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Corinne Corradi, GPH – 30.04.21

# Antimicrobial Resistance (AMR)

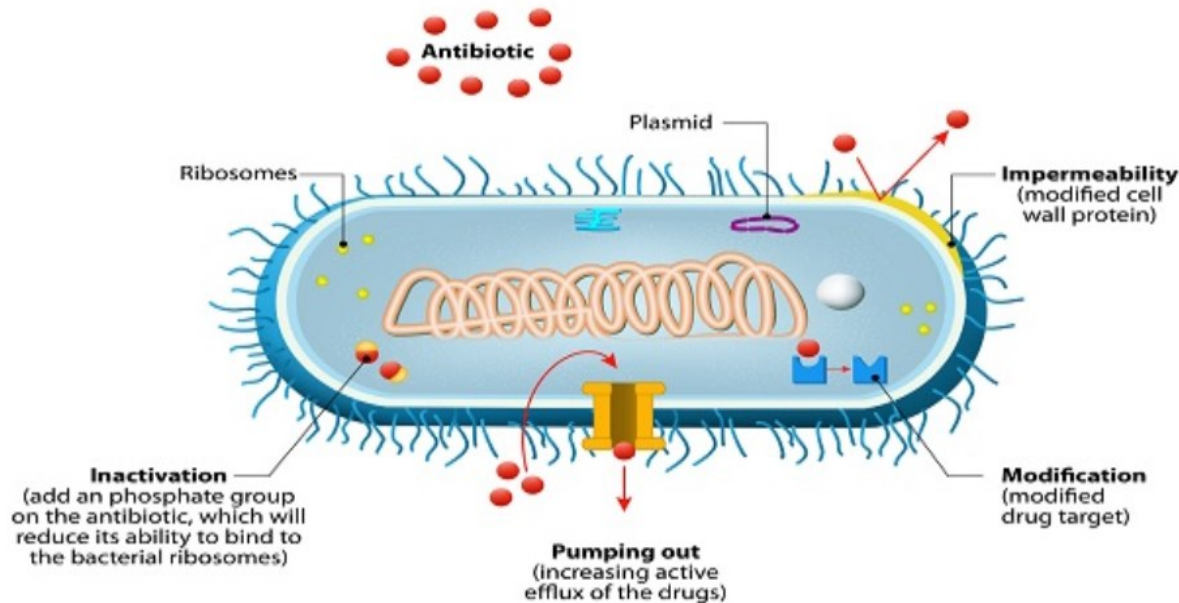
A global public health threat



# Introduction – what are resistances?

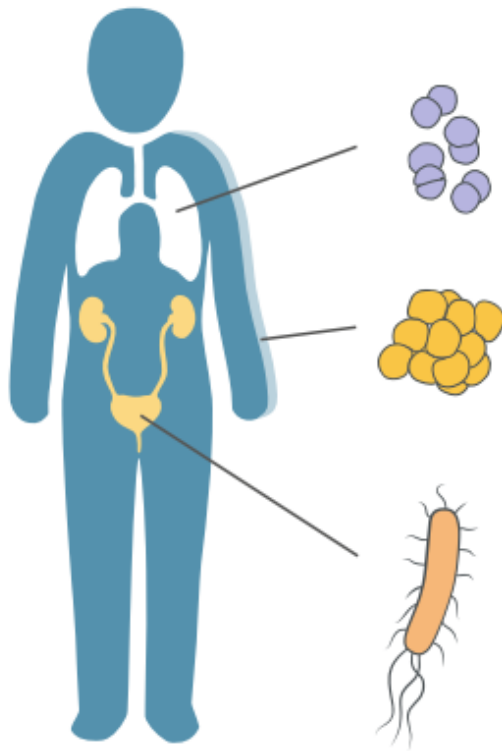
Antimicrobial Resistance (AMR) occurs when **bacteria, viruses, fungi and parasites change over time and no longer respond to medicines making infections harder to treat** and increasing the risk of disease spread, severe illness and death.

