

# Antimicrobial Resistance: threat and action. Opportunities and challenges for the health policies

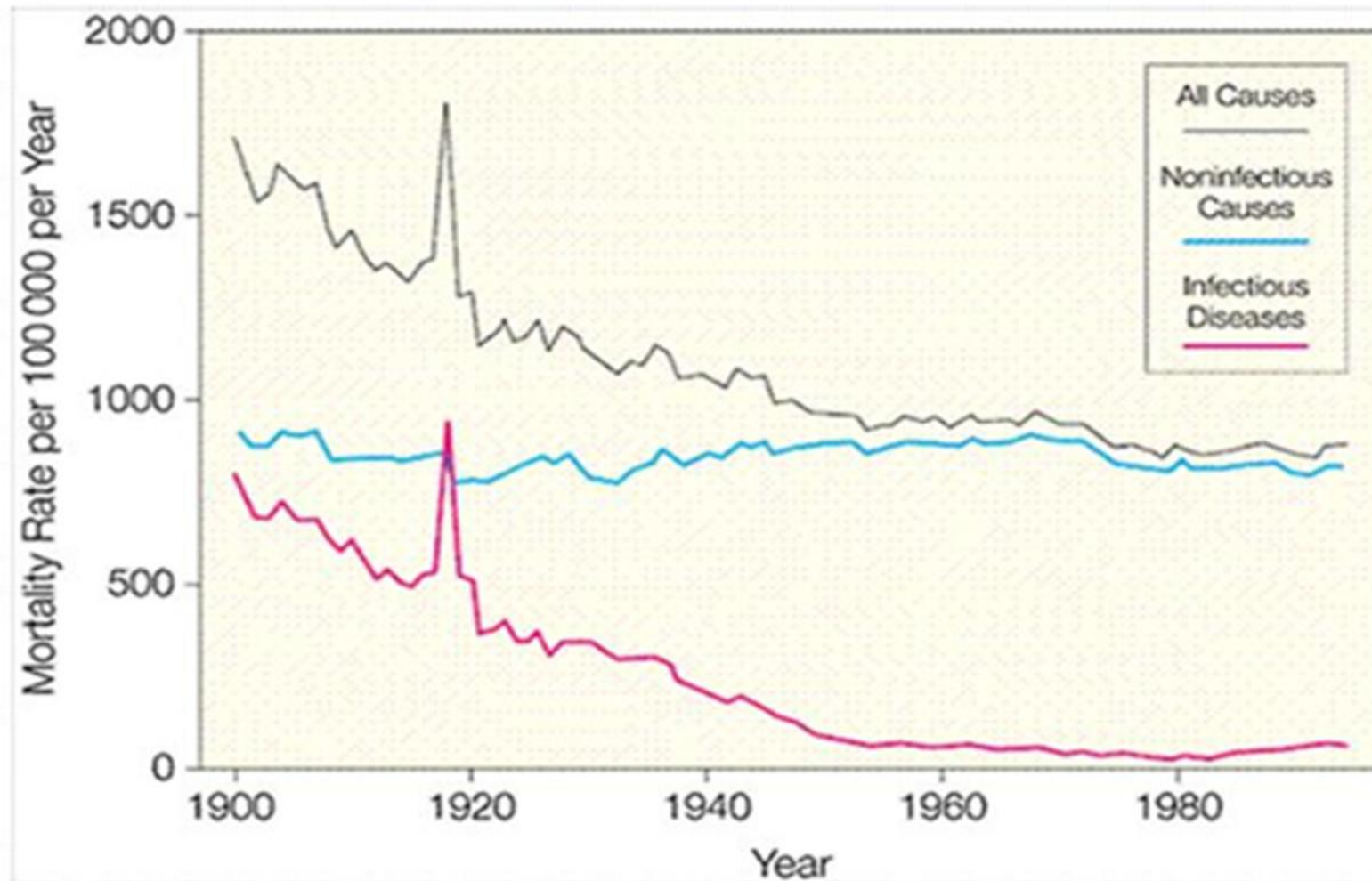
Consumo de antibioticos y trasmision de resistencia entre humanos y animals: un riesgo real?

Madrid, 5<sup>th</sup> June 2018

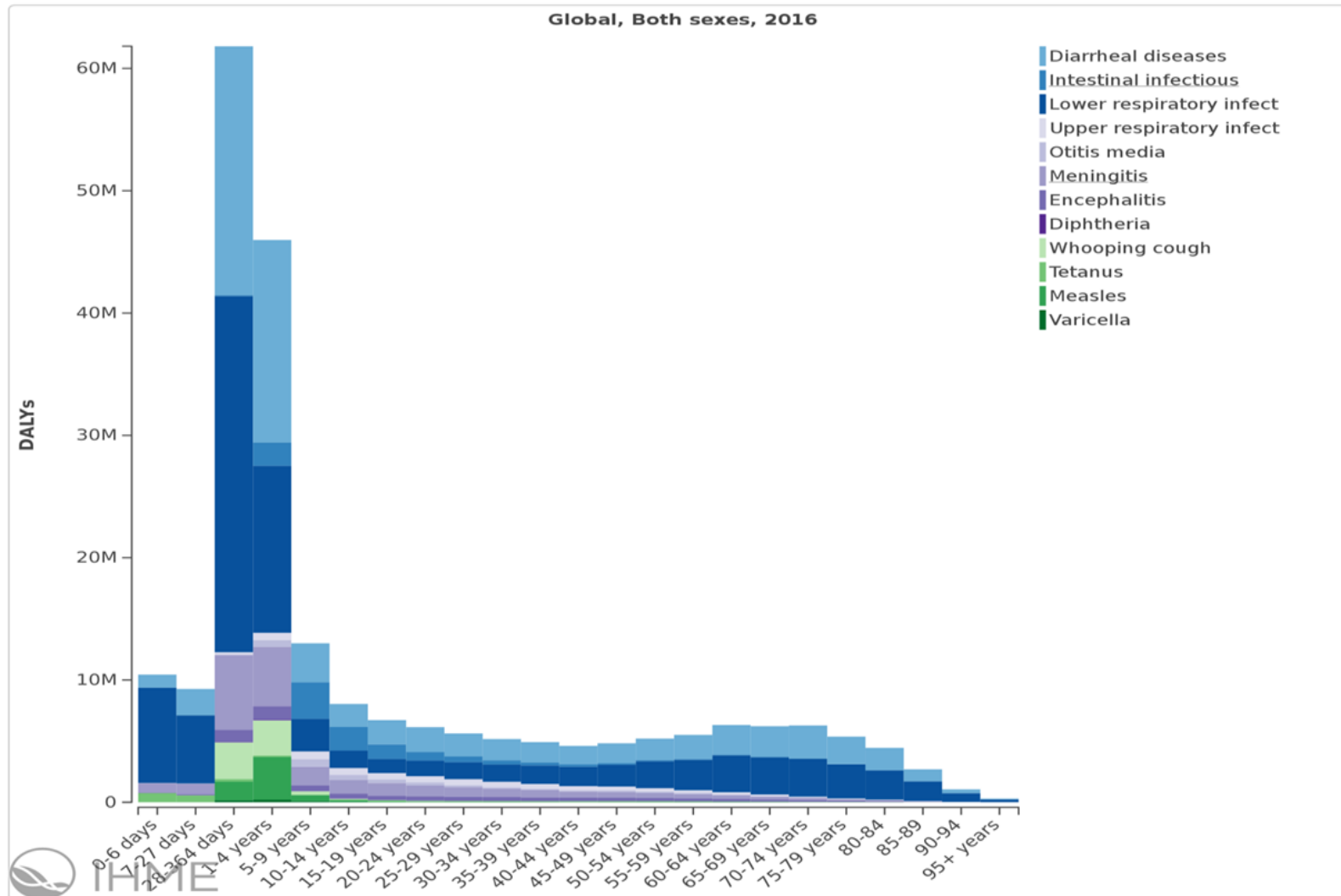


**World Health  
Organization**

# Impact of antimicrobials on infectious disease in Europe

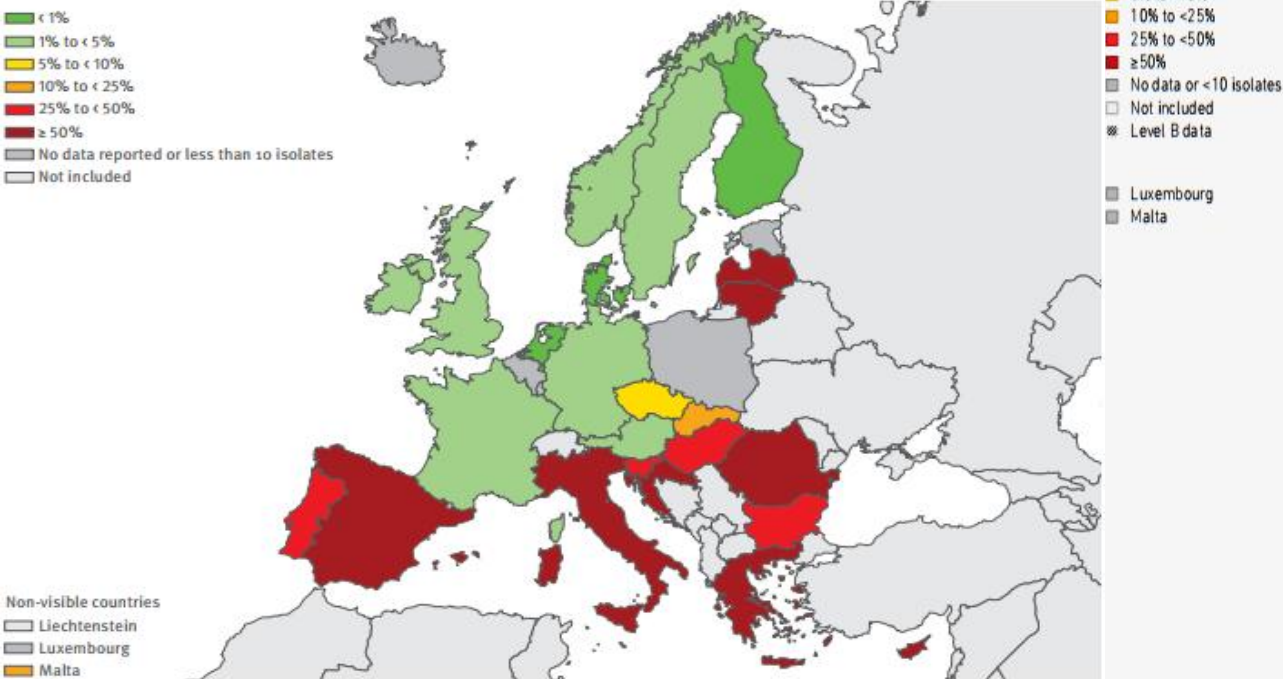


# Burden of infectious disease is in the under 5s



# Multidrug-resistant *Acinetobacter* spp.

Figure 3.20. *Acinetobacter* spp. Percentage (%) of invasive isolates with combined resistance to fluoroquinolones, aminoglycosides and carbapenems, by country, EU/EEA countries, 2014

