

Prevention of Antimicrobial Resistance (AMR)

Update on International Strategies
foring humanitarian symposium 2018

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AMR – a global problem

0. Definition

1. What are the problems?
2. What needs to be done & which plans exist?
3. What is missing?

ABR and AMR

- Antibiotic resistance (ABR)
only bacteria
- “Antimicrobial resistance (AMR) threatens the effective prevention and treatment of an ever-increasing range of infections caused by bacteria, parasites, viruses and fungi.”

WHO (2014) Antimicrobial resistance: global report on surveillance.

Antibiotic resistance



Antibiotics kill most bacteria...

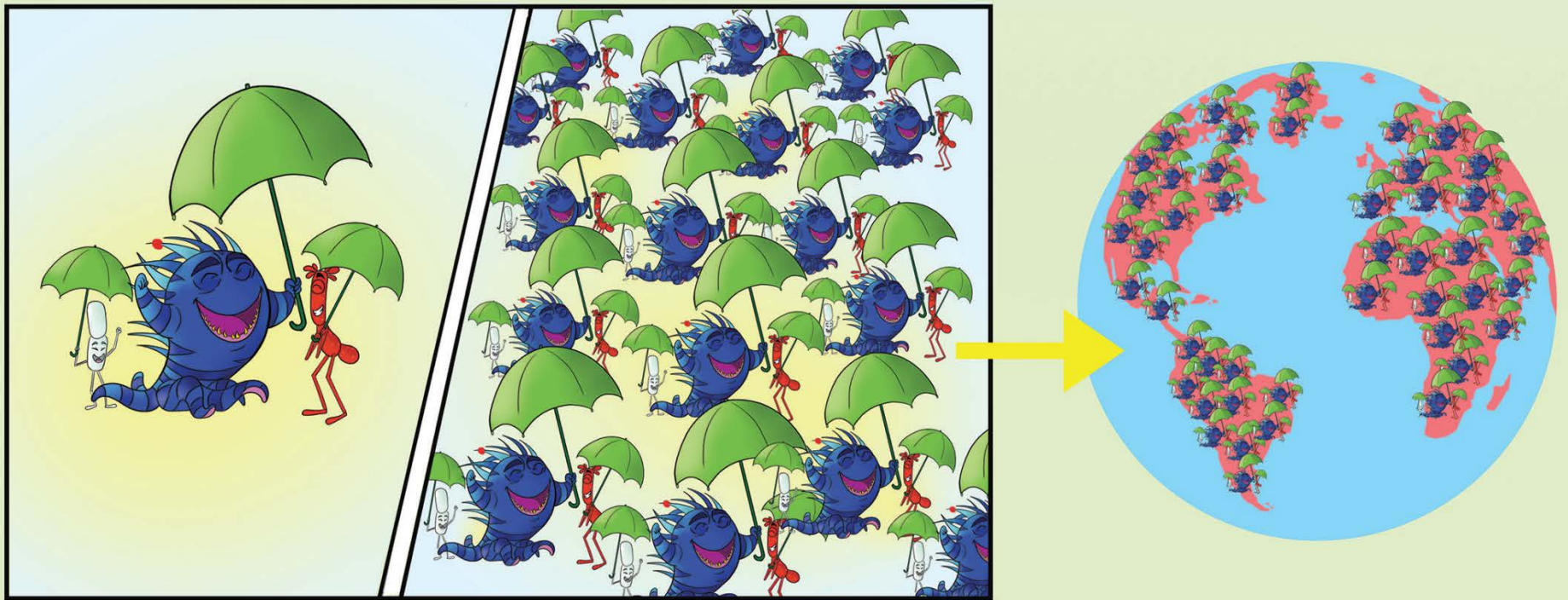


...but some can survive and become
antibiotic resistant (=superbugs)



