

# Future of AMR surveillance beyond EARS-Net

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And indeed, everything that one can discern has numbers,  
hence it is impossible to grasp or recognize anything without  
them.

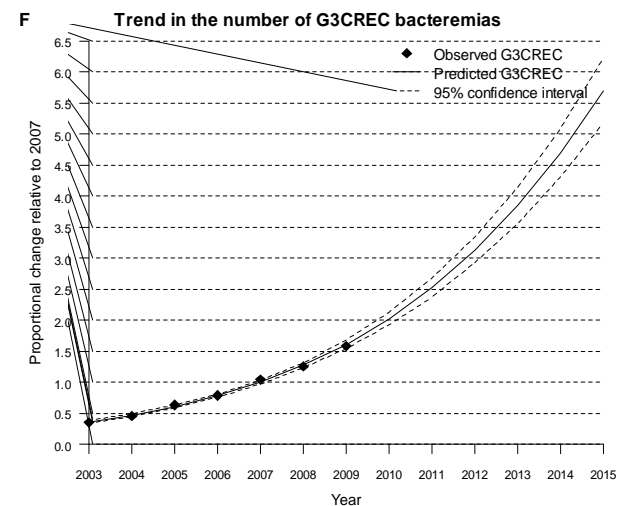
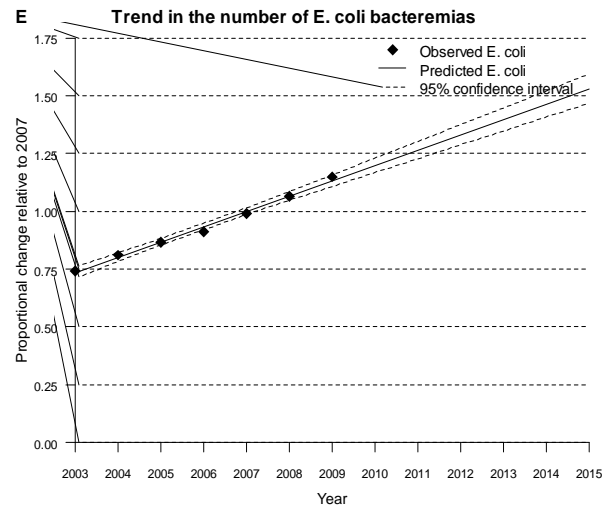
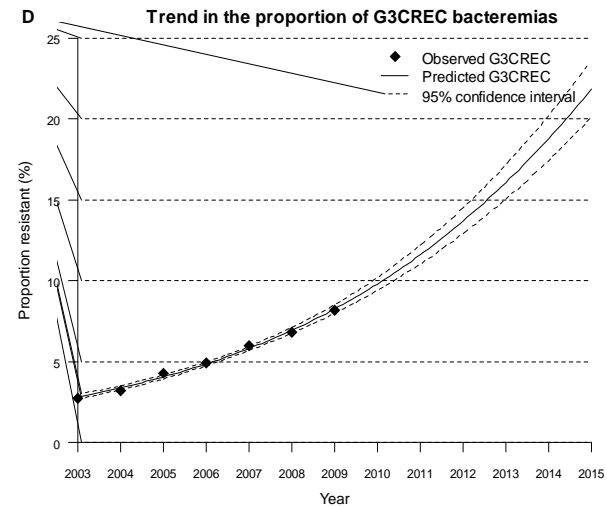
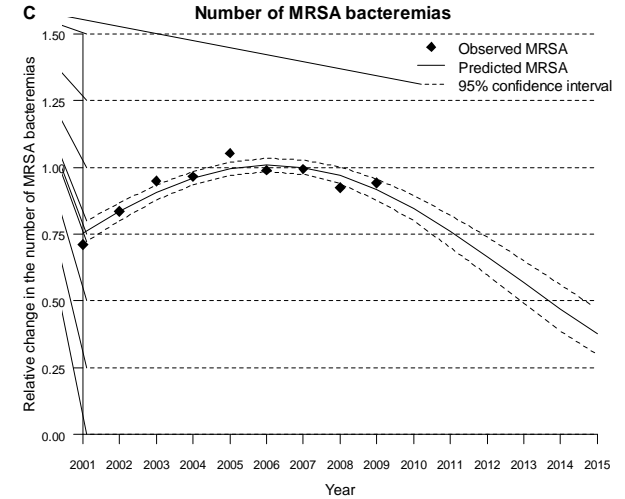
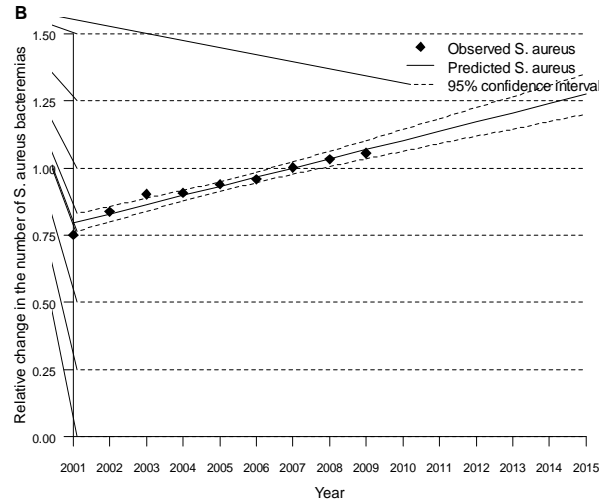
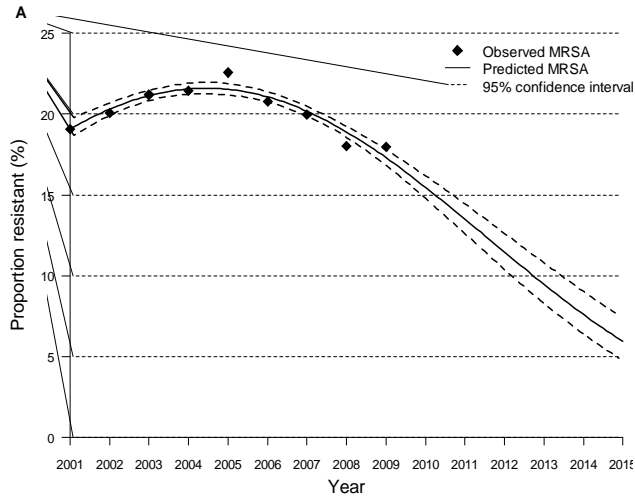
Philolaos of Kroton, 440 BC

