



Inclusion of antimicrobial resistance in training programmes for community health workers

Technical brief



World Health
Organization

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Abbreviations

AMR antimicrobial resistance

CHW community health worker

IPC infection prevention and control

WASH water, sanitation and hygiene

WHO World Health Organization



1 Background

Antimicrobial resistance (AMR) occurs when bacteria, viruses, fungi and parasites no longer respond to antimicrobial medicines. As a result of AMR, antibiotics and other antimicrobial medicines become ineffective and infections become difficult or impossible to treat, increasing the risk of disease spread, severe illness, disability and death (1). AMR is associated with about 5 million deaths a year (2) and is projected to cause 39 million deaths between 2025 and 2050 if there are no effective interventions (3). Furthermore, AMR causes significant morbidity (Box 1), increases health-care expenditure, saturates health-care capacity and reduces the quality of care and trust in health systems. In agriculture, AMR can result in production losses, damage livelihoods and jeopardize food security (4). If AMR is unchecked, by 2035 it could cause a loss of 1.8 years of life expectancy globally and cost the world US\$ 412 billion a year in additional health-care costs and US\$ 443 billion per year in lost workforce productivity.¹ The burden of AMR is disproportionately higher on low- and middle-income countries (5), which makes AMR not only a global public health problem but an issue of health equity and socioeconomic development.

In the health-care sector, AMR is driven by overuse and misuse of antimicrobials, in many instances to substitute for insufficient diagnostic laboratory services, inadequate infection prevention and control (IPC) and suboptimal water, sanitation and hygiene (WASH) systems in health care and communities (6). Lack of access to effective, appropriate antimicrobials and insufficient high-quality health care for communicable diseases also contribute to overuse and misuse of antimicrobials (7). Furthermore, insufficient coverage with vaccination increases the likelihood of infections and antimicrobial use, thereby leading to AMR (8). Indiscriminate antimicrobial use in animal health and agriculture and the spread of resistance throughout the environment (9) have further implications for drug-resistant infections in human health. As the drivers of AMR are complex and challenging, the solutions must be multisectoral and comprehensive.

The WHO publication *People-centred approach to addressing AMR in human health* (10) calls for mainstreaming AMR-related interventions into health systems strengthening and particularly into primary health care. It recommends engagement of various community stakeholders and ensuring a competent, committed, multidisciplinary primary health care workforce that includes community health workers (CHWs).



Tori was a collegiate gymnast who developed a life-threatening infection of the left thigh due to methicillin-resistant *Staphylococcus aureus*. It appeared to be a simple problem, and her instructors thought it was a muscle sprain. The infection was therefore not diagnosed rapidly, and she finally had eight operations in 2 weeks and 1 month in hospital. Tori then underwent 6 months of gruelling physical therapy, during which she learnt to regain use of her leg and walk once more. The episode strongly influenced her career decisions, and she is now medical student pursuing research in infectious diseases. She uses every opportunity to tell her story to raise awareness and action on AMR among policy-makers and other stakeholders.

¹ Economic case for AMR investment, in preparation by the Quadripartite Technical Group on the Economics of AMR.

Who are community health workers (CHWs)?

CHWs are health workers based in communities, who conduct outreach from their homes, beyond primary health care facilities or at peripheral health posts that are not staffed by doctors or nurses. They are either paid or volunteers. They have fewer than 2 years of training but have at least some training, if only for a few hours, and are often selected and accepted in their role by community members.

CHW programmes differ widely among regions and countries with respect to their mandate, entry requirements, gender distribution, expectations and remuneration. Globally, CHWs are predominantly women. CHW programmes have been shown to be effective in improving community health, case management of specific diseases, increasing child survival, immunization uptake and many other health-related outcomes.

CHWs perform a variety of roles, which can be broadly clustered into six overlapping categories:

- provision of diagnostic, treatment or clinical care;
- encouraging uptake of health services;
- provision of health education and motivation for behaviour change;
- data collection and record-keeping;
- provision of psychosocial support; and
- improving relations between the health system and the community.



2 Purpose and target readership



The purpose of this brief is to sensitize officials responsible for CHW programmes about the inclusion of AMR in CHW training and tasks. The readers will include policy-makers in ministries of health, heads of health regulatory authorities and educational institutions, health system programme managers, educators in CHW training programmes and development agencies.



