

Innovation et communication sont liées pour lutter contre l'antibiorésistance

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DOI : DaVolterra (French Law Innovation and Research)



A renewed reading of what happened

March 11, 2013, 68 Submit UK

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Chief Medical Officer Dame Sally Davies:
Resistance to antibiotics risks health
'catastrophe' to rank with terrorism and climate
change



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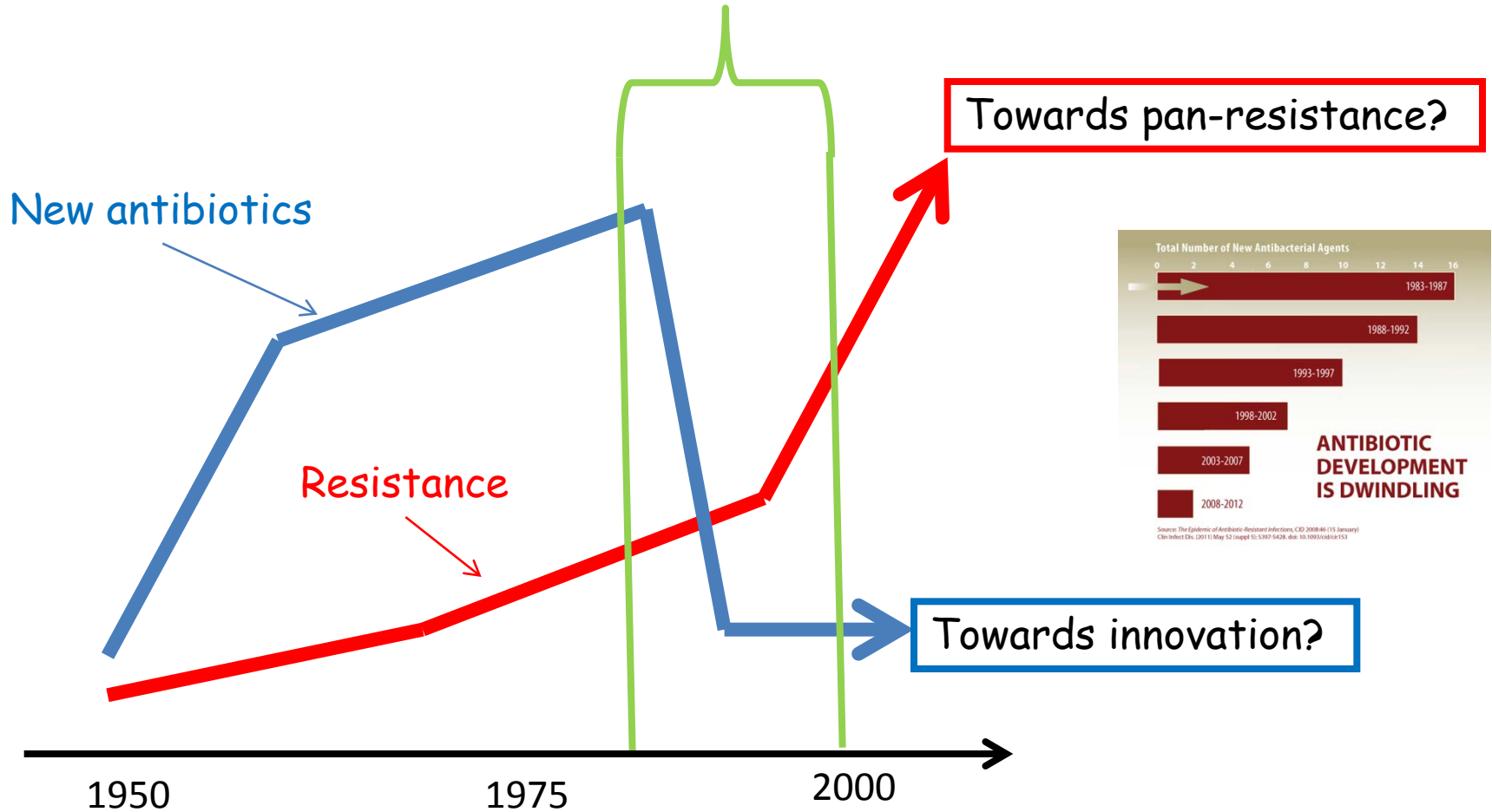
No simple way for the return

A new reading of what happened...

