

Antibiotikaresistens ur ett globalt perspektiv

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www.reactgroup.org



Antibiotika

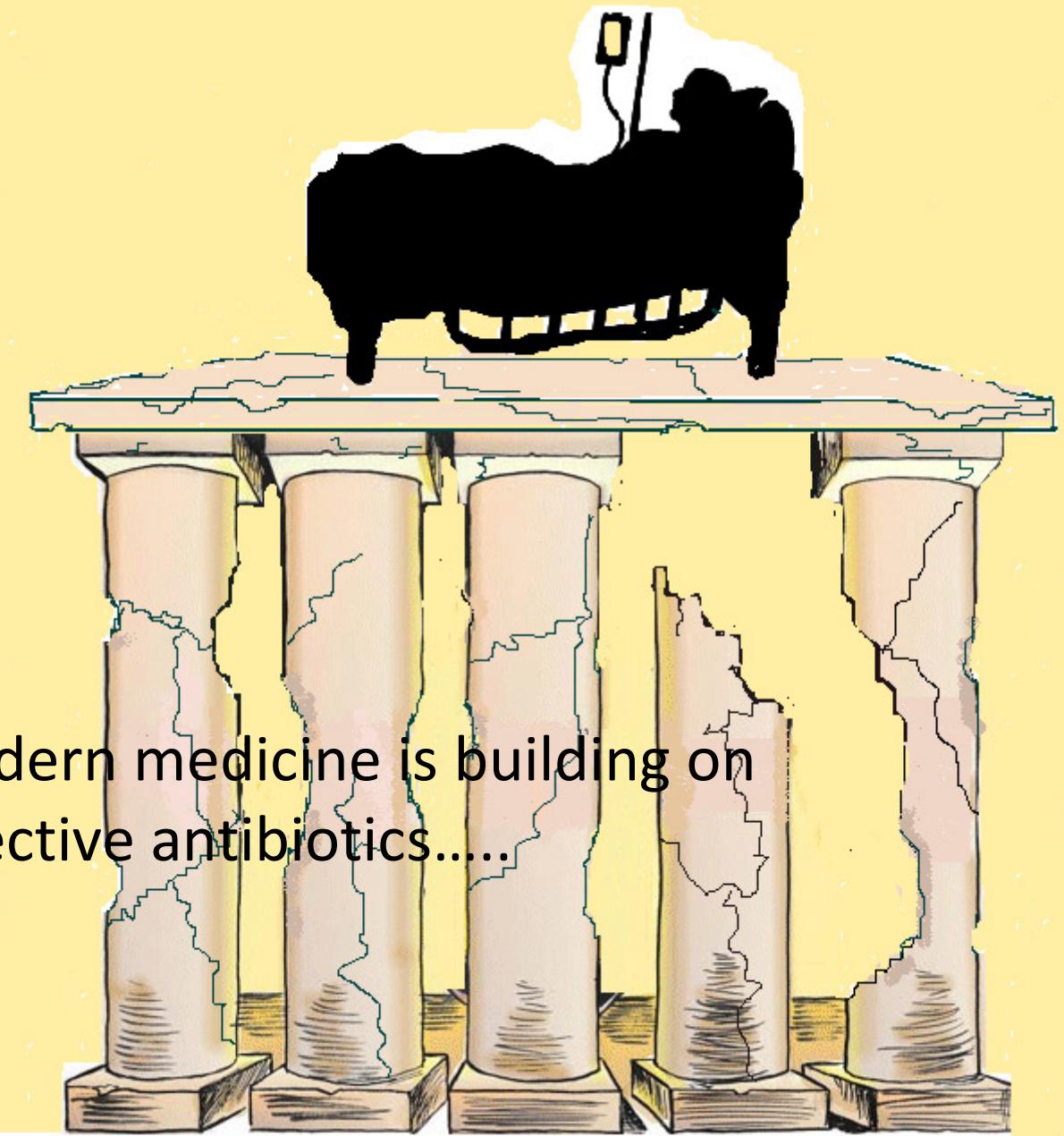


En mänsklig rättighet
eller en ändlig resurs ?

**Antibiotika-
resistens**

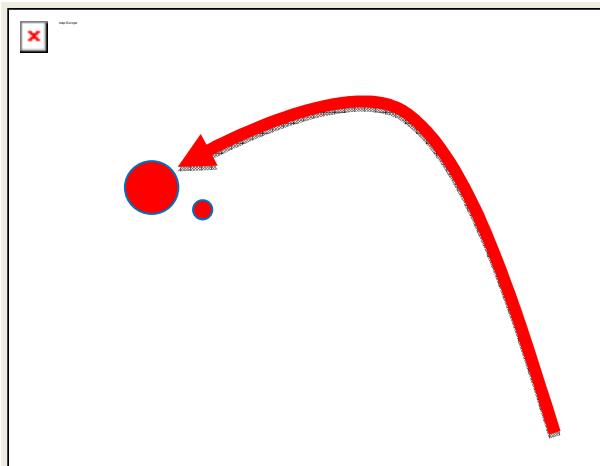
**Läkemedels-
utveckling**

**Morbiditet
Mortalitet
Kostnader**



Modern medicine is building on
effective antibiotics....

Epidemic diffusion of KPC-producing *K. pneumoniae* of Clonal Complex 11 (ST258, ST512) in Italy



late 2008

The first cases



early 2011



late 2013

How Scientists Stopped Klebsiella Pneumoniae: Deadly Superbug Killed 6 At NIH Clinical Center

By LAURAN NEERGAARD 08/22/12 05:19 PM ET

As a deadly infection, untreatable by nearly every antibiotic, spread through the National Institutes of Health's Clinical Center last year, The staff resorted to extreme measures.

They built a wall to isolate patients, gassed rooms with vaporized disinfectant and even ripped out plumbing

'Superbug' stalked NIH hospital last year, killing six





**The implications of widespread resistant strains of gonorrhoea:
Are we heading towards a postantibiotic era?**

**106 million new cases of gonorrhoea yearly-
many of which are not treatable with
available drugs**

How large is the unknown ?

The tip of the iceberg





In Dar es Salaam, Tanzania, the paediatric mortality rate from gram-negative infections were more than 43 %. Antibiotic resistance were a significant risk factor for a fatal outcome

Blomberg et al BMC Infect Dis 2007

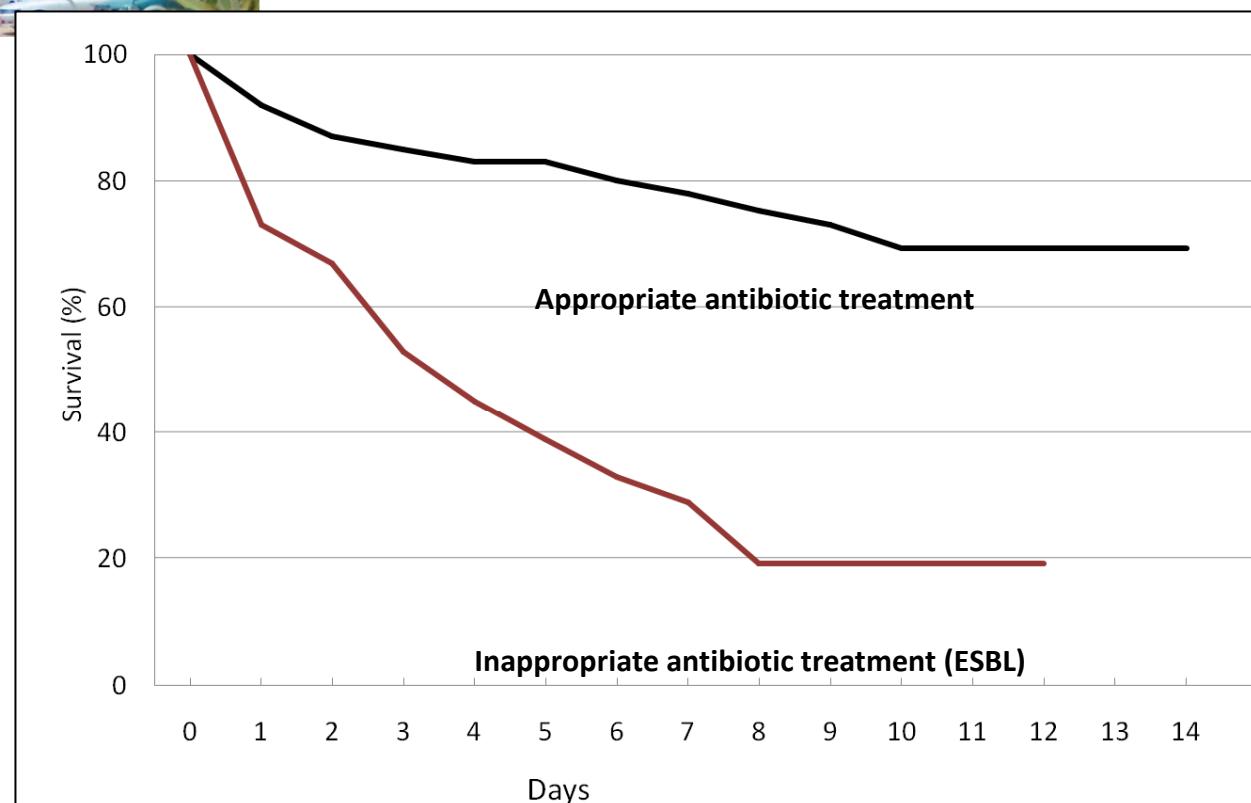
Antibiotic resistance is causing significant mortality



Severe neonatal
bacterial infections

Tanzania, 2000's:

Gramnegative (ESBL) is causing a decrease the chance of a 14-day survival from ~ 70% to 20%