## MECHANISMS OF ANTIMICROBIAL RESISTANCE



Source: biospace.com

# Typical bacterial infections affecting us



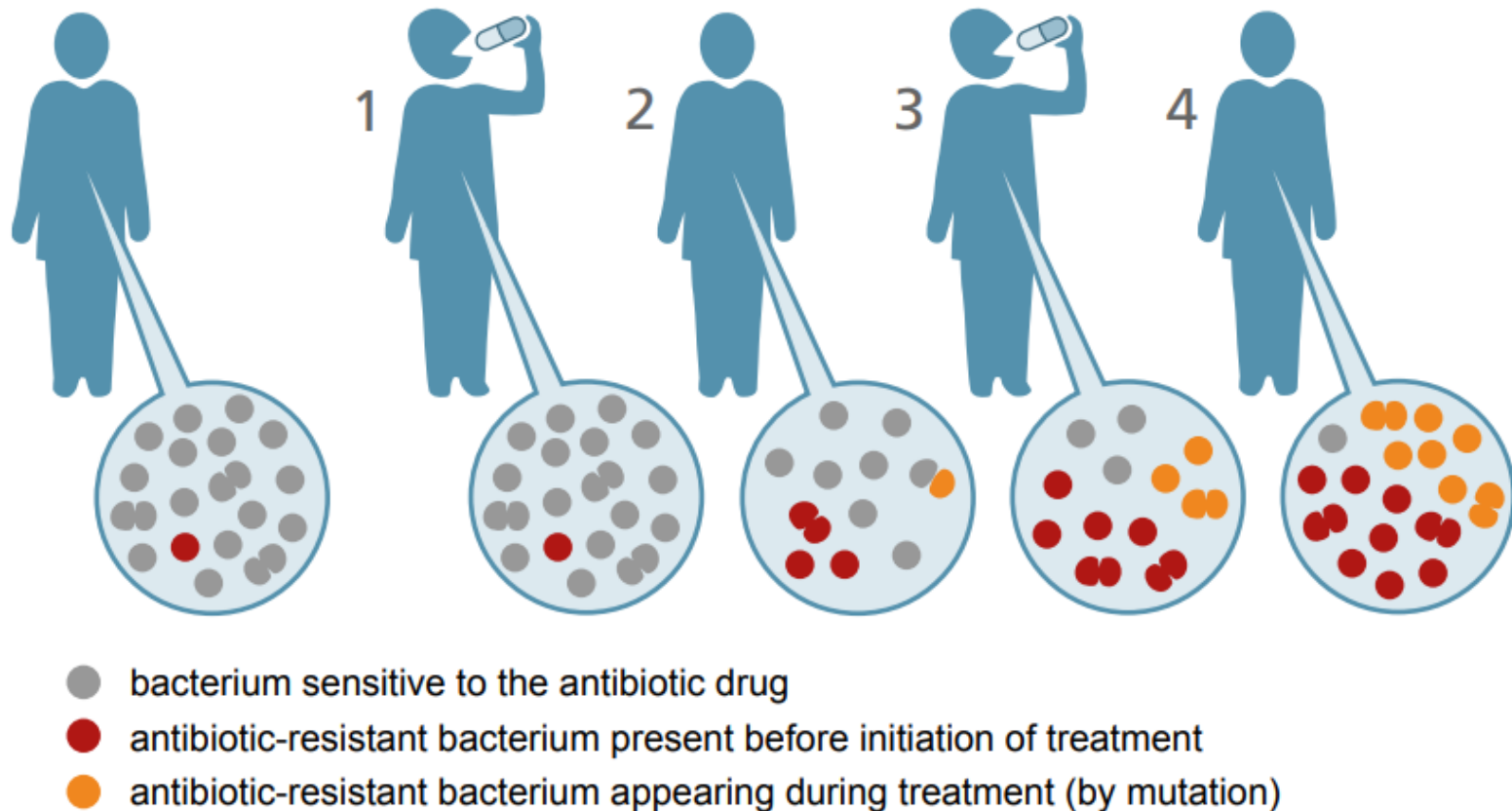
***Streptococcus pneumoniae*** (pneumococci) are known to induce pneumonia. Following vaccination campaigns, the number of infections due to penicillin-resistant pneumococci has fallen since 2004.

The proportion of infections induced by **Methicillin-resistant *Staphylococcus aureus*** (found in skin infections) has been reduced threefold since 2004, thanks to the early identification and treatment of infected patients in hospitals.

