



Fact sheets on sustainable development goals: health targets

Antimicrobial Resistance

Antimicrobial resistance (AMR) is an increasingly serious threat to the gains made in health and development and for the attainment of the Sustainable Development Goals (SDGs) (1,2). AMR can compromise the achievement of the SDGs, affecting health security, poverty, economic growth and food security. Action is necessary across sectors and settings to mitigate prevent and control AMR.

Overview

AMR is defined as the resistance of bacterial, viral, parasitic and fungal microorganisms to antimicrobial medicines that were previously effective for treatment of infections. It occurs naturally over time but is accelerated by:

- the inappropriate use of antimicrobial medicines in the health, animal, food, agriculture and aquaculture sectors;
- lack of access to health services, including to diagnostics and laboratory capacity; and
- antimicrobial residues in soil, crops and water (2,3).



AMR and SDGs: facts and figures



If no action is taken to contain AMR, the economic cost in terms of lost global production between now and 2050 would be US\$ 100 trillion (4,5). Low- and middle-income countries would be more negatively impacted and a widening of the inequity gap within countries is expected (4,5).



- The indirect costs of drug-resistant infections to the individual and society from morbidity, disability, premature deaths and reduced effective labour supply are estimated to cause a decrease in the global economic output of 1–3% by 2030, with estimated losses ranging from US\$ 1 trillion to US\$ 3.4 trillion annually if no action is taken (4,5).



Ensure sustainable food production systems: antimicrobial agents are essential for food security. Global consumption of antimicrobials in food/animal production was estimated at 63 000 tonnes in 2010 and is projected to rise by 70% by 2030 (4,6,7). Doubling agricultural productivity while reducing antimicrobial use is a challenge.



Currently, it is estimated that AMR causes 25 000 deaths annually in the European Union alone (8).

Reduce preventable maternal deaths: globally, it is estimated that more than 30 000 women die each year as a result of severe infections when giving birth (9).

End preventable neonatal and childhood deaths: estimates suggest that more than 200 000 newborns die each year around the world from infections that do not respond to available drugs; the vast majority of these deaths occur in developing countries (9). These numbers may rise if and when the antibiotics that treat these infections become less effective (4, 10, 11).

End the epidemics of communicable diseases: the emerging resistance to drugs to treat HIV, tuberculosis and malaria is an obstacle for the achievement of target 3.3.

- With increasing global use of antiretroviral therapy both to treat and to prevent HIV infection, and increasing global trends in resistance to these drugs, treatment options may become limited. As a result, more expensive treatment regimens associated with greater long-term toxicity would be needed (12, 13).
- The European Region has the highest rates of drug-resistant tuberculosis (TB) in the world. Around 73 000 people in the Region are estimated to fall ill with multidrug-resistant TB (MDR-TB) every year, which requires longer treatment with more drugs and is associated with lower success rates. In 2014, 966 cases of extensively drug-resistant TB (XDR-TB) were reported in the Region, accounting for approximately 18% of the cases of MDR-TB (14).
- Worldwide, 357 million new sexually transmitted infections are estimated to occur every year, of which some are becoming increasingly resistant to drugs (15). These infections can cause long-term disability, infertility and even death. In particular, gonorrhoea is a major concern as some gonorrhoeal infections are now completely untreatable with available antibiotics (15).

Universal health coverage: to address AMR it is essential to improve health systems performance while making progress towards universal health coverage (Box 1).

- In the European Region, gaps remain in surveillance and regulation of prudent use of antibiotics in community and hospital settings in the European Region (16).
- Prescription rates vary greatly, with higher rates in southern and eastern Europe and approximately 20–30% of antibiotic consumption being without prescription (19–22).
- Total antibiotic use in humans in 2011 ranged from 13 defined daily doses for the Netherlands to 42 for Turkey (Fig. 1) (19).
- Overall, the sustainability of health system is endangered by AMR. In the EU alone, it is estimated that AMR annually costs €1.5 billion a year in health care costs and productivity losses (8, 23).



Although there is no scientifically documented evidence to date of widespread illnesses among the general public caused by pharmaceutical and microbial hazard waste from health care, poorly managed health care waste can reach and contaminate groundwater, drinking-water, soils, food crops and sediments. This can potentially have serious environmental effects, including toxicity to wildlife and the generation of antibiotic-resistant bacteria (24–26).