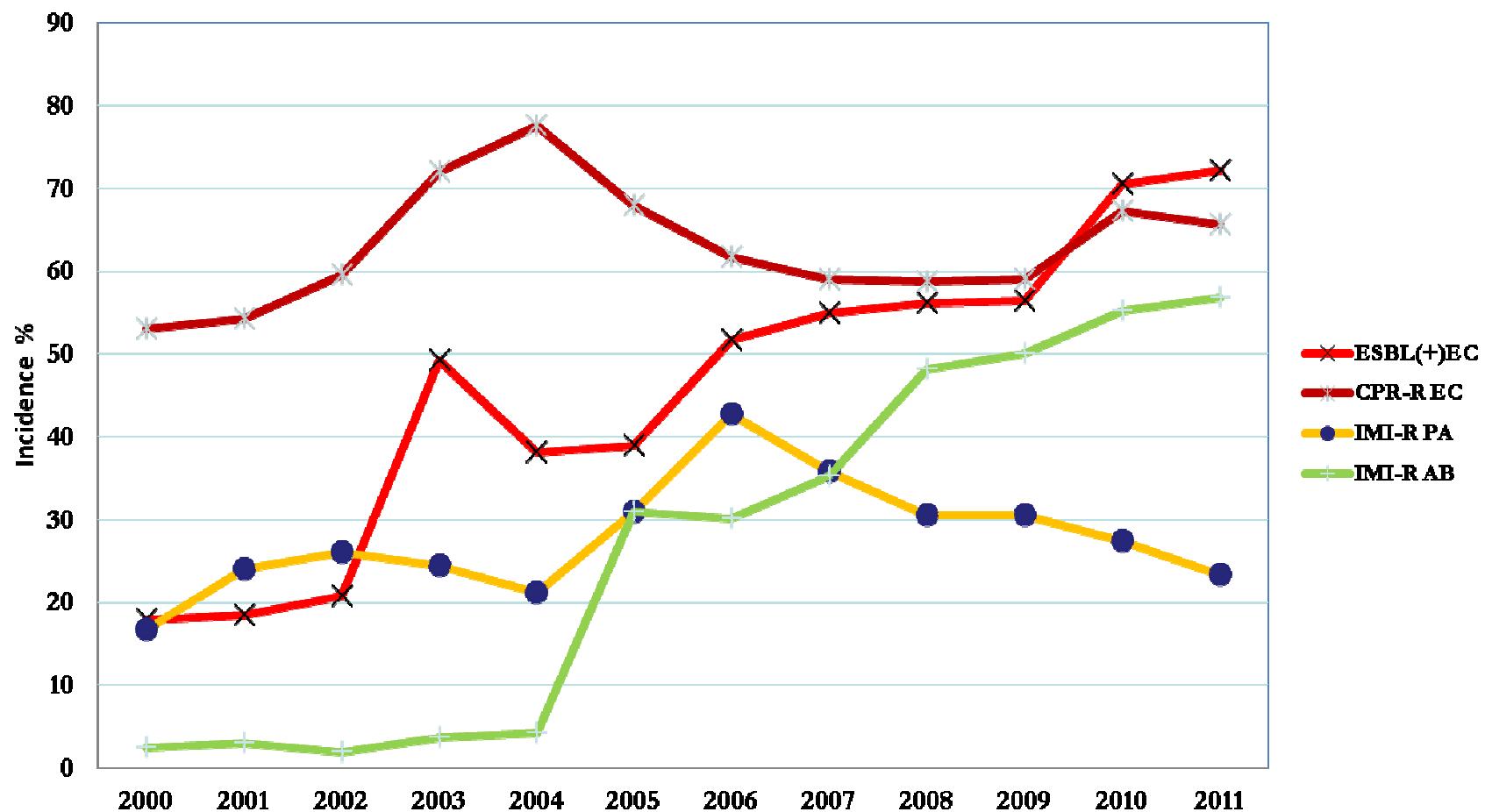
Adapted from Blomberg,
BMC Infect Dis 2007

One child dies every five minutes because the antibiotics given are not effective due to bacterial resistance



*Zulfiqar Bhutta presentation at ReAct
conference Sep. 2010*

Major G(-) resistance bacteria



3rd-gen. ceph-R
Gram-neg. bact.



Carbapenems



Colistin-S only
Gram-neg. bact.



Colistin



Pan-resistant
Gram-neg. bact.

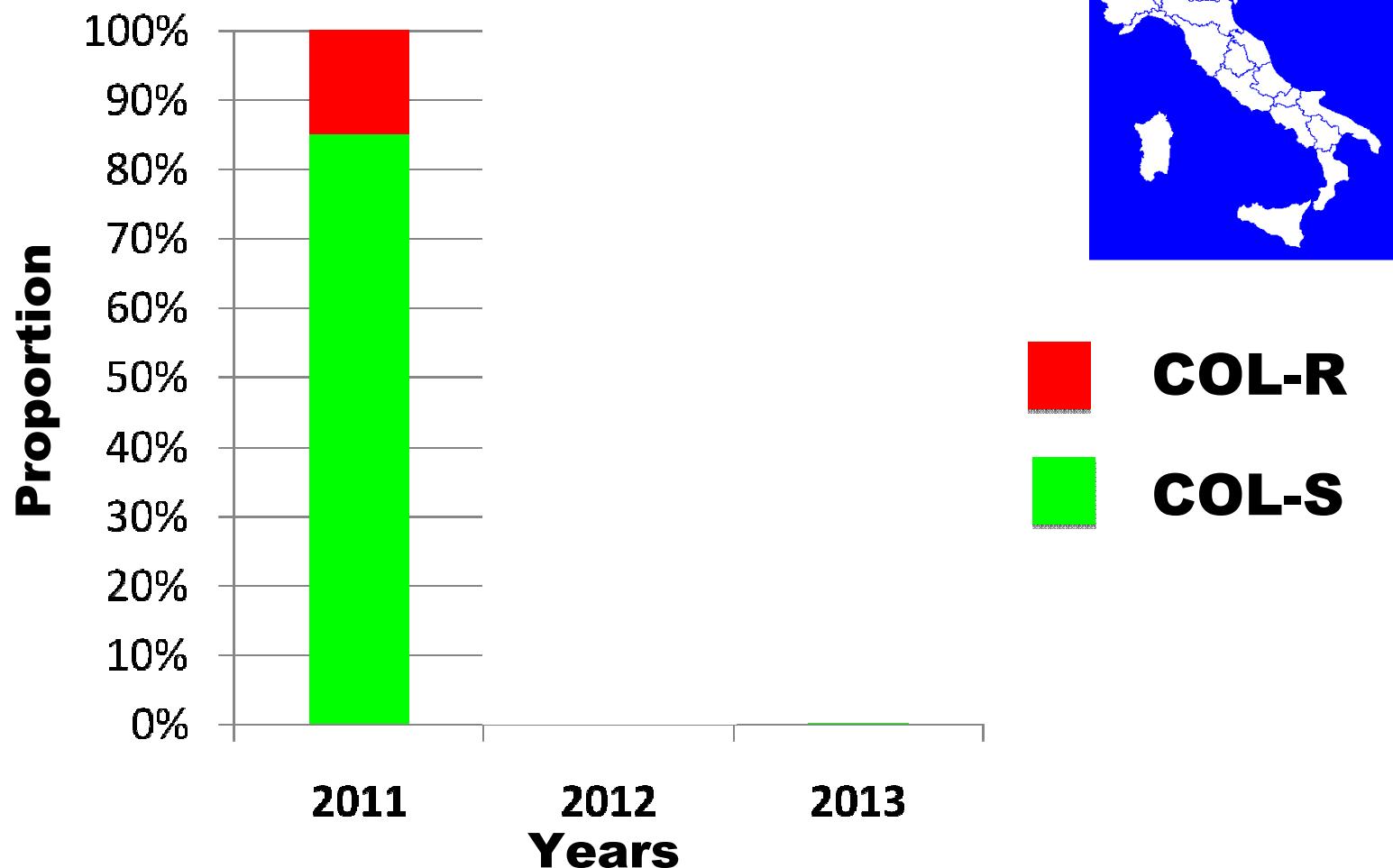
Colistin-resistant (pan-resistant) bacteria appearing in many countries

Source: Falagas ME, Kasiakou SK. *Clin Infect Dis* 2005;40:1331-41.
Michalopoulos AS, et al. *Clin Microbiol Infect* 2004;11:115-21.

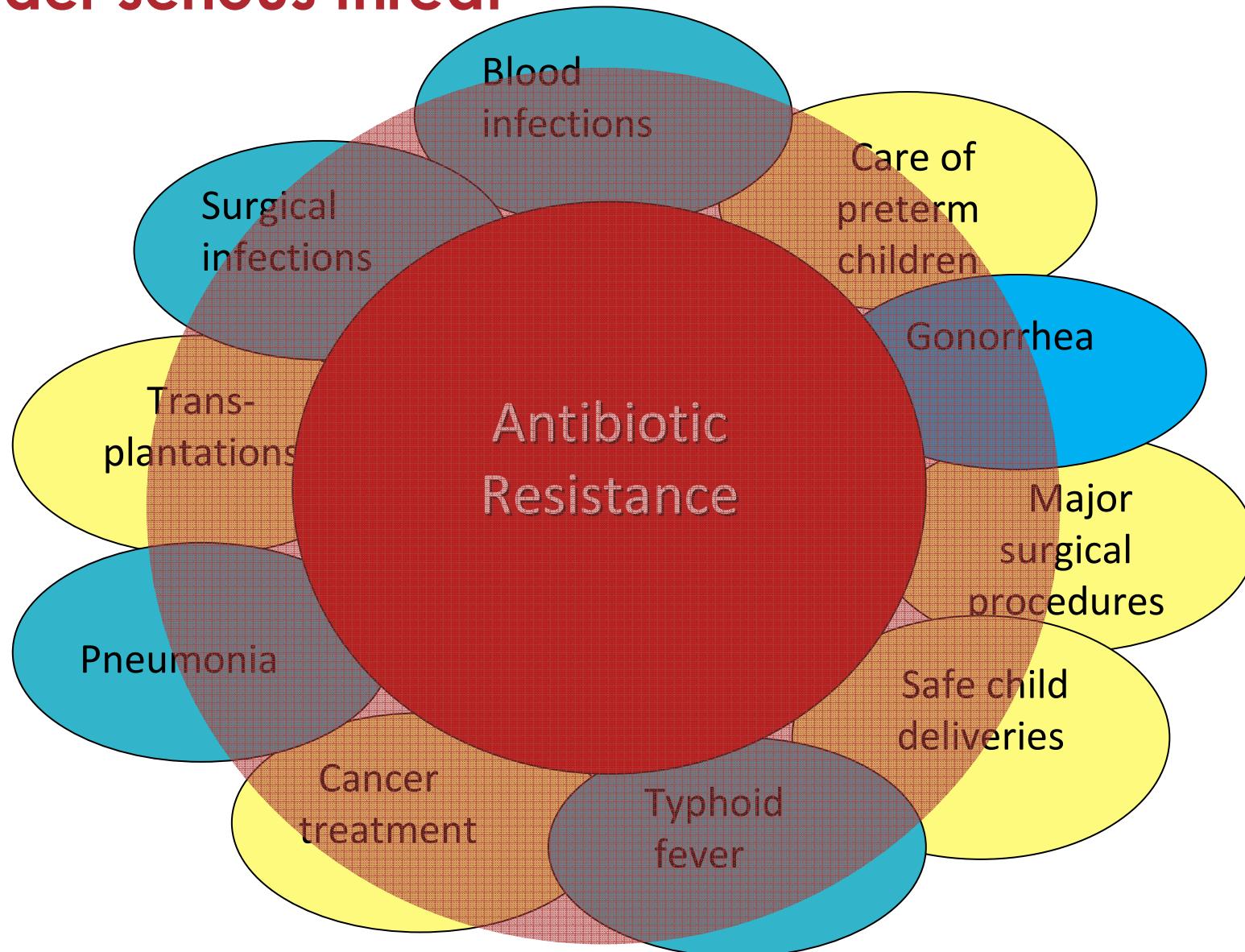
Polymyxins – Empirically or as definitive therapy?