And **share resistance**
with all other bacteria

Antibiotic resistance

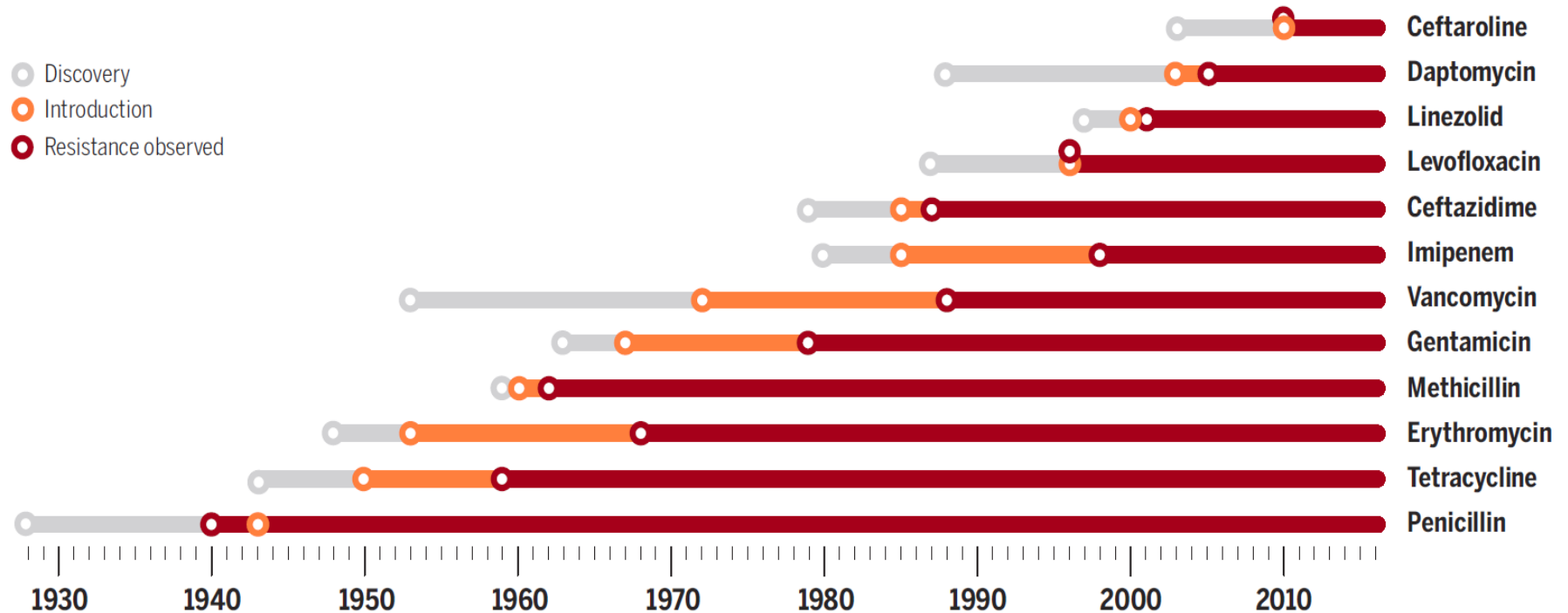


Superbugs multiply and spread everywhere

Resistance is inevitable

The rise of resistance

Bacteria have developed resistance to every antibiotic discovered so far, sometimes even before the drug reached the market. The appearance of resistance does not mean that a drug has become completely useless.

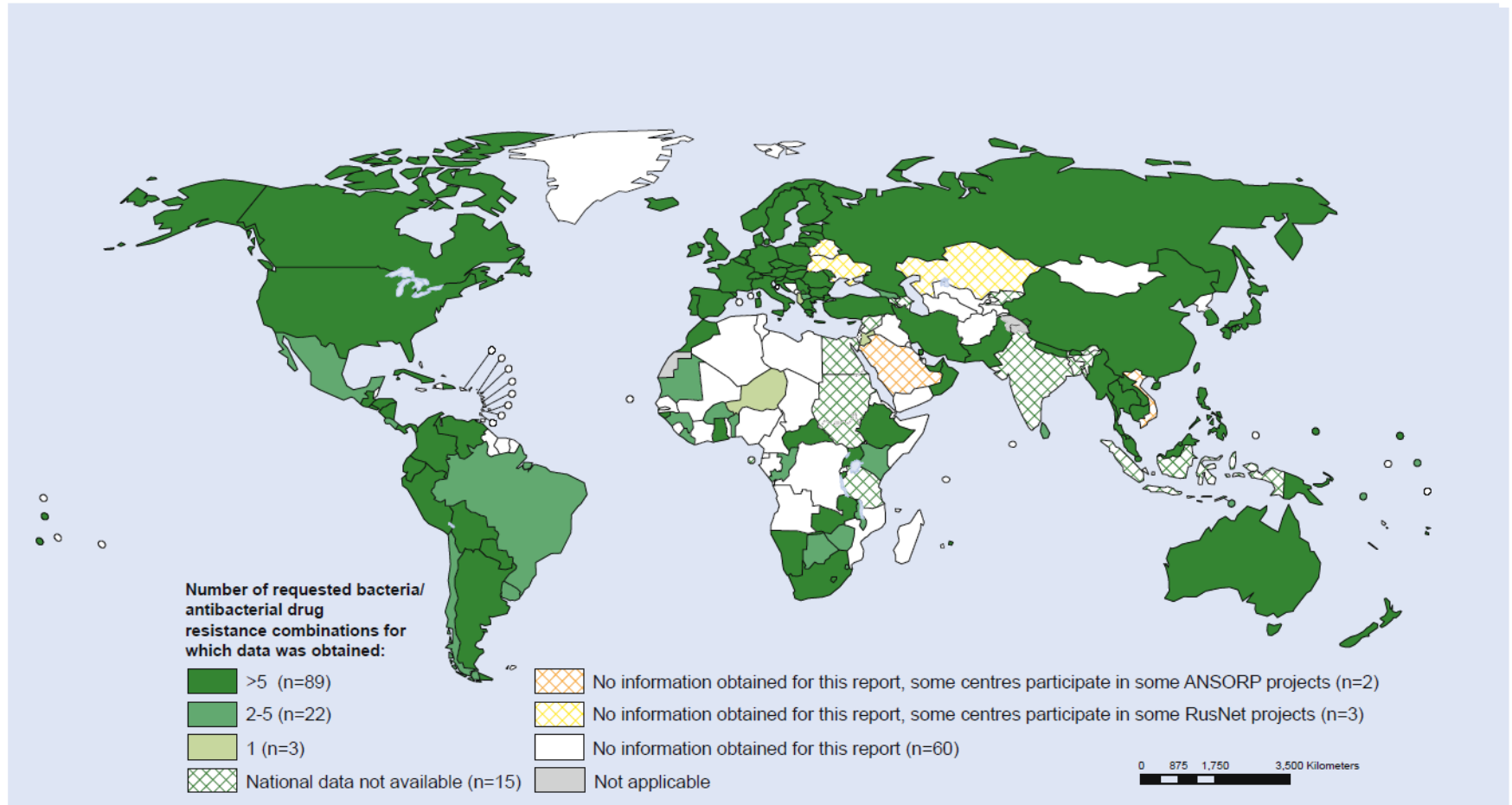


1. What are the problems

- Antibiotic resistance is on the rise
- More people die unnecessarily
- Treatment becomes more complicated and expensive