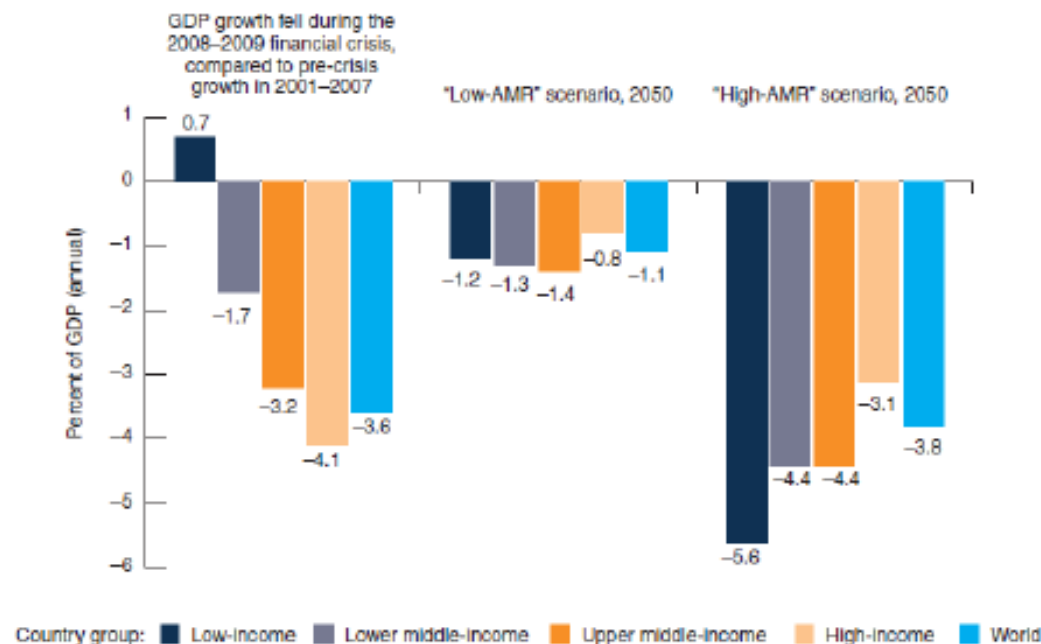


2014 EARS-net

2016 CAESAR

# Economic Impact

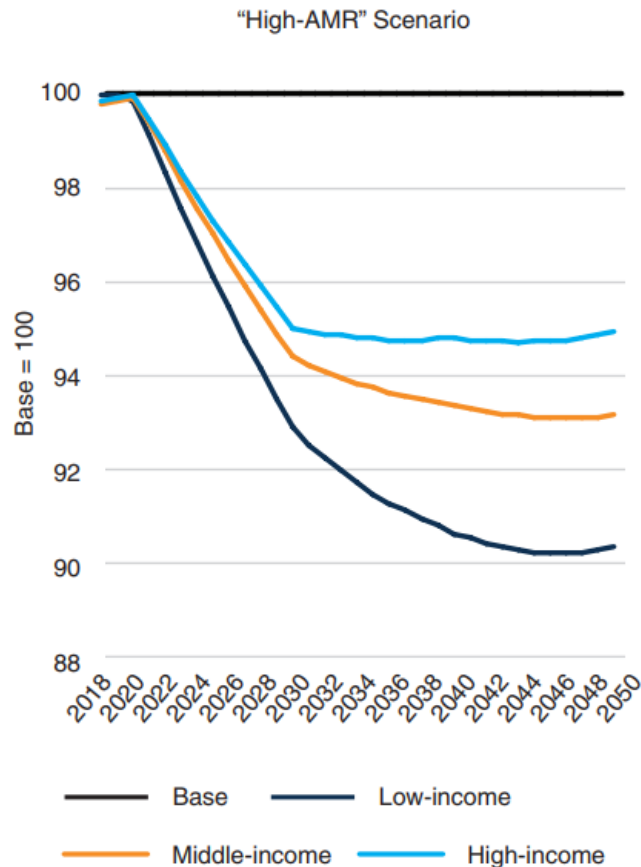
- Economic Costs of AMR May Be as Severe as During the Financial Crisis
- AMR could reduce GDP substantially, but unlike in the recent financial crisis, the damage could last longer and affect low-income countries the most.



Source: World Bank, March 2017. Drug-Resistant Infections: A threat to our economic future

# AMR Impact on Livestock Production

Decline in Livestock Production Could Be Substantial and Most Pronounced in Low-Income Countries



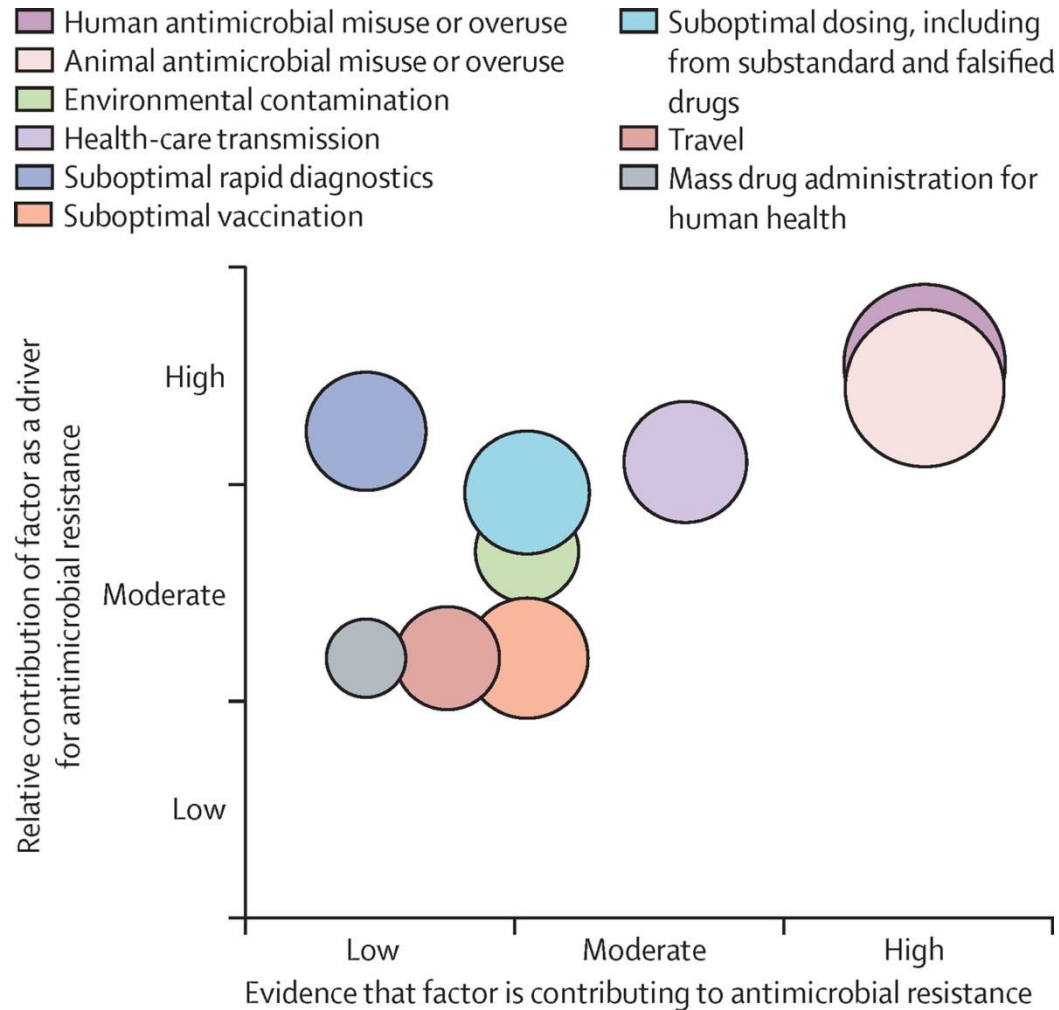
AMR reduces livestock production

- Poor animal health
- Restrictions on exports by trade partners

This particularly affects low- and middle-income countries

World Bank Group Report on Drug-Resistant Infections (March 2017)