3 Dimensions of AMR in communities

Several causes of and solutions for AMR can be influenced by interventions in local communities.



Front-line health workers during a polio vaccination campaign in Somalia
(© WHO)

- Awareness about AMR and appropriate use of antimicrobial medicines:** Community awareness about AMR and appropriate use of antimicrobial medicines for infections is necessary for any positive change in behaviour by individuals and households (11).
- Infection prevention and control practices:** Some beliefs and practices related to infection control, especially during pregnancy, childbirth and childhood, are determined by communities and peer-learning. Such practices can contribute to the burden of infections and use of antimicrobials in communities (12).
- Health-seeking behaviour for infections:** Health-seeking behavior for infections is also determined by individual and community understanding of the scope of and access to health-care services (13). Trust in the health system affects health-seeking behaviour and use of over-the-counter antimicrobials (14). In many settings, CHWs also provide timely, proper referral of sick people to health care, which can increase the likelihood of accurate diagnosis and appropriate use of antimicrobials.
- Uptake and administration of vaccines:** Vaccine hesitancy is associated with and influenced by community beliefs and practices, and it affects trust in health systems. Community interventions in several countries have increased vaccine uptake. This is critical, as it has been shown that vaccines against 23 specific pathogens can reduce the requirement for antibiotics by 22% globally (15). CHWs can contribute to addressing vaccine hesitancy, improve uptake of current and new vaccines and improve trust in proven health-care interventions. In some settings, they are authorized to administer vaccines by relevant national bodies (16).
- Community decisions on access to health care:** In many regions, especially in countries with decentralized local self-government institutions, some decisions on access to health care are taken by community leaders (17). CHWs can explain the importance of AMR to community leaders and therefore improve access to quality-assured care for infectious diseases.

- **Availability of over-the-counter antimicrobials:** In many countries, antimicrobials are available over the counter because of inadequate implementation of regulations, financial incentives for sales and a low perception of the threat of AMR (78). Better general understanding of AMR and social audits by community leaders could reduce the availability and sale of over-the-counter antimicrobials in areas with adequate access to health care.
- **Waste management in communities and health-care facilities:** Waste management practices in households and health-care facilities are strongly influenced by community leadership and their understanding of optimal practices and infections (79). Waste management is also a determinant of infections and later use of antimicrobials. CHWs can contribute to strengthening the understanding of community leaders.
- **Access to clean drinking-water in households:** Greater community participation, social capital and sense of ownership are determinants of the sustainability of water systems (20). Other factors, such as the age and gender and level of education of the head of the family also influence access to safe drinking-water (21). Sustainable access to safe drinking-water reduces the incidence of water-borne diseases and thereby use of antimicrobials.
- **Community engagement in WASH:** Local access to improved drinking-water and sanitation services are often determined by community decisions. Successful models such as “community-level total sanitation” (22) involve community understanding and mobilization to improve WASH. Trained CHWs who promote community health can influence such decisions.
- **Food safety practices:** CHWs can promote food safety by educating communities about proper food handling, hygiene and storage. By reducing the probability of food-borne infections that may require antimicrobials, they can help to reduce the risk of AMR.
- **Use of antimicrobials and infection prevention on farms:** Use of antimicrobials, vaccines and biosecurity in food animals depends on the knowledge and understanding of farmers, which is often determined by peer learning and community support (23). CHWs usually interact closely with the field staff and extension workers of other departments, including community animal health workers, and can therefore assist them in spreading awareness about the importance of reducing the use of antimicrobials on farms, which is linked to emergence of AMR in humans (24).
- **Community engagement for response to outbreaks, epidemics and pandemics:** Antimicrobials have been used without authorization in communities during outbreaks, epidemics and pandemics. CHWs can identify outbreaks early through interactions with the community, which can facilitate early access to proper treatment, including antimicrobials when indicated. CHWs can also play a role in risk communication and addressing misinformation (25) that could lead to inappropriate use of antimicrobials.



A health worker in Kenya washing her hands during an oral cholera vaccination campaign

© WHO / Billy Miaron



4 Strategies to optimize the contribution of CHWs to reducing AMR

The structure of CHW programmes, the training requirements, remuneration and even the expectations of CHWs differ among countries and even among groups of CHWs in a country. Strategies to increase the impact of CHWs in AMR interventions should therefore be chosen carefully, according to the context. Some or all of the following strategies could be considered.