The Global Partnership represents an important prerequisite for addressing AMR worldwide. Heads of State at the United Nations General Assembly in September 2016 recognized the need for stronger systems to monitor drug-resistant infections and the volume of antimicrobial agents used in humans, animals and crops, as well as for increased international cooperation and funding (Box 2) (2).



Achievements in the dimensions covered by SDG 17 (finance, technology and innovation, capacity-building, fair trade, policy and institutional coherence, multistakeholder partnership and data monitoring and accountability) would support efforts to strengthen regulation of antimicrobial usage. They would also improve knowledge and awareness, promote best practices, foster innovative approaches using alternatives to antimicrobial agents and support the development of new technologies for diagnosis and vaccines.

Commitment to act

Member States at the Sixty-eight World Health Assembly in May 2015 (28) committed to ensure, for as long as possible, continuity of successful treatment and prevention of infectious diseases with effective and safe medicines that are quality assured, used in a responsible way and accessible to all who need them with the adoption of the Global action plan on antimicrobial resistance (17).

Heads and representatives of State and governments reaffirmed this commitment at the High-level meeting of the United Nations General Assembly on antimicrobial resistance in September 2016 (2).

Box 1. Leaving no one behind...

Universal health coverage: achieving universal health coverage will support the mitigation and containment of AMR. Ensuring equitable access to affordable essential medicines for all enables patients to complete uninterruptedly the full course of antimicrobial drugs. Ensuring access to vaccines for all prevents infections, thus reducing the need for antimicrobial drugs. Other essential actions to combat AMR include renewing investment in research and development of new medical products (17, 18).

The strategic objectives of the Global action plan are to:

- improve awareness and understanding of AMR through effective communication, education and training;
- strengthen the knowledge and evidence base through surveillance and research;
- reduce the incidence of infection through effective sanitation, hygiene and infection-prevention measures;
- optimize the use of antimicrobial medicines in human and animal health;
- develop the economic case for sustainable investment taking into account the needs of all countries; and
- increase investment in new medicines, diagnostic tools, vaccines and other interventions.

By 2011, all 53 Member States in the WHO European Region had adopted the European strategic action plan on antibiotic resistance (2011–2020) (23), which is fully in line with the Global action plan (17), and have worked on its implementation with the support of WHO and its partners.

Box 2. Intersectoral action

One health: under a “one health” approach, AMR containment would be supported by effective surveillance of trends in antimicrobial consumption and resistance in agriculture and veterinary sectors, the implementation of animal immunization and the promotion of improved hygiene and biosecurity (3,18).

A manual has been developed by WHO, in collaboration with the Food and Agriculture Organization of the United Nations (FAO) and the World Organisation for Animal Health (OIE), to assist countries in preparing or refining their national actions plans. It aims to facilitate the participation of all relevant sectors and outlines an incremental approach that can be adapted by countries to their specific needs, circumstances and available resources (27).

Monitoring progress

The WHO Regional Office for Europe is developing a joint monitoring framework for the SDG, Health 2020 and noncommunicable diseases indicators¹ to facilitate reporting in Member States and to provide a consistent and timely way to measure progress. AMR will compromise all Health 2020 targets (29). The following, as proposed in the global indicators framework of the United Nations Economic and Social Council (ECOSOC), will support monitoring progress in AMR (30).

ECOSOC indicators

- 1.5.2. Direct economic loss attributed to disasters in relation to global gross domestic product
- 2.4.1. Proportion of agricultural area under productive and sustainable agriculture
- 3.1.1. Maternal mortality rate
- 3.2.1. Under-5 mortality rate
- 3.2.2. Neonatal mortality rate
- 3.3.1. Number of new HIV infections per 1000 uninfected population, by sex, age and key populations
- 3.3.2. Tuberculosis incidence per 100 000 population
- 3.3.3. Malaria incidence per 1000 population
- 3.3.4. Hepatitis B incidence per 100 000 population
- 3.8.1. Coverage of essential health services (defined as the average coverage of essential services based on tracer interventions that include reproductive, maternal, newborn and child health; infectious diseases; noncommunicable diseases; and service capacity and access among the general and the most disadvantaged populations)
- 3.9.2. Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe water, sanitation and hygiene for all (WASH) services)
- 3.b.1. Proportion of the target population covered by all vaccines included in their national programme
- 3.b.2. Total net official development assistance to medical research and basic health sectors
- 3.b.3. Proportion of health facilities that have a core set of relevant essential medicines available and affordable on a sustainable basis
- 3.d.1. International Health Regulations capacity and health emergency preparedness
- 6.1.1. Proportion of population using safely managed drinking-water services
- 6.2.1. Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water
- 6.3.1. Proportion of wastewater safely treated
- 8.1.1. Annual growth rate of real GDP per capita
- 12.4.2. Hazardous waste generated per capita and proportion of hazardous waste treated, by type of treatment
- 17.16.1. Number of countries reporting progress in multistakeholder development effectiveness monitoring frameworks that support the achievement of the sustainable development goals