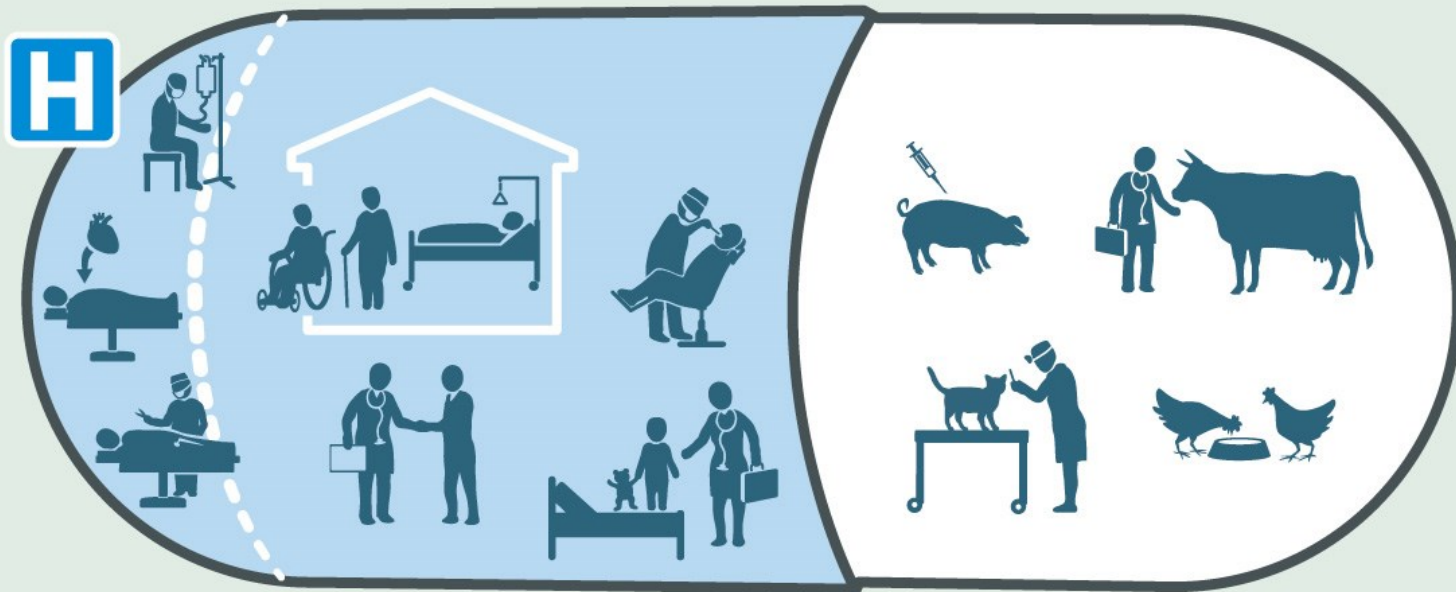
The proportion of ***Escherichia coli*** (often found in urinary tract infections) resistant to fluoroquinolones has almost doubled since 2004. And resistance to a wide-spectrum antibiotic – 3rd and 4th generation Cephalosporins has been multiplied fivefold.

# What leads to resistant bacteria?

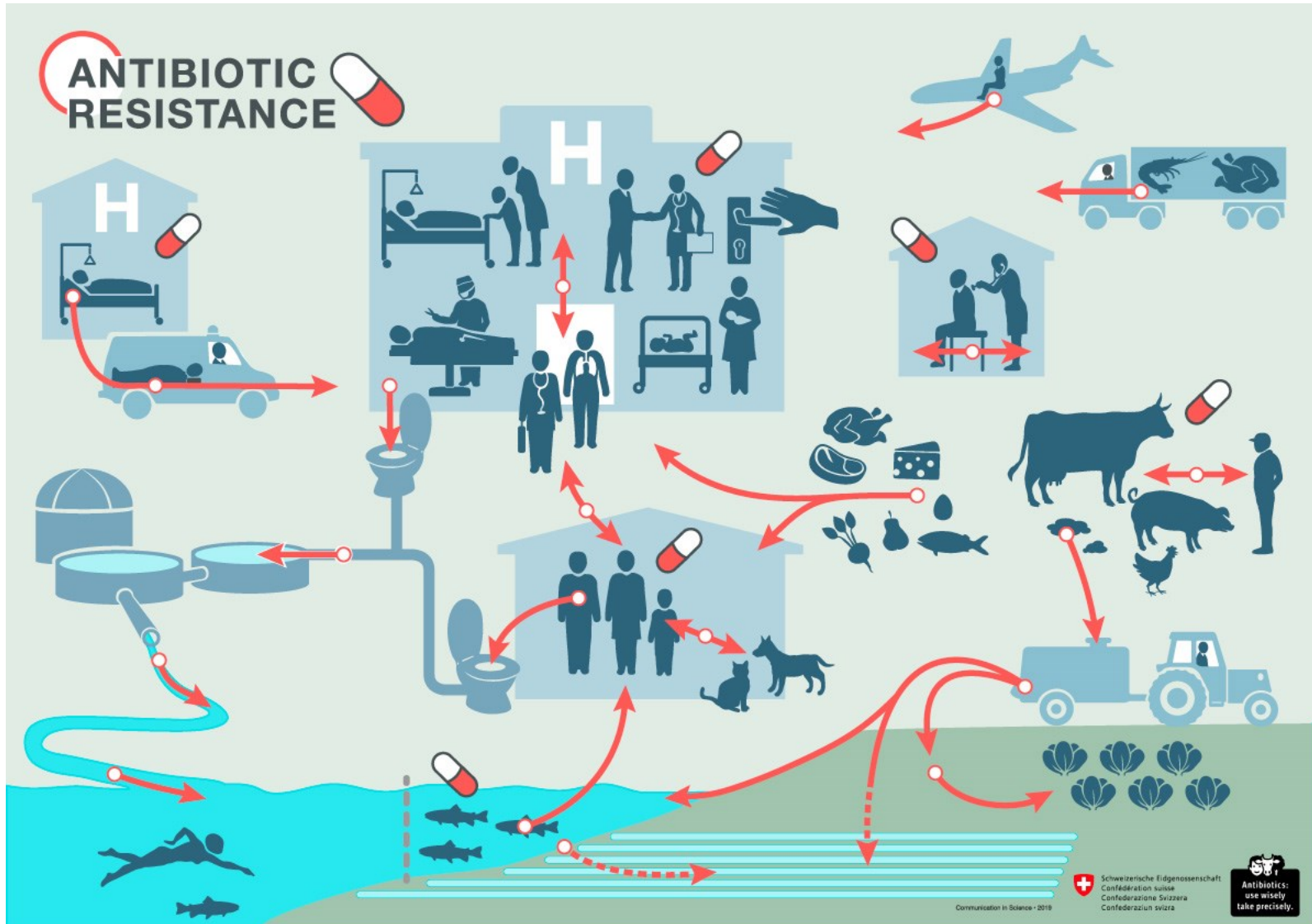
Each time that antibiotics are used, the subset of bacteria able to endure their onslaught not only survive but can make the most of the elimination of susceptible bacteria around them to thrive.



