

COMBAT ANTIMICROBIAL RESISTANCE

What is ANTIMICROBIAL RESISTANCE?

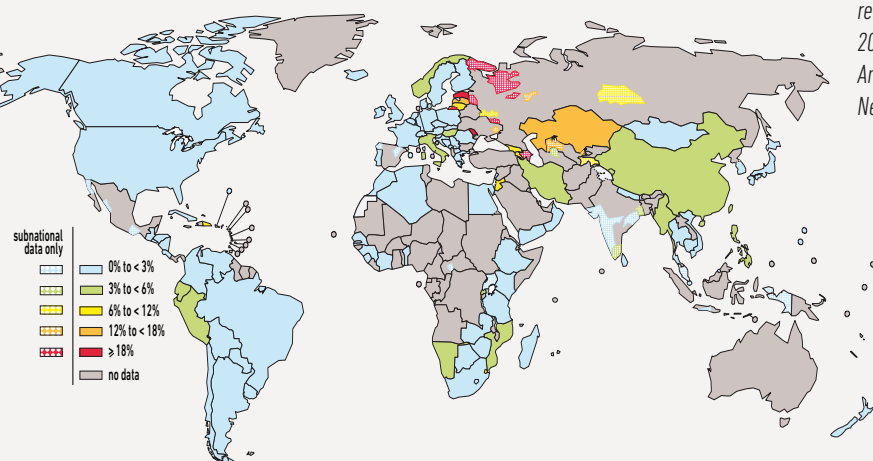
Antimicrobial resistance (AMR) is resistance of a microorganism to an antimicrobial medicine to which it was previously sensitive. Resistant organisms (they include bacteria, viruses and some parasites) are able to withstand attack by antimicrobial medicines, such as antibiotics, antivirals, and antimalarials, so that standard treatments become ineffective and infections persist and may spread to others. AMR is a consequence of the use, particularly the misuse, of antimicrobial medicines and develops when a microorganism mutates or acquires a resistance gene.

WHY IS AMR A GLOBAL CONCERN?

- > **AMR kills** — Infections caused by resistant microorganisms often fail to respond to the standard treatment, resulting in prolonged illness and greater risk of death.
- > **AMR challenges control of infectious diseases** — AMR reduces the effectiveness of treatment because patients remain infectious for longer, thus potentially spreading resistant microorganisms to others.
- > **AMR threatens a return to the pre-antibiotic era** — Many infectious diseases risk becoming uncontrollable and could derail the progress made towards reaching the targets of the health-related United Nations Millennium Development Goals set for 2015.
- > **AMR increases the costs of health care** — When infections become resistant to first-line medicines, more expensive therapies must be used. The longer duration of illness and treatment, often in hospitals, increases health-care costs and the financial burden to families and societies.
- > **AMR jeopardizes health-care gains to society** — The achievements of modern medicine are put at risk by AMR. Without effective antimicrobials for care and prevention of infections, the success of treatments such as organ transplantation, cancer chemotherapy and major surgery would be compromised.
- > **AMR compromises health security, and damages trade and economies** — The growth of global trade and travel allows resistant microorganisms to be spread rapidly to distant countries and continents.

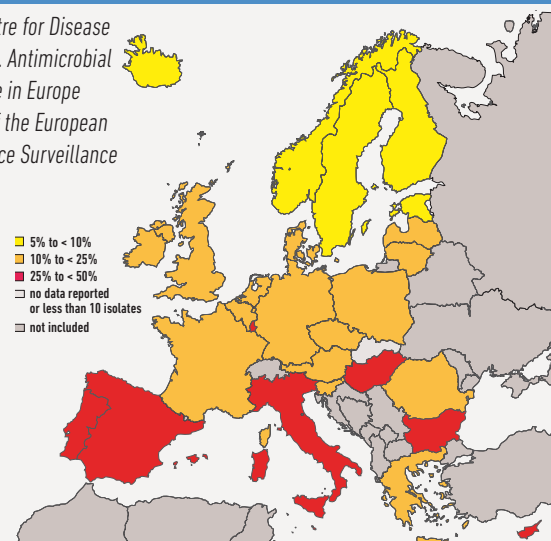
Percentage of MDR-TB among new TB cases since 1994

