

One Health and community engagement: two complementary approaches for tackling antimicrobial resistance

What is antimicrobial resistance and why is it a global concern?

Antimicrobial resistance (AMR) occurs when microorganisms that cause infections evolve ways to survive the drugs designed to kill them. A well-known example is the ability of bacteria to develop resistance against antibiotics. However, resistance also occurs in viruses, parasites and fungi. AMR arises naturally, but is accelerated by the inappropriate use of antimicrobials, such as the overuse or misuse of drugs.

In recent years, the spread of AMR has quickened and it now constitutes a major threat to global public health. Treating infections is becoming increasingly complex and sometimes impossible. Drug-resistant infections often require the use of less effective, more toxic and more expensive alternative drugs, which cause longer and more severe illness, more deaths and higher treatment costs. Without effective antimicrobials, crucial medical and societal developments at the heart of modern life would be under threat.

Bacterial infections: antibiotic resistance has been found all over the world in an increasing number of bacterial strains. As many antibiotics are becoming less effective, infections such as pneumonia, tuberculosis, blood poisoning, gonorrhoea and foodborne diseases are becoming harder to treat. This is particularly true for tuberculosis, the leading cause of death from infectious disease worldwide, of which there are now both multi- and extensively-drug resistant strains. If antibiotics lose their effectiveness, routine medical procedures, such as caesarean sections, will become impossible because of the risk of drug-resistant bacterial infections.

Malaria: artemisinin-based combination therapies effectively treat infections caused by the most common malaria parasite, *Plasmodium falciparum*. However, in five countries of the Greater Mekong Subregion, the parasite has become resistant to almost all available antimalarials, making treatment of the disease extremely challenging. There is growing concern that antimalarial resistance will spread to other regions of the world, especially sub-Saharan Africa, where over 90 percent of global malaria cases and deaths occur.

HIV: the widespread availability of effective antiretroviral drugs has been instrumental in containing the HIV/AIDS pandemic in high-income countries. However, HIV resistance to the most commonly used drugs is on the rise, resulting in the need to resort to alternative, more expensive drugs. Increasing use of antiretroviral drugs in middle and lower income countries is likely to lead to an increase in resistance, with serious long-term implications for the ability to control the global spread of the disease and improve the lives of people living with HIV/AIDS.



Bacteria-filled Petri dish. Credit: Alpha Tauri

Why does it require a One Health approach?

A major contributor to the spread of AMR is the misuse of antimicrobials in humans, for example when antibiotics are used to treat non-bacterial infections. This is particularly common where antibiotics can be bought without a prescription and where lack of regulation, inadequate knowledge and inappropriate practices lead to antibiotics being overprescribed by health workers and overused by the public.

However, AMR cuts across traditional sector boundaries and has significance beyond human health. For example, the spread of AMR can be minimised by avoiding infections, which requires access to safe water

and sanitation and good hygiene practices (WASH). Another important factor in the spread of AMR is the misuse of antibiotics in livestock and farmed fish, often to stimulate growth and prevent rather than cure infections. Resistant microorganisms can spread through the food chain, but also through contaminated water and soils, for example through pollution from inadequate treatment of industrial and farm waste. Due to the many interdependencies, AMR is not only a health concern, but also a threat to food security and development.

Given this, the fight against AMR is a prime example of the need to adopt a 'One Health' approach – a coordinated, collaborative, multidisciplinary and cross-sectoral approach to improving health and wellbeing.



Chicken farms in rural Bangladesh. Credit: Hasin Hayder

In focus: Antibiotic use in Bangladesh

In March 2018, with Global Challenges Research Fund (GCRF) support, the University of Leeds, ARK Foundation, Malaria Consortium and the University of Liverpool conducted a household survey on the use of antibiotics among 1,301 adults in 26 villages of Comilla district, Bangladesh. The results suggest that awareness of antibiotics is limited among the general population, but that antibiotic use is common. Inappropriate use of antibiotics in both humans and animals was reported, as were poor sanitation and hygiene practices. Specifically:

- just under half of the respondents (48 percent) said that they had heard of antibiotics
- over three quarters (78 percent) of those who said they had heard of antibiotics reported having taken one before
- nearly a quarter (22 percent) said they did not have a prescription from a certified health provider the last time they took an antibiotic
- around one fifth (19 percent) indicated that they had not completed the full course as recommended by a certified health provider
- over two fifths (42 percent) of poultry-owning households said the poultry at least sometimes drinks from or bathes in water storage containers, ponds or wells that are mainly used for drinking or cooking water by the household
- nearly a quarter (22 percent) of cattle-owning households that buy commercial feed reported that they sometimes buy feed that contains antibiotics.

What can we do to minimise its spread?

Tackling AMR is not going to be an easy task. Developing new drugs or vaccines, improving WASH, encouraging the appropriate use of antibiotics in food production, and reducing environmental contamination will be important cornerstones of efforts to minimise resistance. Equally important will be enabling healthcare providers to prescribe antimicrobials only when needed; for example with the help of rapid diagnostic tests, treatment guidelines and training.

