POCKET FACTS 01

Dangerous increase: Antimicrobial Resistance (AMR)

Facts about a silent pandemic – and how to fight it

Empa
Materials Science and Technology

5

million
deaths associated with AMR infections per year.

60

US$ billion
annual health costs due to AMR, projected to rise to US$ 160 billion by 2050.

130

million
AMR infections each year, with an estimated annual increase of 20–30%.

AMR is one of the greatest and most urgent global health risks.

AMR effects people in all countries, leaves doctors with fewer and fewer effective drugs and makes even standard medical procedures much riskier. New types of drugs and strategies are urgently needed.

Key facts about AMR from the World Health Organization (WHO)

How does AMR arise?

AMR occurs regularly over time when microbes develop resistance to drugs such as antibiotics, antivirals or antifungals. Microbes are living organisms that naturally evolve and adapt to their environment.

Sustained exposure to insufficiently dosed antibiotics can push them to develop a resistance to survive. Super-bugs are SUPER-strong bacteria that have developed resistance to all manmade antibiotic substances.

Mutation
In a population of bacteria, an individual bacterium randomly mutates, developing AMR by chance.

Selection
When exposed to an antibiotic at near-lethal concentrations, all bacteria die – except the resistant one(s).

Multiplication
The resistant bacterium reproduces and can subsequently acquire more resistances against other antibiotics.

What can I do to reduce AMR?

- Prevent infections in the first place by practicing good hygiene.
- Avoid misuse and overuse of antimicrobial substances, e.g. using antibiotics against viral infections.
- Get vaccinated, especially (but not only) when travelling.

More info on what you can do: StAR – Strategy on Antibiotic Resistance (Swiss Government platform)

What is Empa doing about it?

We develop for instance:

- Novel materials for delivery, dosage and optimal storage of antimicrobials
- Improved diagnostics for rapid and reliable detection of AMR
- «Living» therapeutics containing probiotics and phages (viruses that kill bacteria), creating a living antimicrobial environment unlikely to cause AMR

More info on what we do: AMR research at Empa

Knowledge & facts, brief and to the point, on important current topics – and what we are doing about it.
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