1. The role of generics
2. A North-South complex relationship
3. What happened at the turn of the millennium ? .

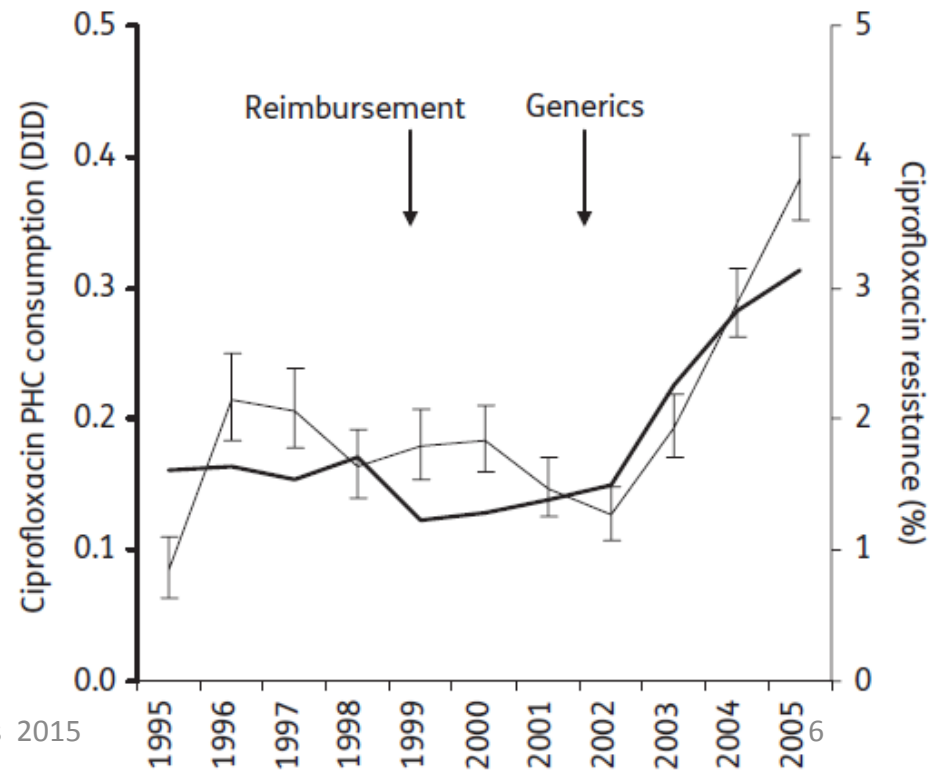
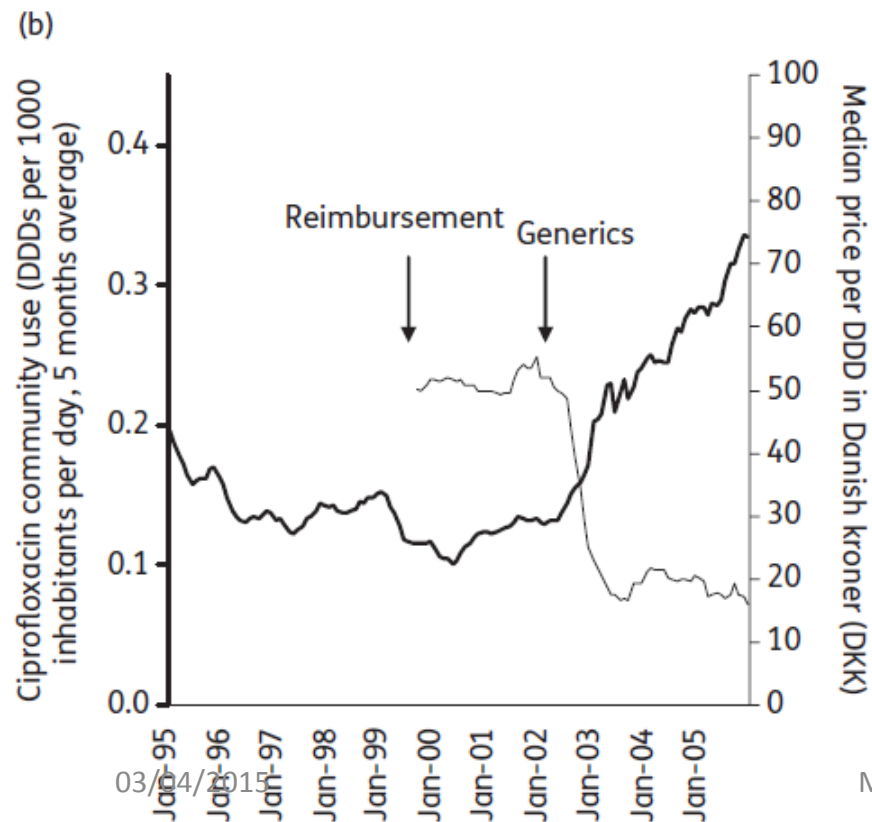
A schematic view of antibiotic/resistance evolution

