Innovation et communication sont liées pour lutter contre l’antibiorésistance

Antoine Andremont
University Paris-Diderot Medical School (France)
antoine.andremont@bch.aphp.fr

DOI : DaVolterra (French Law Innovation and Research)
A renewed reading of what happened

March 11, 2013, G8 Submit UK

Chief Medical Officer Dame Sally Davies: Resistance to antibiotics risks health 'catastrophe' to rank with terrorism and climate change
A better understanding of what happened

No simple way for the return

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Chief Medical Officer Dame Sally Davies: Resistance to antibiotics risks health 'catastrophe' to rank with terrorism and climate change
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 millenium?
A schematic view of antibiotic/resistance evolution

As patents get old, generics invade the markets

New antibiotics

Resistance

Towards pan-resistance?

Towards innovation?
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...

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

1. The role of generics
2. A North-South complex relationship
3. What appened at the turn of the millenum?
BLSE burden of diseases
Paris (France) Bichat university hospital

- Community borne
- In part food chain related

Years

Hospital only

Hygiene programs

Incidence/100 admission
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
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✓ Which innovations?
✓ The question is more complex than it was thought!
✓ Why is it so difficult to communicate about AMR?
• 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 than it was though!
- Why is it so difficult to communicate about AMR?
The question is more complex than we thought...

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

Peter Collignon¹,²*, Prema-chandra Athukorala³,⁴, Sanjaya Senanayake⁵,⁶, 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
The correlation coefficient between antibiotic usage and average antibiotic resistance is 0.40.

The correlation coefficient between control of corruption and average antibiotic resistance is -0.77.

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

Fig 2. 'Average Microbial Resistance' against 'Control of Corruption.'
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.
No simple way for the return

✓ Which innovations?
✓ The question is more complex than it was though!
✓ Why is it so difficult to communicate about AMR?
Why is it so complex to communicate about AMR?
(with the help of Pr. J. Arquembour 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.