Knowledge is incomplete

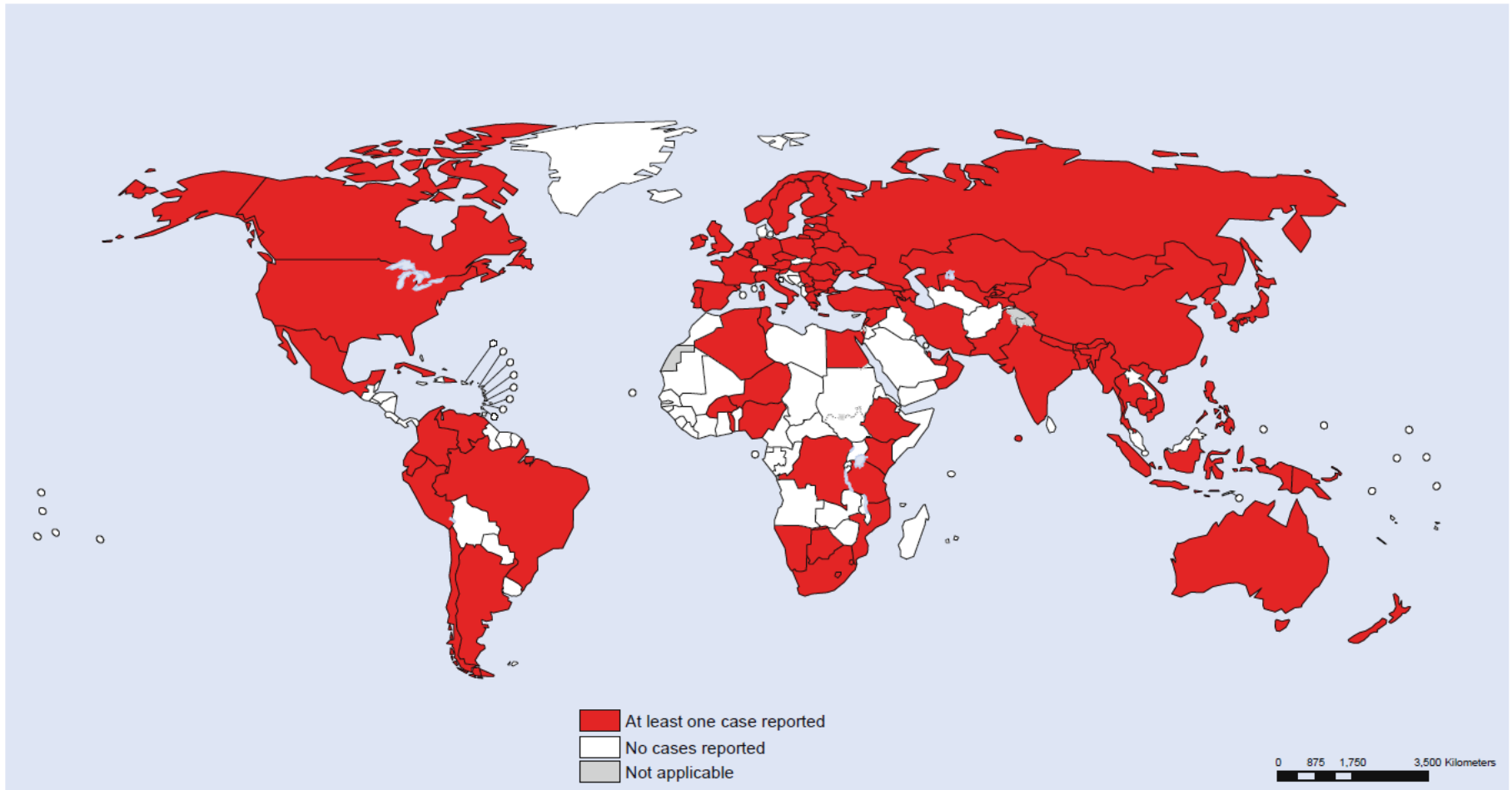
Figure 2 Availability of data on resistance for selected bacteria–antibacterial drug combinations, 2013



WHO (2014) Antimicrobial resistance: global report on surveillance.

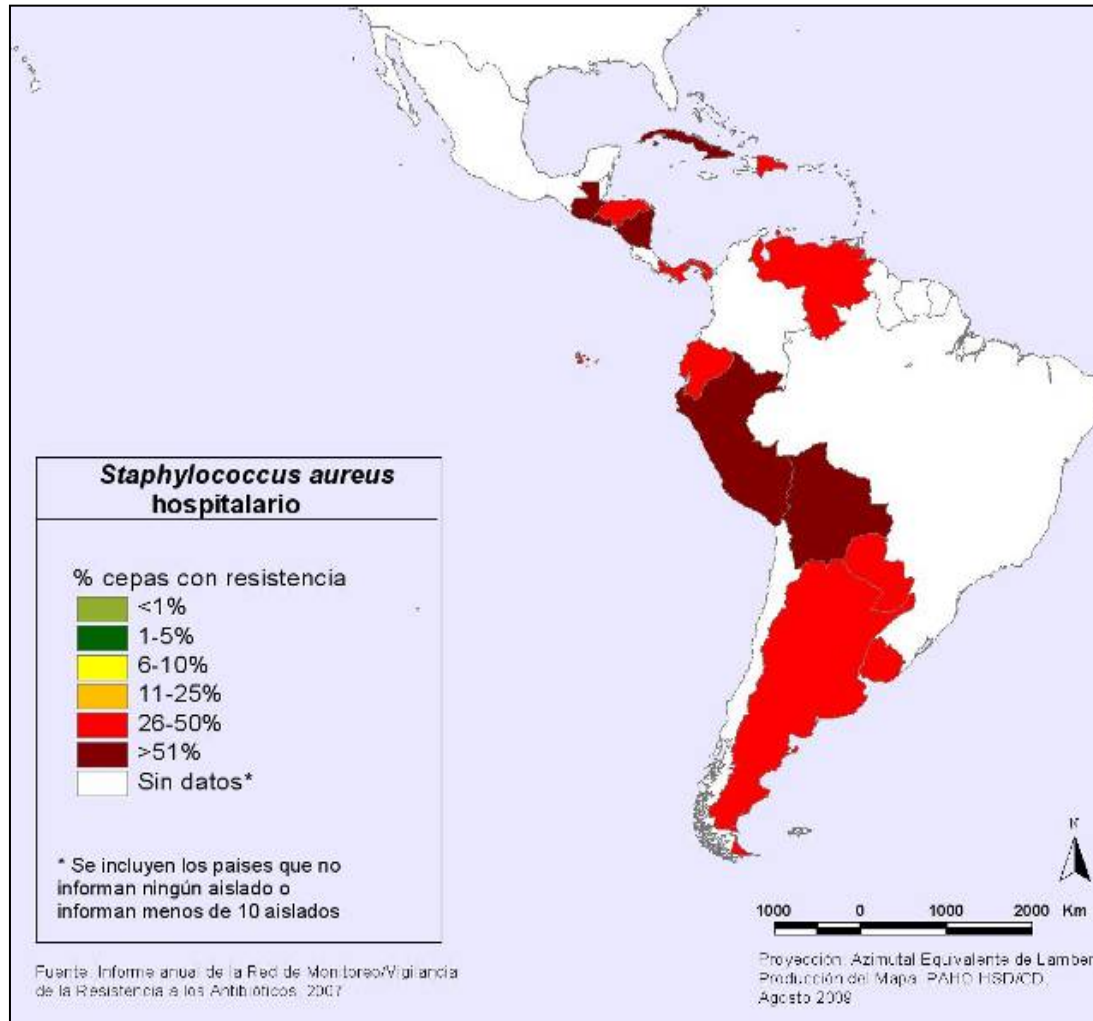
Resistance is widespread: TB

Figure 16 Countries that notified at least one case of extensively drug-resistant TB (XDR-TB) by the end of 2012



WHO (2014) Antimicrobial resistance: global report on surveillance.