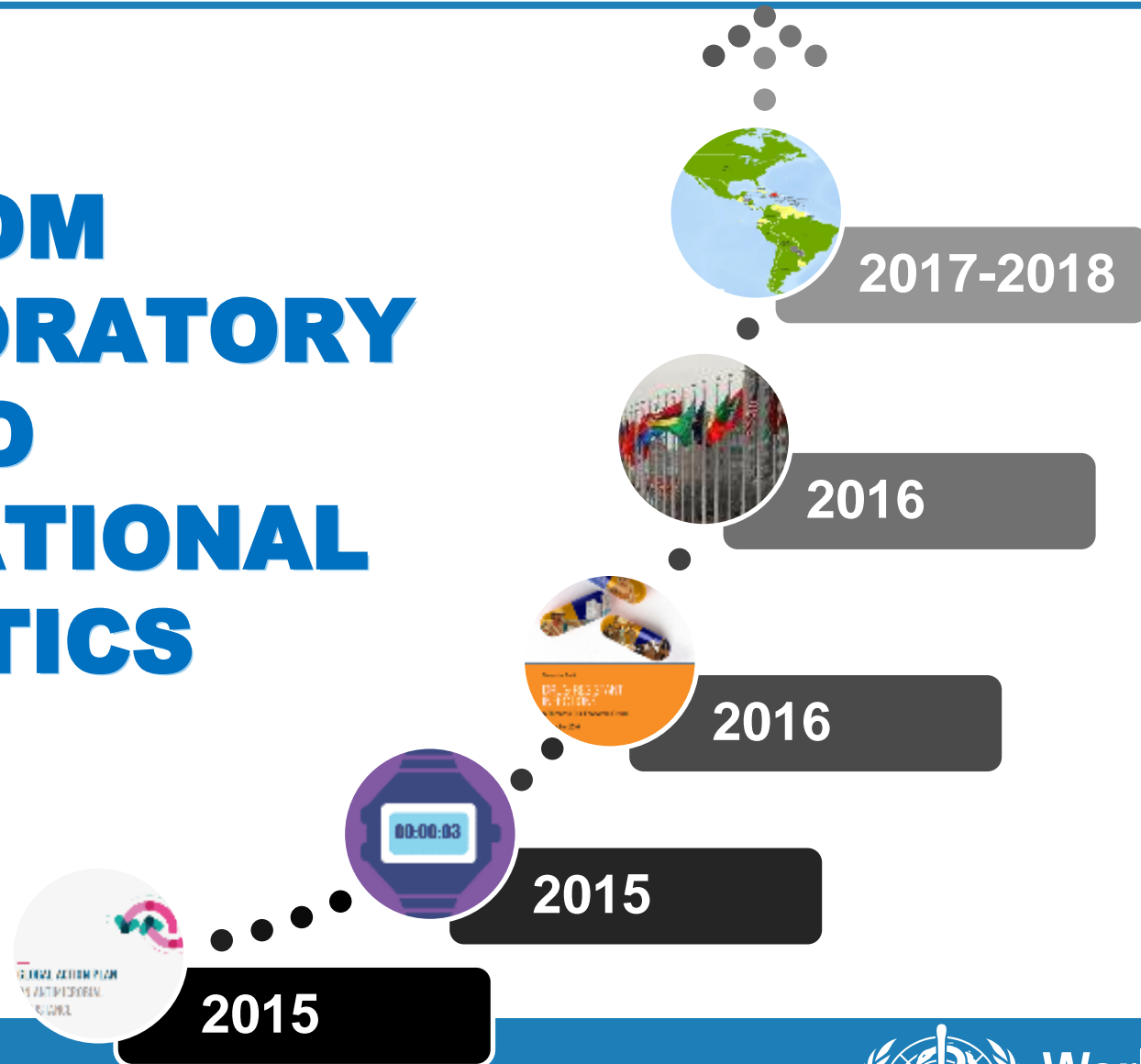
# Factors Contributing to AMR



Holmes at al., 2016

# ANTIMICROBIAL RESISTANCE

## FROM THE LABORATORY TO INTERNATIONAL POLITICS



# AMR and SDGs



AMR strikes hardest on the poor  
→ Rate of resistance is high  
→ Lack affordable treatment



Untreatable infections in animals threaten sustainable food production for our population



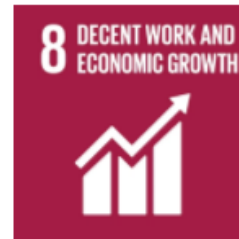
Antimicrobials are fundamental components of all health systems



All of which require multi-stakeholder partnerships



Antibiotic residues from hospitals, pharmaceutical companies and agriculture contaminate the water



\*Cumulative costs of AMR is predicted to be US \$120 trillion by 2050



It is crucial to balance access, innovation and conservation of antimicrobials to contain AMR

\*World Bank Group Report on Drug-Resistant Infections (March 2017)

# Global Action Plan's 5 Strategic Objectives

1. Improve awareness and understanding
2. Strengthen knowledge through surveillance & research
3. Reduce the incidence of infection
4. Optimize the use of antimicrobial medicines
5. Ensure sustainable investment

**Develop National Action Plan**

**Bring AMR to the UNGA**



# THE ONE HEALTH COLLABORATION



Food and Agriculture  
Organization of the  
United Nations



World Health  
Organization

**World leader in  
food  
& agriculture**

**World leader in  
animal health  
& welfare**

**World leader  
in  
human health**

**Tripartite Agreement / Collaboration  
(Common priorities including  
antimicrobial resistance)**



World Health  
Organization

# UN General Assembly

## Special Session on AMR – 21 Sep 2016



**Asamblea General**

Distr. general  
19 de octubre de 2016

Septuagésimo primer periodo de sesiones  
Tema 127 del programa

**Resolución aprobada por la Asamblea General el 5 de octubre de 2016**

*[sin remisión previa a una Comisión Principal (A/71/L.2)]*

**70/3. Declaración política de la reunión de alto nivel de la Asamblea General sobre la resistencia a los antimicrobianos**

# Ad-hoc Inter Agency Coordination Group



<http://www.who.int/antimicrobial-resistance/interagency-coordination-group/IACG-firstMtgReport.pdf?ua=1>



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# World Antibiotic Awareness Week (12 – 18 November 2018)



Misuse of **ANTIBIOTICS**  
puts us all at risk.

Taking antibiotics when you don't need them speeds up antibiotic resistance. Antibiotic resistant infections are more complex and harder to treat. They can affect anyone, of any age, in any country.

Always seek the advice of a healthcare professional before taking antibiotics.



World Health Organization

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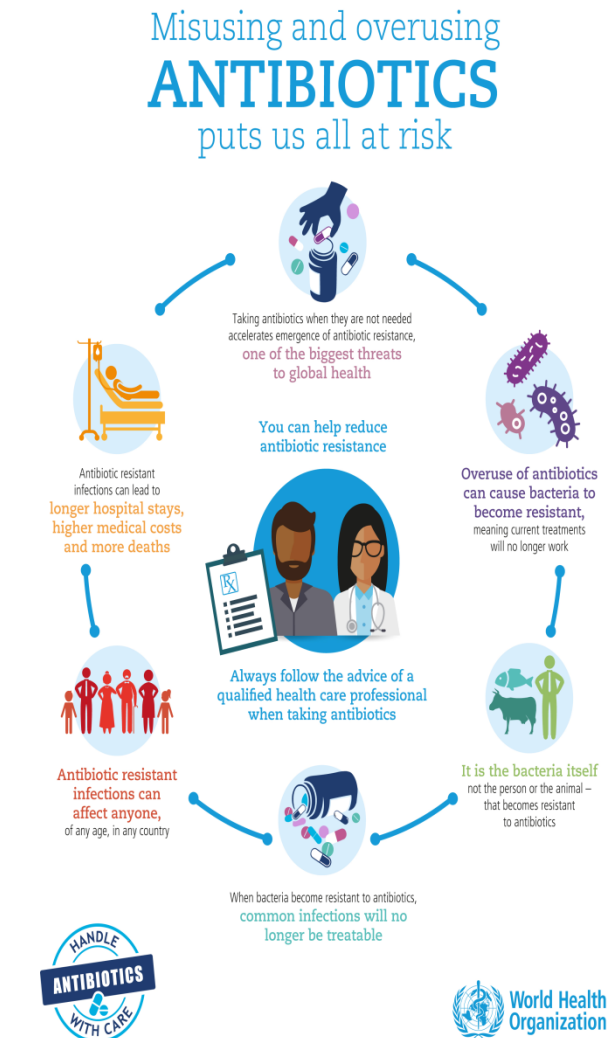
Develop National Action Plan



# AMR Surveillance: Information for Action

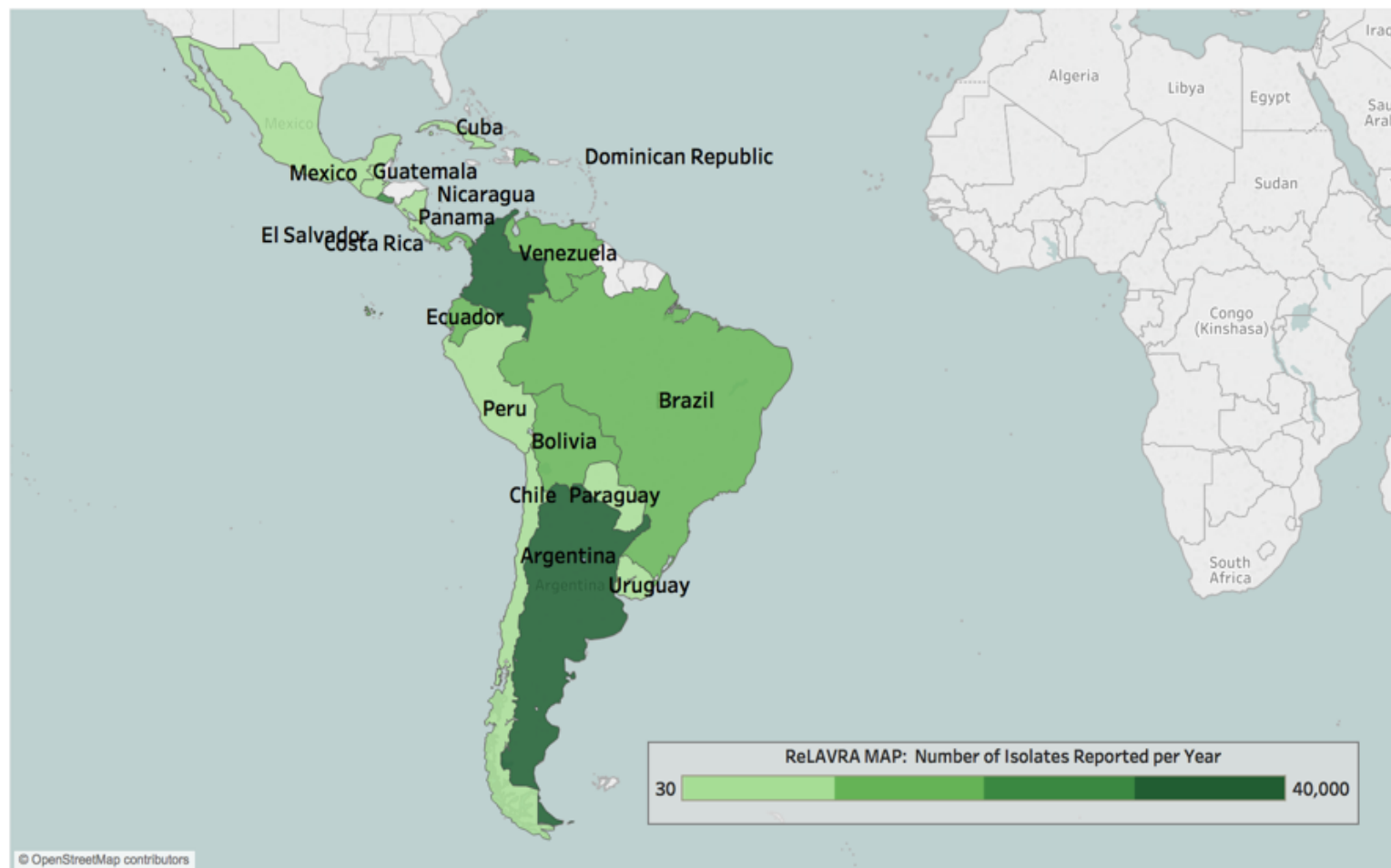
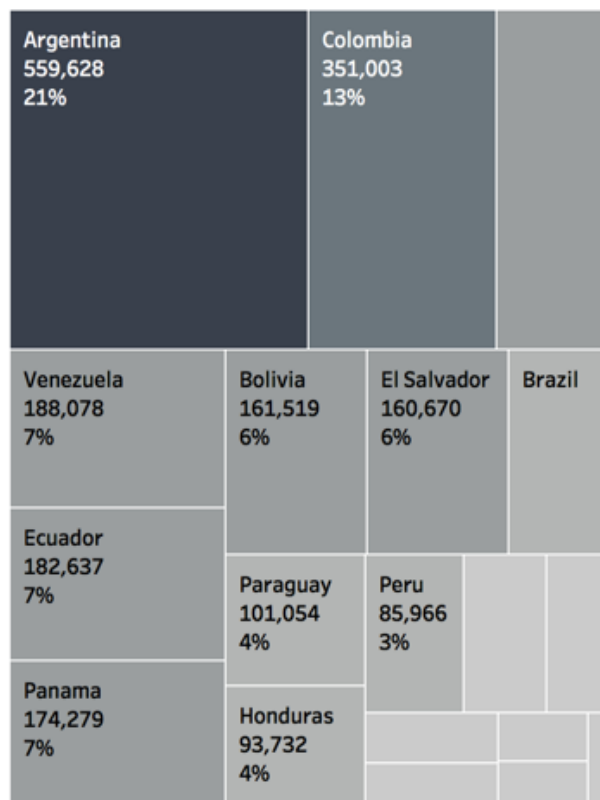
Surveillance of AMR is key for collecting information that can be used

