

## When the drugs don't work

Anti-Microbial Resistance is one of the most serious challenges to human existence. Liz Tayler updates us on where Africa is in its response so far

The cellulitis is spreading, the patient with pneumonia is just not getting better. What is going on? Sometimes of course there may be another underlying pathology, the diagnosis was not right in the first place, the drugs used were fake or of poor quality. But increasingly the underlying cause may be that the bacteria causing the infection are no longer susceptible to the drugs that are being used.

There has been talk of AMR and superbugs in Europe and North America for years, but this is a global problem, and if we do not get on top of it, the greatest problems will be in Africa and Asia. It is here that the burden of infectious diseases remains high, here that health systems are weak and fragile, and here that people will be least able to cope with the increased costs of longer and more expensive treatment. The O'Neill review of AMR has suggested that if not properly addressed, there may be 10 million deaths because of AMR by 2050, with over 4m of these in Africa. It will not only be a health problem, but will have a major impact on economies, particularly in low and middle-income countries.

In much of Africa we don't really know the extent of the problem at the moment. There are some excellent laboratories in teaching hospitals or research institutes, but most doctors in Africa cannot access a laboratory that does consistent and reliable sensitivity testing. There are no surveillance systems that allow us to get a representative sample of infections so that we can know what is really going on at community level. The data that we do have shows resistance to common antibiotics can be very high. Such results need to be interpreted with caution as often the patients that are tested will be those with treatment failure, who have received multiple courses of treatment.

Antibiotic resistance is not a new phenomenon: some bacteria have always had resistant genes, and mutations are continually occurring. Exposure to antibiotics kills the sensitive bacteria, allowing the resistant ones to proliferate.

The overuse of antibiotics and other antimicrobials (antimalarials, antiretrovirals and TB drugs,) in the human and animal sectors is driving the emergence and proliferation of new strains. Poor environmental sanitation and hygiene contribute to the rapid spread of infection.

Antibiotics have underpinned the major health gains of the last fifty years. We would not have made

the massive reductions in child mortality or reduced deaths from TB, HIV and malaria without ready access to cheap, effective drugs. If the drugs stop working then these gains are vulnerable. Developments of twentieth century medicine, such as cancer treatments and invasive surgery and joint replacements, can only be done safely because we can manage infection. In an era of drug resistance the risks of these procedures will be much higher.

Antibiotics have allowed us to get away with poor care, but this is not going to last much longer. They have been used as a substitute for investing in health facilities with clean water, toilets, and an environment that can be kept clean. They have been used as a substitute for good hygiene and care. Busy practitioners may prescribe antibiotics and other antimicrobials to almost all patients because they don't have the time to make a diagnosis, and add in anti-infective medication just in case.

In some settings all women will take a course of antibiotics to cover a normal delivery because they fear the risks of maternal and neonatal sepsis. This may seem sensible, if the facility is dirty and overcrowded, and there is a high risk of invasive procedures, but antibiotics are not indicated for a normal delivery, and what we really need is good hygiene and clean safe deliveries. In neonatal units, infants become colonised with resistant bacteria such as ESBL very rapidly, and so when they do get sick, it is with a resistant strain that is much more likely to kill them

So what needs to be done? We really need a societal change in how we deal with infection. Infection prevention and control are sometimes seen as a bit of a luxury, but many of our health systems are at the moment failing against the first rule of medicine – to 'Do no Harm'. It is not acceptable to offer health services in a facility without a clean toilet and adequate hand washing facilities. AMR provides another imperative to really scale up WASH and environmental sanitation, immunisation and IPC programmes.

We need to use antibiotics more appropriately. Not every case of fever is bacterial in origin, and many conditions are going to be self limiting and will be just as well treated with antipyretics and watchful waiting. Of course better diagnostics would help (just as Rapid Diagnostic Tests did with malaria), but even with good clinical skills, prescribing can become a lot more focused. The antibiotic chapter of the WHO Essential Medicines list was updated last year. Twenty-four common infective syndromes were reviewed and