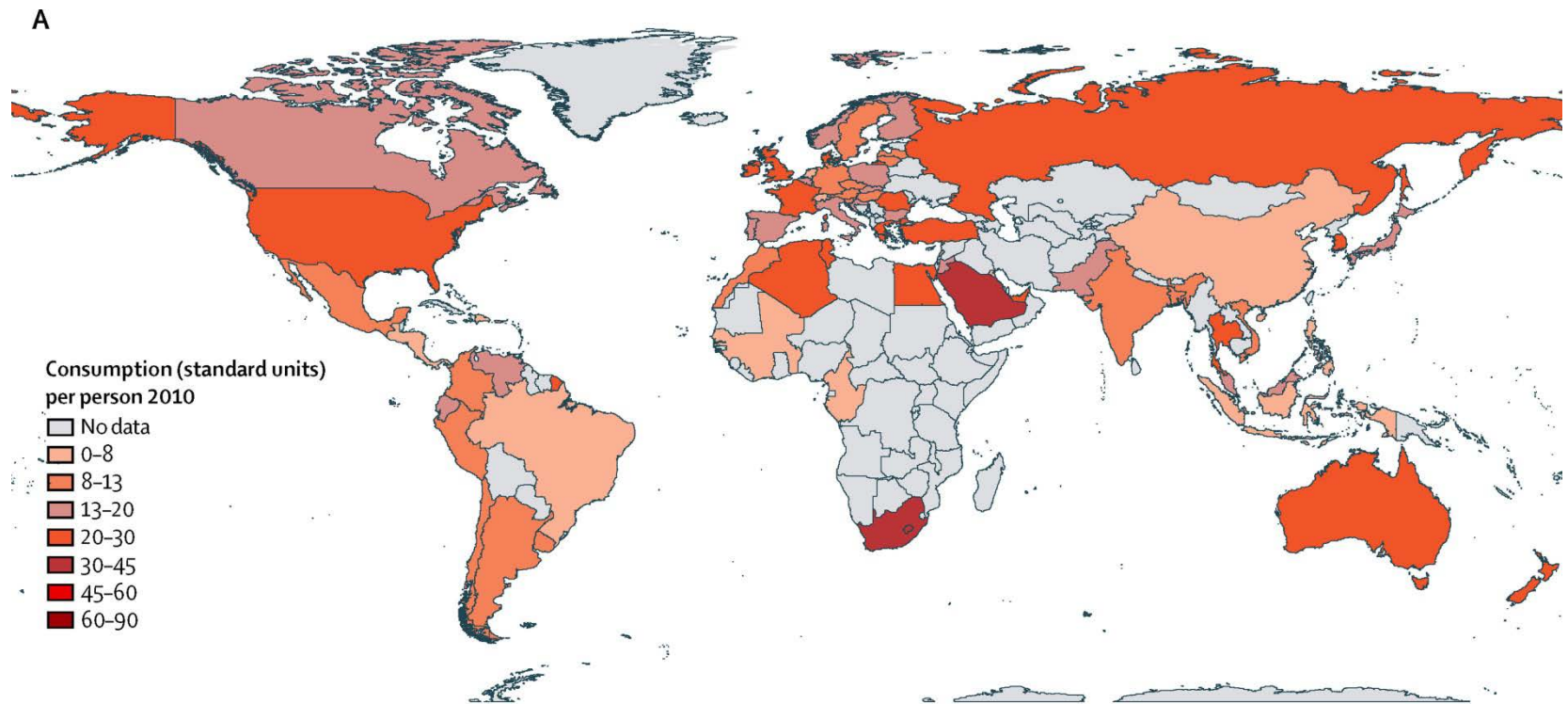
Methicillin-resistant *Staphylococcus aureus*



% of Methicillin-resistant
Staphylococcus aureus out of all
S. aureus causing
hospital-related
infections in latin
America, 2007