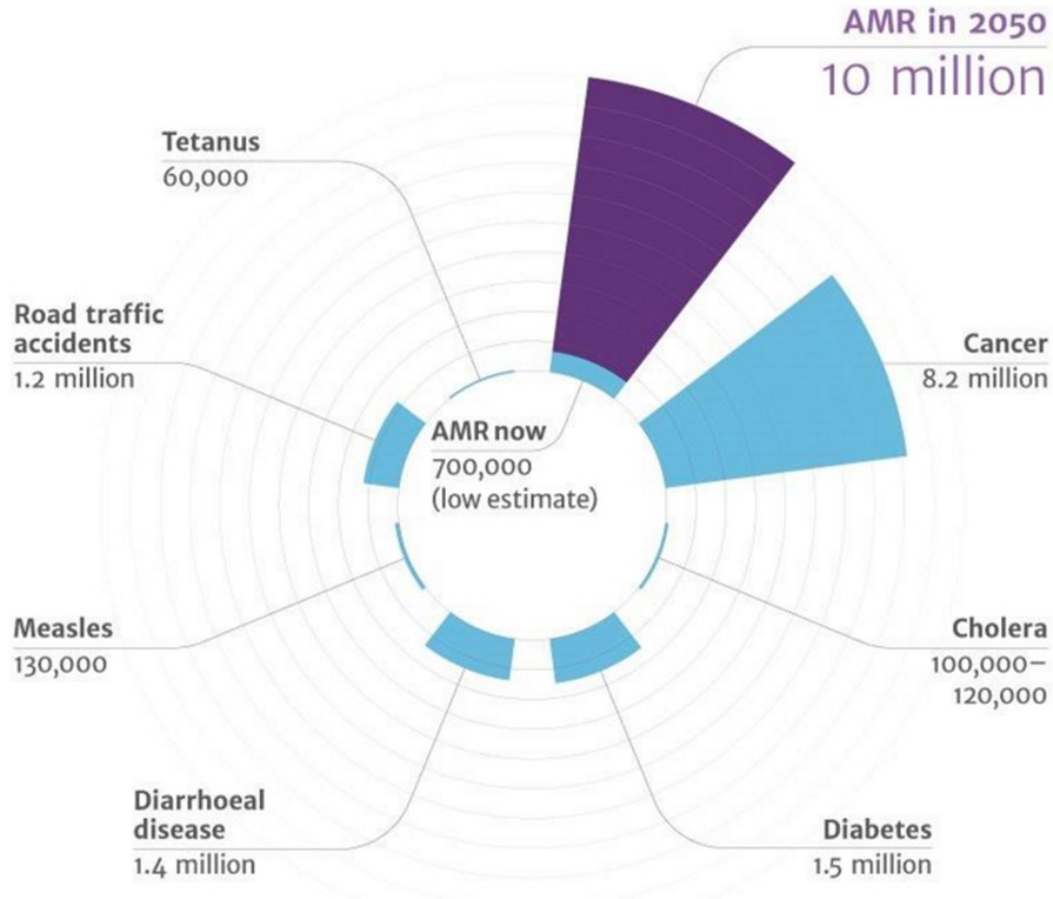
# IMPORTANCE OF ANTIBIOTICS IN SWITZERLAND








# How big is it the burden of disease ? (Mortality)




Source: O'Neil Report

## **Failing to tackle antimicrobial resistance will:**

- Prevent us from treating serious and even common infections
- Make surgery riskier
- Place mothers' and their newborns' lives at risk

 Majority of countries endorsed the WHO Global Action Plan for Antimicrobial Resistance in 2015 (Tripartite WHO, FAO, OIE)



 A key objective of the action plan is to optimize antibiotic use by increasing access to the antibiotics at lower risk of resistance and reducing use of the antibiotics at higher risk – those that are most valuable for human health.



