics are still perceived by the general public to be a domain related to human health. This can continue till a more robust interministerial agency or group is established in the country. A multi stakeholder approach is the best possible method in dealing with the issue.<sup>[20]</sup> Financing of activities related to raising awareness should be entirely financed by the government

through budgetary provisions. Development funding or international aid should be looked at as a supplementary source of funds only and not the primary source.<sup>[21]</sup> Larger countries should look at establishing standalone interministerial agencies for implementation of the activities related to increasing awareness on antibiotic use and AMR. This can be the coordinating agency for operationalization of the respective national action plans. Smaller countries can have interministerial coordination group jointly funded by all the ministries involved for overseeing the implementation.<sup>[20]</sup> There should be civil society participation in the implementation process and also transparency in the decision-making process. The decision-making process should be based on clearly defined conventions or frameworks and possible conflicts of interest should be avoided.<sup>[22]</sup> The progress of activities involved in raising awareness and their impact should be monitored and evaluated by intergovernmental agencies mandated to do so. This is needed as AMR is an issue which can easily cross national boundaries. Care should be taken however to ensure that these evaluations do not compromise the principles of sovereignty of nations.<sup>[22]</sup> Agencies of UN such as UNESCO and UNICEF should be encouraged to be active partners and should assist WHO, FAO, and OIE in effectively designing messages regarding awareness on an international stage. The mandate for this partnership should come from the highest possible level; and the message should be transmitted at all levels of these agencies. A Global Health Partnership approach is best suited for a complex, global issue, such as AMR.<sup>[23]</sup>

### Designing the Messaging Approach

When approaching specific interest groups with the aim of increasing awareness, a targeted approach should be taken rather than using general media tools. The existing communication channels between the government and these groups should be explored and utilized to its full potential rather than investing in new communication channels.<sup>[13]</sup> The issue of antibiotics residues in food served by quick service restaurant chains and varying standards followed by them regarding procurement of meat products in LMIC should be highlighted. This can possibly induce policy changes in the procurement practices of restaurant chains and also increase the demand for “antibiotic-smart” food among consumers.<sup>[24]</sup> The awareness on Human Immunodeficiency Virus (HIV) infection and its modes of transmission is high in most parts of the world. There should be an attempt to learn from the successes of how awareness was created for HIV and adapt it to the issue of AMR.<sup>[25]</sup>

There is a risk of groups with commercial interests (such as pharmaceutical companies or organisations funded by them) taking over the campaign and orienting it to ways which can benefit them or their interests. There should be an institutional mechanism, therefore, to evaluate potential partners regarding their commercial interests and funding channels.

### Engaging Professional and Industry Groups

Raising the level of awareness among professional and occupational groups (who use or prescribe antibiotics) can lead to behavior change. It should, therefore, receive priority, while national action plans are operationalized.<sup>[13]</sup> Professional associations and trade unions can be effective tools to engage professional groups. Governments should take active interest in engaging these groups, directly or through civil society organisations. Besides a policy for engaging these groups, there should be a framework for engagement. Associations of medical/nursing practitioners, pharmacists, farmers, and other groups, such as teachers, provide a window of opportunity to improve awareness even among the general population.<sup>[26]</sup> International professional organizations/associations can also play an important role in raising awareness and bringing about behavior change. Since the mandate of these organizations is transnational, engagement can be done through specialized UN agencies. Industry groups and trade bodies should be engaged when operationalizing national action plans. The import of Active Pharmaceutical Ingredients and their distribution in the market can potentially be monitored with the help of trade bodies.<sup>[27]</sup> International and national bodies representing pharmaceutical industry should initiate stewardship conversations with different local companies engaged in manufacture/marketing of antimicrobial products.<sup>[28]</sup> Wherever possible, professional associations and industry groups should be encouraged to communicate their position statements and “code-of-conduct” for its members regarding antibiotic use, marketing, and AMR. The position statements and “code-of-conducts” can be tools to induce behavior change in the members, though these are in no way enforceable.<sup>[29]</sup> Specific training modules could be developed for engaging professional groups, and efforts should be made to increase awareness through short training sessions. There should be a clear action plan in place regarding development of these modules and administering them.<sup>[30]</sup> The mandate for engaging professional groups should be given to interministerial agency or coordination group (whichever is applicable). However, in large countries the regional health authorities can also help in effective engagement.