Prioritize CHW involvement as a policy

The role of CHWs in AMR interventions should be recognized and acknowledged by policy-makers, and CHWs should be included in AMR policies and plans. The expectations of their role must be clearly defined in programming of interventions and evaluation frameworks.



Raise the awareness of other health workers about the role of CHW

Other health workers, including prescribers, pharmacists and public health experts, should be aware of the potential role of CHWs in AMR interventions. This will ensure better planning of interventions, especially those for community engagement or primary care.



Strengthen pre-service training

Include AMR, IPC and WASH in CHW pre-service education and training curricula, with clear learning objectives, activities and assessment of skills and core competencies. Model field placements can also enhance practical skills and competencies.



Encourage interprofessional education and collaborative practice

Encourage formal and informal interprofessional education to raise awareness and enable CHWs to understand opportunities to intervene to prevent and mitigate AMR in their settings, by raising awareness, use of IPC to prevent infections, encouraging responsible, appropriate antibiotic use, discouraging over-the-counter antibiotic use, appropriate referrals, better WASH and vaccine uptake. Essential One Health practices in the community that are relevant to AMR may also be included



Conduct refresher programmes

In view of the multisectoral nature and complexity of AMR, short refresher programmes should be provided regularly for CHWs to increase their capacity sustainably.



Identify priorities

Although several tasks related to AMR can be expected from trained CHWs, their practice should focus on those most relevant to local needs and conditions.



Enhance information, education and communication

Awareness-raising among the public and critical community stakeholders requires communication assets in local languages. These could be posters, flyers, flipcharts or social media tiles. Content and key messages for community radio and megaphones could also be prepared when relevant.



Integrate AMR into other programmes in health and education systems

Integration of AMR-related activities of CHWs into other well-functioning programmes on disease conditions, primary care, IPC and WASH, preparedness and response, can ensure sustainability.



Provide supportive supervision

Supervision of newly recruited and trained CHWs and provision of opportunities for them to increase their competence and acquire more sophisticated AMR-related skills over time can improve their work. Supervision could be provided by trainers, competent senior CHWs, medical officers or public health officers, who are usually supervisors.



Ensure outreach to community leaders

As community leaders play a role in decisions on community practices regarding infections, access to health care and WASH services, CHWs should work with them on AMR-related interventions.



Ensure programme assessment, monitoring and evaluation

Systems should be in place to monitor and evaluate the practice of trained CHWs and provide clear feedback on the effectiveness of their interventions. Periodic evaluations are useful.



5 Curricular themes and elements in training CHWs in AMR

The following themes are suggested for inclusion in a curriculum for training CHWs in AMR. The objectives, activities and methods for assessment of skills and competence can be formulated according to local health needs, the educational level of CHWs (26), the available resources and socio-cultural preferences. The learning can also be interactive and practical, to improve impact (Box 2).

● **Basic concepts of AMR, including drivers and impact:**

- appropriate use of antimicrobials;
- definitions of AMR, differences among types of antimicrobials;
- basic concepts of mechanisms of resistance;
- drivers of resistance, including possible reasons for non-recommended use of antimicrobials in their context;
- global and local impacts of AMR in treating infections and infectious diseases; and
- impact of AMR on population health.

● **Prevention of AMR in communities:**

- importance of IPC, WASH and vaccines in reducing infections and the need for antimicrobials;
- optimal WASH practices and systems, including assessing them in households and communities;
- vaccination schedules and administration of vaccines (only where authorized) in communities;
- strategies for assessing and improving vaccine uptake;
- infection prevention and control, guidelines and practices; and
- discouraging use of over-the-counter use of antimicrobials, when possible.

● **Referral services for infectious conditions:**

- identification of symptoms of common acute infections and signs of severity;
- referral pathways and provisions for infectious conditions;
- integrated management of neonatal and childhood illness and associated protocols;
- identification of symptoms of chronic infections such as tuberculosis and leishmaniasis;
- role of CHWs in vertical programmes on communicable diseases and related community referral pathways; and
- role of CHWs in prevention and management of communicable diseases within comprehensive primary health care.

● **Community engagement on AMR:**

- communication about AMR and appropriate use of antimicrobials in local languages with culturally sensitive techniques through accessible, trusted channels such as local gatherings, religious assemblies and local radio stations;
- expectations of community leaders on AMR and conveying them;
- identification and protection of the interests of vulnerable populations in infection prevention (e.g. through vaccination and hand hygiene), access to health care for infections and appropriate use of antimicrobials; and
- methods for rapid assessment of community needs and assets for AMR and appropriate use of medicines.