# Why is it a problem for SDC?

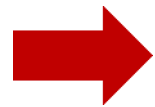
## Health impact:

- High burden of disease, more deaths and longer treatment periods
- Public health threat: slow but global spread and increase, unknown reservoir / interactions with animal and environmental domain, multi-drug resistant bacteria pandemic

## Economic impact

- Loss of lives & livestock, increased health care spending

# Is it really a top priority in LMIC?



In selected low- and middle-income countries, the **proportion of resistant infections ranges from 40-60%** compared to an average of 17% for OECD countries.



Crisis of emerging antibiotic resistances mirroring that of the COVID-19 in the age of globalisation

DOI: <https://doi.org/10.4414/smw.2020.20402>

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Swiss Med Wkly. 2020;150:w20402

Nordmann Patrice<sup>abc</sup>, Poirel Laurent<sup>abc</sup>, Frey Joachim<sup>d</sup>

# Core tasks to tackle AMR

## 1. Prevention of infections:

- WASH (hygiene, clean water and sanitation)
- Vaccination against some bacterial infections
- Infection prevention within health institutions (health centre, hospital)

## 2. Rational use of antibiotics in human and animal medicine:

- Regulation
- Updated prescription guidelines

## 3. Low or no use in agricultural sector

- Alternative to pesticide use

## 4. Waste water management and treatment

- Community level / cities
- Hospital waste
- Pharmaceutical manufacturing

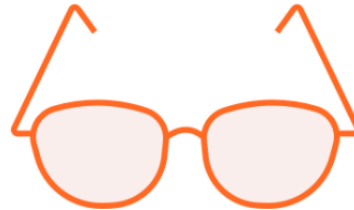
## 5. Surveillance of resistance patterns

- in all domains (integrated)



## Access

*Which indicates the antibiotic of choice for each of the 25 most common infections. These antibiotics should be available at all times, affordable and quality-assured.*



## Watch

*Which includes most of the "highest-priority critically important antimicrobials" for human medicine and veterinary use. These antibiotics are recommended only for specific, limited indications*



## Reserve

*Antibiotics that should only be used as a last resort when all other antibiotics have failed.*



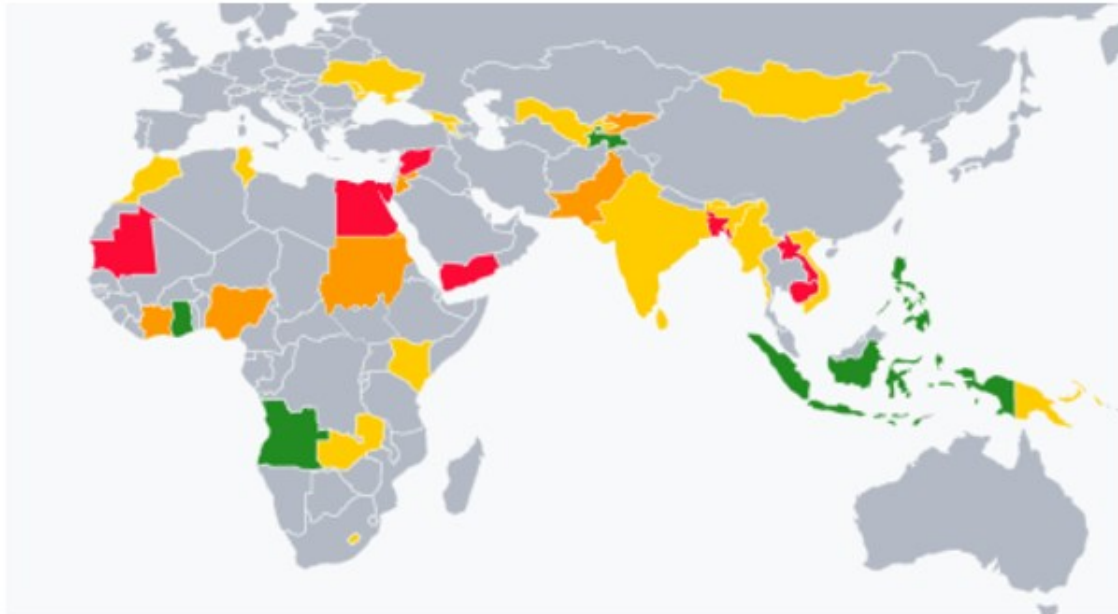
# National Action Plans (NAP)