- Definitive, only when susceptibilities were known until 2004
- Epidemics of OXA-23 *A. baumannii*: polymyxins → empirically prescribed in many hospitals
- Emergence of KPC-2 Enterobacteriaceae: polymyxins → empirically prescribed in most hospitals
- Resistance Increasing in some centers, especially in

Evolution of colistin resistant KPC-Kp in one large tertiary care hospital



Disease treatments and medical procedures under serious threat



- Selektion
- Spridning
- Brist på nya antibiotika
- Brist på snabb diagnostik

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China: Intravenous antibiotics for common colds



10 april 2011 kl 07:55

Annual antibiotic use per capita

Sweden :7 grams **China :138 grams**



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Illegal OTC antibiotic sale in the EU

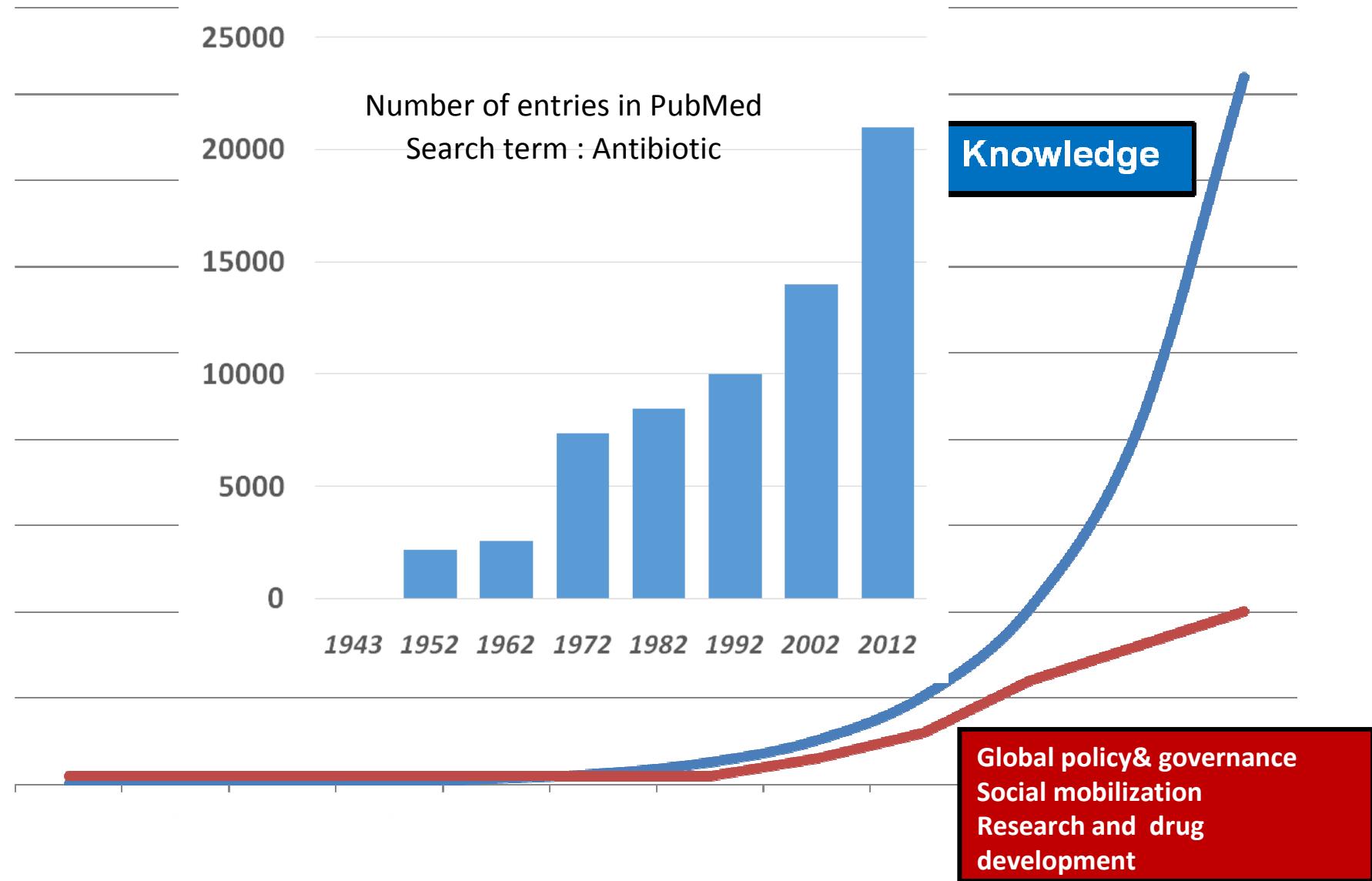


Athens, Greece 2008 (174 pharmacies)
2008:

- 100% of all visited pharmacies sold Amoxicillin/clavulanate acid OTC
- 53% sold Ciprofloxacin OTC, despite extra restrictions for fluoroquinolone prescriptions

Plachouras et al. Euro Surveill. 2010

The gap between science and policy



Global strategies against antibiotic resistance

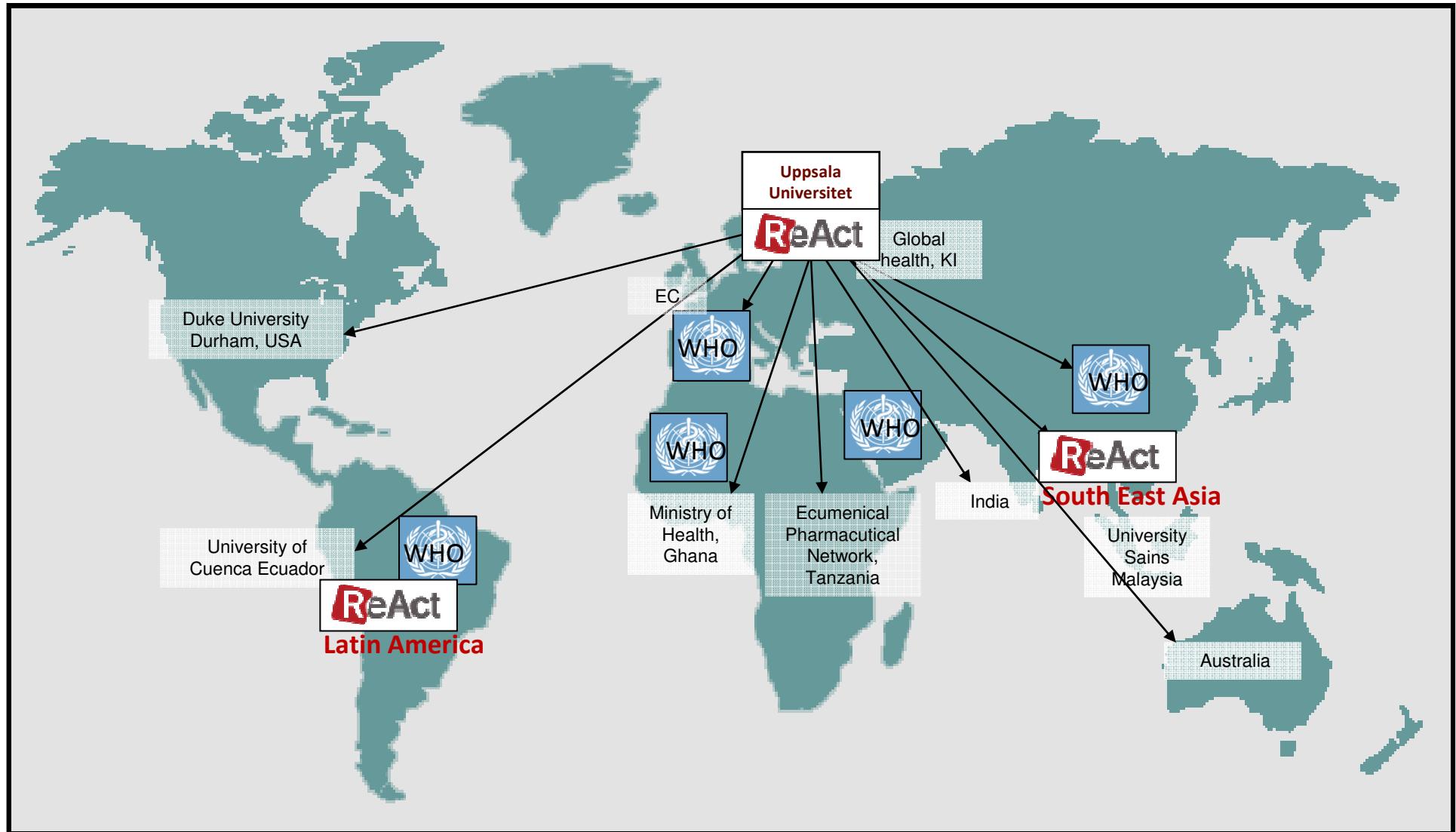


Will we respond to antibiotic resistance in time?



