Antimicrobial resistance ±a global epidemic

Prepared by the Secretariats of WHO, WIPO and WTO

Not an expert in AMR?

Watch this 5-minutes video explaining the most important facts:

https://www.youtube.com/watch?v=xZbcwi7SfZE

What is antimicrobial resistance?

Antimicrobial resistance (AMR) occurs when bacteria, parasites, viruses and fungi become resistant to antimicrobial drugs that are used for treating the infections they cause. Every time an antimicrobial medicine is used, it diminishes the effectiveness for all users, because its usage increases the possibility for the bacteria to become resistant. Antimicrobial resistance threatens the effective prevention and treatment of an increasing range of infections, including blood poisoning, pneumonia, diarrhoea, gonorrhoea, tuberculosis, HIV/AIDS and malaria.

Resistance against antibiotics (medicines used to prevent and treat bacterial infections) is an urgent problem because antibiotics are a cornerstone of modern medicine and most medicinal procedures in human and animal health rely on functioning antibiotics.

What causes antimicrobial resistance?

Antimicrobial resistance is mainly driven by inappropriate use. Global antibiotic consumption in humans has increased by 36% between 2000 and 2010.[1] Half of this increased use is regarded as unnecessary, e.g. when antibiotics are used to treat illnesses like common colds horticulture. In the US, for example, more than 70% of antibiotics are used in agricultural production, primarily for growth promotion and prophylaxis.[2] Worldwide consumption in animals is estimated to rise by 67% from 63,151 tons in 2010 to 105,596 tons in 2030.[3]

How does resistance develop?

Resistant bacteria can be transmitted to humans through various channels such as the food chain, animal-to-human contact, and the environment.[4]

Globalization fuels the spread of antimicrobial resistance where transmission is facilitated by increased trade, travel and both human and animal migration. Travellers often carry home resistant bacteria from holidays or business trips. An example of globalization fuelling the spread of antimicrobial resistance is seen in the antibiotic-resistant strain of colistin. Colistin is widely used in Chinese livestock which has likely led the bacteria to evolve, gain resistance and transmit from livestock to humans through food. This strain was reported earlier this year in the US[5] and Europe.[6] This example shows that antimicrobial resistance cannot be tackled in isolation by individual countries but needs global cooperation.

Why is antimicrobial resistance a problem?

Antimicrobial resistance affects high-, low- and middle-income countries. There are particular diseases that have higher rates of antimicrobial resistance such as tuberculosis and gonorrhoea. Recent global estimates in 2013 reveal 480,000 new cases of multidrug-resistant tuberculosis (MDR-TB) with extensively drug-resistant tuberculosis (XDR-TB) present in 100 countries. Further, there are treatment failures as a result of resistance to

Stewardship

Stewardship describes the careful and responsible management of resources entrusted to one's care. With respect to antimicrobials, stewardship refers to appropriate antimicrobial treatment to improve patient outcomes while minimizing the development and spread of resistance.

Core considerations in determining a stewardship framework for appropriate use of antimicrobials include:

- the type of antimicrobials that should be included in the framework;
- the type of antibiotics that should be subject to a conservation scheme; and
- identification of actors and responsibilities of all stakeholders from manufacturers of antimicrobials to the end users of antimicrobials such as clinical staff and patients.

A range of stewardship measures can be used to appropriately use and distribute antimicrobials. These measures along with many other measures can include:

- better diagnostics in health care facilities in order to facilitate appropriate use of antibiotics;
- avoiding unnecessary use of antibiotics;
- prescription and distribution of antibiotics through adequately trained personnel;
- improving education and training of all people who work with antibiotics: health care workers, pharmacists and other dispensers, patient, national governments and others;
- appropriate distribution of antibiotics that facilitates access to, but does not lead to excessive use of antibiotics;
- quality assurance audits to support antimicrobial stewardship embedding into practice.

Addressing the rising threat of AMR requires a holistic and multi-sectoral (One-Health) approach[13] because antimicrobials used to treat various infectious diseases in animals may be the same or be similar to those used in humans. Resistant bacteria arising either in humans, animals or the environment may spread from one to the other, and from one country to another.

While access to effective antimicrobials is a prerequisite for productive and sustainable agriculture, in particular in relation to animal husbandry, antibiotics have to be used with more responsibility. Therefore, effective stewardship in tackling antimicrobial resistance requires a global multidisciplinary collaborative effort across industries.

Innovation

There is a severe lack of investment in new medicines against microbes. The market-

In the long run, building strong health systems is the most sustainable approach to ensuring affordable access to good-quality essential medicines, including antimicrobial medicines and vaccines, as well as diagnostics and other vital interventions.

Antimicrobial resistance and trade

Given that no country is self-sufficient in the supply of medicines, trade in general is essential to ensure access. Eliminating trade barriers such as high tariffs, unnecessary custom formalities and other obstacles contribute to ensuring access to affordable medicines.

Certain measures to incentivize appropriate use of antibiotics can impact international trade of antibiotics or products that have been manufactured using antibiotics or that are carriers of resistant bacteria. Such measures would likely be measured against the WTO Agreements on Technical Barriers to Trade (TBT), or the Agreement on