Access Innovation and Conservation

The experience of ReAct

Otto Cars MD PhD
Professor Infectious Diseases
Uppsala University, Sweden
Founder and senior adviser ReAct

“"A future free from the fear of untreatable infections""
Antibiotic Resistance: A silent tsunami
Figure 1

Occurrence of carbapenemase-producing *Enterobacteriaceae* based on self-assessment by national experts, 38 European countries, May 2015
The shortfall of the R&D pipeline

EMA-ECDC-ReAct pipeline analysis

- 90 antibacterials against organisms of public health importance
- 66 new active substances
- 27 with new targets or new mechanisms of action
- 15 are systemic
- 4 against gram-negative
- 2 act on new targets
- 0 with new mechanism of action

The bacterial challenge: time to react
A call to narrow the gap between multidrug-resistant bacteria in the EU and the development of new antibacterial agents

www.ecdc.europa.eu
www.ema.europa.eu
“The infrastructure of antibiotic discovery both in academia and in industry is at a dangerously low level and needs to be rebuilt”
A leaking system

New antibiotics

Marketing

Volume sales

Misaligned financial incentives

Irrational use
“Nobody likes to lose business. We give whatever they ask. Competition, location of shops, license issues...everything has become commercialized”
- Urban pharmacist

“Even reputed companies offer complimentaries. If you prescribe more, they offer air conditioned car or free tickets.... Of late, we are forced to try new antibiotics”
- Urban doctor
Typical Pharmaceutical Economic Model:
Return is driven by sales volume

**Investment**
Preclinical and clinical development.
Demonstration of safety & efficacy

**Return of Investment**
Price (somewhat) controlled by authorities/payers
Volume (somewhat) driven by company and competition

Price x Volume
3Rs for innovating novel antibiotics: sharing resources, risks, and rewards

The stream of new antibiotics is struggling to keep up with emerging bacterial resistance. Anthony So and colleagues examine what can be done to increase innovation.
Innovative financing to achieve de-linkage

WHO Consultative Expert Working Group on R&D Financing and Coordination

R&D Investment

Revenue

Price X Quantity

Delinkage: Divorcing R&D Funding from Product Pricing

Product Price

Delinkage: Divorcing ROI from volume-based sales

Antibiotic Innovation Policy Discussions
WHO Global action plan:
“The cost of investment in research and development may need to be de-linked from price and the volume of sales to facilitate equitable and affordable access to new medicines”
Innovative Medicines Initiative
New Drugs for Bad Bugs (ND4BB)
Innovative Medicines Initiative
New drugs for Bad Bugs (NB4BB)

“Public investment into development of new antibiotics should come with appropriate obligations to governments, regulators, producers, and distributors with respect to the marketing and responsible use of these new products to avoid the rapid build-up of drug resistance”.

(WHO/DNDi concept note: Guiding principles)

US Biomedical Advanced Research and Development Authority
BARDA
Innovative Medicines Initiative
New drugs for Bad Bugs (NB4BB)

Both IMI and BARDA are supporting pivotal trials of the Astra-Zeneca combination avibactam-aztreonam

US Biomedical Advanced Research and Development Authority
BARDA
A systematic review and critical assessment of incentive strategies for discovery and development of novel antibiotics

Matthew J Renwick, David M Brogan and Elias Mossialos
Universal Access to Effective Antimicrobials: An Essential Feature of Global Collective Action against Antimicrobial Resistance

Nils Daulaire, Abhay Bang, Göran Tomson, Joan N. Kalyango, and Otto Cars

Journal of Law, Medicine & Ethics, 2015
High Proportion of Intestinal Colonization with Successful Epidemic Clones of ESBL-Producing Enterobacteriaceae in a Neonatal Intensive Care Unit in Ecuador

Viveka Nordberg¹,²*, Arturo Quizhpe Peralta³,⁴, Telmo Galindo³, Agata Turlej-Rogacka⁵,⁶, Aina Iversen⁵,⁶, Christian G. Giske⁵,⁶, Lars Návér¹,²
Availability of old antibiotics

*C. Pulcini et al. CID 2012;54:268*

Ongoing Update 2015: Availability decreases, common long lasting shortages