*A seminar on the growing threat of antibiotic resistance
September 14-17, 2005, Uppsala*

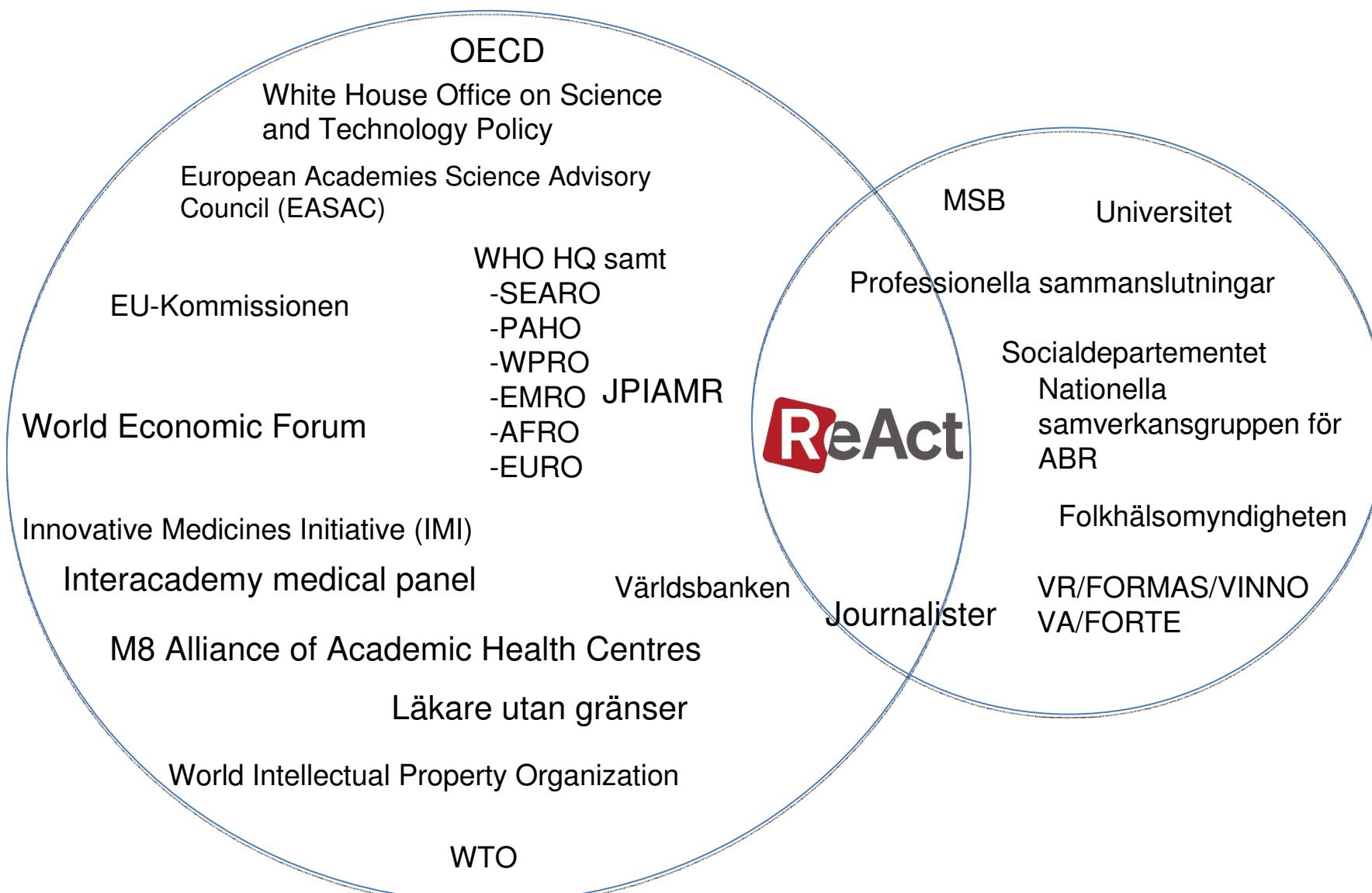
ReActs nätverk



ReActs fokusområden

- Lyfta resistensfrågan i den globala debatten
- Verka för etablering nationella /regional program mot antibiotika resistens
- Samverkan med WHO
- Främja behovsdriven forskning och utveckling av nya effektiva antibiotika

ORGANISATIONER SOM SÖKT KOMPETENSSTÖD FRÅN REACT



REACT IN LATIN AMERICA



■ Cuenca, miércoles 2 de mayo de 2007

ReAct arranca sus actividades en Latinoamérica

El investigador sueco Otto Cars, coordinador global de ReAct (Acción Contra la Resistencia Bacteriana, por sus siglas en inglés), dio una conferencia sobre "Los antibióticos están perdiendo su efectividad" presentó el tema de resistencia bacteriana en el auditorio de la Facultad de Medicina de la Universidad de Cuenca.

"La resistencia bacteriana, catalogada por la OMS (Organización Mundial de la Salud) como una de las mayores amenazas a la salud mundial, debe ser una preocupación de todos", comentó Arturo

de seres humanos.

"Las actuales y futuras generaciones deben tener acceso a una prevención y a un tratamiento efectivo contra las infecciones bacterianas, como parte de su derecho a la salud", destaca el investigador.

Eso motivó que en el 2004, desde la Universidad de Uppsala, Suecia, se lanzara ReAct. Hasta la fecha, el programa está respaldado por organizaciones e instituciones académicas de 23 países.

Desde inicios de este año, la FCCMM (Facultad de Ciencias Médicas de la Universidad de Cuenca) ha comenzado a implementar el programa ReAct en Ecuador.



The Cuenca Declaration, 2008

The problem is not
the bacteria but
ourselves.

The destruction of mother earth
and the cosmos by the
consumer society which has
invaded and destroyed the
sacred site of different forms of
life including the world of
bacterias



foto resistencia

La resistencia a los antibióticos en fotos



ProAct

South East Asia

- Supporting the establishment of national policy platforms on ABR
- Conference in 2011
- Engaging consumer groups





Ghanaian working group on AMR



2011: MoH working towards the development of a national policy for management of ABR

2013: Establishment of a national policy

Focus Areas and Categories in the Toolbox



UNDERSTAND Basic information about ABs and the problem of resistance	ENGAGE Empowerment and education for change	MEASURE Surveillance and data on antibiotic use, resistance and infection	RATIONAL USE Strategies to promote rational use of antibiotics	INFECTION CONTROL Strategies to promote infection prevention and control	POLICY Coordinated efforts to address ABR as a global health issue
Introduction	Introduction	Introduction	Introduction	Introduction	Introduction
Antibiotics and resistance	Community action	Health care facilities	Health care facilities	Health care facilities	Health care facilities
How did we end up here?	Change behaviors	In the community	The community	The community	Components of ABR policy
Impact of ABR	Build collaboration	Get data/statistics	Educational initiatives	Long term care	Ecological sustainability
What can I do?	Educational resources	Measure knowledge	Regulate AB use	Regulate IPC	Health and development
			Animal sector	Animal sector	Innovation



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resistens**

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Treatment options: The new kids on the block?

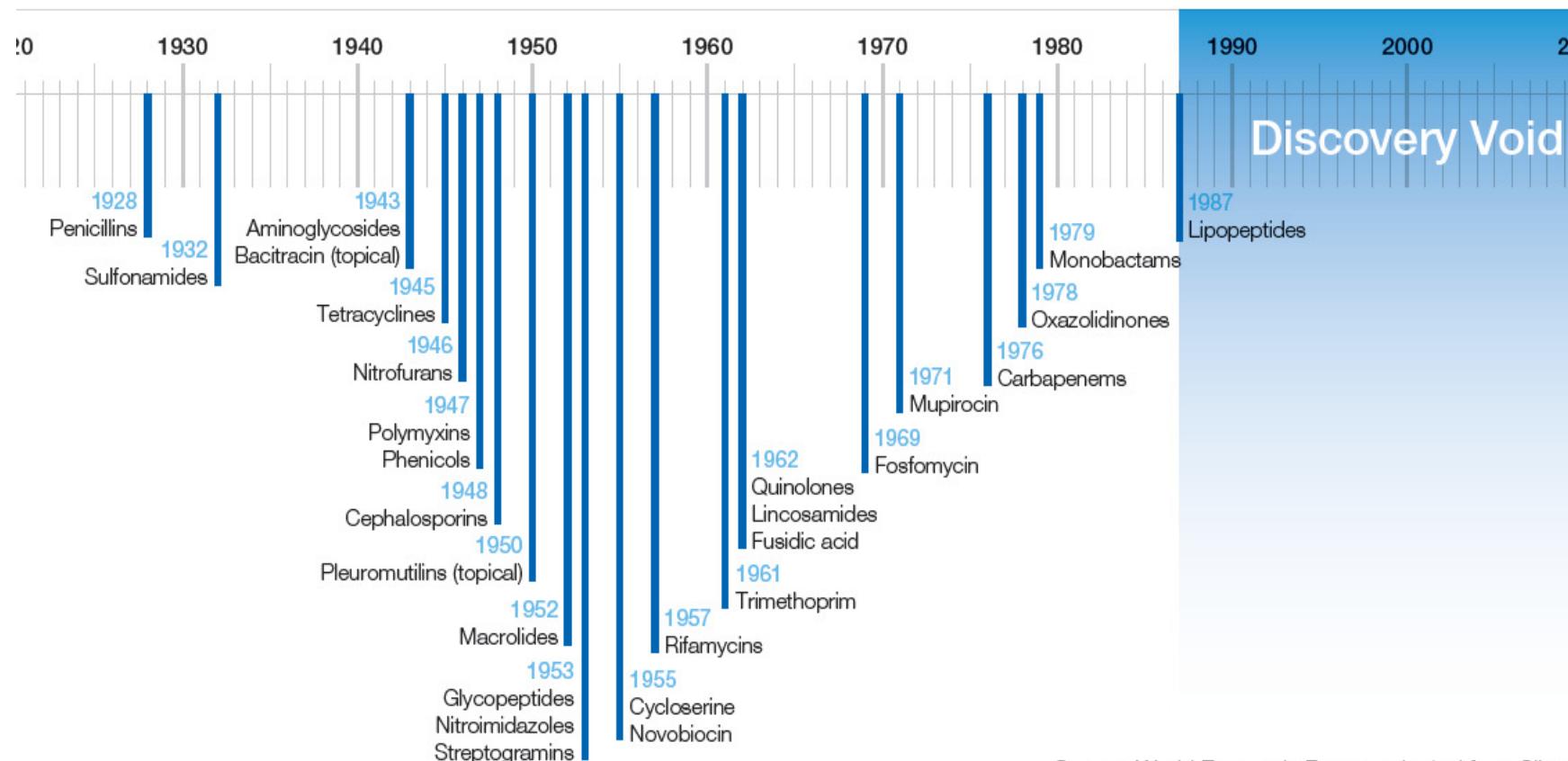


Thanks to Magnus Gottfredsson for the slide

Ingen ny klass av antibiotika sedan 1987

Antibiotic Discovery Void:

discovery dates of distinct classes of antibiotics. No new classes have been discovered since 1987.