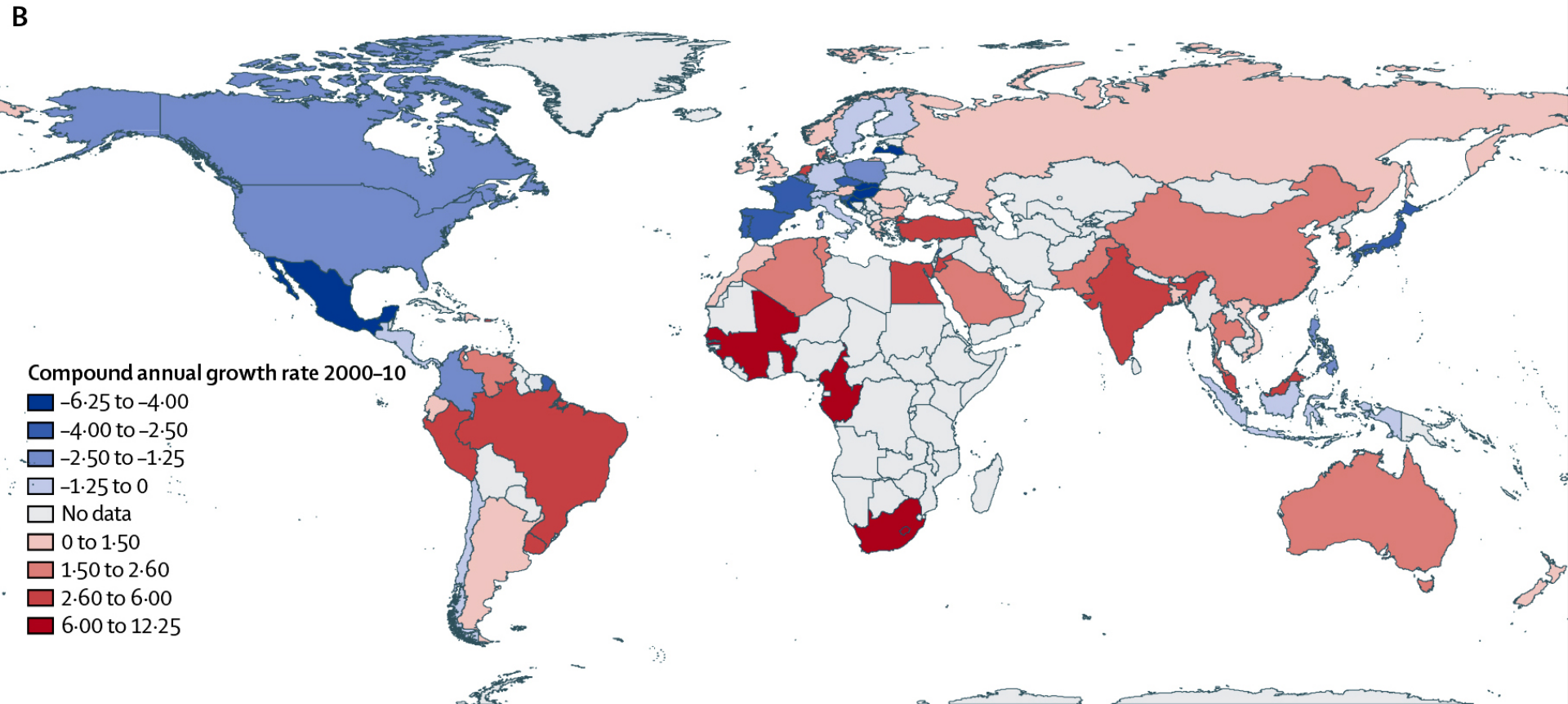
Too much of a good thing

Antibiotic consumption per person



Poorer countries are catching up

Consumption growth



Resistance travels

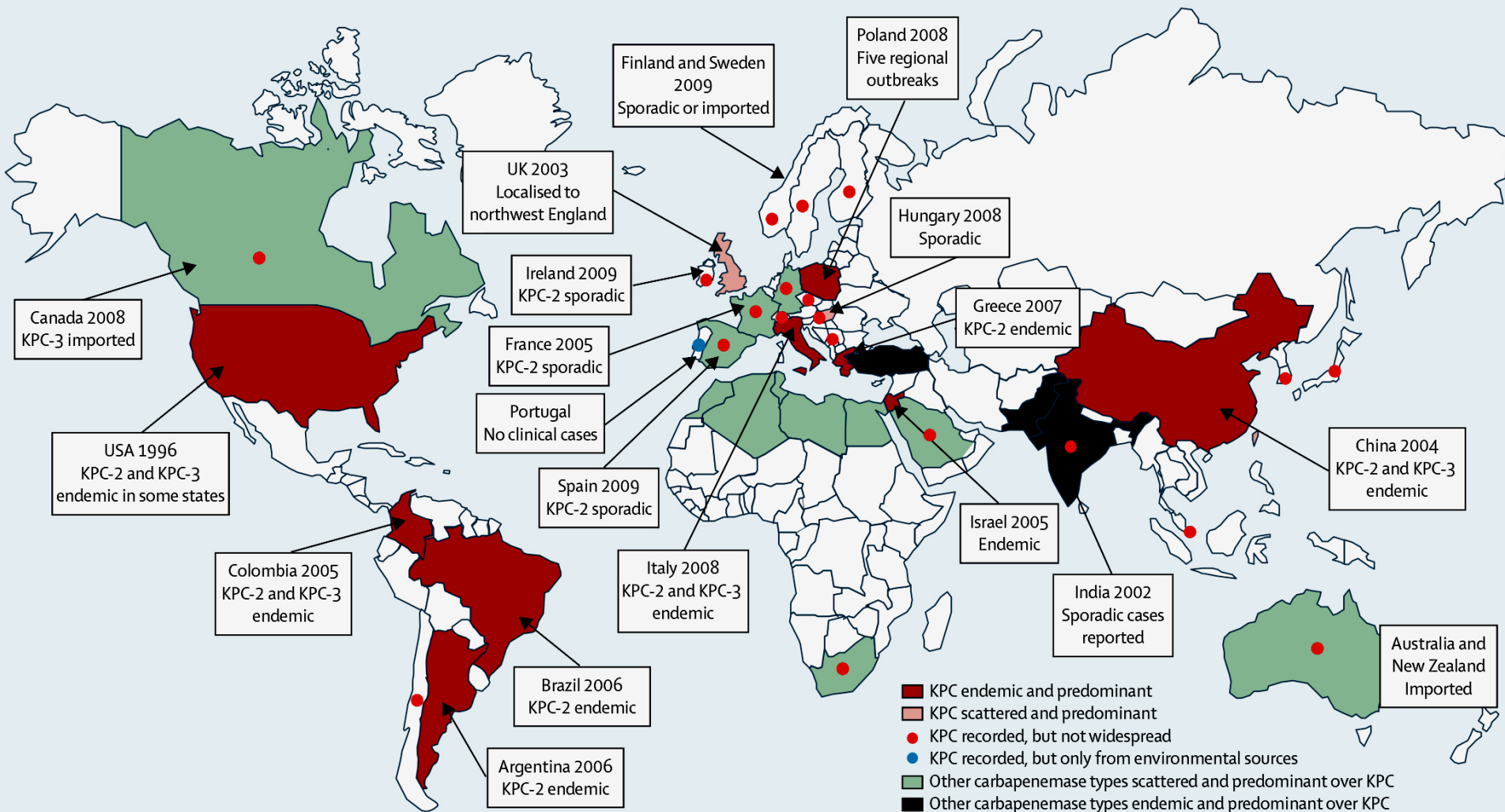


Flights between 6000 airports 2012

(Wieler 2016)