As patents get old, generics invade the markets



The « catastrophic » impact of antibiotic generics on resistance has been well demonstrated for ciprofloxacin in Denmark.

Jensen US, et al. JAC 2010



A new reading of what happened...

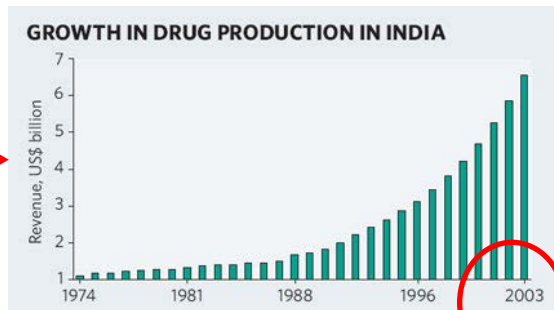
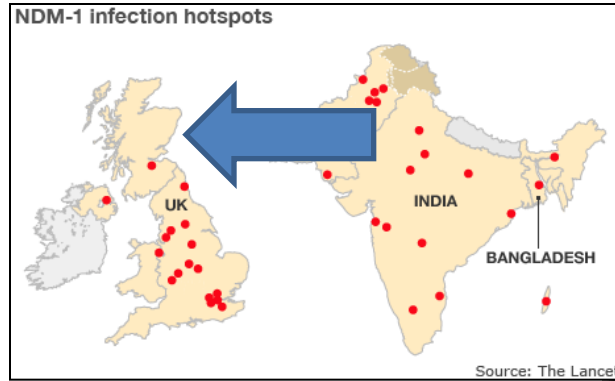
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A complex « North-South » relationship