- to assess the **spread** and magnitude of AMR
- to inform **burden** of disease estimates
- to drive local, national and global action: guidelines



## la Red Latinoamericana de Vigilancia de la Resistencia a los Antimicrobianos (ReLAVRA)

Number of isolates Reported to ReLAVRA  
(Aggregated 2000-2014)

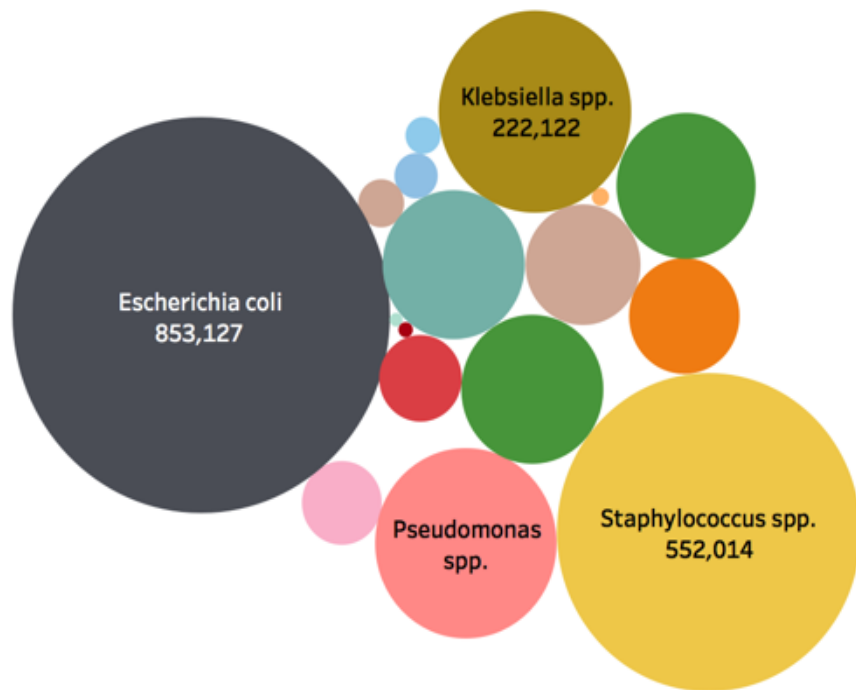


Year of Year

< 2014 > [Timeline controls] Show history

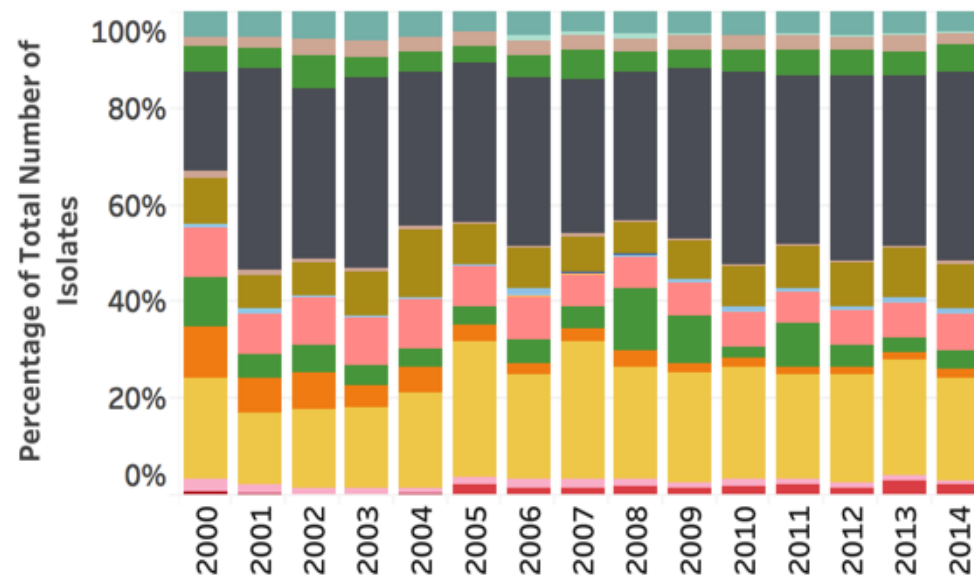
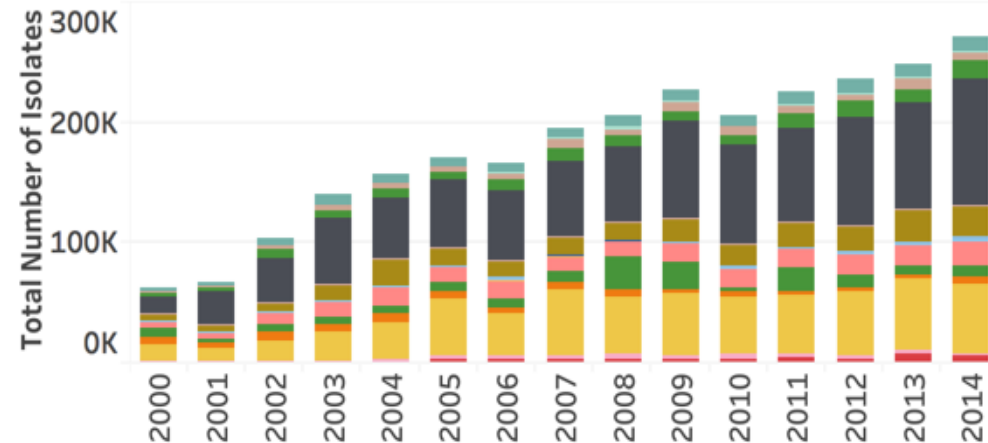
## la Red Latinoamericana de Vigilancia de la Resistencia a los Antimicrobianos (ReLAVRA 2000-2014)

### Flitros



**Total Number of Isolates Reported  
(2000-2014)**

**2,680,831**



**País**  
(All)

**Año**  
(Multiple values)

**Pathogen**

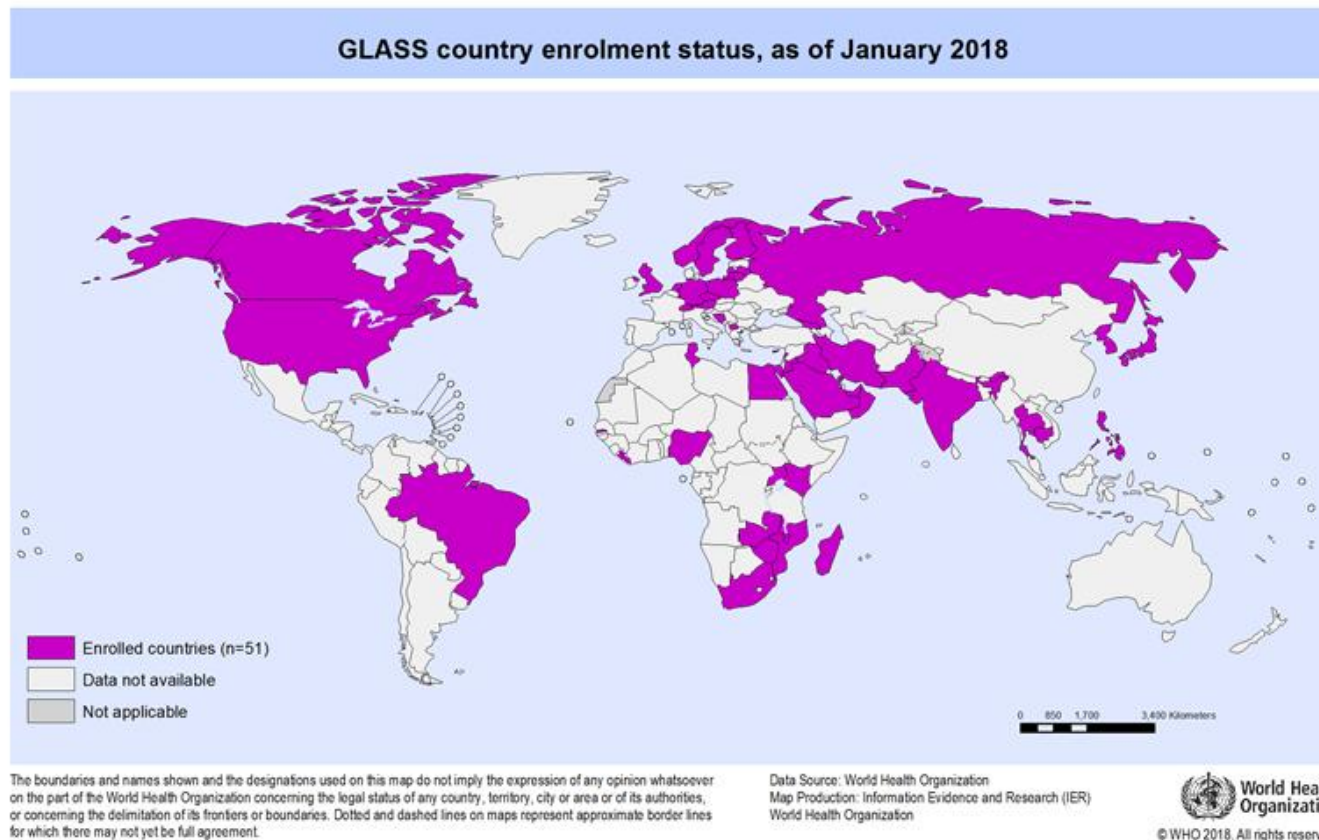
- Acinetobacter baumannii
- Enterobacter spp.
- Enterococcus spp.
- Klebsiella spp.
- Proteus mirabilis
- Salmonella spp.
- Shigella Spp.
- Staphylococcus spp.
- Streptococcus spp.
- Vibrio Cholerae
- Campylobacter spp.
- Escherichia coli
- Haemophilus influenzae
- Neisseria gonorrhoeae
- Neisseria meningitidis
- Pseudomonas spp.
- Streptococcus pneumoniae