# Topics

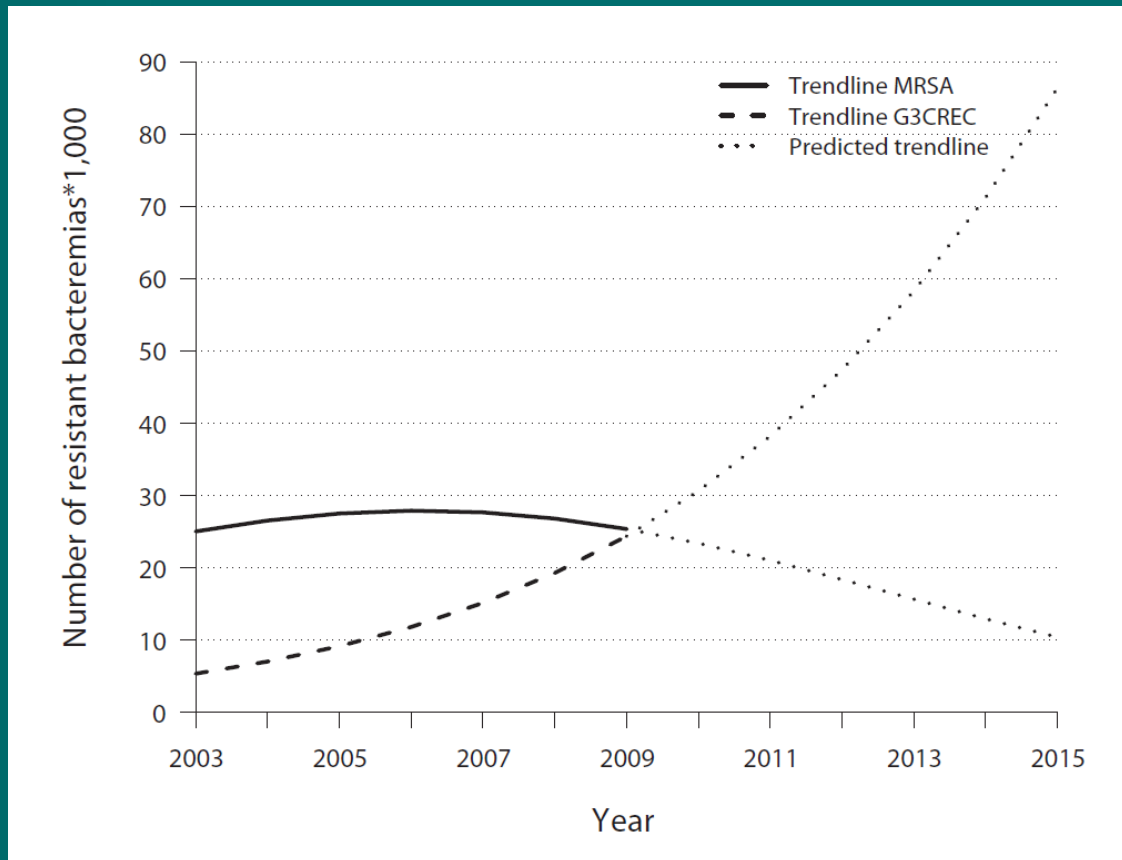
- ❑ Networks beyond, global?
- ❑ Inequality, the poor rich divide
- ❑ Bottlenecks and solutions