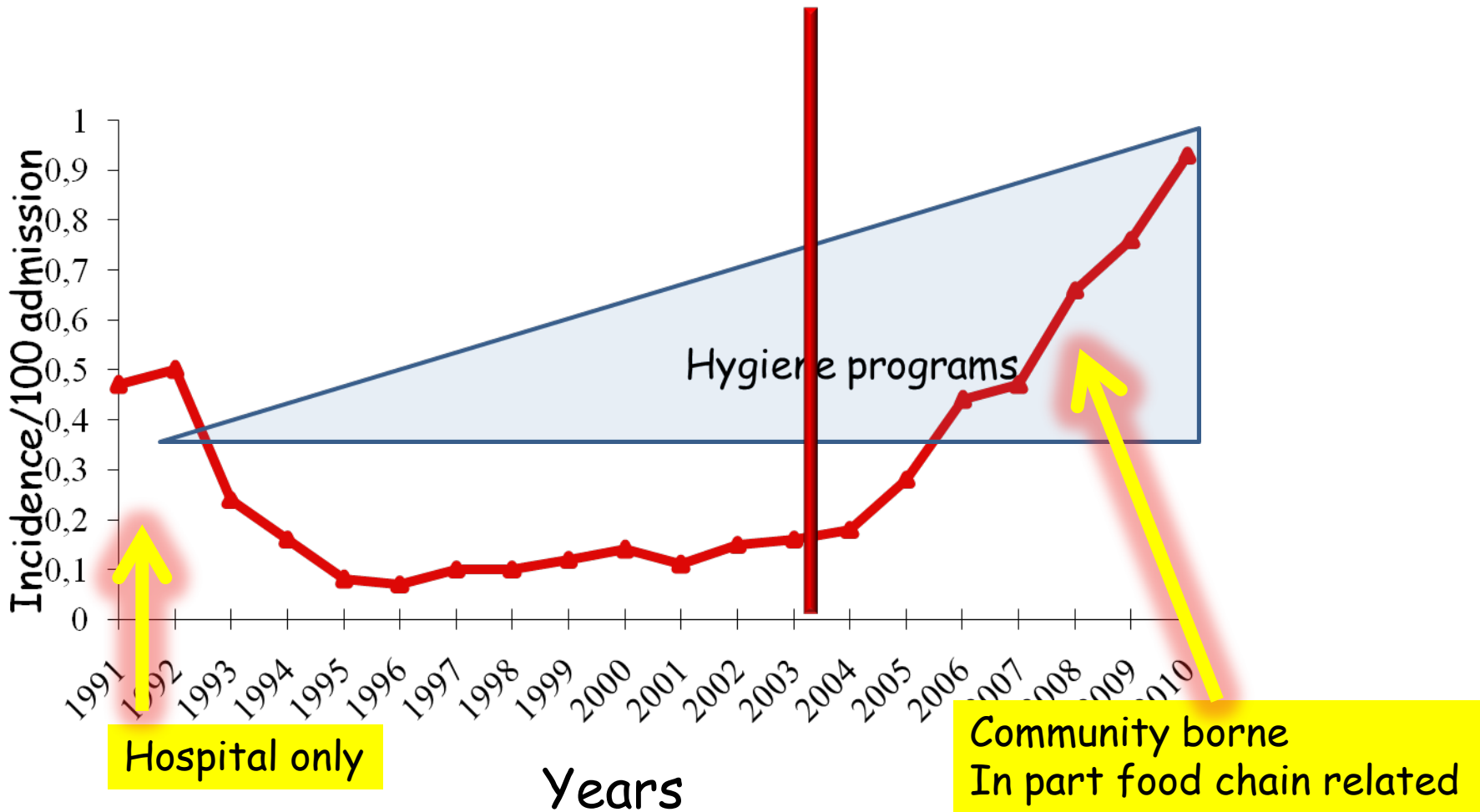
- ✓ A discovery from the « North » rapidly transposed in the « South » in a then still colonial world.
- ✓ An uncontrolled wave of antibiotics in the North but even much more in the South
- ✓ Most of antibiotics currently produced in the BRICS countries