Health 2020 core indicators

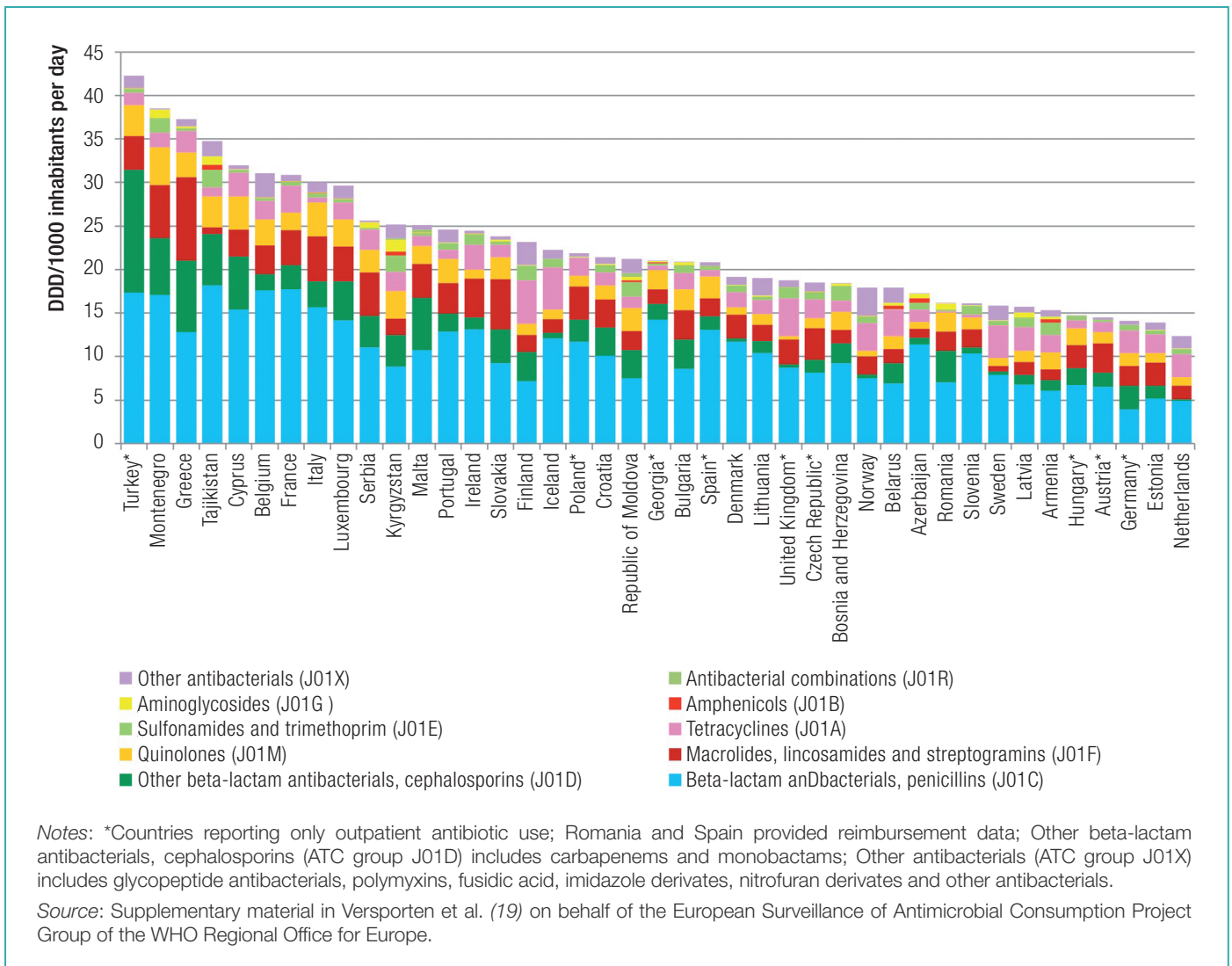
- 3.1.a. Infant mortality per 1000 live births, disaggregated by sex
- 3.1.b. Life expectancy at birth, disaggregated by sex
- 5.1.a. Private household out-of-pocket expenditure as a proportion of total health expenditure
- 5.1.c. Total expenditure on health (as a percentage of gross domestic product)