Why global networks?

# Epidemiological trajectories in Europe



# Epidemiological trajectories in Europe



Inequality, the poor rich divide

# Current guidelines (IMCI, 2005)

## Antibiotic treatment of non-severe and severe pneumonia

EXAMPLI

For children 2 months up to 5 years with non-severe pneumonia in non-HIV countries three days in place of five days of antibiotic therapy with either oral amoxicillin or cotrimoxazole should be used. Where antimicrobial resistance to cotrimoxazole is high, oral amoxicillin is the better choice. Oral amoxicillin should be used twice daily instead of thrice daily. Injectable ampicillin plus injection gentamicin is preferable to injectable chloramphenicol for very severe pneumonia in children 2-59 months of age. For management of HIV-infected children, newly developed WHO draft treatment guidelines should be used. Children with wheeze and fast breathing and/or lower chest indrawing should be given a trial of rapid acting **inhaled bronchodilator**, before they are classified as having pneumonia and prescribed antibiotics.

Sch  
Cotrim

1  
nes

## Low osmolarity ORS and antibiotic treatment for bloody diarrhoea

Countries should now use and manufacture low osmolarity ORS for the management of dehydration in all children with diarrhoea but keep the same label to avoid confusion. Ciprofloxacin is the most appropriate drug for the management of bloody diarrhoea in place of nalidixic acid which leads to rapid development of resistance. Along with increased fluids and continued feeding, all children with diarrhoea should be given zinc supplementation for 10-14 days.

Dose  
of syrup for  
child age  
2 months  
up to  
2 months  
(4-10 kg)