## WHO Guidelines

But little progress in implementation since 2015



# AMR NAP implementation in LIC

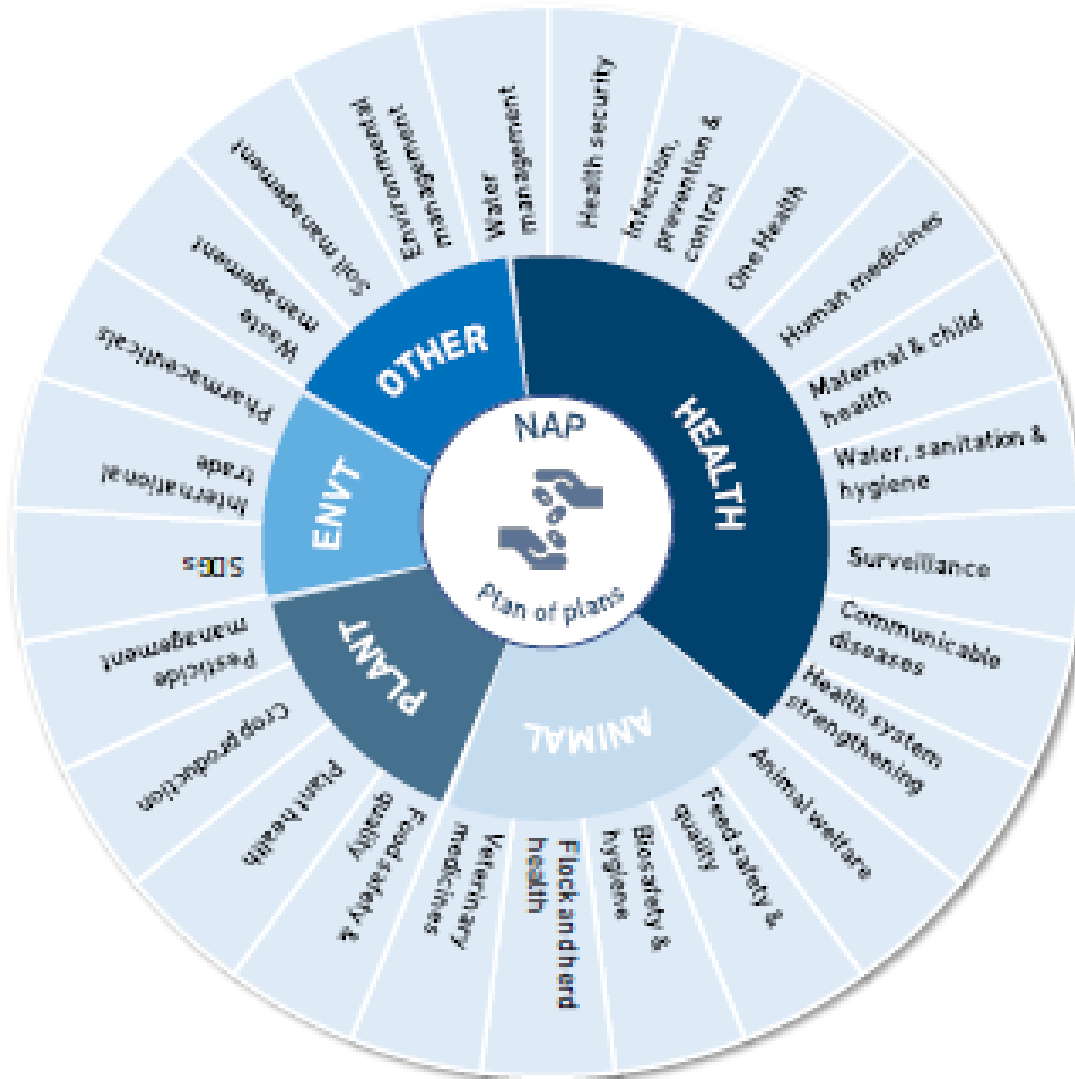


-  A - No/weak national policies for appropriate use.
-  B - National policies for antimicrobial governance developed for the community and health care settings.
-  C - Practices to assure appropriate antimicrobial use being implemented in some healthcare facilities and guidelines for appropriate use of antimicrobials available.
-  D - Guidelines and other practices to enable appropriate use are implemented in most health facilities nationwide. Monitoring and surveillance results are used to inform action and to update treatment guidelines and essential medicines lists.
-  E - Guidelines on optimizing antibiotic use are implemented for all major syndromes and data on use is systematically fed back to prescribers.