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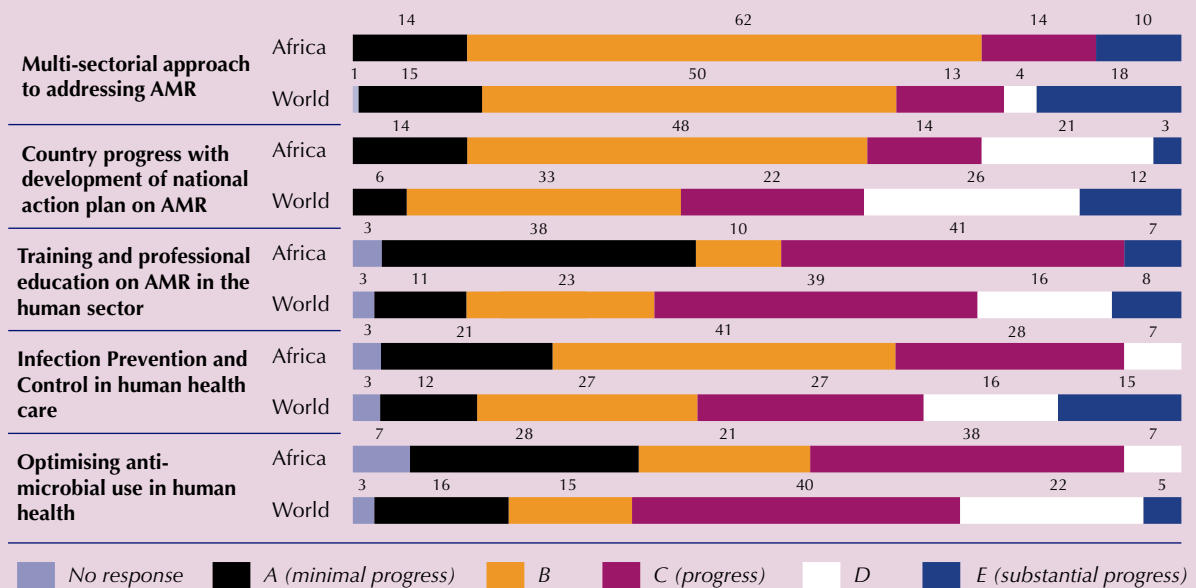
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### AMR country self-assessment survey key results African Region

To assess country progress in addressing AMR, a self-assessment survey has been developed and run by the three Tripartite organisations: Food and Agriculture Organization of the United Nations (FAO), World Organisation for Animal Health (OIE) and World Health Organization (WHO). The results of the second tripartite self-assessment survey have just been published. Here we report selected key results for the WHO African Region, and how they compare to the world.

Twenty-nine countries out of the 47 WHO Member States in the African Region responded to this round of the self-assessment survey, a response rate of 61.7%. In total, 154 (79.4%) of the 194 WHO Member states responded.

African countries report less progress in all domains when compared to all countries together, but were at a similar level to other low and lower middle income countries. What is encouraging is the progress made since the first country self-assessment survey in 2017. Eleven African countries reported having National action plans, (and WHO is aware of at least another three who failed to respond to this survey). Fourteen have a plan currently in development. Clear progress has been made since 2017 when seven of the countries reported having developed a national action plan, and six having one in development. There is similar progress in other domains.



<b>Awareness</b>	<b>20</b> countries with some awareness raising activities about the risks of AMR in human health (reported)
<b>Monitoring and surveillance</b>	<b>9</b> countries with national surveillance system in humans (reported)
<b>Reducing the incidence of infection</b>	<b>10</b> countries with national IPC programme (reported)
<b>Optimising the use of AB medicines</b>	<b>19</b> countries with requirements for antibiotic prescription

Based on the survey data of 29 countries out of the 47 WHO member states in the African region that responded. Results of all countries on all domains are available in full on [www.who.int/antimicrobial-resistance/global-action-plan/database/en](http://www.who.int/antimicrobial-resistance/global-action-plan/database/en)

optimal treatment suggested. Medicines were classified using the AWARE classification into ACCESS, those that should be widely available for first line use, WATCH which need to be available for specialist use, and RESERVE which are those drugs such as carbapenems and colistin that we really do need to preserve for treatment of last resort.

Hospitals really should have stewardship pro-

grammes, ideally linked to IPC, which set clear guidelines, monitor the use of antibiotics, and feed back to prescribers. When well run, these programmes generally improve health outcomes, cut antibiotic use and lengths of stay.