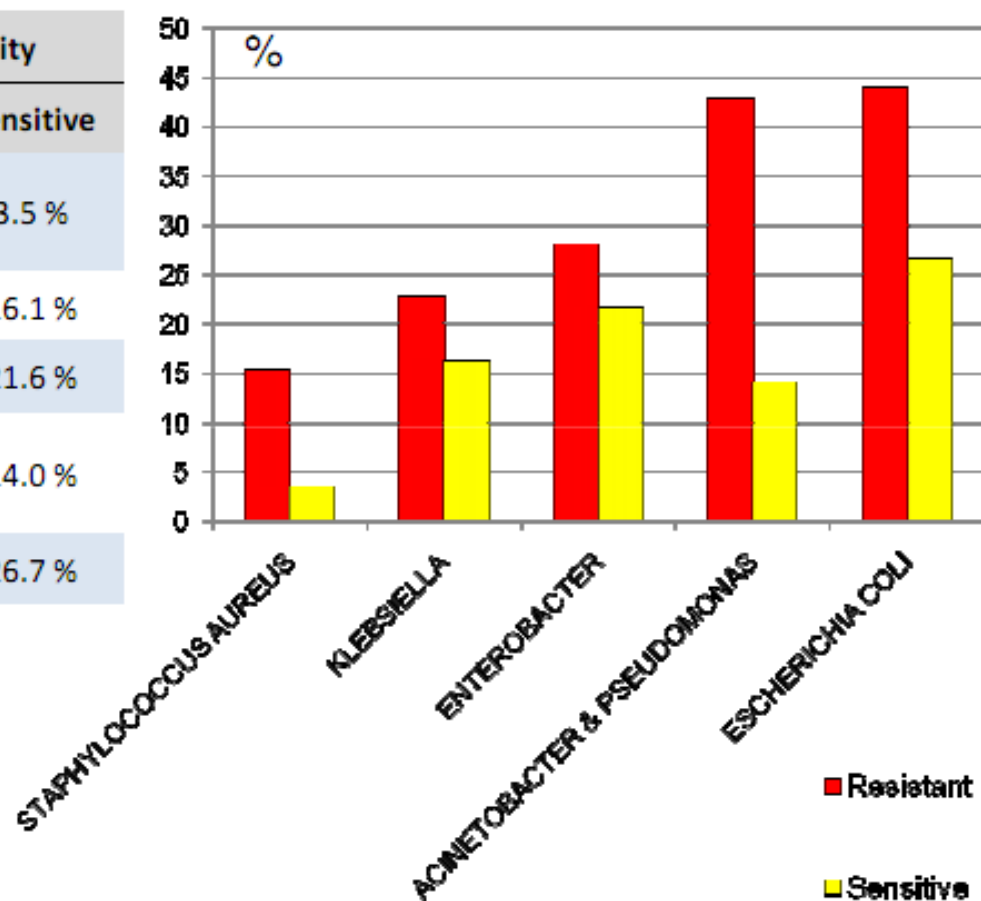
## Treatment of fever/malaria

The antimalarial drug policy in countries will vary and IMCI adaptations generally follow the national policy. In most countries, artemisinin-based combination therapies have been shown to improve treatment efficacy. The advantages of artemisinin-based



## Case Fatality Rates (Neonatal sepsis)

Organism	Susceptibility	
	Resistant	Sensitive
STAPHYLOCOCCUS AUREUS	15.4 %	3.5 %
KLEBSIELLA	22.8 %	16.1 %
ENTEROBACTER	28.0 %	21.6 %
ACINETOBACTER & PSEUDOMONAS	42.7 %	14.0 %
ESCHERICHIA COLI	44.0 %	26.7 %