● **Basic concepts of One Health**

- importance of other sectors in AMR prevention:
 - agriculture,
 - animal health,
 - food safety,
 - aquaculture and
 - environment;
- identification of antimicrobial misuse and overuse in other sectors; and
- key elements of engagement with field staff in sectors other than human health and effective communication about AMR among sectors.

● **Initiatives for AMR and the role of CHWs**

- national action plan on AMR and its objectives;
- concept of antimicrobial stewardship in health-care facilities and communities;
- drivers of AMR and the role of CHWs in preventing them; and
- building trust and community ownership of AMR interventions.

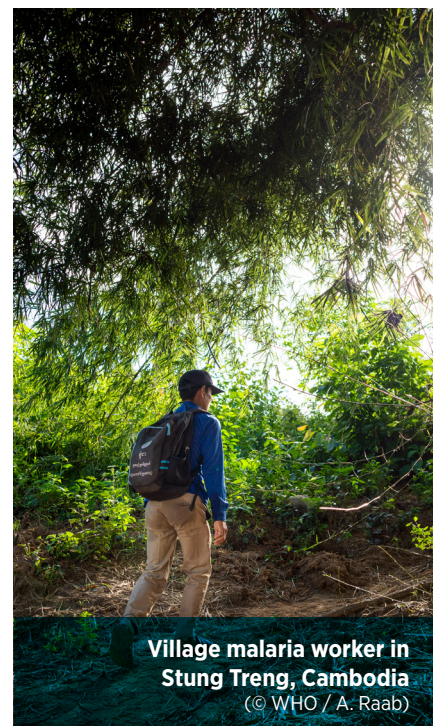
● **Monitoring and reporting antimicrobial use and infection prevention practices**

- antimicrobials used commonly in the area;
- simple tools for quantifying antibiotic use in communities and households;
- identification and documentation of antimicrobial use in households and disposal by households and communities;
- qualitative research methods to explore perceptions and attitudes towards infection prevention, antimicrobial use and resistance; and
- strategies for measuring IPC, WASH and vaccine acceptance in communities.

Box 2

Strategies to improve the delivery and impact of AMR education and training for CHWs

- Include interactive teaching methods such as role play, group discussions and simulations.
- Use local examples to inform learners about the burden and drivers of AMR in their community.
- Include stories from patients or health workers.
- Include field visits, field placements and practical training so that trainees acquire practical skills.
- Offer mentorship after training by competent, experienced CHWs.
- Facilitate interactions with field workers in other sectors such as agriculture or veterinary services.
- Conduct follow-up assessment, and provide feedback on performance.
- Recognize good performance, and co-opt CHWs as trainers for subsequent sessions.



Village malaria worker in Stung Treng, Cambodia
(© WHO / A. Raab)



6 AMR-related tasks expected from CHWs

The tasks expected of CHWs are listed below. These could be used in preparing curricula, setting standard operating procedures and planning measures for the usefulness of training. The tasks should be contextualized to local conditions and the requirements and expectations of the CHW programme.

Practice activities	Common associated tasks
Conducting a home visit	<ul style="list-style-type: none"> ● assessing the environment, hygiene and other determinants of infectious diseases; ● collecting information on symptoms and signs of infectious conditions prevalent in the area, especially those associated with poor WASH practices, from individuals in the household; and ● explaining the importance of WASH to household members.
Behavioural change communication	<ul style="list-style-type: none"> ● collecting relevant, reliable information and educational resources on the prevention, diagnosis and treatment of infectious conditions prevalent in the area and AMR; and ● educating individuals and households about antibiotics (and other antimicrobials), AMR and appropriate use of antibiotics under the guidance of a qualified health worker.
Access to health services	<ul style="list-style-type: none"> ● collecting information on referral services for infectious diseases, including facilities, at all levels of the health-care system and eligibility for the services; ● obtaining information on the guidelines for Integrated Management of Childhood Illnesses (27) and their applicability in the local context; ● explaining the resources and referral services available for acute and chronic infections in simple, easy-to-understand language; and ● developing referral plans for infections according to the preferences of the recipients.
Assessing and planning service delivery for households and communities	<ul style="list-style-type: none"> ● collecting information on the requirements for home delivery of various vertical programmes on infectious diseases; ● identifying households to be prioritized for home visits and community preventive and curative services; ● planning delivery of services to all households, including in hard-to-reach areas; and ● monitoring uptake of services for infectious diseases, including preventive health and vaccination, by the target groups.
Mobilizing community resources	<ul style="list-style-type: none"> ● mapping community assets with an appropriate tool to identify the resources and strengths of the community for preventing and managing infections; and ● planning and conducting meetings of all important community stakeholder groups, including community leaders and representatives of vulnerable groups, to discuss interventions to prevent and manage infections.