# *Klebsiella pneumoniae* Percentage Non-susceptibility (I+R) to Imipenem

Data Source: ReLAVRA



# GLASS participation (January 2018)



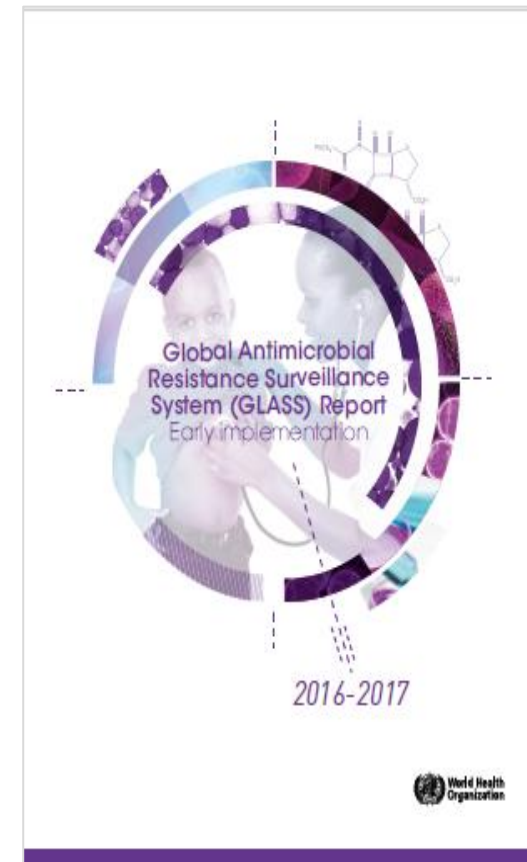
More than one fourth of  
WHO Member States  
are enrolled in GLASS

(52 countries – 30% of  
the world population)

# GLASS First Report

## Global Antimicrobial Resistance Surveillance System (GLASS) report: early implementation 2016-2017

- GLASS implementation steps over 2016-2017
- results from first data collection: **April to July 2017**
- information of the status of national surveillance systems (**42 countries**) and AMR data (**22 countries**).
  - ✓ 21 high-income countries, 16 middle-income countries and 5 low-income countries



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# Preventing Infections

## Infection Prevention and Control

- Core Components implementation manuals and assessment framework
- Hand Hygiene Day
- Guidelines

## Vaccines

- AMR in new vaccine development



# Implementing Antibiotic Stewardship & IPC

- AB stewardship and IPC should be integrated in national action plans
- Financial restrictions pose as a challenge for some countries
  - Important to consider **non-traditional stewards** (e.g. community health workers) in resource-limited settings
- Collaboration among countries and taking a multidisciplinary approach to AB stewardship is crucial

Goff, Debra A., and Marc Mendelson. "Antibiotic Stewardship Hits a Home Run for Patients." *The Lancet Infectious Diseases* (2017): n. pag. Web.

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# Priority pathogens for R&D

## TUBERCULOSIS: A GLOBAL PRIORITY FOR RESEARCH AND DEVELOPMENT

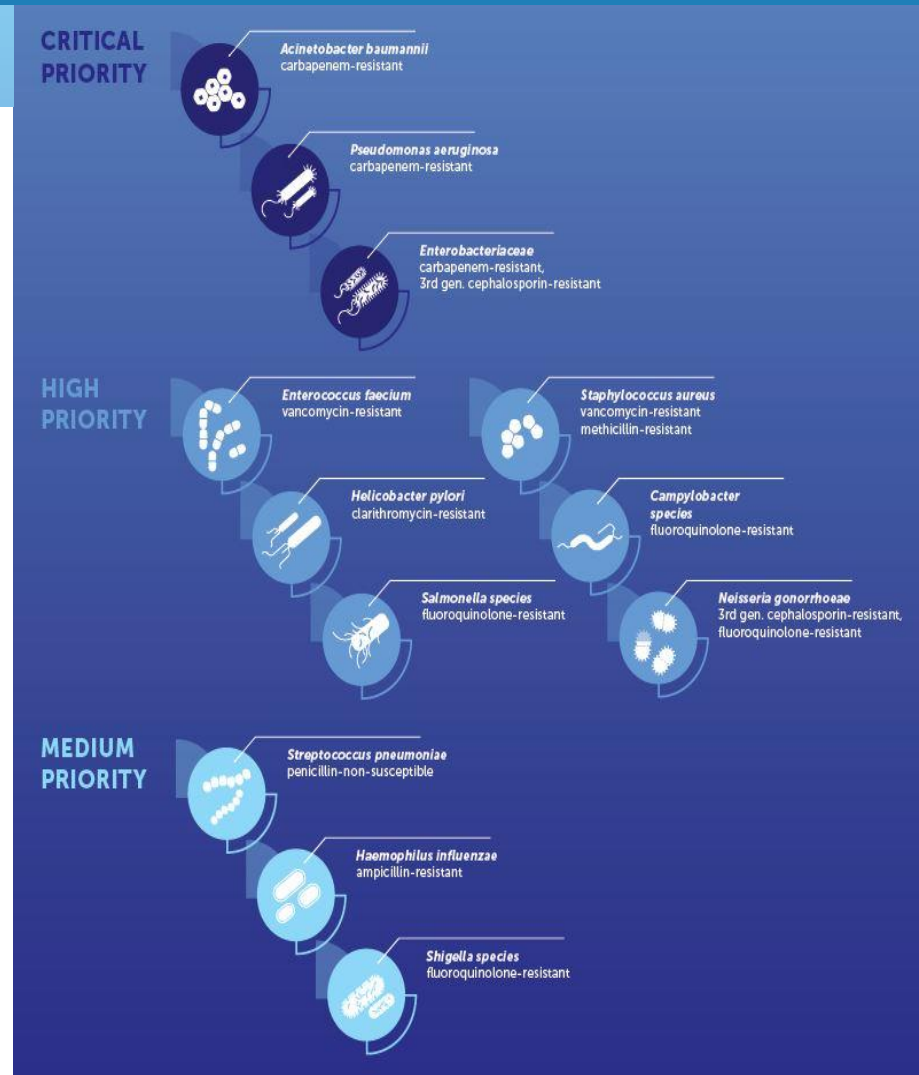
### Critical needs:

#### Drug-resistant TB

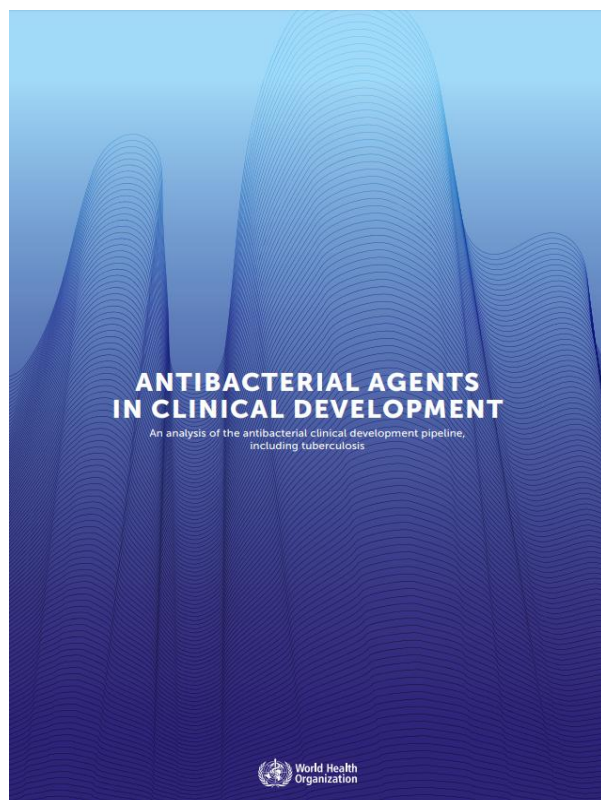
#### Gram-negative bacteria:

- Carbapenem-resistant *A. baumannii*
- Carbapenem-resistant *P. aeruginosa*
- Carbapenem-resistant and 3<sup>rd</sup> generation cephalosporin resistant *Enterobacteriaceae*

- Source: [http://www.who.int/entity/medicines/areas/rational\\_use/PPLreport\\_2017\\_09\\_19.pdf?ua=1](http://www.who.int/entity/medicines/areas/rational_use/PPLreport_2017_09_19.pdf?ua=1)



# Antibacterial agents in clinical development



- **51** new antibiotics in the clinical pipeline
- **33** against priority pathogens
- **~9** are innovative
- **Pipeline is insufficient to treat priority pathogens & TB**
- Of **10 phase-I** antibiotics to tackle gram-negative bacteria only **1-2** will make it to market in **7 years**

Source: <http://apps.who.int/iris/bitstream/10665/258965/1/WHO-EMP-IAU-2017.11-eng.pdf?ua=1>

# Pipeline is not promising: Stewardship

- Invest in rationale use of Antimicrobials
- Only when necessary
- When necessary use the right antimicrobial (simplest)

Source: <http://apps.who.int/iris/bitstream/10665/258965/1/WHO-EMP-IAU-2017.11-eng.pdf?ua=1>