# Current guidelines (WHO et al, 2006)

WHO/PSM/PAR/2006.4



The Medical Export Group BV



United Nations Children's Fund



United Nations Population Fund

## The Interagency Emergency Health Kit 2006

Medicines and medical devices  
for 10,000 people for  
approximately 3 months

Basic unit for 1,000 pop

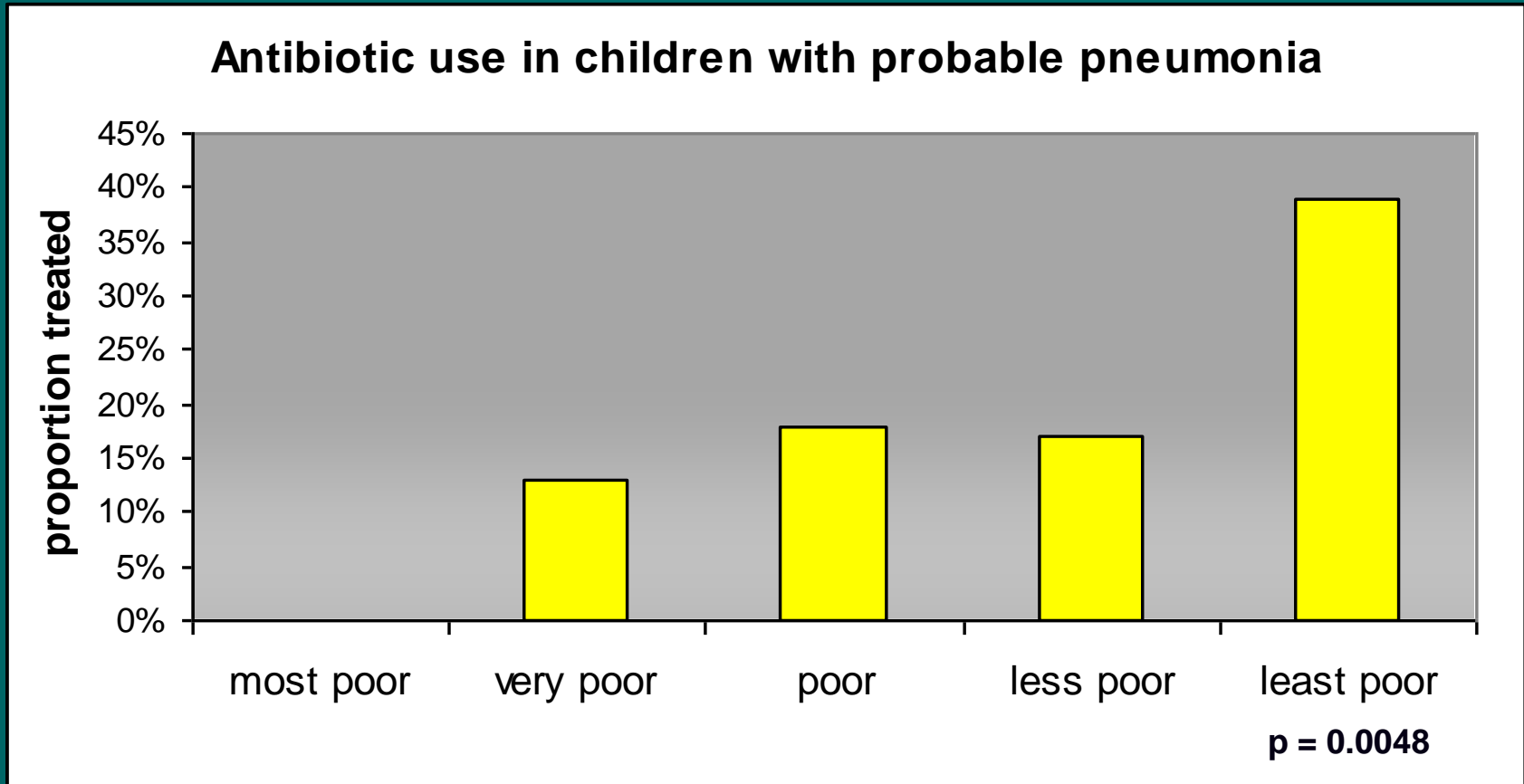
Amoxicillin is the only  
antibiotic included in the  
basic unit,