### Stakeholders of the Messaging Strategy

Being a complex and multisectoral issue, AMR requires a broader approach in terms of building a consensus on the messages and the potential target audience. Large campaigns are sometimes effective in building awareness among general public and professional groups, but the efforts involved may be disproportional to the impact of the strategy.<sup>[31]</sup> Any such campaign also needs to identify the potential barriers at the level of individuals, communities, and health systems, which is possible only through a bottom-up strategy. The primary care physicians, family physicians, local veterinarians, and local administrators are pivotal in ensuring the success of such campaigns. The role of family physicians in effective leadership of healthcare campaigns

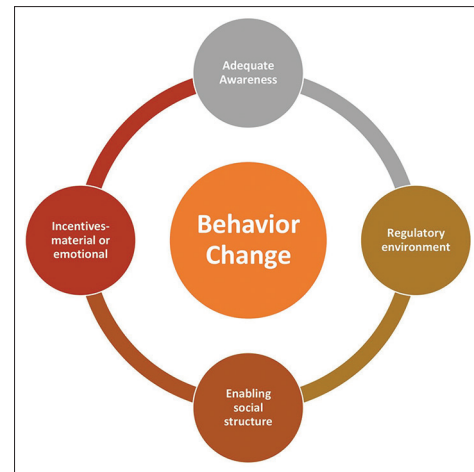
has been highlighted in multiple platforms.<sup>[32]</sup> For any messaging strategy or intervention to succeed in healthcare sector, it needs to be integrated into the routines of primary care, which is possible only through the support of primary care practitioners, family physicians, and the local health system administrators.<sup>[33]</sup> A similar level of support may also be required from the grass-roots leadership of those non-human sectors, which are big users of antimicrobial products. It has been demonstrated that such campaigns are effective in the domain of AMR, if there is a right messaging strategy, support from all the stakeholder groups, and an effective follow-up mechanism.<sup>[34]</sup> Therefore, a preliminary understanding of communication strategies for healthcare campaigns is a necessity among professional groups, which are stakeholders in the process of tackling AMR.

## Awareness and Behaviour Change

Raising awareness on the misuse of antibiotics in various sectors is one of the most important steps in bringing about a sustainable change in behavior. Many healthcare planners and policymakers assume that increasing awareness will result in a change in behavior. However, this is mostly a very simplistic view of human decision-making processes.<sup>[35]</sup> We propose that behavior change is the final fruit of a long and hopefully dynamic process. This process should rest on four pillars: adequate awareness, robust regulatory environment, emotional or material incentives, and an enabling social structure. Along with the process of building adequate awareness on AMR, there should be efforts to address the other three areas mentioned above. We need a responsive and comprehensive regulatory system that can look at antibiotic use more holistically. There should be some kind of incentives for physicians, pharmacists, or farmers to rationalize antibiotic use. The society should start frowning upon the practice of using antibiotics irrationally. All these are essential for translating increase in awareness to a change in human behavior [Figure 1].

## Conclusion

Effective communication plays a remarkable role in improving the level of community awareness about important healthcare issues. But increasing awareness alone does not result in significant behavior change, unless the issues are addressed holistically. The messaging should be culturally relevant and adapted to the preferences of the target population. Even though a multi-stakeholder approach is preferred, clear leadership responsibilities should be assigned in the whole communication processes. The role of champions and social influencers are very important in deciding the success of messaging, as their presence adds a layer of credibility to the whole exercise. In the case of AMR, it is pertinent that the messaging strategy should not be high jacked by commercial entities, who have conflicting interests in the sector. Even though professional and industry groups can be allies in a potential communication campaign on AMR, care should be taken to ensure that the process is free of any conflicts of interest. More importantly, it is pertinent to accept that awareness is just one part of the entire behavior



**Figure 1:** Behaviour change in public health

change process and the targets for the communication campaign should not be restricted to raising of awareness.

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

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