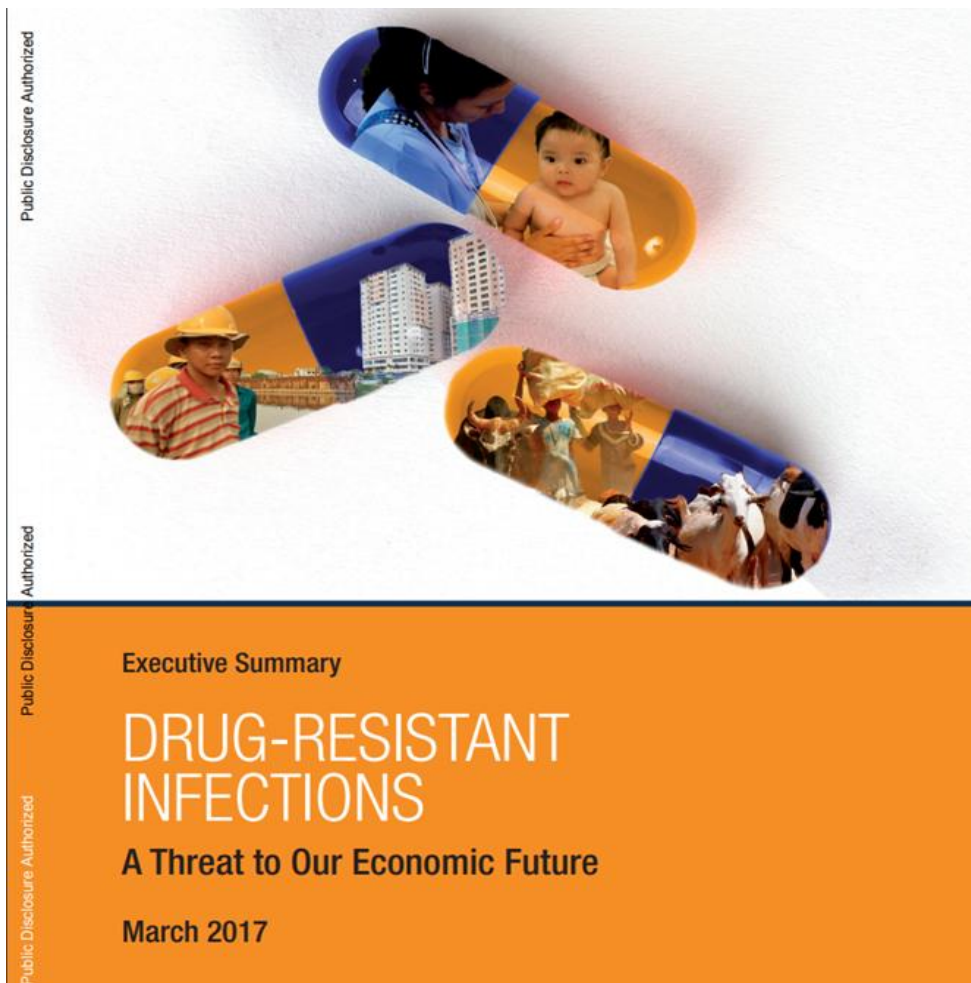
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5. **Ensure sustainable investment**

Develop National Action Plan

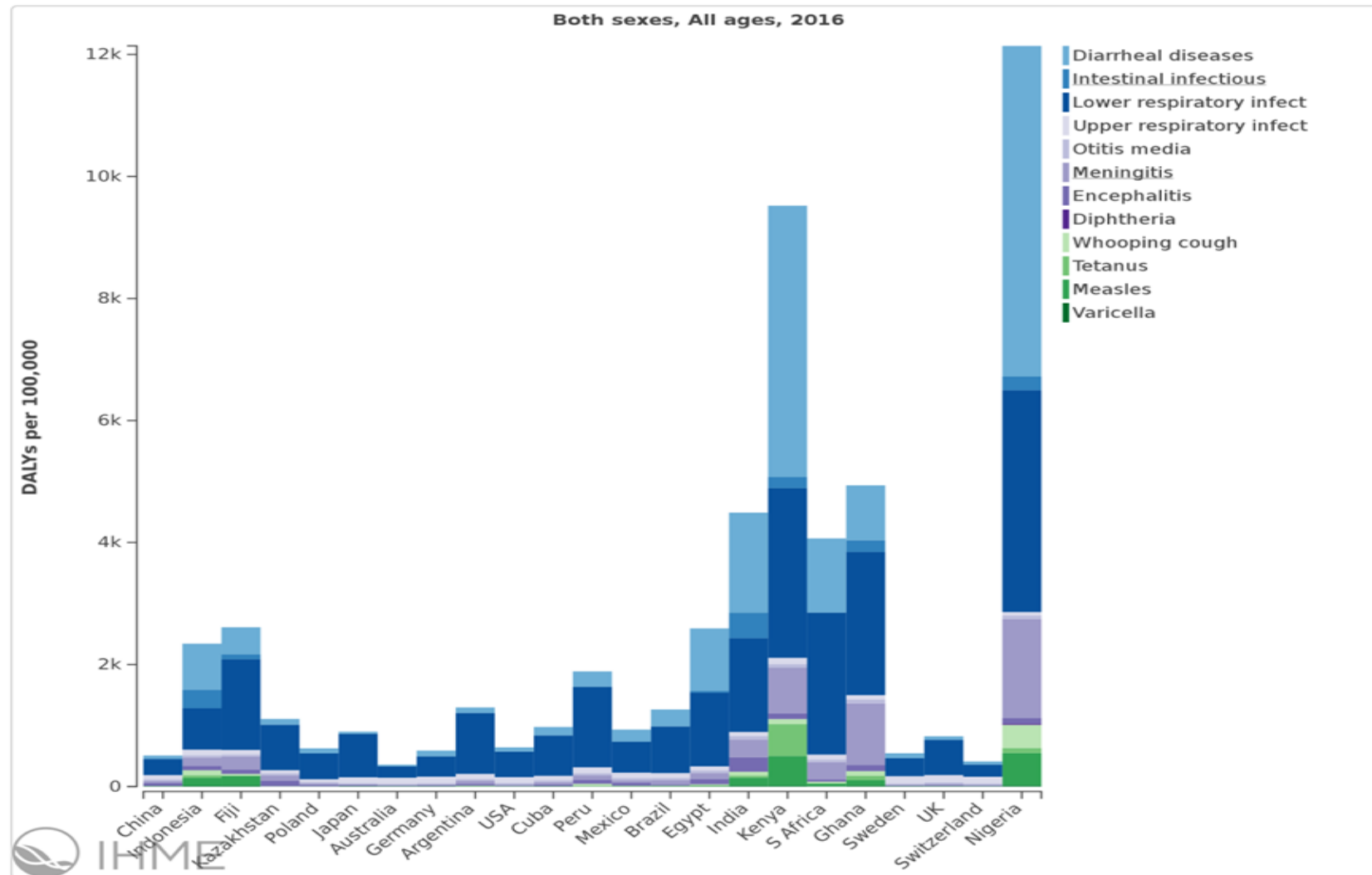


# Economic Case



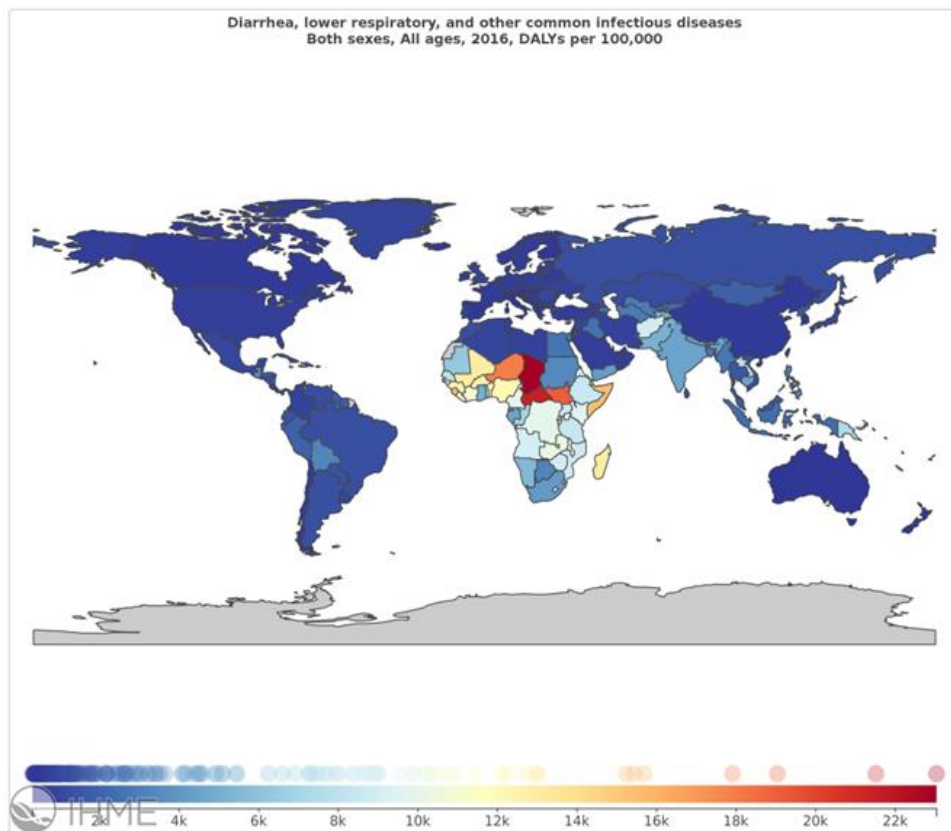
- Sample Investment Cases for ministries of finance in middle and low income countries
- AMR as a development issue
- Costing and tools for inclusion in plans and budgets