Resistance on the move

Klebsiella pneumoniae carbapenemases (KPCs)



AMR – many factors

- I. over-prescribing & dispensing of antibiotics
- II. misuse of antibiotics by patients
- III. over-use & misuse of antibiotics in livestock, fish farming & on plants
- IV. lack of new antibiotics being developed
- V. poor infection control in hospitals, clinics & farms
- VI. lack of toilets & proper sewage disposal

But also environmental pollution



Drug plant in Hyderabad

© phoenix/NDR/Christian Baars

Hyderabad, India

Water from sewers,
rivers, drinking water

- 26 of 28 samples
resistant bacteria

- 14 of 16 samples
with antibiotics

Cut-off for resistance
selection exceeded

Infection
DOI 10.1007/s15010-017-1007-2

ORIGINAL PAPER

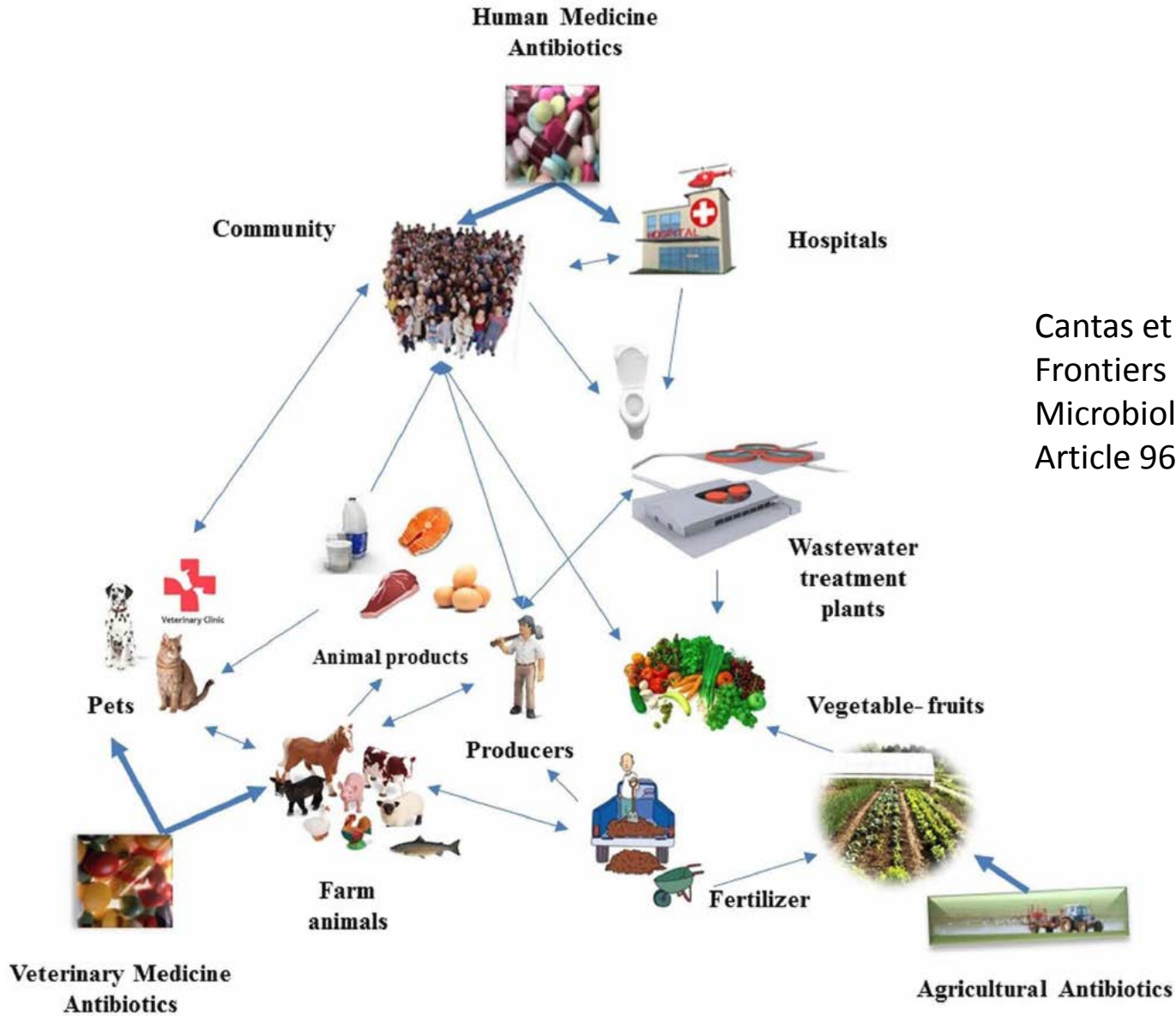
Environmental pollution with antimicrobial agents from bulk drug manufacturing industries in Hyderabad, South India, is associated with dissemination of extended-spectrum beta-lactamase and carbapenemase-producing pathogens

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- Moxifloxacin 5,500 x
- Ciprofloxacin 700 x
- Ampicillin 115 x
- Clarithromycin 110 x

AMR a complex picture



Cantas et al. (2013)
Frontiers in
Microbiology; 4,
Article 96

2. What needs to be done?

One health approach

- The health of people, animals and environment are closely interlinked

'One Health' is an approach to designing and implementing programmes, policies, legislation and research in which multiple sectors communicate and work together to achieve better public health outcomes.

www.who.int/features/qa/one-health/en/

The One Health Triad



<https://followtheoutbreak.files.wordpress.com/2013/10/science.jpg>

WHO Global action plan on antimicrobial resistance

The May 2015 World Health Assembly adopted a global action plan on antimicrobial resistance, which outlines five objectives:

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

WHO Global action plan on antimicrobial resistance

- Framework for action
- Support for member states
- Surveillance network for ABR
- Detailed recommendations for diverse sectors to tackle AMR for national implementation