Source: World Economic Forum, adapted from Silver

BBC

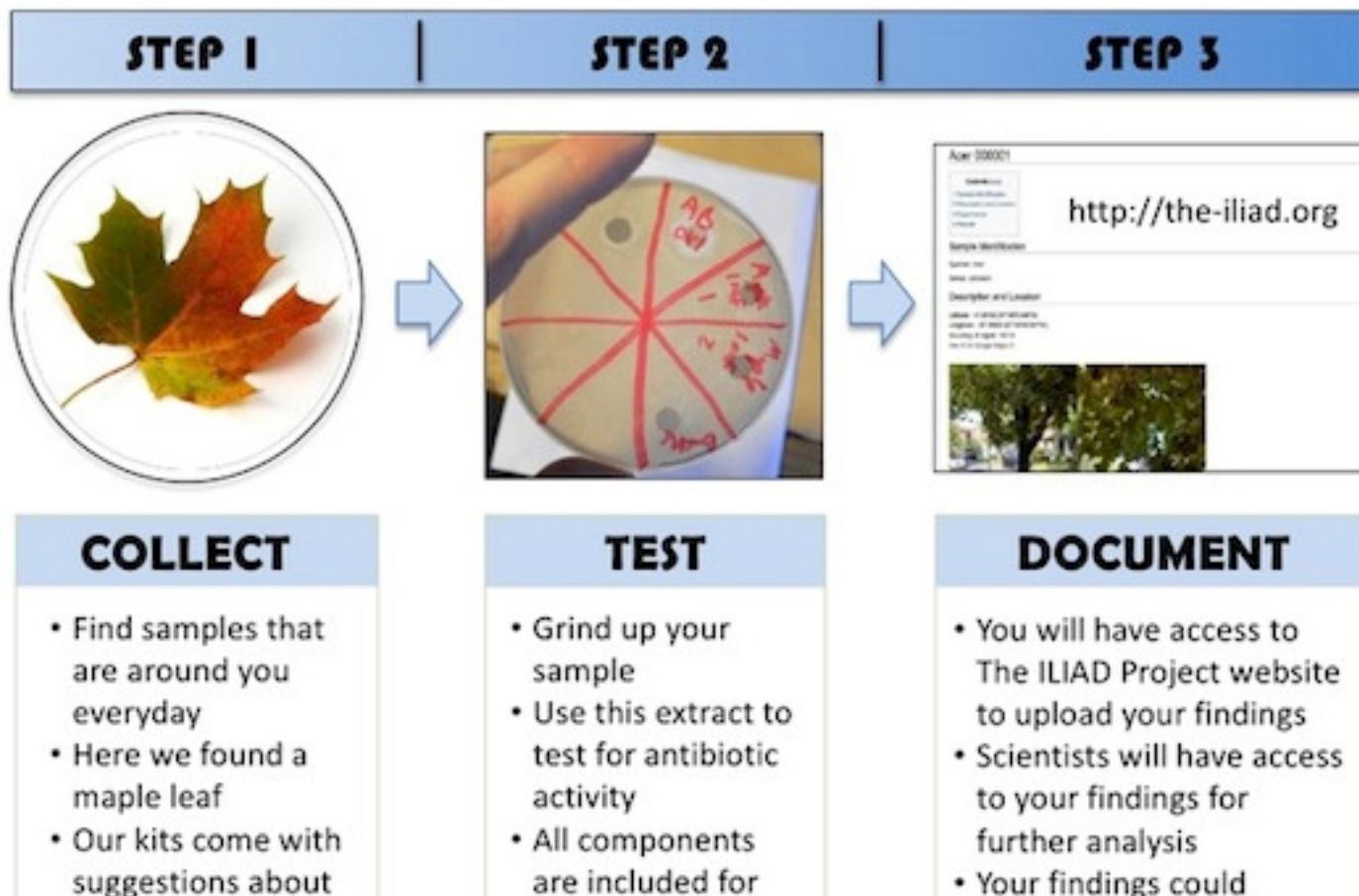
NEWS HEALTH

Cave bacteria could help develop future antibiotics



Drug detectives: scientists want to crowdsource the discovery of new antibiotics

The ILIAD project looks to amass an army of citizen scientists



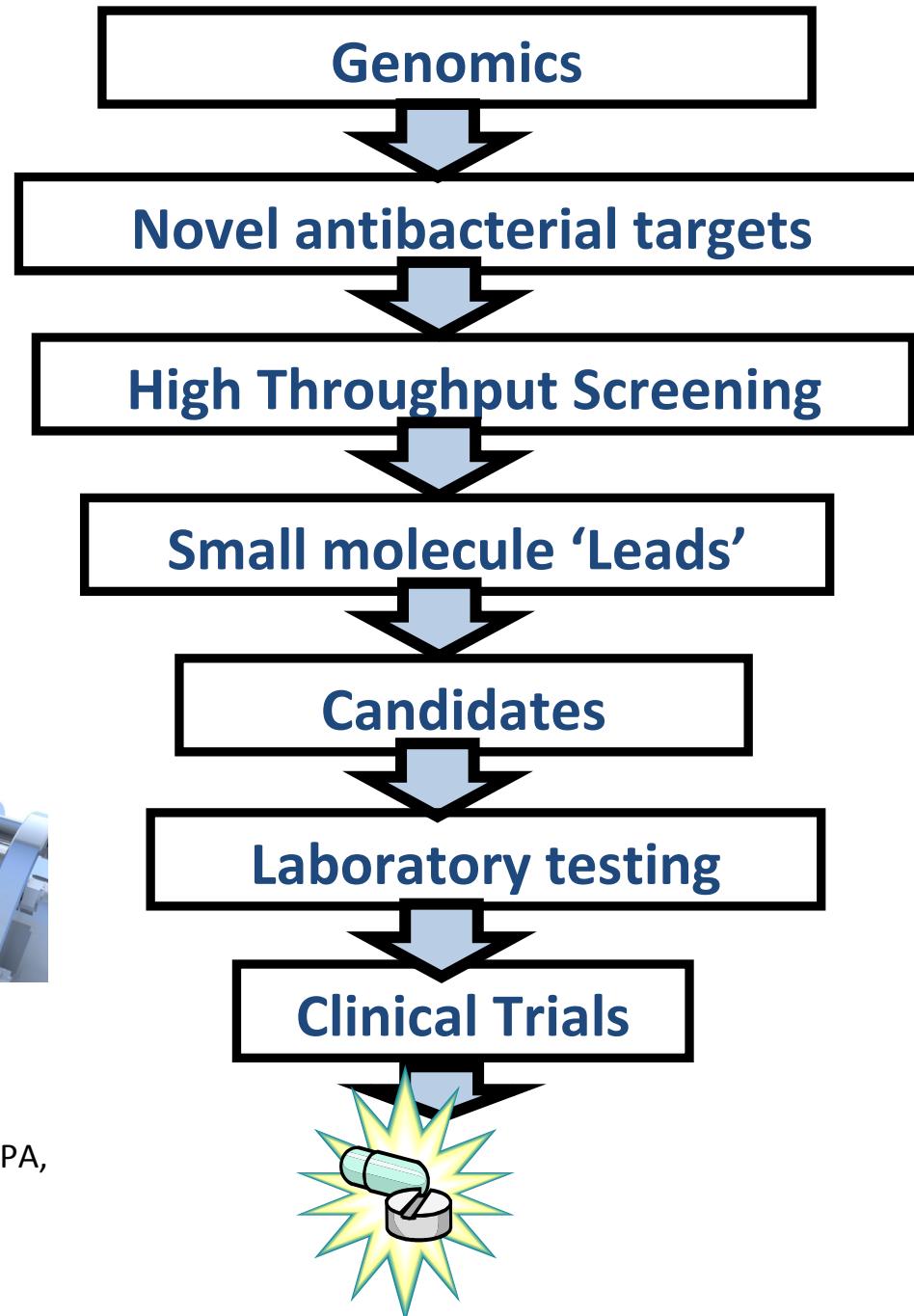
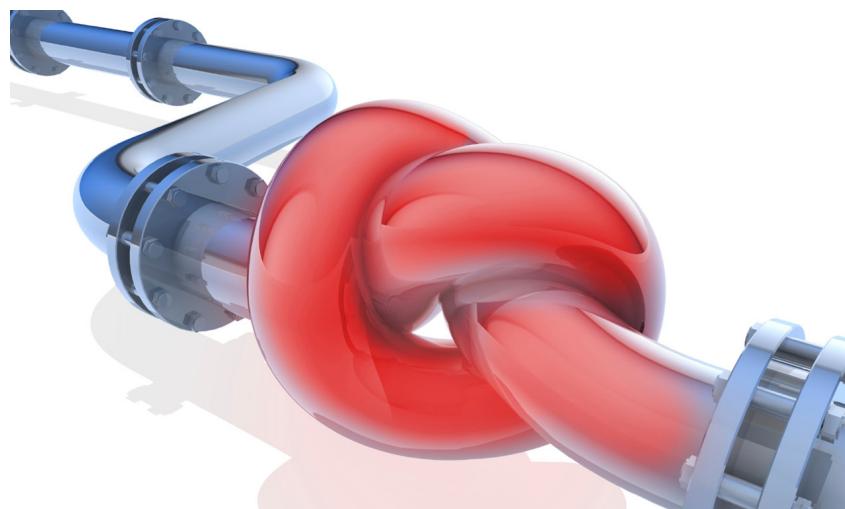
Innovative Incentives for Effective Antibacterials