# Huge variation in the burden of infectious disease

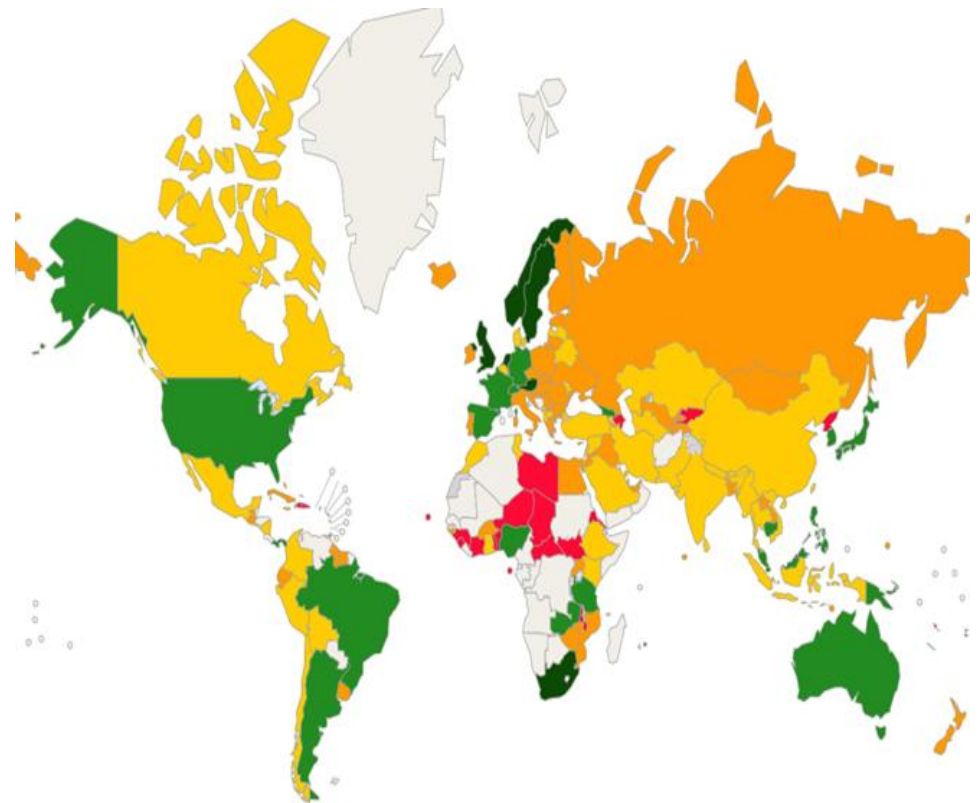


# Burden of infectious disease: low income countries

## Burden of Infectious Disease



## Progress in developing an AMR National Action Plan



# Global Action Plan's 5 Strategic Objectives

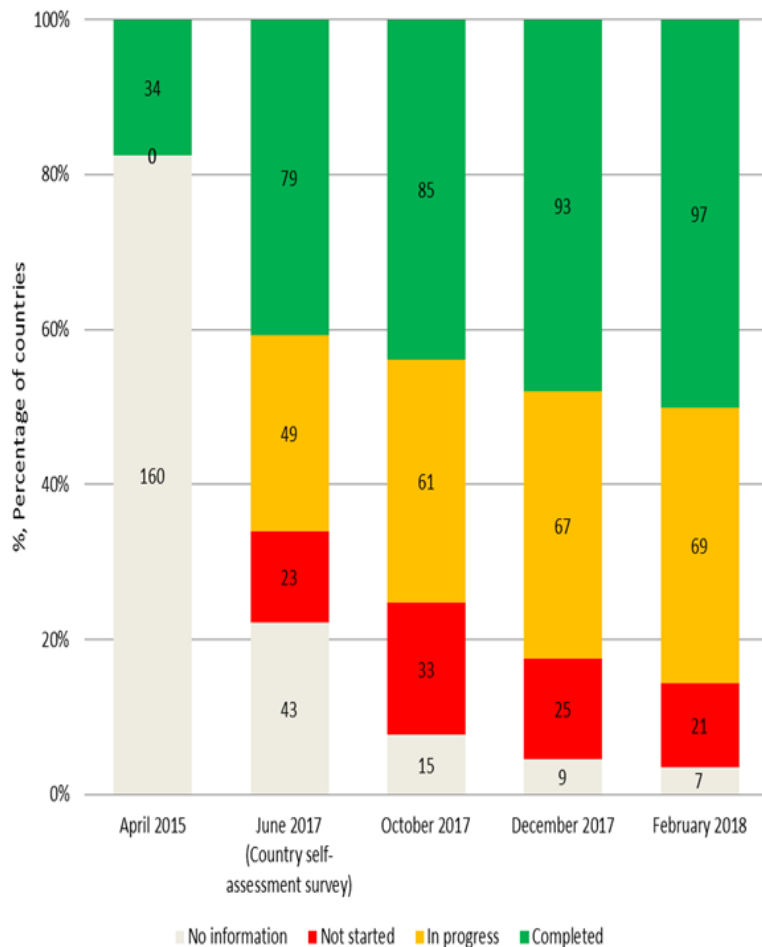
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## Develop National Action Plan

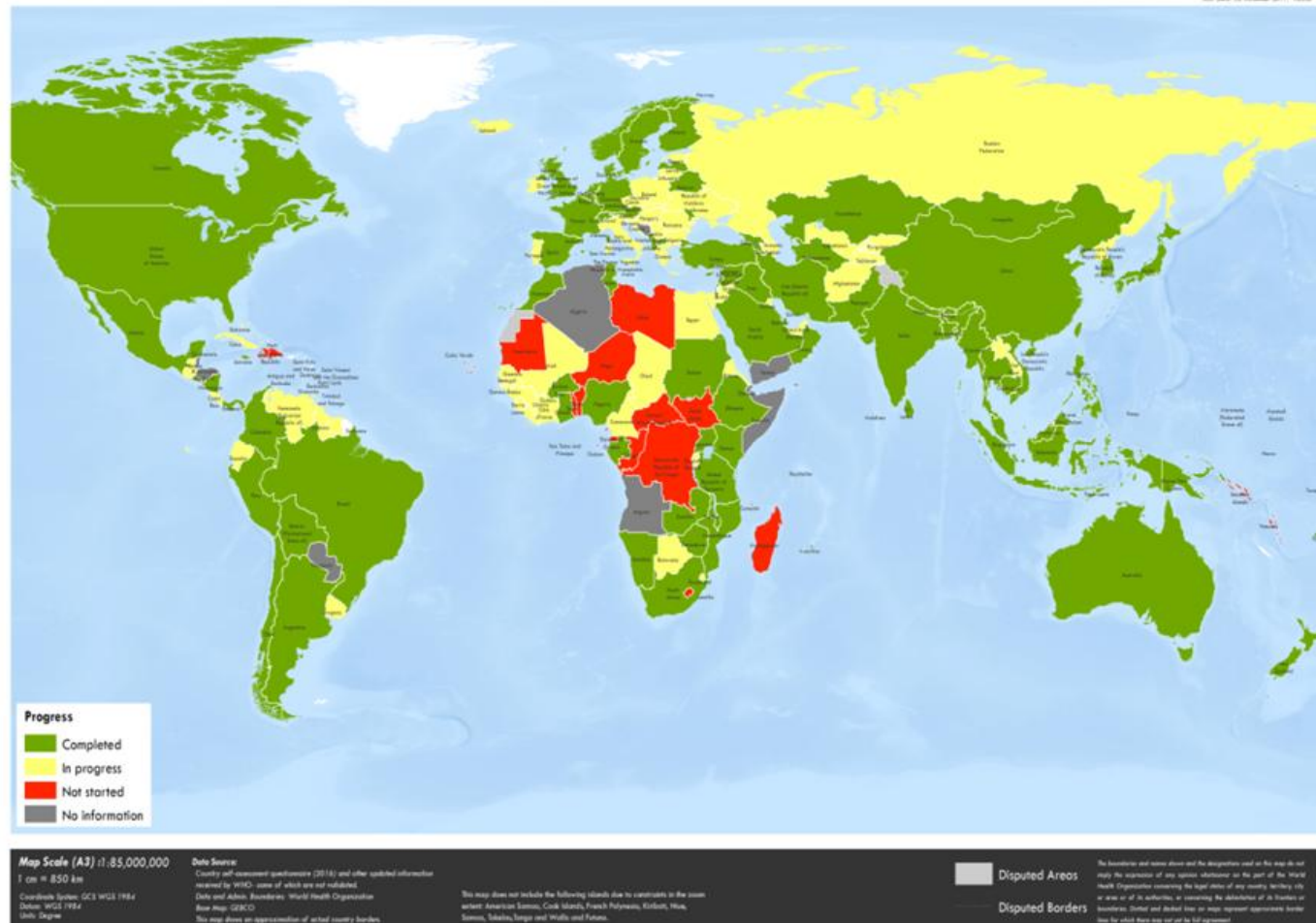


# Progress in developing multisectoral AMR National Action Plans Feb 2018

Country progress of NAP on AMR



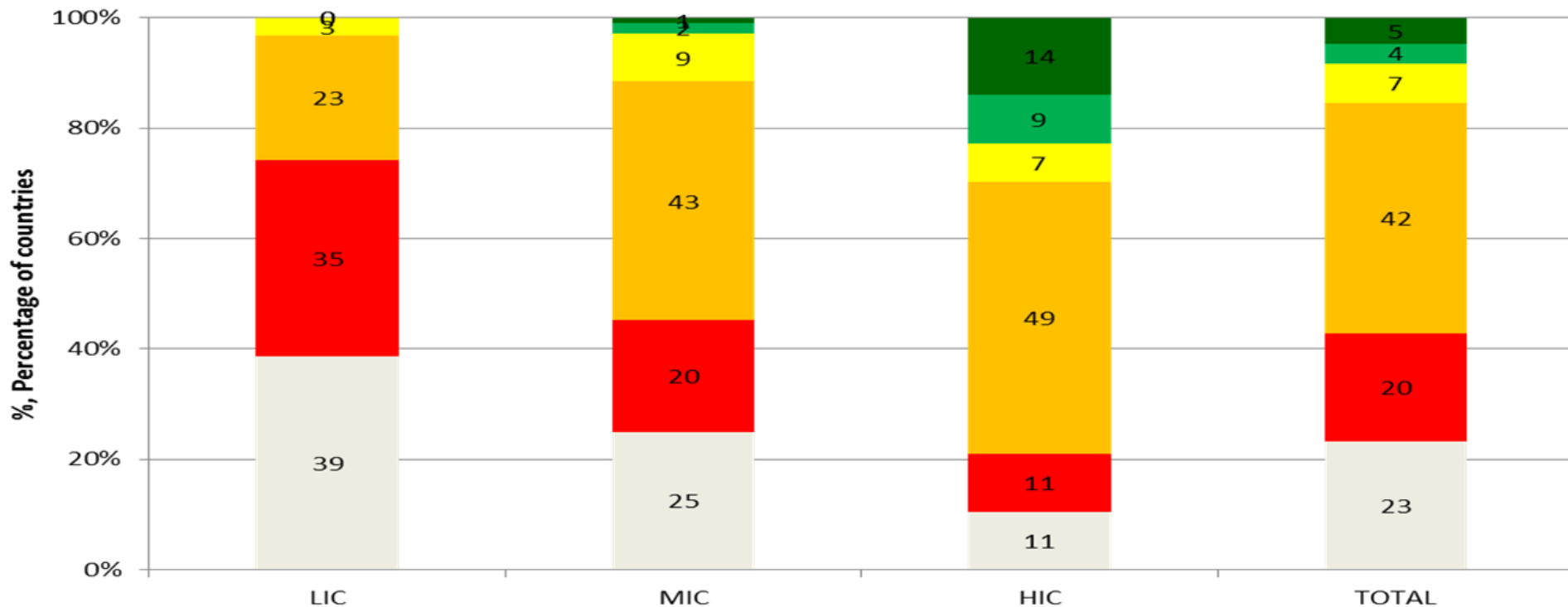
Country progress on development of national action plans on antimicrobial resistance (as of 08 November 2017)



# Progress is better in High income countries

## Governance Arrangements

Figure 1: One Health working arrangements



■ No response

■ A No formal multi-sectoral governance or coordination mechanism exists.

■ B Multi-sectoral working group(s) or coordination committee on AMR established that includes representatives of human health, animal health, environment and other sectors, with Government leadership.