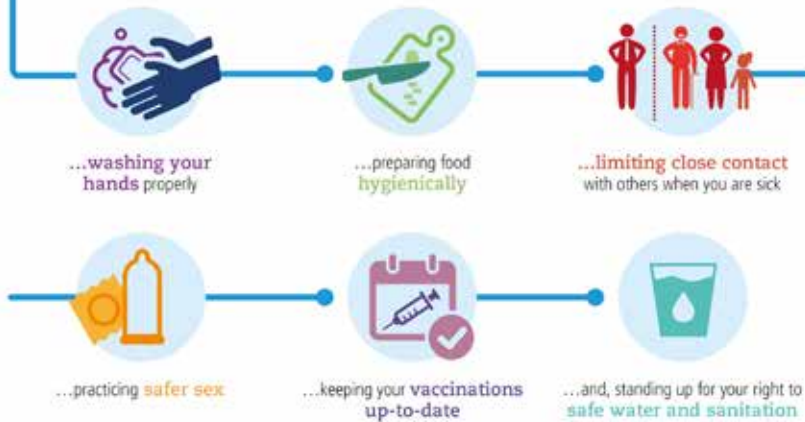
Of course the bulk of antibiotics are consumed in the community. There is massive consumption through the unregulated informal private sector in many countries.

# Everyone has a ROLE TO PLAY

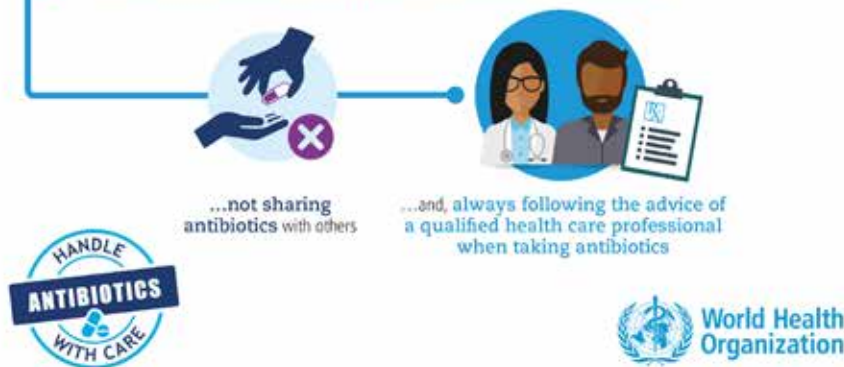
## You can help prevent antibiotic resistance

Preventing infection can reduce the use of antibiotics, and limit the spread of antibiotic resistance. Good basic hygiene is one of the most effective ways to reduce the risk of infection.

You can reduce the risk of infection by:



You can also reduce the spread of antibiotic resistance by:



WHO infographic for World Antibiotic Awareness Week 2017

Antimicrobials are often perceived as ‘strong medicines’ worth trying whenever anyone is sick. The profit margins are often higher on expensive drugs, and so these are quite widely sold, and often aggressively marketed by pharmaceutical representatives. Tightening up on sales regulation, particularly for the WATCH and RESERVE classes of drugs, is an urgent priority.

We need a much better understanding of what is going on, both in terms of resistance patterns, and understanding the consumption and use of antibiotics. It may not be affordable to have good laboratories in all hospitals, but there should be at least a few labs that are undertaking good surveillance, monitoring trends and that can help clinicians understand sensitivity patterns.

Understanding of AMR and the use of antibiotics is

very low among the public and policy makers, and even qualified health professionals. Studies of medical students and newly qualified doctors in Europe and America show that they feel inadequately trained around antibiotic prescribing and AMR. We don’t have as much data for Africa, but the picture is likely to be the same.

Much of this article has focused on what needs to be done to address antibiotic resistance. This is not because resistance in diseases such as malaria, TB and HIV is not a major threat. It is, the ambitious targets for TB, HIV and malaria elimination may become unattainable if resistance is not contained. However, much of the response to resistance for these drugs is part of established disease programmes. There has been much less investment and systematic action to address bacterial infections, which pose a threat across the health systems.

Abuse of antibiotics is not just a problem in human health. We know that more antibiotics are fed to healthy animals than to sick humans. The Food and Agriculture Organisation, Organisation for Animal Health and WHO have all agreed that feeding antibiotics to animals for growth promotion should be phased out as quickly as possible. Enforc-

ing this is still a challenge, with few African countries having any restriction on this yet. As farming becomes more intensive, the use of antibiotics (often again as a substitute for good hygiene and biosecurity) is likely to increase. Antibiotic residues get into the water supply from factories, farms and hospitals, and when they mix with bacteria, resistance can develop and spread.

Antimicrobial resistance is now recognised as one of the greatest threats to human health. It has been discussed at the United Nations (few health issues are) and all countries have committed to develop a national action plan. Most countries have done this, but the challenge is now to turn plans into action, and to move beyond ministries of health into sustained action across the wider health system.