Another, frequently overlooked, tool at our disposal is the implementation of social and behaviour change (SBC) interventions targeted at the general public. These could, for example, encourage people to: only use antibiotics when they are prescribed by a certified health professional; complete a full course of antibiotics to completely cure infections; prevent infections by regularly washing their hands, preparing food hygienically and keeping their vaccinations up-to-date; and not use antibiotics for growth promotion or disease prevention among any healthy livestock they own.

How could community engagement help contain antimicrobial resistance?

Increasing knowledge and awareness is often not enough to trigger sustainable SBC. Many factors combine together to affect the health of individuals and communities, including the physical, social and economic environment. For example, people's behaviour is shaped by social norms, i.e. what people perceive is appropriate conduct in their social context.

One approach that has been effective in influencing people's health-related behaviour is community engagement, which involves enabling communities to take action to improve health and reduce health inequalities. Successful examples of community engagement include the formation of women's groups to improve behaviours around maternal and newborn health, and community-directed treatment campaigns for neglected tropical diseases.

In the context of AMR, community engagement could help raise awareness of the threat of resistance and shape social norms that encourage community members to seek a diagnosis from a certified provider

rather than to self-medicate when ill. It could also address the overuse of antibiotics in domestic animals, especially in settings where people do not have access to advice from qualified veterinary surgeons. Thus, the vision is to harness communities as powerful allies in the fight against AMR, capable of holding government, health services, industry and each other to account for minimising the spread of resistance.



Antibiotics. Credit: Zach Bulick



A Community Dialogue meeting in Comilla district, Bangladesh. Credit: ARK Foundation

In focus: Community Dialogue to address antibiotic resistance in Bangladesh

In collaboration with the Ministry of Health and Family Welfare and supported by funding from the Antimicrobial Resistance Cross Council Initiative and the GCRF, between April and October 2018 the University of Leeds, ARK Foundation and Malaria Consortium conducted an implementation research study exploring the use of Community Dialogue for addressing antibiotic resistance in Comilla district, Bangladesh.

The Community Dialogue Approach (CDA) sees community-based volunteers host regular community meetings to explore how a specific health issue affects the community, identify solutions to the problem and decide on how the community will address the issue. It builds on the assumption that public discussion, increased awareness and collective decision making will, over time, create a sense of accountability within the community and between communities and health services. This in turn, it is assumed, will affect the social norms that shape the behaviour of the wider community (i.e. not just those who actively participate in the meetings). This approach has been used successfully to improve the uptake of health services and increase the adoption of positive behaviours in different countries and for a range of other health issues.

For example, one such intervention in Mozambique led to increased knowledge of schistosomiasis and self-reported adoption of preventive behaviours such as the use of latrines.

In this study, we trained 55 volunteers from the catchment area of five Community Clinics (which provide primary healthcare to around 30,000 people in total) on the appropriate use of antibiotics and on basic communication and facilitation skills. These volunteers then convened over 400 meetings, each of which was attended by 40 community members on average. The volunteers were supervised by members of the network of Support Groups that manage the Community Clinics. Decisions documented by communities included not buying antibiotics without a prescription, visiting the Community Clinic if unwell, and encouraging handwashing among community members. A major challenge observed was volunteers' ability to facilitate rather than dominate the meetings and to encourage the active participation of attendees. This highlighted the need for the programme to reinforce key training messages via regular feedback meetings with volunteers. Observations also revealed a need to strengthen communities' capacity to plan for putting decisions into action and to monitor progress.



Misuse of antibiotics in farming is contributing to increasing antimicrobial resistance

Recommendations

To strengthen the fight against AMR, we propose the following:

1. National platforms and mechanisms for collaboration and coordination between One Health stakeholders from different sectors (including public health, animal health, agriculture, fisheries, WASH and environment) need to be established.
2. Government-owned, national One Health strategies for tackling AMR need to be developed, spelling out stakeholders' roles and responsibilities, as well as joint aims, objectives, activities and indicators.
3. Recognising the role of community engagement and SBC in the fight against AMR, stakeholders with relevant expertise need to be involved in national platforms and strategy development activities.
4. Comprehensive analyses need to be conducted to better understand the drivers of and barriers to adoption of positive antimicrobial-related behaviours at the community level.
5. Platforms need to be created at community level to enable community members to explore how AMR affects their communities, develop locally-appropriate solutions and take action to address the issue. The CDA provides an opportunity to establish such platforms.
6. Embracing a One Health approach, community-level platforms need to bring together different sections of the community whose behaviours might affect the use of antimicrobials in humans and animals (e.g. public and private healthcare providers, veterinary services and farmers).
7. In the interest of sustainability, community-level platforms need to be embedded within existing health service and community structures, such as the network of community clinics and associated support groups.
8. For maximum impact, community engagement needs to be complemented by other SBC approaches, for example mass media campaigns addressing positive behaviours and social norms to minimise the spread of AMR.

Resources

- Read a [brief](#) introducing the Community Dialogue project in Bangladesh.
- Watch an [animated video](#) summarising the CDA.
- Read a [guide](#) to implementing the CDA.

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For more information, please contact:

Rebecca King, University of Leeds: R.King@leeds.ac.uk
Rumana Huque, ARK Foundation: rumana@arkfoundationbd.org
Christian Rassi, Malaria Consortium: c.rassi@malariaconsortium.org
Sophia Latham, University of Liverpool: S.Latham@liverpool.ac.uk



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