With links to many different national plans and strategies, NAPs are often a 'plan of plans'



# The six strategies for success

## 1. Establish AMR coordination committee roles and responsibilities

While the AMR coordinating committee's specific responsibilities will vary from country to country, they will typically include: leadership and coordination, momentum building, advocacy, communication, evidence building, and monitoring. To be effective, AMR committees must also be given high-level political support, authority and resources to act, and clear lines of accountability.

## 2. Prioritize AMR activities

In resource-constrained settings, it may not be possible to carry out all the NAP activities at once; AMR committees will need to decide where to focus their efforts. To do that they will need to identify which activities really require new resources, and which could be achieved by adapting or scaling up existing AMR-relevant projects and programs.

## 3. Get AMR into plans

If AMR action is to be sustained and properly resourced, it has to be part of the national development agenda. That means AMR concepts and activities must be embedded in government planning and budgeting processes at all levels; national, sectoral and departmental.

## **4. Engage stakeholders**

Implementing NAPs requires action across multiple sectors, from health, food safety and agriculture to environment, education and trade. That means diverse stakeholders (including government, politicians, academics, professionals, donors and civil society) have to take responsibility for AMR action within their own spheres of influence.

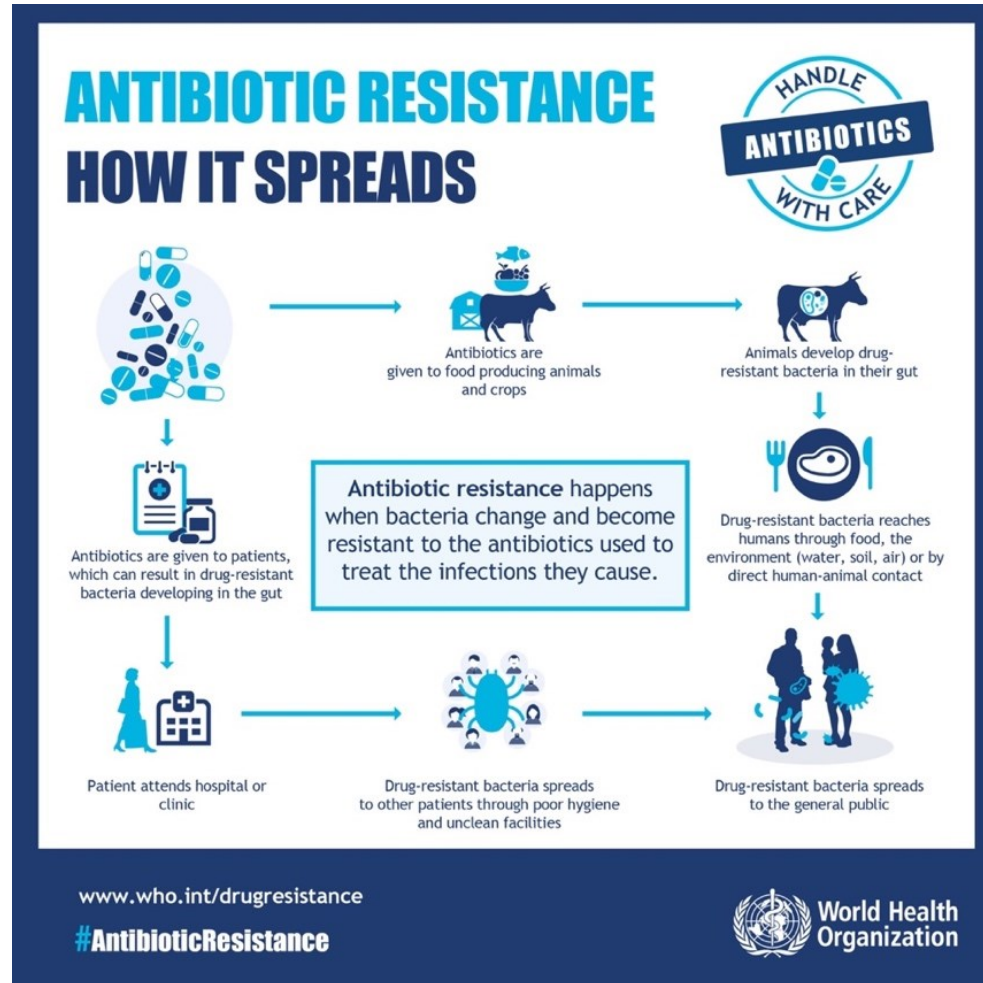
## **5. Make the case for investment**

Convincing politicians and donors of the need for investment is important to drive the AMR agenda forward at a high level. But to implement the NAP on the ground, budget managers, departmental decision-makers and potential partners will also need to be persuaded to invest additional resources into tackling AMR, or to realign existing programming to better address it.