Prevention

Humans

- Better living conditions (water, sewage ...)
- Hygiene
- Cleaner food
- AB use in animals



AB use in animals

- Ban antibiotics as growth stimulant
- Healthy environment
- Limit use to treatment of diseases
- Use qualified vets



AB use in humans

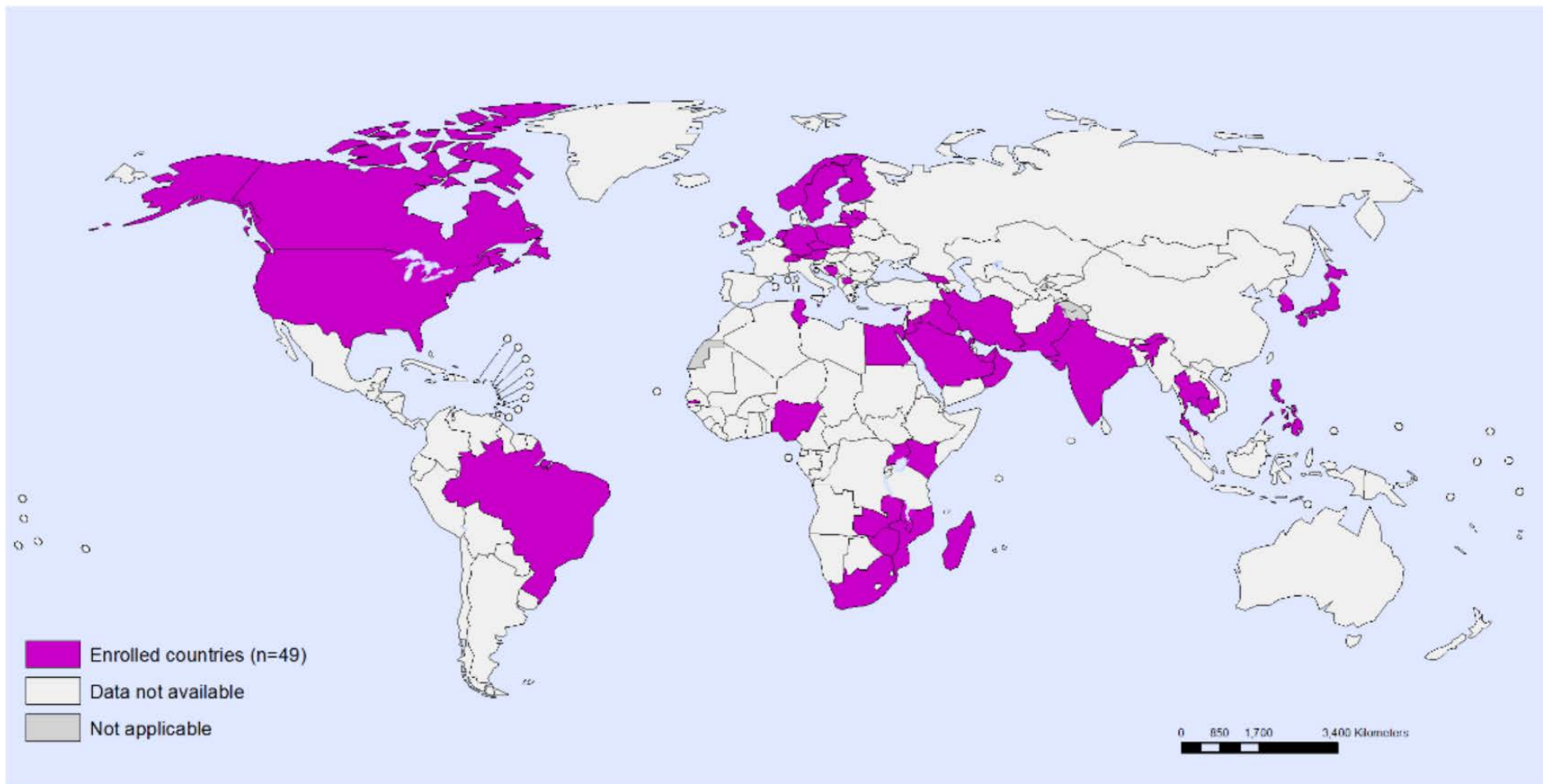
- Less and better targeted prescriptions
 - Needs surveillance & laboratories
 - Control of distribution >Rx
 - Training of prescribers (AB stewardship)
- Better hygiene in health facilities
- Education of patients
- Access to treatment >UHC

Implementation

- National plans
- Local implementation in the different sectors
 - Talking to and actively involving actors
 - Changing attitude and behaviour
- Stumbling blocks
 - e.g. lack of clean water

WHO surveillance network

GLASS country enrolment status, as of December 2017



The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

Data Source: World Health Organization
Map Production: Information Evidence and Research (IER)
World Health Organization



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3. What's (sometimes) missing?

One health not taken seriously

- Cooperation across sectors difficult
- Tackling poverty would reduce the need for antibiotics dramatically
- Integration of AMR policies in the existing health system (no vertical approach) =UHC
- Teaching doctors antibiotic stewardship is rare even in rich countries

What's missing?

Action on animal health

- Large scale intensive farming (more profitable at cost of the environment)
- Commercial interest in selling antibiotics
- Farmers and doctors don't talk with each other