Practice activities	Common associated tasks
Providing community advocacy	<ul style="list-style-type: none"> collecting information on the services and provided by the government and relevant community organizations, which can determine prevention and management of infections and improve sanitation and drinking-water facilities; informing individuals and families about government provisions, projects and schemes that could improve their standard of living, social determinants of health and drivers of communicable diseases; identifying and communicating gaps in health-care delivery and WASH services in the community to community leaders; advocating for and with communities to increase access to quality-assured primary, secondary and tertiary health-care services for infectious diseases; and supporting communities in demanding better access to high-quality WASH services.
Educating other CHWs	<ul style="list-style-type: none"> identifying the learning needs of newly recruited community health workers regarding prevention and management of infections; training newly recruited community health workers in early diagnosis, management and referral for infectious diseases in communities; conducting peer learning sessions for newly recruited CHW on effective communication with individuals and households, especially on vaccine uptake, appropriate use of medicines, disposal of waste, clean drinking-water and environment hygiene; and identifying other community extension workers, including community animal health workers, and sensitizing them about AMR and its drivers.



7 Conclusion

AMR is increasingly understood as a systemic issue, which requires a whole-of-society approach. There is wide support for global and national action on AMR, which has up to now been largely top-down but should consist of robust community engagement. Community stakeholders can raise awareness about appropriate use of antimicrobials and AMR, influence individual and community behaviour related to infection prevention and control and co-develop solutions. Appropriately supported CHWs are a trusted, effective cadre for reaching community stakeholders with locally relevant messages, evidence-based advice and customized interventions. Strengthening pre-service education and in-service training for CHWs can meaningfully engage them as leaders in the AMR response and amplify the impact of interventions.

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Further reading

- Antimicrobial resistance (2023): <https://www.who.int/news-room/fact-sheets/detail/antimicrobial-resistance>.
- Global action plan on antimicrobial resistance (2015) <https://iris.who.int/handle/10665/193736>.
- Global strategy on human resources for health: Workforce 2030 (2020) <https://iris.who.int/handle/10665/252799>
- Health workers' education and training on antimicrobial resistance: curricula guide (2019) <https://iris.who.int/handle/10665/329380>. License: CC BY-NC-SA 3.0 IGO.
- People-centred approach to addressing antimicrobial resistance in human health: WHO core package of interventions to support national action plans (2023) <https://iris.who.int/handle/10665/373458>. License: CC BY-NC-SA 3.0 IGO.
- What do we know about community health workers? A systematic review of existing reviews (2021) <https://iris.who.int/handle/10665/340717>. License: CC BY-NC-SA 3.0 IGO.
- WHO competency framework for health workers education and training on AMR (2018) <https://iris.who.int/handle/10665/272766>. License: CC BY-NC-SA 3.0 IGO.
- WHO guideline on health policy and system support to optimize community health worker programmes (2018): <https://iris.who.int/handle/10665/275474>. License: CC BY-NC-SA 3.0 IGO.
- WHO, UNICEF. Management of sick children by community health workers: intervention models and programme examples (2006) <https://iris.who.int/handle/10665/44226>.

Annex.

Development of the brief

The literature was reviewed to identify the dimensions of AMR in communities and the possible roles of CHWs in addressing AMR. Priority was given to peer-reviewed articles published during the past decade and to relevant reports from United Nations agencies. A draft was prepared by the AMR division at WHO headquarters and reviewed by AMR teams in WHO regional offices. Feedback was also obtained from relevant teams working on health workforce, IPC and primary health care at WHO headquarters. The purpose of the review was to ensure that the technical content, language and suggestions made are appropriate for potential users worldwide. The brief was later peer-reviewed by eight experts in AMR and CHW programming. The brief was finalized after inclusion of the recommendations of the peer reviewers.