## **6. Tailor the message**

If people are to invest in new activities or change existing ones to help implement the NAP, they must be able to see that AMR is relevant to their own goals and objectives. Effectively tailoring the message to enable that requires focusing.

# WHO Awareness campaigns

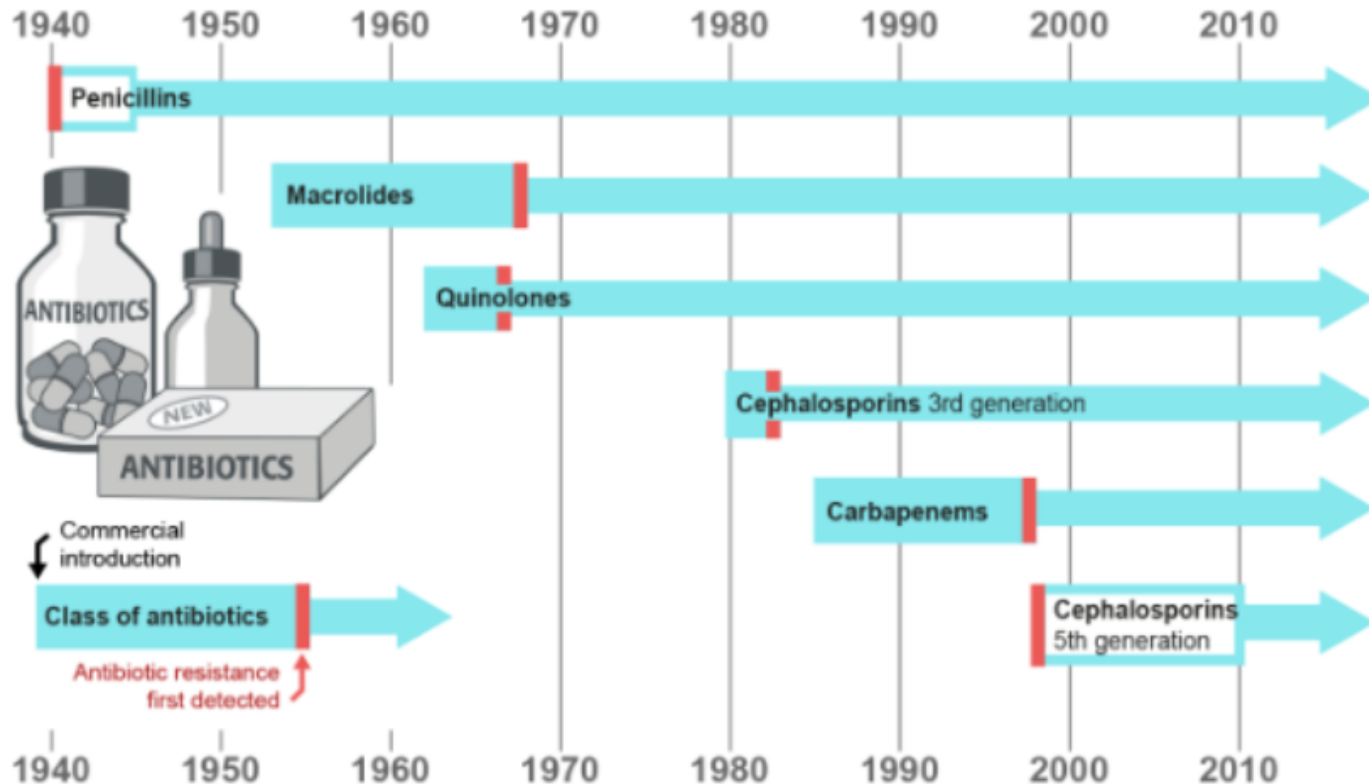


# Through which channels can SDC support action against AMR?

- Support NAPs and AMR specific capacities within local and national health programs and structures, including the private sector
- The same in agricultural and environmental programs, or even better through integrated one health approaches
- Be aware of local burden of disease, latest research results and interlinkages to other disease programs and synergies (diagnostics, supply chain, service quality, sexual reproductive health and neonatal health)

# Research and Development of new antibiotics is necessary, but not the main solution

## The short life span of antibiotic drugs





# R&D of new antibiotics and rapid diagnostics test supported by Switzerland (FOPH/ SDC)

**GARDP** (Global Antibiotic Research and Development Partnership)

- > 5 new antibiotics by 2025
- > better distribution and regulation in LMIC

**FIND** > rapid tests to distinguish bacterial from other infections (viral, malaria..) to reduce unnecessary use of antibiotics

**RAMP** > Better antibiotic manufacturing standards to decrease resistance building through waste water in the environment



# Thank you !

For more information:  
<https://adoptaware.org>