se2009.eu

1990-talets

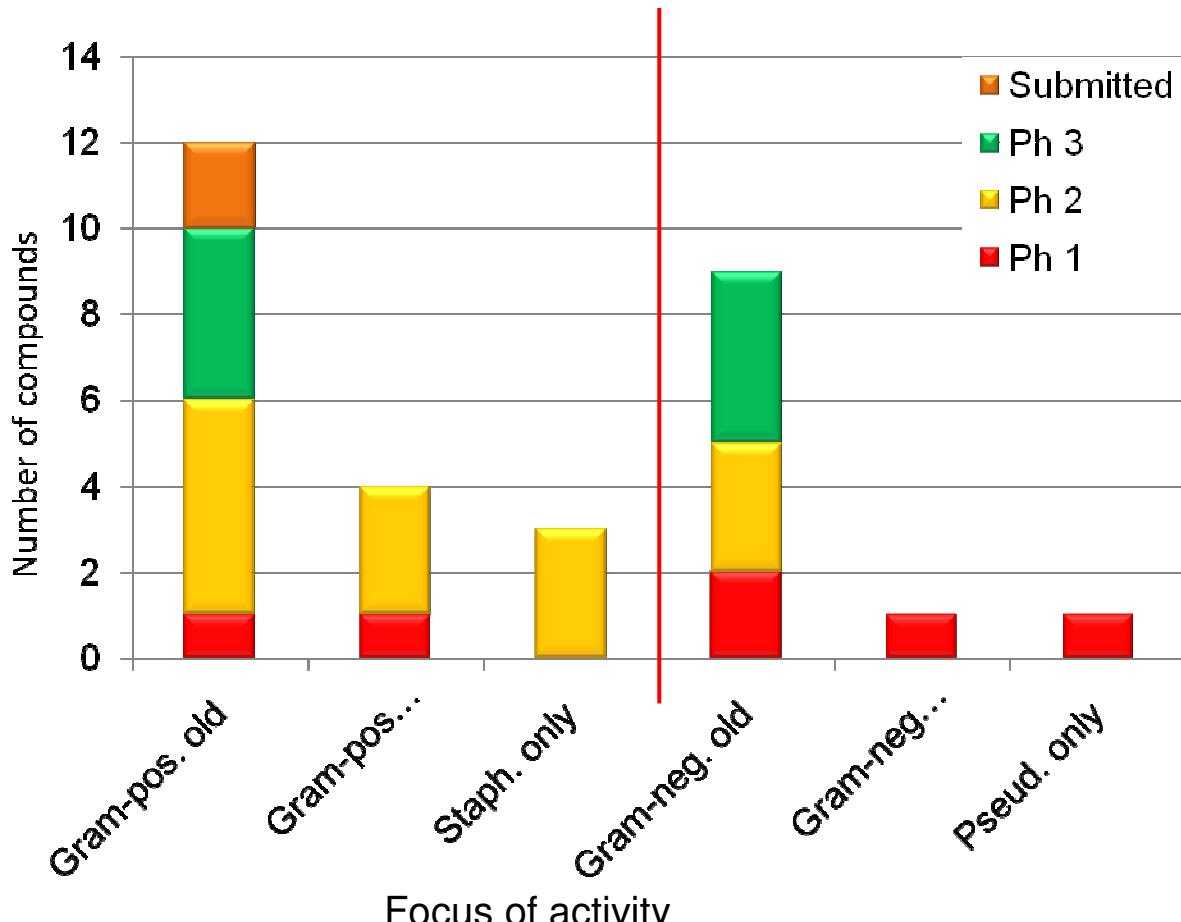
“genomics approach”
har misslyckats



From David J Payne GlaxoSmithKline, Collegeville, PA,
USA with permission

R&D Pipelines 11/2013

Small molecules in clinical development Phase 1-3, NDA/MAA



Old: Analog of used antibacterial class
Novel: New antibacterial class

ReActs policyarbete för global tillgång till effektiva antibiotika

The collage consists of five distinct images arranged in a grid-like fashion:

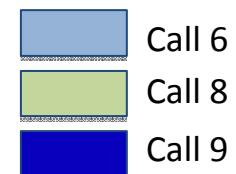
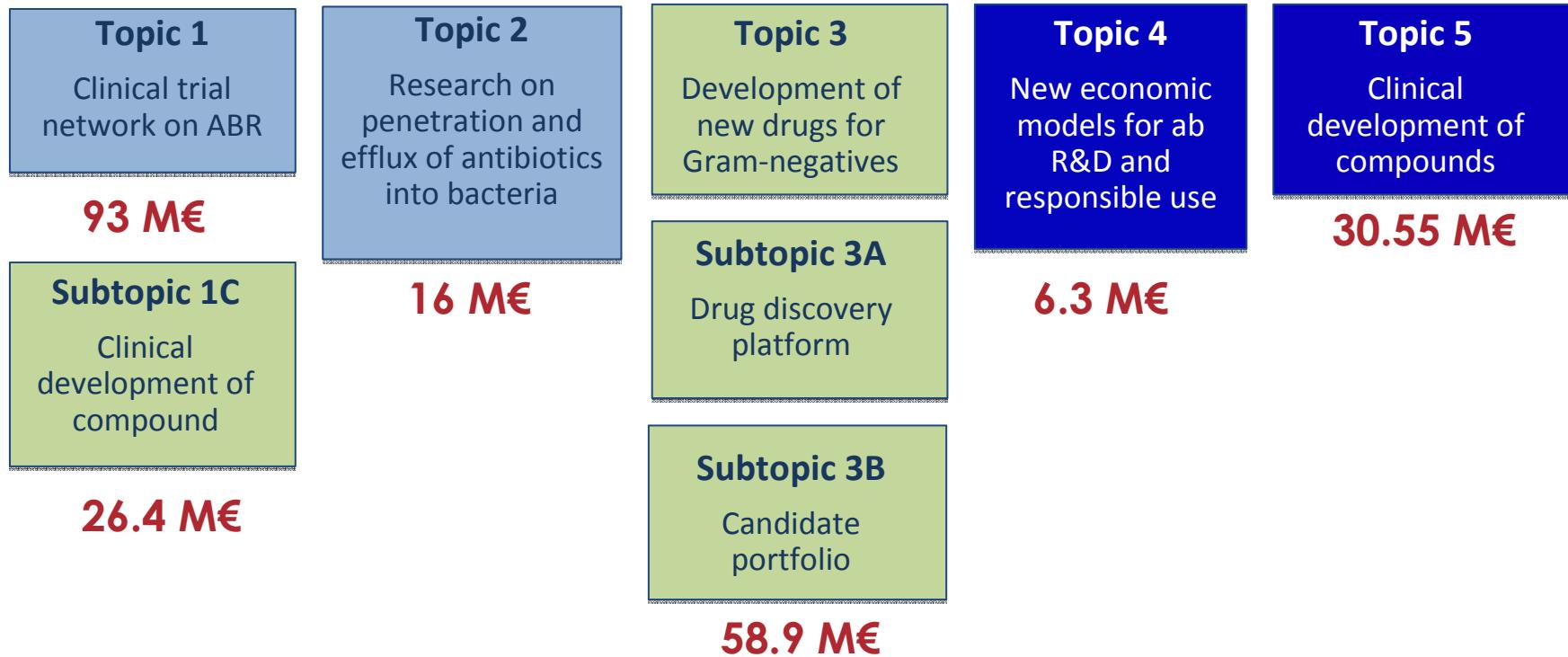
- Top Left:** A white banner for a conference. It features the Uppsala University logo, the ReAct logo (red square with white text), and the text "The Global Need for Effective Antibiotics - moving towards concerted action". Below this is a photograph of a petri dish showing bacterial growth. At the bottom, it says "September 6-8, 2010 Uppsala, Sweden".
- Top Middle:** A yellow banner for a policy seminar. It features the ReAct logo and the text "Collaboration for Innovation The Urgent Need for New Antibiotics". Below this is the text "ReAct policy seminar, Brussels, 23 May 2011".
- Top Right:** A yellow background with a blue circular logo in the top right corner. The text "and incentives", "fostering innovation", and "antibiotic research" is visible.
- Middle Left:** A purple journal cover for "DRUG RESISTANCE Updates". The cover features a blue and white abstract graphic at the bottom. Text on the cover includes "Volume 15, Issues 9-10, October-December 2011", "Reviews and commentaries in antimicrobial and anticancer chemotherapy", and "In this issue".
- Middle Center:** A photograph of a prescription pad with a large "RX" written on it. Several red and grey capsules are scattered on the pad. In the background, there's a yellow prescription bottle and some papers.
- Middle Right:** A black and white electron micrograph showing several rod-shaped bacteria.
- Bottom Right:** The European Observatory on Health Systems and Policies logo, which includes a stylized eye icon and the text "European Observatory on Health Systems and Policies".



Uppsala, september 2010

EU gör stora satsningar på nya antibiotika

New Drugs for Bad Bugs (ND4BB, IMI)



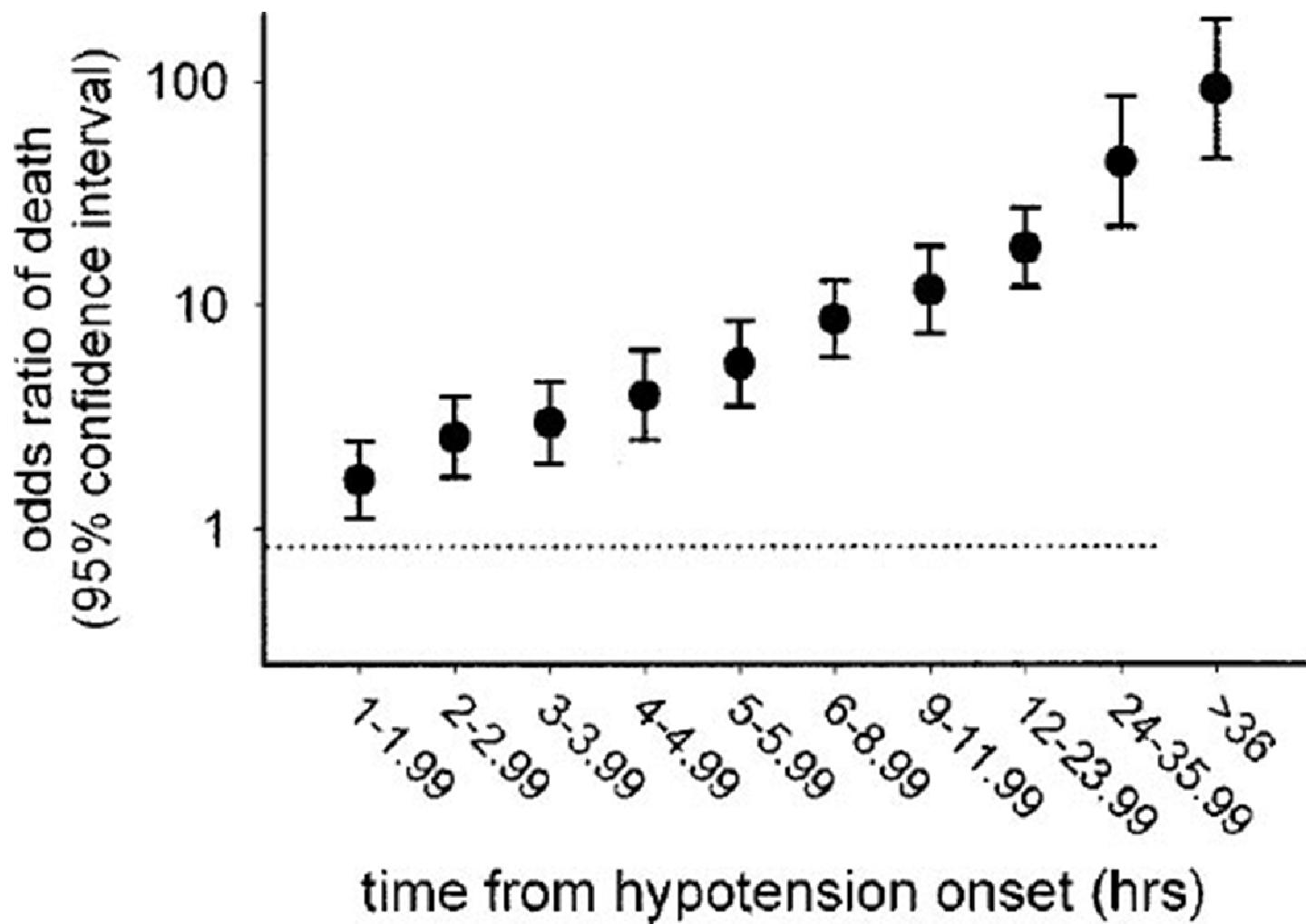
Towards a new business logic for R&D of novel antibiotics