- ✓ A new threat of invasion of multiresistant bacteria from the south arriving to the North



A better understanding of what happened...

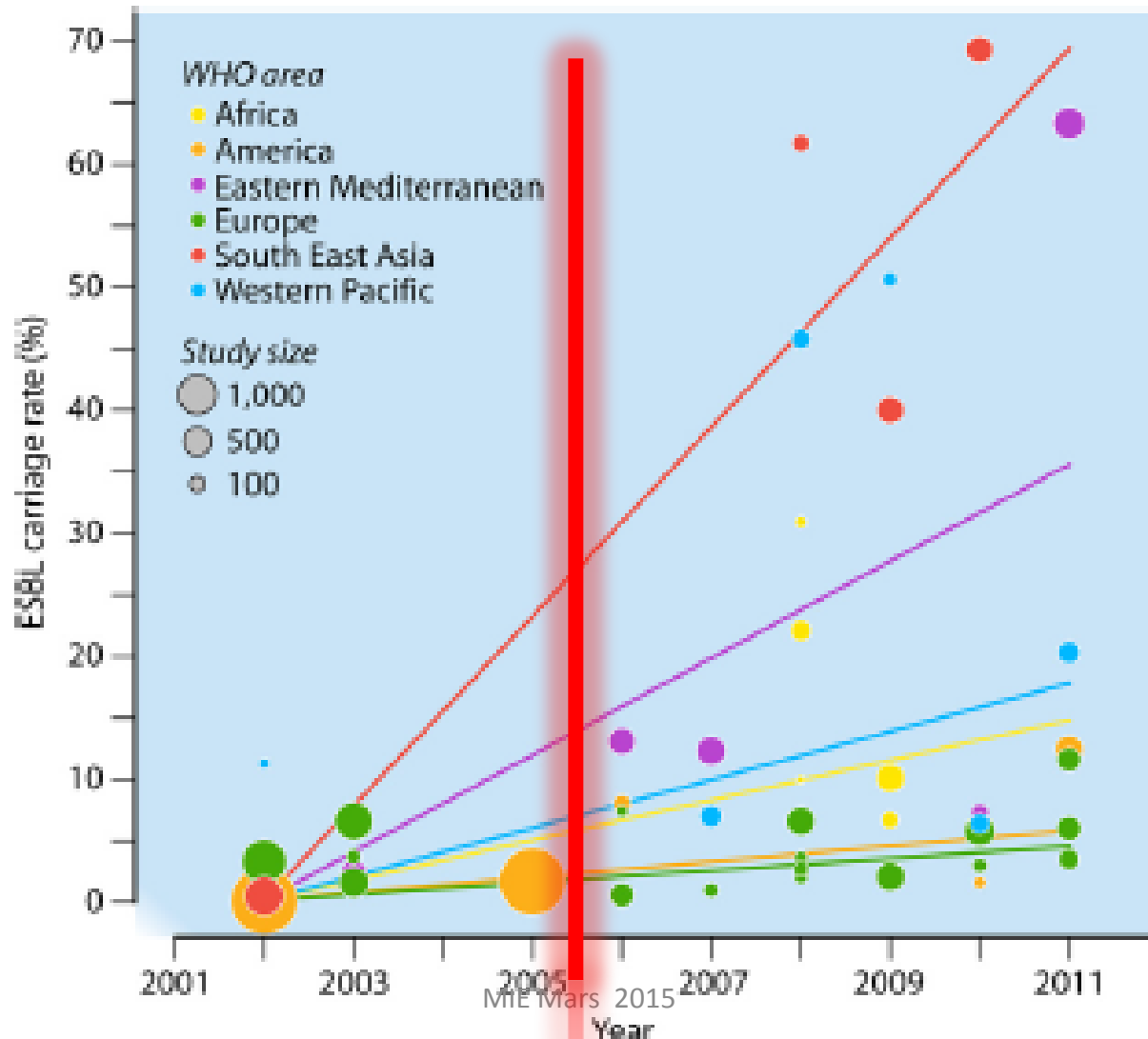
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BLSE burden of diseases Paris (France) Bichat university hospital