Source: World Health Organization. Multidrug and extensively drug-resistant TB (M/XDR-TB). Global Report on Surveillance and Response



AMR surveillance in Europe: proportion of *Escherichia coli* invasive isolates with resistance to fluoroquinolones in 2009

Source: European Centre for Disease Prevention and control. Antimicrobial resistance surveillance in Europe 2009. Annual Report of the European Antimicrobial Resistance Surveillance Network (EARS-Net)



COMBAT DRUG RESISTANCE
No action today, no cure tomorrow

Facts on antimicrobial resistance

- About 440 000 new cases of multidrug-resistant tuberculosis (MDR-TB) emerge annually, causing at least 150 000 deaths. Extensively drug-resistant tuberculosis (XDR-TB) has been reported in 64 countries to date.
- Resistance to earlier generation antimalarial medicines such as chloroquine and sulfadoxine-pyrimethamine is widespread in most malaria-endemic countries. Falciparum malaria parasites resistant to artemisinins are emerging in South-East Asia; infections show delayed clearance after the start of treatment (indicating resistance).
- A high percentage of hospital-acquired infections are caused by highly resistant bacteria such as methicillin-resistant *Staphylococcus aureus* (MRSA) and vancomycin-resistant enterococci.
- Resistance is an emerging concern for treatment of HIV infection, following the rapid expansion in access to antiretroviral medicines in recent years; national surveys are underway to detect and monitor resistance.
- Ciprofloxacin is the only antibiotic currently recommended by WHO for the management of bloody diarrhoea due to *Shigella* organisms, now that widespread resistance has developed to other previously effective antibiotics. But rapidly increasing prevalence of resistance to ciprofloxacin is reducing the options for safe and efficacious treatment of shigellosis, particularly for children. New antibiotics suitable for oral use are badly needed.
- AMR has become a serious problem for treatment of gonorrhoea (caused by *Neisseria gonorrhoeae*), involving even "last-line" oral cephalosporins, and is increasing in prevalence worldwide. Untreatable gonococcal infections would result in increased rates of illness and death, thus reversing the gains made in the control of this sexually transmitted infection.
- New resistance mechanisms, such as the beta-lactamase NDM-1, have emerged among several gram-negative bacilli. This can render powerful antibiotics, which are often the last defence against multi-resistant strains of bacteria, ineffective.

WHAT DRIVES AMR?

Inappropriate and irrational use of medicines provides favourable conditions for resistant microorganisms to emerge and spread. For example, when patients do not take the full course of a prescribed antimicrobial or when poor quality antimicrobials are used, resistant microorganisms can emerge and spread. Underlying factors that drive AMR include:

- > Inadequate national commitment to a comprehensive and co-ordinated response, ill-defined accountability and insufficient engagement of communities.
- > Weak or absent surveillance and monitoring systems.
- > Inadequate systems to ensure quality and uninterrupted supply of medicines.
- > Inappropriate and irrational use of medicines, including in animal husbandry.
- > Poor infection prevention and control practices.
- > Depleted arsenals of diagnostics, medicines and vaccines as well as insufficient research and development on new products.

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The emergence of AMR is a complex problem driven by many interconnected factors; single, isolated interventions have little impact. A global and national multi-sectoral response is urgently needed to combat the growing threat of AMR.

THE RESPONSE OF THE WORLD HEALTH ORGANIZATION

WHO is engaged in guiding the response to AMR through: policy guidance, support for surveillance, technical assistance, knowledge generation and partnerships, including through disease prevention and control programmes; essential medicines quality, supply and rational use; infection prevention and control; patient safety; and laboratory quality assurance.

WHO calls on all key stakeholders, including policy-makers and planners, the public and patients, practitioners and prescribers, pharmacists and dispensers, and the pharmaceutical industry, to act and take responsibility for combating antimicrobial resistance.

The World Health Organization has selected "combat antimicrobial resistance" as the theme for World Health Day 2011. On this day, WHO will issue an international call for concerted action to halt the spread of antimicrobial resistance and recommends a six-point policy package for governments.

For more information: <http://www.who.int/world-health-day/2011>