- Needs driven - based on analysis of pipeline vs resistance and its burden
- Solving the scientific challenges
- Incentives that stimulate R&D of priority antibiotics
- De-linking return of investment from sales
- Controlled use and distribution of new AB
- Equitable global access and affordability

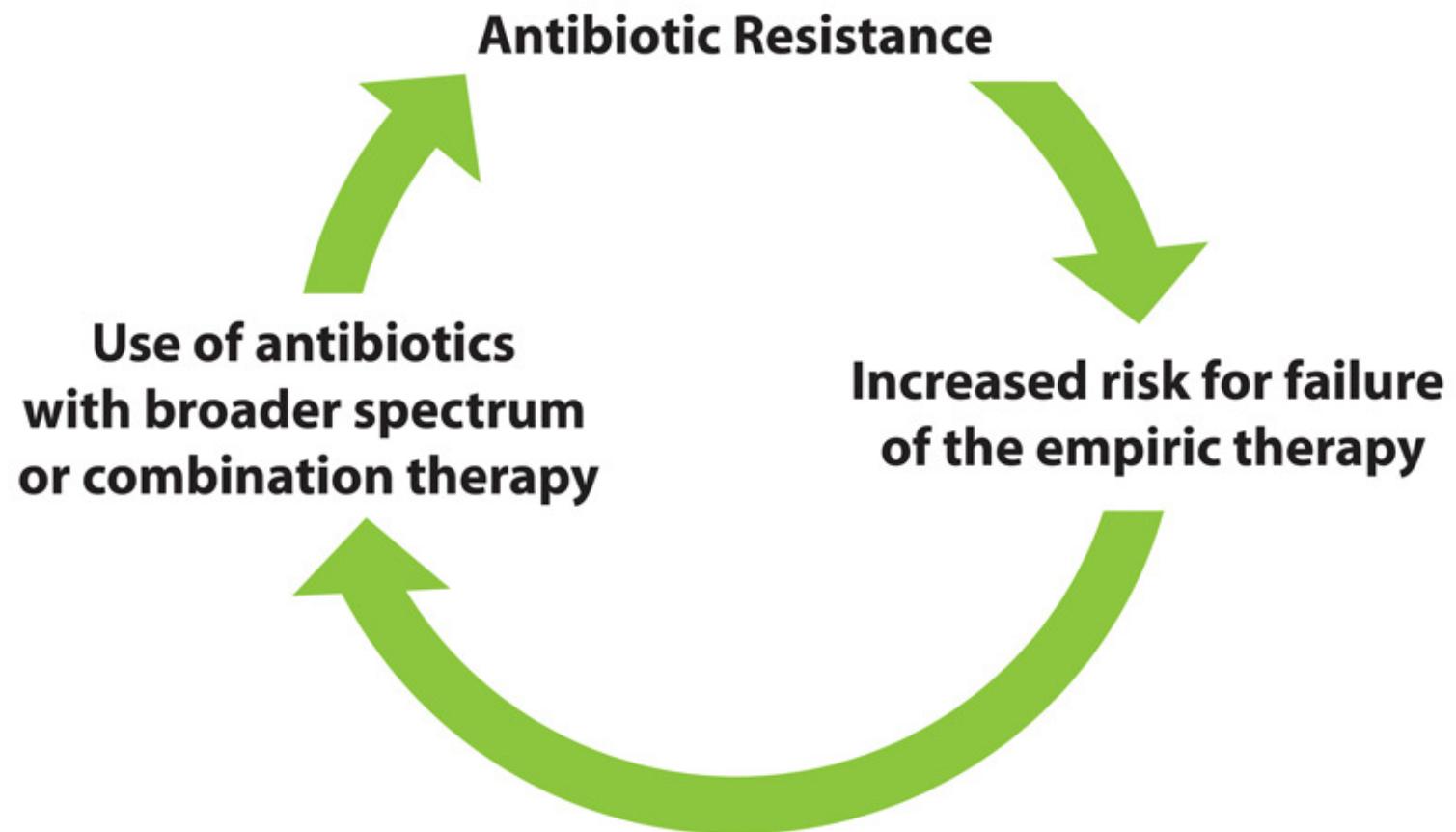
Långsam diagnostik- en fara för patientstäkerheten