## Supplementary unit for 10,000 pop.

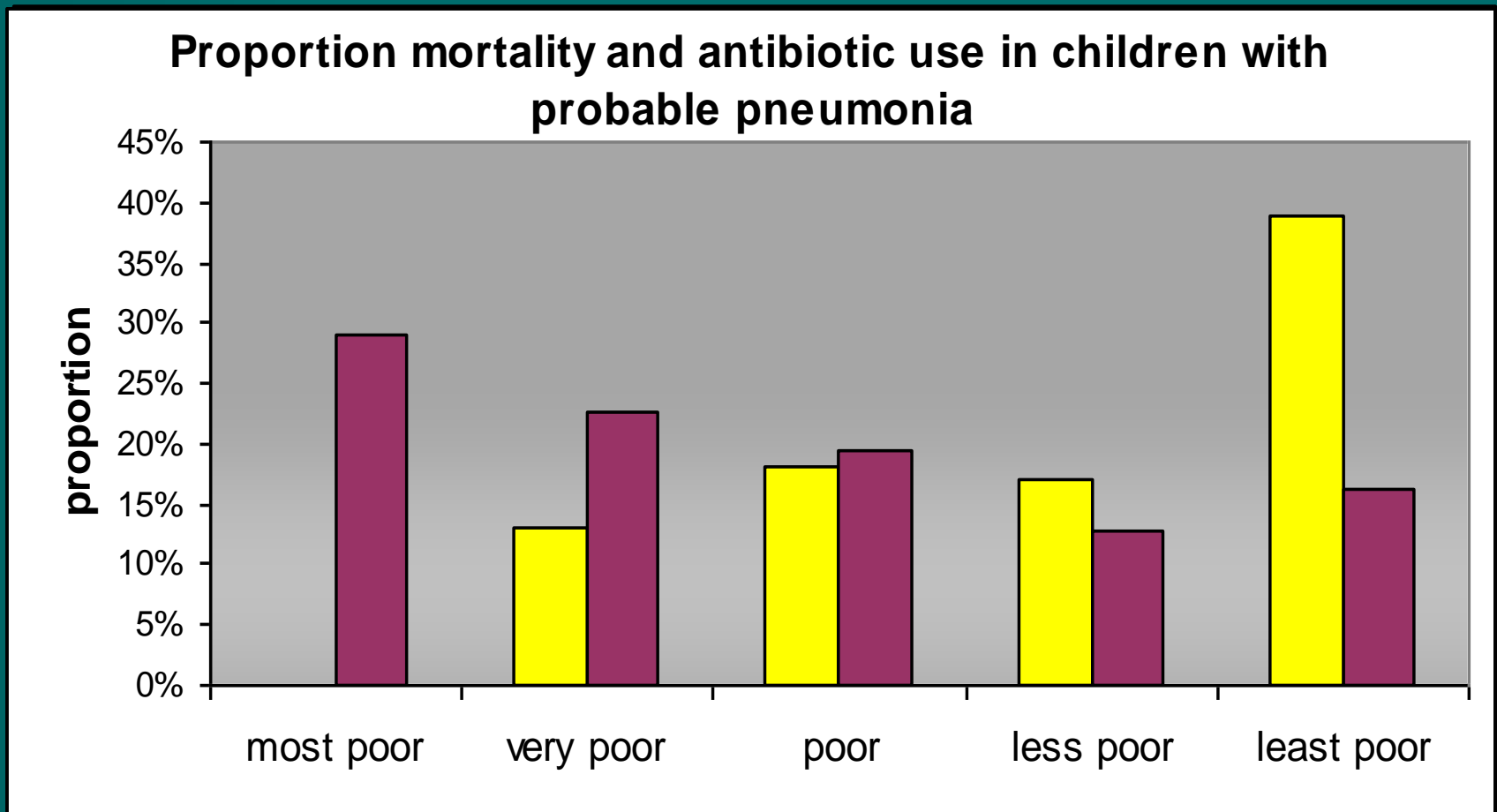
### Anti-infective medicines

benzathine benzylpenicillin, inj 2.4 million IU/vial (long-acting penicillin)	vial	50
benzylpenicillin, inj 5 million IU/vial <sup>18</sup>	vial	250
ceftriaxone, inj 1 g	vial	800
cloxacillin, caps 500 mg <sup>19</sup>	caps	1,000
clotrimazole, pessary 500 mg	pessary	100
doxycycline, tab 100 mg	tab	3,000
metronidazole, tab 500 mg	tab	2,000

# Inequalities among the very poor: baseline survey among <5 year-olds in Kilombero Tanzania (n=2005)



# Inequalities among the very poor: baseline survey among <5 year-olds in Kilombero Tanzania (n=2005)



# Health and demographic surveillance sites (HDSS)

- ❑ have been established in 39 Asian and African countries as part of the INDEPTH initiative
- ❑ monitor over 2 million individuals at household level on a regular basis
- ❑ create an opportunity to monitor antibiotic use at consumer level
- ❑ have good data management capacities
- ❑ Malaria vaccine trials provide a unique opportunity at 11 African sites installing blood culture facilities.