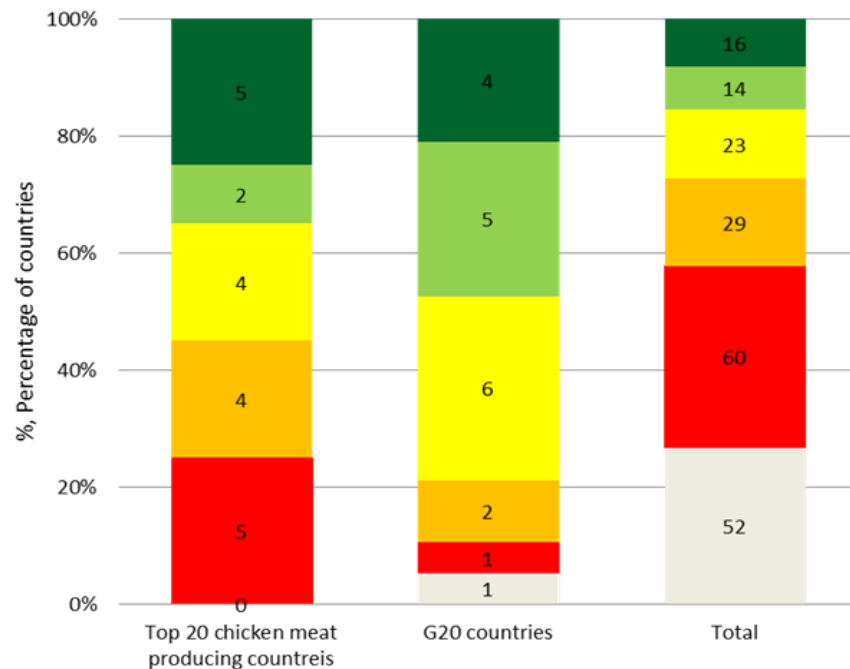
■ C Multi-sectoral working group(s) is (are) functional, with clear terms of reference, regular meetings, funding for its activities and reporting/accountability arrangements defined.

■ D Joint working on issues including agreement on common objectives, including restriction of use of critically important antimicrobials.

■ E Integrated approaches implemented to monitor progress on the national AMR action plan and extent of AMR.

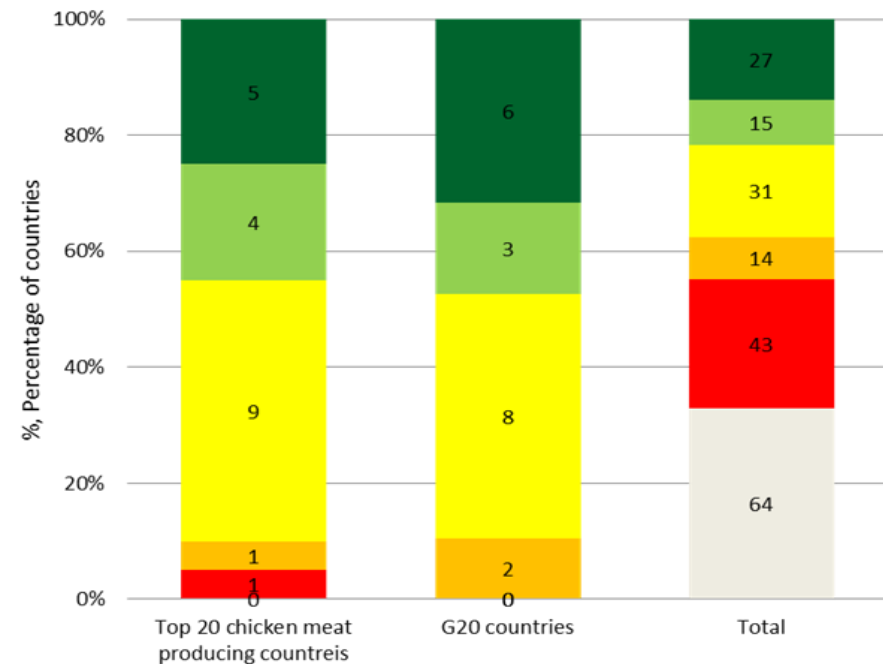
# Stewardship reportedly better in high food producing countries

**Antimicrobial Stewardship & regulation in human health**



- No response
- A No/weak national policy & regulations for antimicrobial stewardship.
- B National policy and regulations for antimicrobial stewardship developed & approved
- C National antimicrobial stewardship program is being implemented in some healthcare facilities
- D Antimicrobial stewardship program is implemented in health care facilities nationwide. Legal/regulatory changes approved and publicised to regulate sales and products for human use, but not fully enforced.
- E Antimicrobial stewardship program is implemented in most health care facilities and in community. Regulations are enforced on access to antibiotics and use in human health.

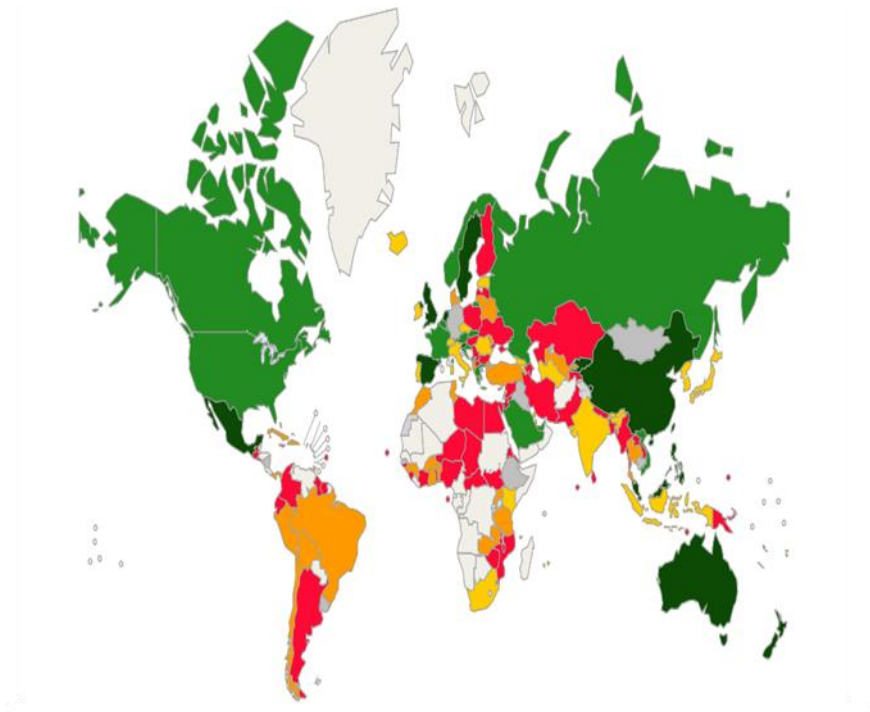
**Antimicrobial stewardship & regulation in animal and crop production**



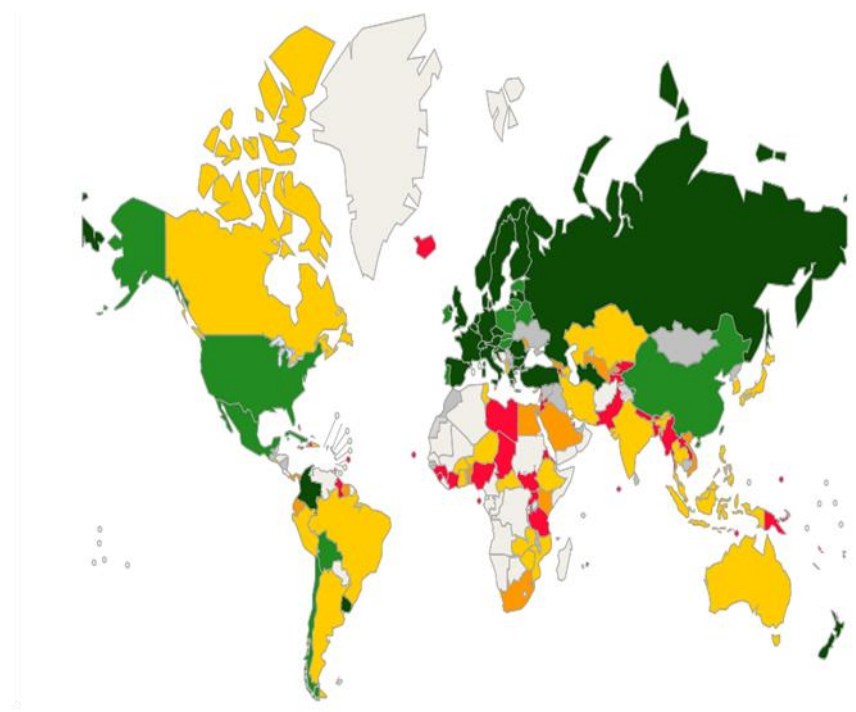
- No response
- A No national policy or legislation regarding the quality and efficacy of antimicrobials and their use in animals, and crops.
- B National policy for antimicrobial stewardship and governance developed.
- C Legislation and regulations approved on import, marketing authorisation, production, distribution and prudent use of high-quality veterinary medicinal products including antimicrobials, based on international standards.
- D Implementation of legislation and regulations on responsible and prudent use of antimicrobials in animals and ensuring safe food supplies.
- E Antimicrobials given to animals are only used to control or treat infectious diseases, under veterinary supervision.

# Implementation is happening

Antimicrobial stewardship in human health



Antimicrobial stewardship in animal & crop production



# Implementation Challenges

- Resources
- Governance
- Integration with broader agendas & programmes
- Monitoring
- Prioritisation

# Conclusion: Multi-sectoral approach needed

- Raise awareness economic and societal costs: investments needed
- Political engagement and high-level coordination of multi-sectoral activities against AMR needed
- Ensure public & private investment in new medicines, diagnostic tools & vaccines while ensuring access to these measures is equitable and affordable
- Encourage the engagement of stakeholders from their countries, including civil society, academic and research institutions, the public and policy makers

# HIC could contribute by:

- Demonstrating achievements of NAP implementation
- Making dedicated resources available
- Participating in the global surveillance system for AMR (GLASS)
- Developing public awareness campaigns and sharing experience
- Reducing use of antimicrobials in human, agriculture & environment
- Three-pronged approach to reactivate the R&D pipeline:
  1. Increasing funding
  2. Support clinical development phase promising antimicrobials
  3. Delinking R&D investments from sales revenues.

# Thank You!



Our time with  
**ANTIBIOTICS**  
is running out.

*Antibiotics are in danger of losing their effectiveness due to misuse and overuse, and in many cases they aren't even needed.*

*Always seek the advice of a healthcare professional before taking antibiotics.*



## Acknowledgements

WHO AMR Secretariat  
Regional AMR Team  
ReLAVRA