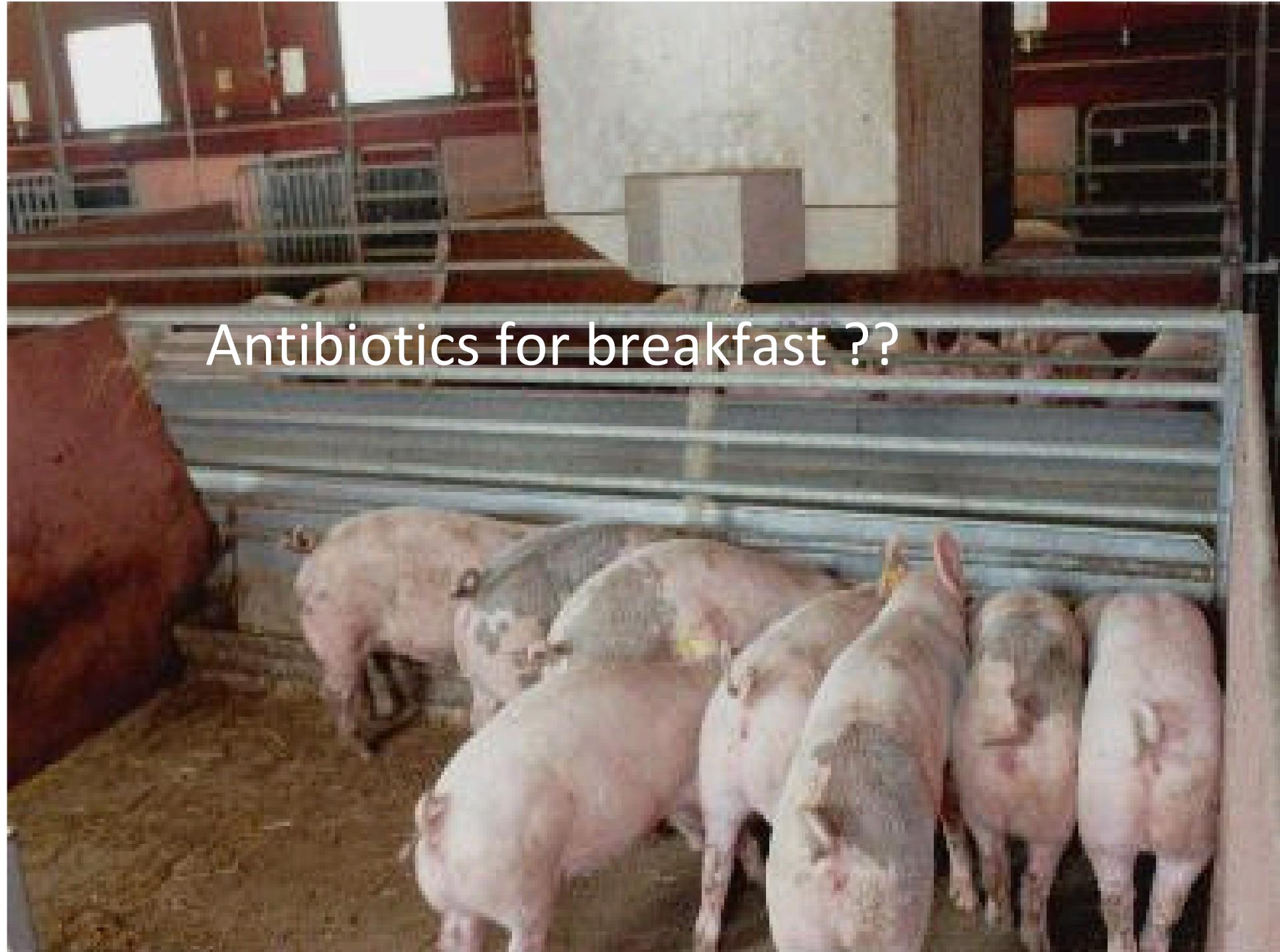


Time to effective treatment is critical



Kumar A, et al. Crit Care Med 34:1589-96, 2006



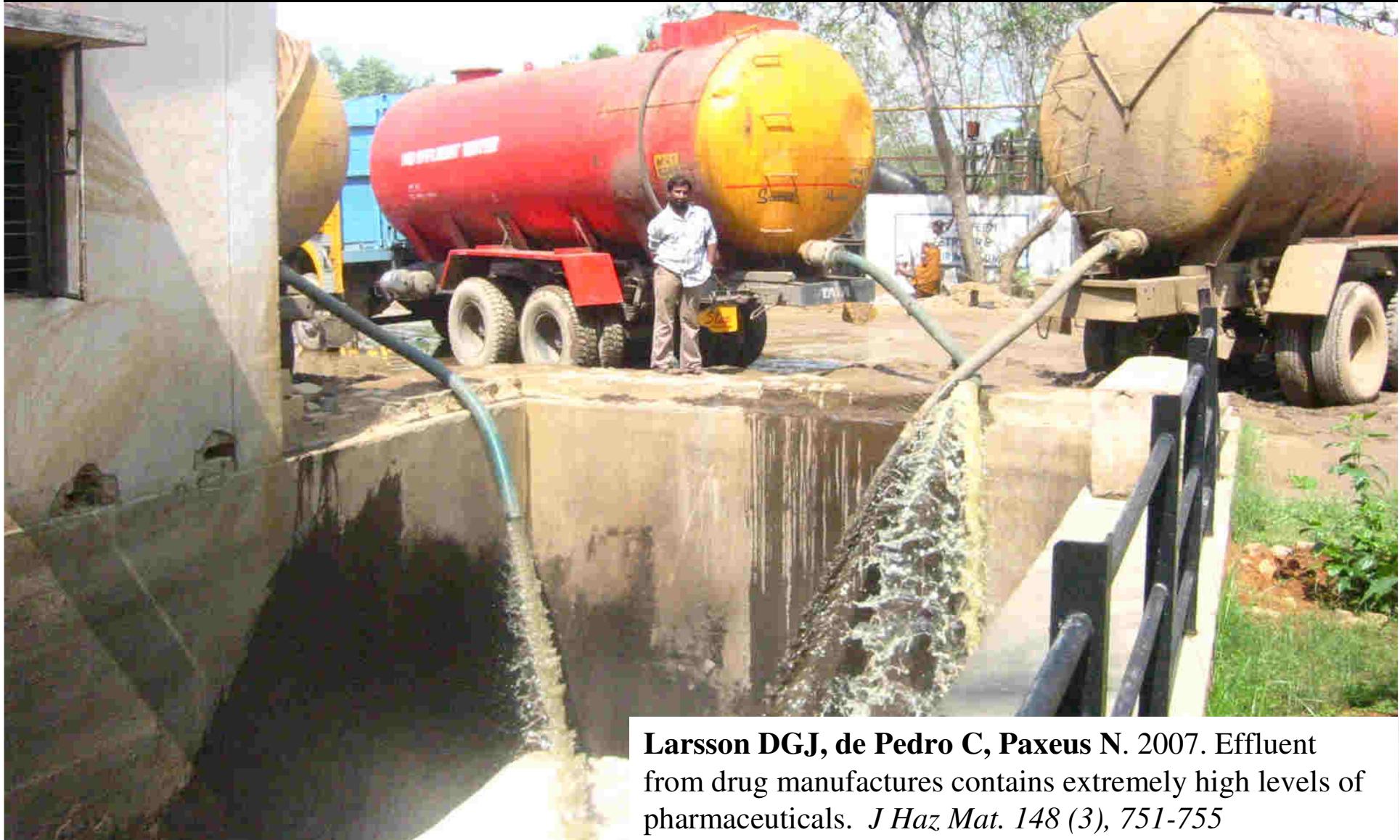


Antibiotics for breakfast ??



Antibiotics in the environment

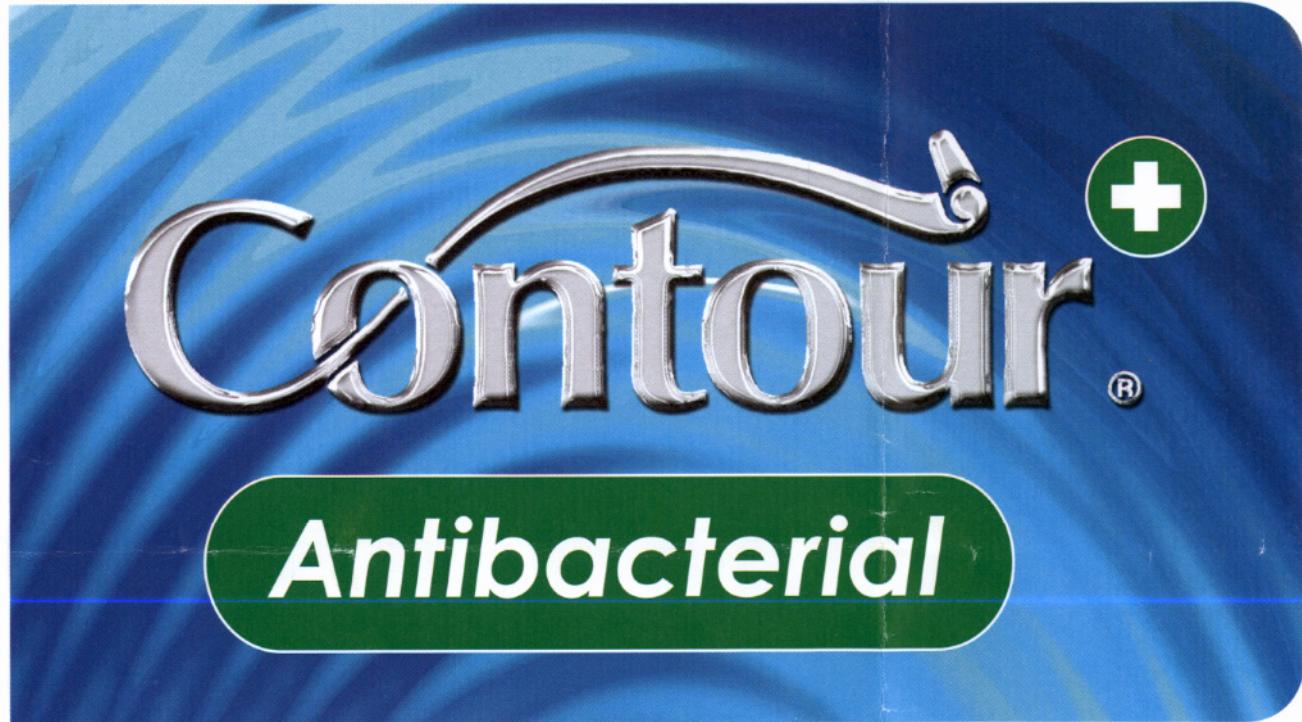
INDIA- A WORLD CENTRE FOR PRODUCTION OF GENERIC DRUGS



Larsson DGJ, de Pedro C, Paxeus N. 2007. Effluent from drug manufactures contains extremely high levels of pharmaceuticals. *J Haz Mat.* 148 (3), 751-755



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- ⊕ Salmonella
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- ⊕ E.coli



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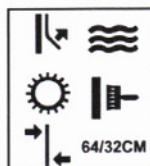
Roll size 10.05m x 0.52m (11yds x 20.5in) approx 5.2m² (56sq.feet)
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"Information sur le niveau d'émission de substances volatiles dans l'air intérieur, présentant un risque de toxicité par inhalation, sur une échelle de classe allant de A+ (très faibles émissions) à C (fortes émissions)

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原产国：英国



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WORLD ECONOMIC FORUM HIGHLIGHTS ANTIBIOTIC RESISTANCE AS A MAJOR GLOBAL RISK



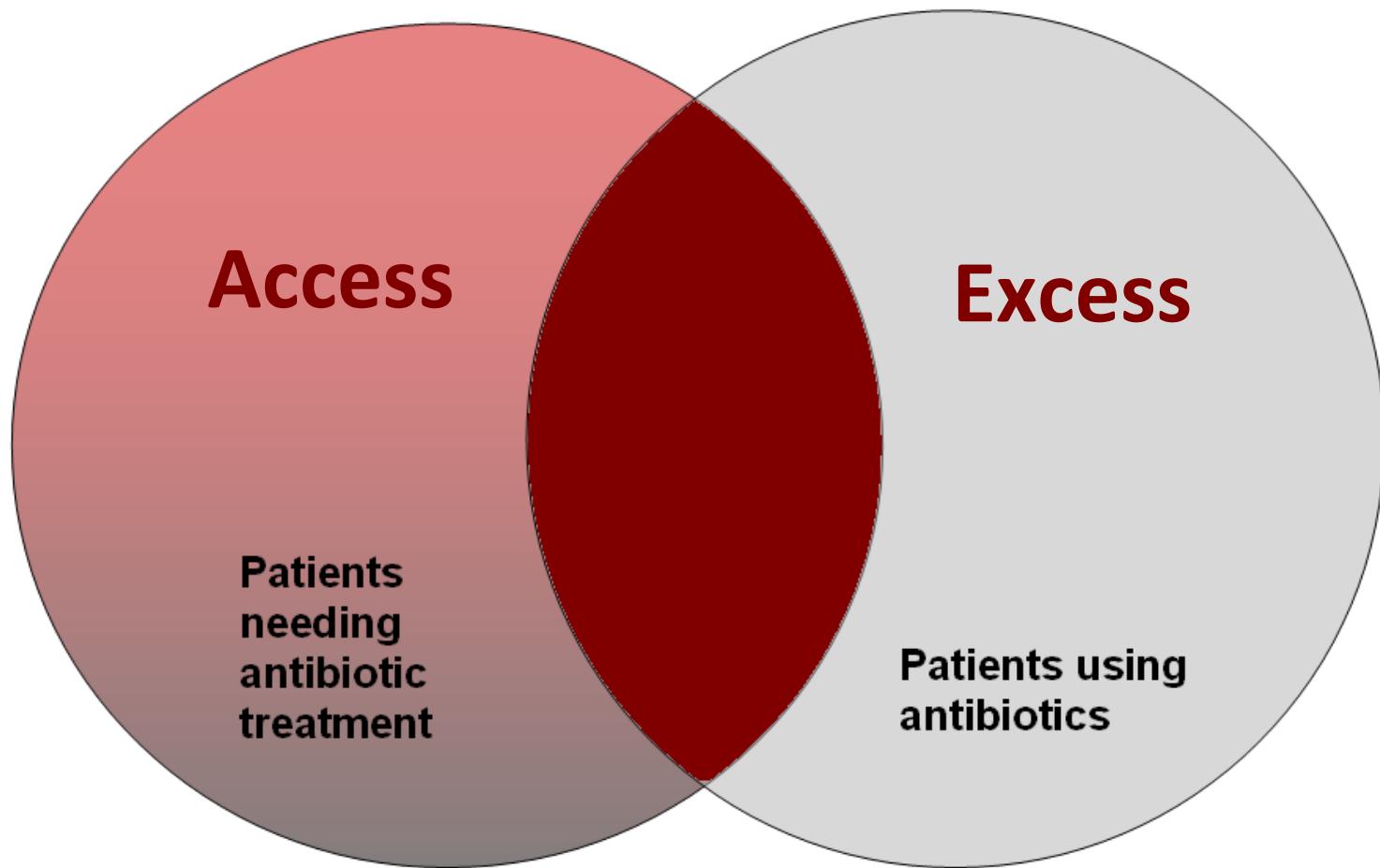
Earlier today the World Economic Forum published their Global Risks 2013 report developed from an annual survey of over 1 000 experts from industry government

Antibiotika



En mänsklig rättighet
eller en ändlig resurs ?

A new business model must be built on the global needs
and secure access and affordability as well as rational use





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