# Ingredients for good AMR surveillance in resource-limited setting

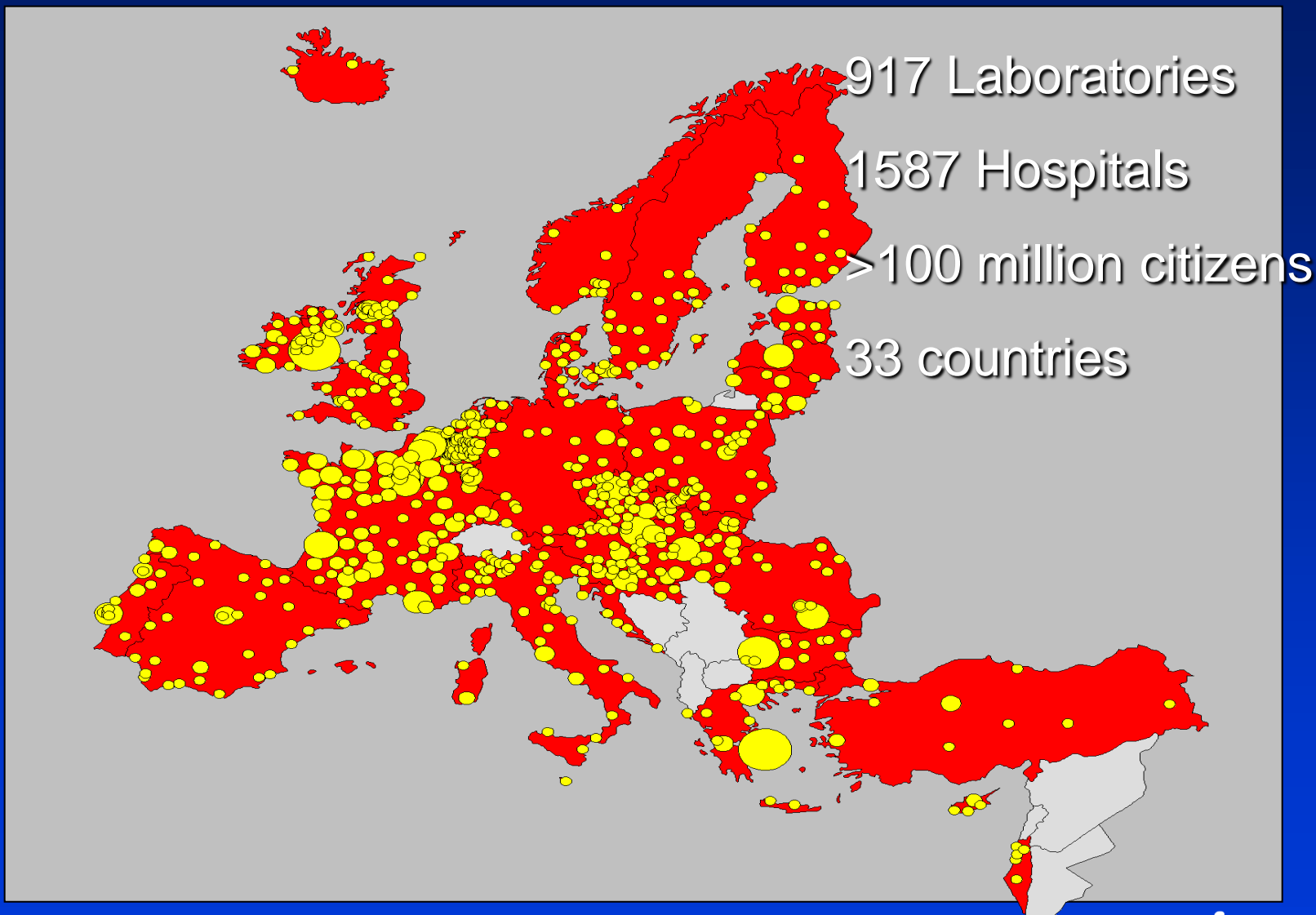
- ❑ demographic surveillance sites with access to representative populations
- ❑ software for multi-level surveillance of AMR (WHO-Net)
- ❑ algorithms to determine the Ab effectiveness gap, access gap, and AMR attributable BoD

## Major bottleneck

- ❑ Laboratory capacity

# Bottlenecks and solutions

# EARSS 2009



**EARSS**

EUROPEAN ANTIMICROBIAL RESISTANCE SURVEILLANCE SYSTEM

**rivm**

National Institute  
for Public Health and  
the Environment



# How did it start ?

- ❑ small
- ❑ two pathogens
- ❑ four compound pathogen combinations
- ❑ 78 laboratories
- ❑ 7 countries

# The uphill struggle:

“...it is doubtful if national rates of resistance have any comparative value at all.”

Surveillance of antimicrobial resistance – what, how and whither ?

R. Bax, R. Bywater, G Cornaglia, H. Goossens, et al  
Clin Microbiol Infect Dis 2001, 7: 316-325



**EARSS**

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# Ingredients for success

- ❑ sentinel surveillance
- ❑ funding
- ❑ common protocols
- ❑ capacity building
- ❑ common procurement strategy
- ❑ resource centres
- ❑ central database
- ❑ steady improvement of quality by surveillance

# Conclusions

- ❑ AMR poses one of the most important challenges to health systems globally, especially in developing countries
- ❑ AMR surveillance networks in developing countries are essential because reducing burden of infection (MDG 4, 5 and 6) has to rely on guidelines with proven effectiveness.
- ❑ Diagnostic capacity has to reach the rural and urban poor.
- ❑ Health and demographic surveillance sites are ready to heed the call. Communication and data managing tools are readily available.
- ❑ Laboratory capacity is the single most important impediment.
- ❑ Experience gathered with European networks can provide crucial guidance.

**Be bold**

Thanks