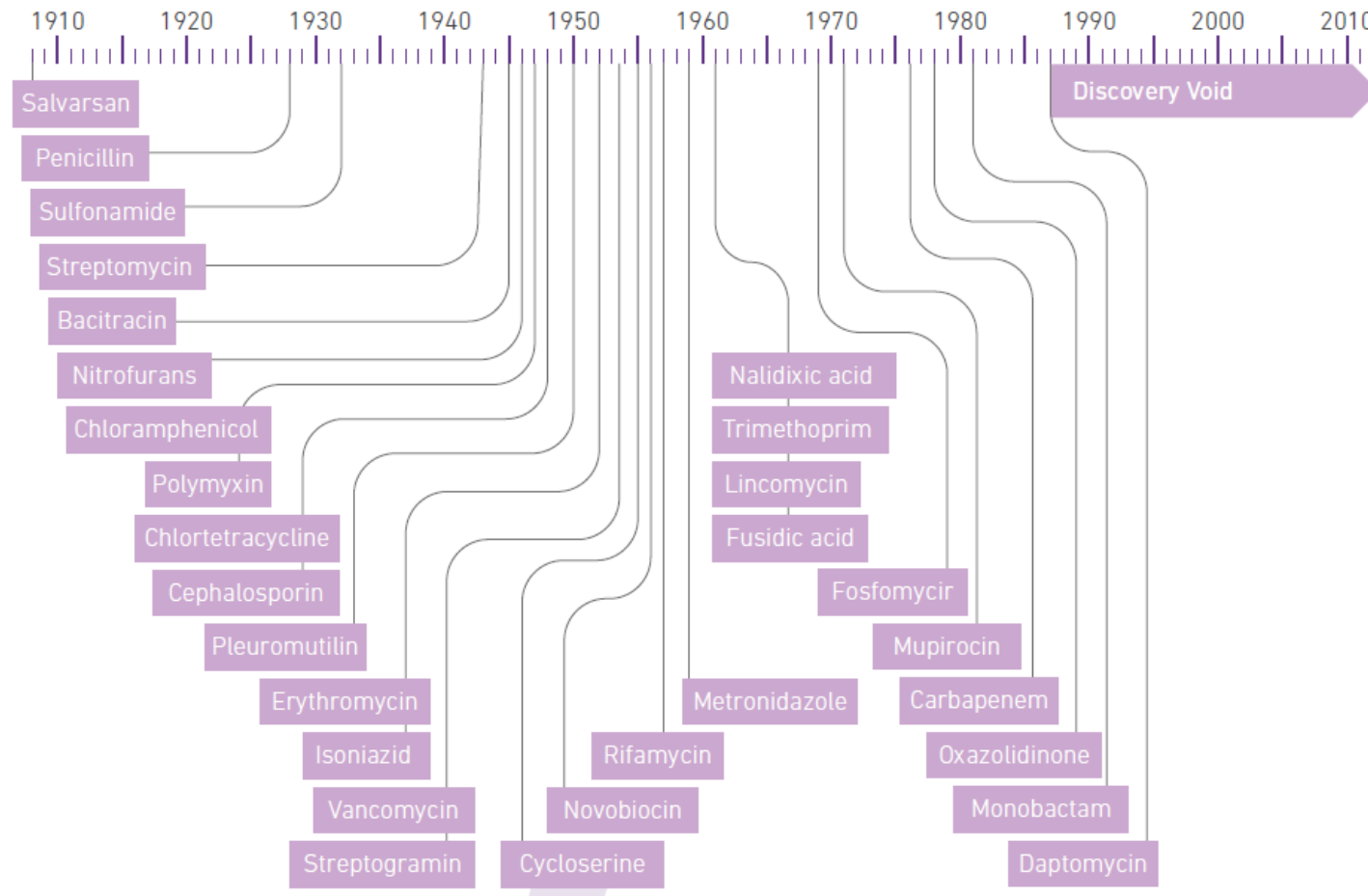


What's missing?

New antibiotics – discovery void

Figure 1 Dates of discovery of distinct classes of antibacterial drugs

Illustration of the “discovery void.” Dates indicated are those of reported initial discovery or patent.



WHO (2014) Antimicrobial resistance: global report on surveillance.

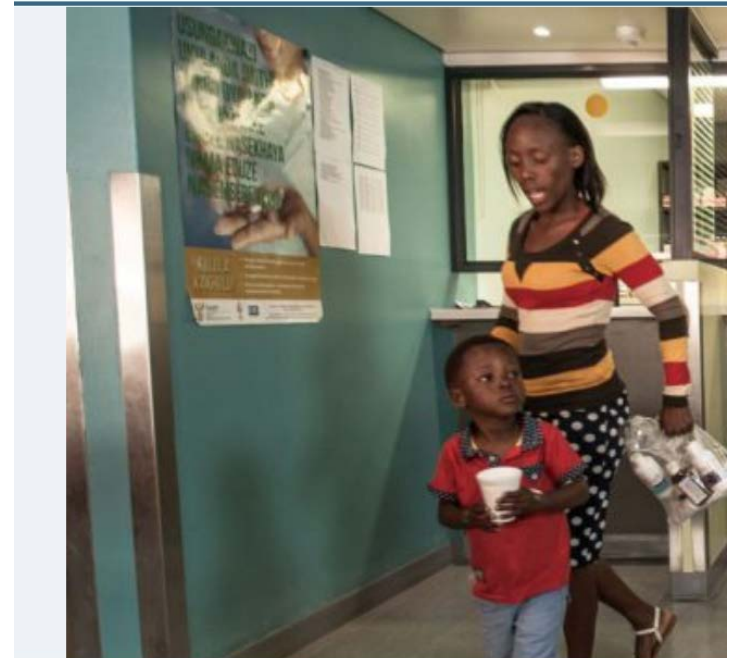
- Little incentive for industry
(other indications more profitable)
- Risk of overuse to recoup cost

Der Chirurg (2017), 88(1)

Research: Public investment needed

First steps taken

- The Global Antibiotic Research & Development Partnership (GARDP)
- WHO and Drugs for Neglected Diseases initiative (DNDi)
- Co-funding by German government



What we do

Online learning tool

BUKO Pharma-Kampagne

Start

**Modul A
Einführung**

Modul B
Grundlagen

Modul C
Verbreitung

Modul D
Humanmedizin

Modul E
Veterinärmedizin

Modul F
Empfehlungen
für die
Projektarbeit

Glossar / Quellen

Login

Modul A Einführung

Ein post-antibiotisches Zeitalter
verhindern



Modul A Einführung

A.1 Resistenzen bedrohen
besonders die Armen

A.2 One World - One
Health

A.3 Globale Krankheitslast

A.4 Soziale
Determinanten

A.5 Globale Strategien

Feedback

Zu den Fragen

www.bukopharma-online-lernbox.de/Antibiotika-Resistenzen

www.bukopharma.de

- Information
- Education
- Advocacy

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