Trends in E-ESBL carriage overtime

(Woerther *et al.* CMR, 2013)



My hypothesis (not a demonstration)



1. The generics of 3GC became available
2. New usages because of low prices in Food chain Animals (FCA) and in humans
3. Environmental antibiotics in emerging economies (plants, dejections...)
4. Selective pressure in environmental bacteria resistant to 3GC. Multiplication.
5. Transfer of this resistance to enterobacteria in FCA that are in contact with the environment
6. Transfer to humans through the food chain

No simple way for the return

- ✓ Which innovations ?
- ✓ The question is more complex than it was thought !
- ✓ Why is it so difficult to communicate about AMR ?

Which innovations ?

- Do we really need the same type of antibiotics as before ? : niche, business model.
- Something else : phages, immunotherapy, other preventive measures ...
- Better communication than recently...

No simple way for the return

- ✓ Which innovations ?
- ✓ The question is more complex that it was though !
- ✓ Why is it so difficult to communicate about AMR ?

The question is more complex than we thought...



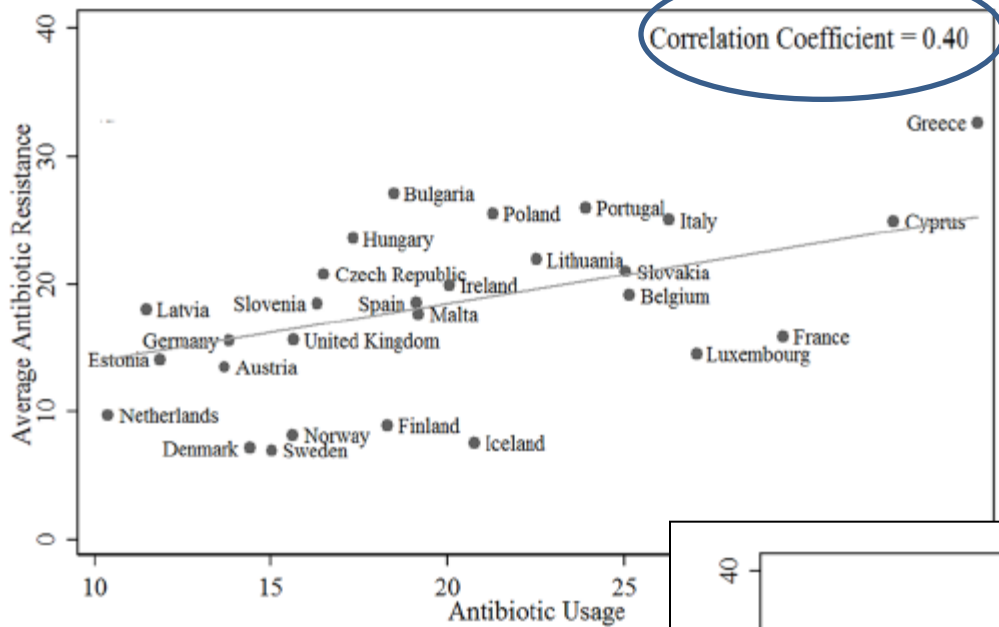
RESEARCH ARTICLE

Antimicrobial Resistance: The Major Contribution of Poor Governance and Corruption to This Growing Problem

Peter Collignon^{1,2*}, Prema-chandra Athukorala^{3,4}, Sanjaya Senanayake^{5,6}, Fahad Khan³

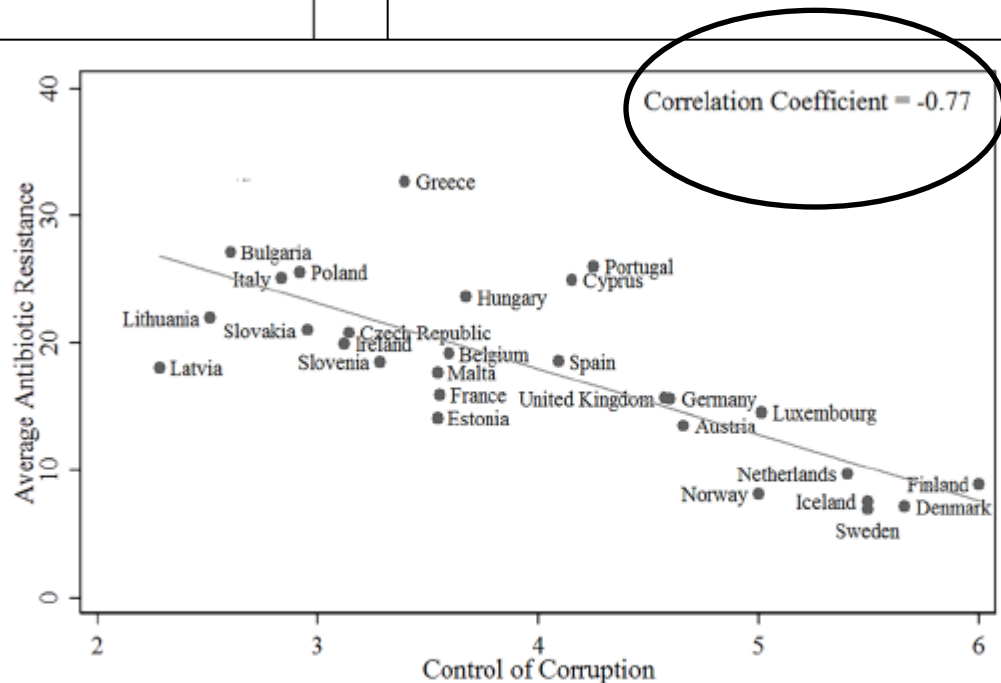
1 ACT Pathology, Canberra Hospital, Australian National University, Garran, Australia, 2 Canberra Clinical School, Australian National University, Garran, Australia, 3 Arndt-Corden Department of Economics, Australian National University, Acton, Australia, 4 School of Environment and Development, University of Manchester, Manchester, England, 5 Australian National University, Garran, Australia, 6 Canberra Hospital, Garran, Australia

* peter.collignon@act.gov.au



Note: Average antibiotic resistance is from EARS-Net database of the Antibiotic usage is from the European Surveillance of Antimicrobial C