Health 2020 additional indicators

- 5.1.a. Maternal deaths per 100 000 live births (ICD10 codes O00–O99 (31))
- 5.1.c. Government (public) expenditure on health (as a percentage of gross domestic product)

¹ EUR/RC67/Inf.Doc./1: joint monitoring framework: proposal for reducing the reporting burden on Member States.

Fig.1. Total antibiotic use in 2011, expressed in number of defined daily doses (DDD) per 1000 inhabitants per day in 29 countries reporting to the European Surveillance of Antimicrobial Consumption network (ESAC-Net) and 12 countries reporting to the Antimicrobial Medicines Consumption network (AMC)



WHO support to its Member States

WHO, in collaboration with the FAO and the OIE, supports the development, control, distribution and appropriate use of new antimicrobial medicines, diagnostic tools, vaccines and other interventions (2).

The WHO Regional Office for Europe, together with a broad range of partners, works actively to contain the spread of AMR in the Region through a multidisciplinary and office-wide approach (23), supporting Member States in the development and implementation of national plans to combat AMR by:

- facilitating intersectoral coordination;
- providing policy advice and technical guidance;
- building capacity for surveillance of antimicrobial use and AMR;
- promoting antimicrobial stewardship;
- supporting the implementation of core components for infection prevention and control programmes in health care facilities; and
- raising awareness among professionals and the general public, as well as assisting with the development of behaviour change campaigns in specific target groups.

Resources

- Global action plan on antimicrobial resistance
<http://www.who.int/antimicrobial-resistance/publications/global-action-plan/en/>
- European action plan on antibiotic resistance
http://www.euro.who.int/__data/assets/pdf_file/0008/147734/wd14E_AntibioticResistance_111380.pdf?ua=1
- Manual and tools for the development of national action plans on antimicrobial resistance
<http://www.who.int/antimicrobial-resistance/national-action-plans/en/>
- Central Asian and Eastern European Surveillance of Antimicrobial Resistance (CAESAR)
<http://www.euro.who.int/en/health-topics/disease-prevention/antimicrobial-resistance/about-amr/central-asian-and-eastern-european-surveillance-of-antimicrobial-resistance-caesar>
- European Surveillance of Antimicrobial Consumption Network
<http://ecdc.europa.eu/en/healthtopics/antimicrobial-resistance-and-consumption/antimicrobial-consumption/ESAC-Net/Pages/ESAC-Net.aspx>
- Surveillance and disease data for antimicrobial resistance
http://ecdc.europa.eu/en/healthtopics/antimicrobial-resistance-and-consumption/antimicrobial_resistance/EARS-Net/Pages/EARS-Net.aspx
- Antimicrobial Medicines Consumption (AMC) Network. AMC data 2011–2014 (2017)
<http://www.euro.who.int/en/health-topics/Health-systems/health-technologies-and-medicines/publications/2017/antimicrobial-medicines-consumption-amc-network.-amc-data-20112014-2017>
- Guidelines on core components of infection prevention and control programmes at the national and acute health care facility level
<http://www.who.int/infection-prevention/publications/ipc-components-guidelines/en/>
- World Antibiotic Awareness Week
<http://www.who.int/campaigns/world-antibiotic-awareness-week/en/>

Key definitions

- **Defined daily dose (DDD).** Unit of measurement of drug consumption: the assumed average maintenance dose per day for a drug used for its main indication in adults (32).
- **Extensively drug-resistant tuberculosis (XDR-TB).** Infection resistant to the main first- and second-line drugs and, therefore, with very limited chances of cure.
- **Multidrug-resistant tuberculosis (MDR-TB).** Infection resistant to two of the most potent anti-TB drugs, resulting from inadequate treatment of TB or poor airborne infection control in health care facilities and congregate settings.
- **Rational use of antibiotics.** Patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time and at the lowest cost to them and their community (33).

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