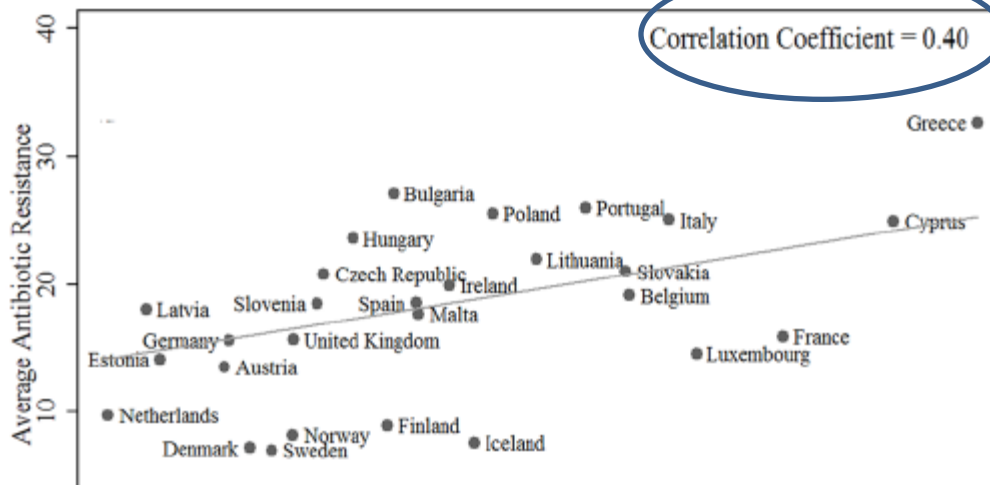
Fig 1. 'Average Microbial Resistance' against 'Antibiotic Use.'



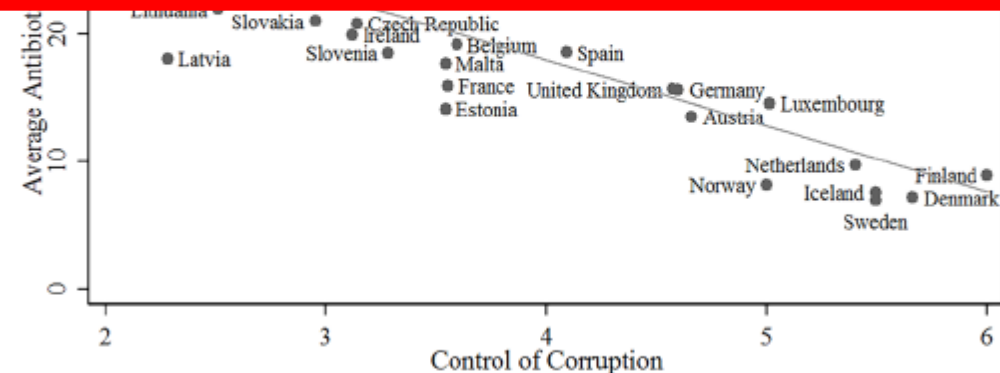
Note: Average antibiotic resistance is from EARS-Net database of the European Centre for Disease Prevention The control of corruption indicator is from International Country Risk Guide

Fig 2. 'Average Microbial Resistance' against 'Control of Corruption.'

doi:10.1371/journal.pone.0116746.g002



Only 28% of the total variation in antibiotic resistance among countries is attributable to variation in antibiotic usage. If time effects are included the explanatory power increases to 33%. However when the control of corruption indicator is included as an additional variable, 63% of the total variation in antibiotic resistance is now explained by the regression.



Note: Average antibiotic resistance is from EARS-Net database of the European Centre for Disease Prevention
The control of corruption indicator is from International Country Risk Guide

Fig 2. 'Average Microbial Resistance' against 'Control of Corruption.'

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No simple way for the return

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Why is it so complex to communicate about AMR ?

(with the help of Pr. J. Arquembourg from Paris Sorbonne Nouvelle)

- A highly **fragmented** question :
 - Many diseases
 - Many types of resistance
 - Many actors involved with divergent interests
 - Medical impact *vs* non-medical but ecological problem
- Possible solutions :
 - Focus on a single type of disease/resistance (ESBL *E. coli*) ?
 - More info on victims !
 - Use unconventional media : internet ? ,
Entertainment education ?

A wrap-up...

- ✓ So far we have had a much too narrow (medical) and straightforward approach
- ✓ We need to address social complexity
- ✓ This will not be easy nor quick
- ✓ But it will be expensive !!!

« The question » a painting from Alam-Tadena (1836-1912)

I am not sure
of the
answer...

Will we succeed
in controlling
antibiotic
resistance ?



Thank you very
much for your
attention.