We are facing a world without effective antibiotics-

The urgent need for collective action

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Antimicrobial resistance or *Antibiotic* Resistance - a semantical confusion?

Antimicrobial resistance (AMR)

Antiviral agents

(e.g drugs for **HIV**)

Antiparasitiic agents

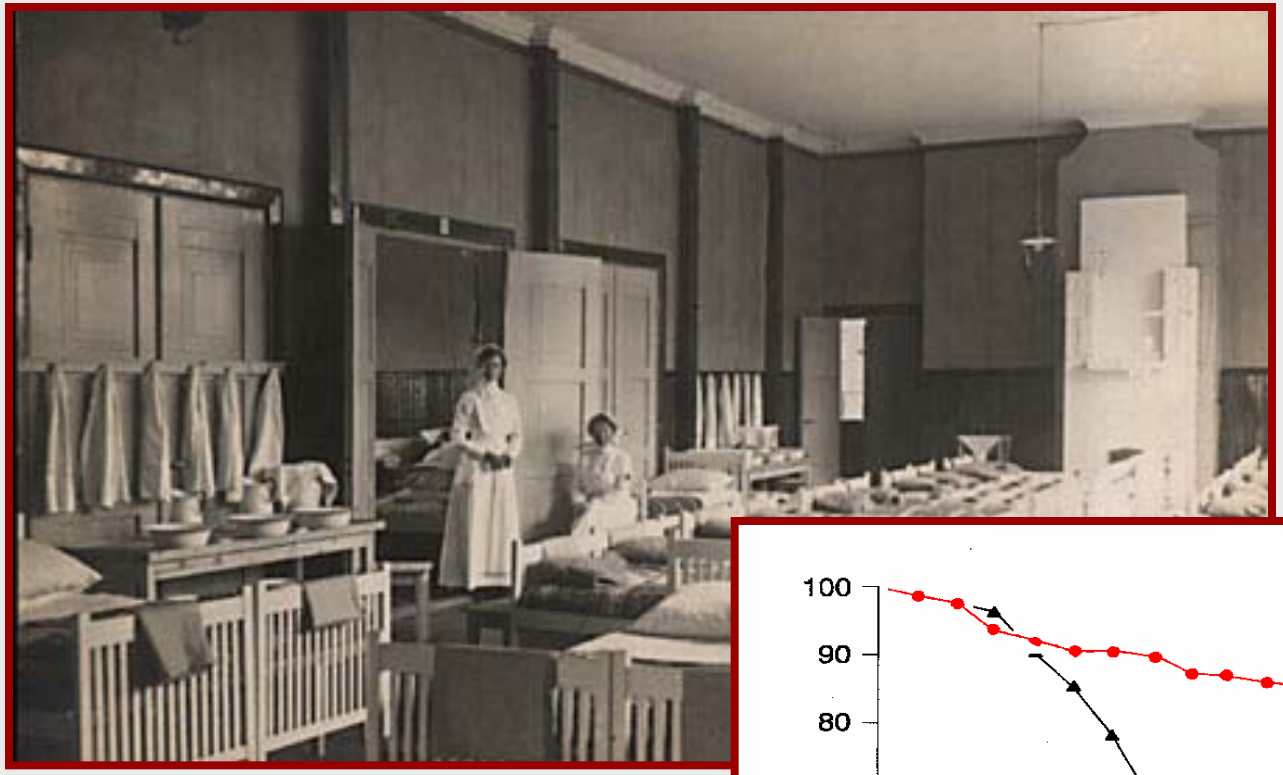
(e.g drugs for **malaria**)

ABR

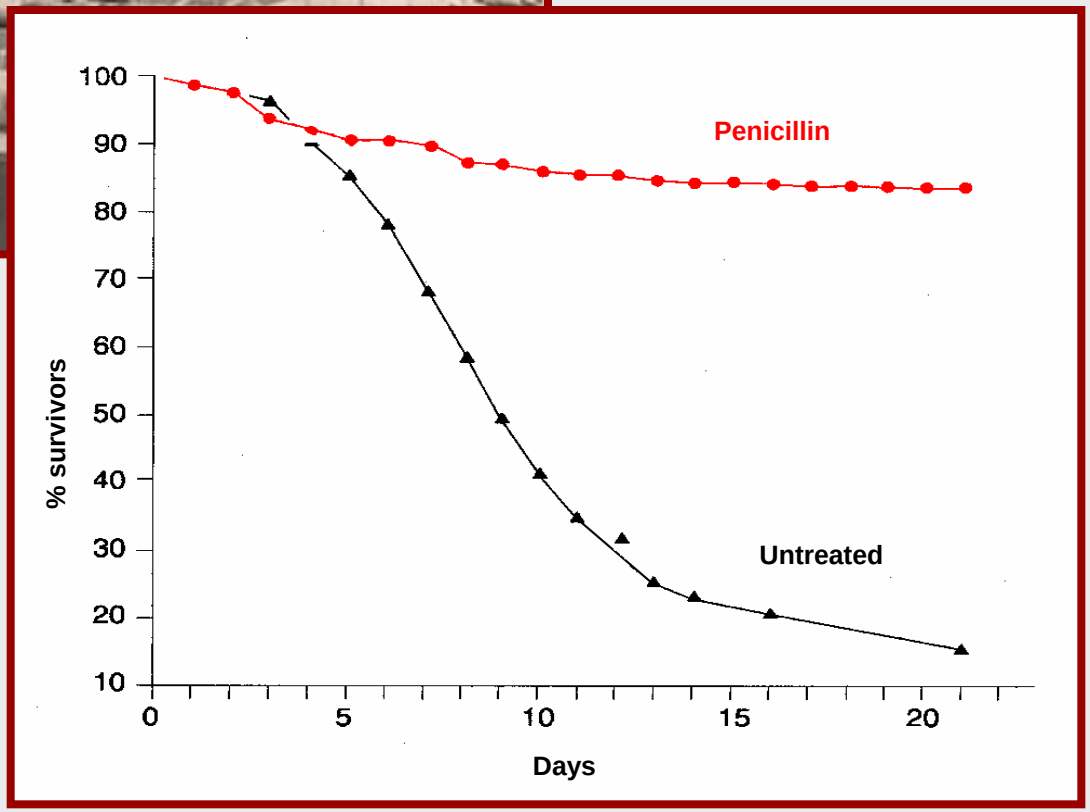
Antibacterial agents =Antibiotics (e.g. drugs for **tuberculosis**)

and

other bacterial diseases …

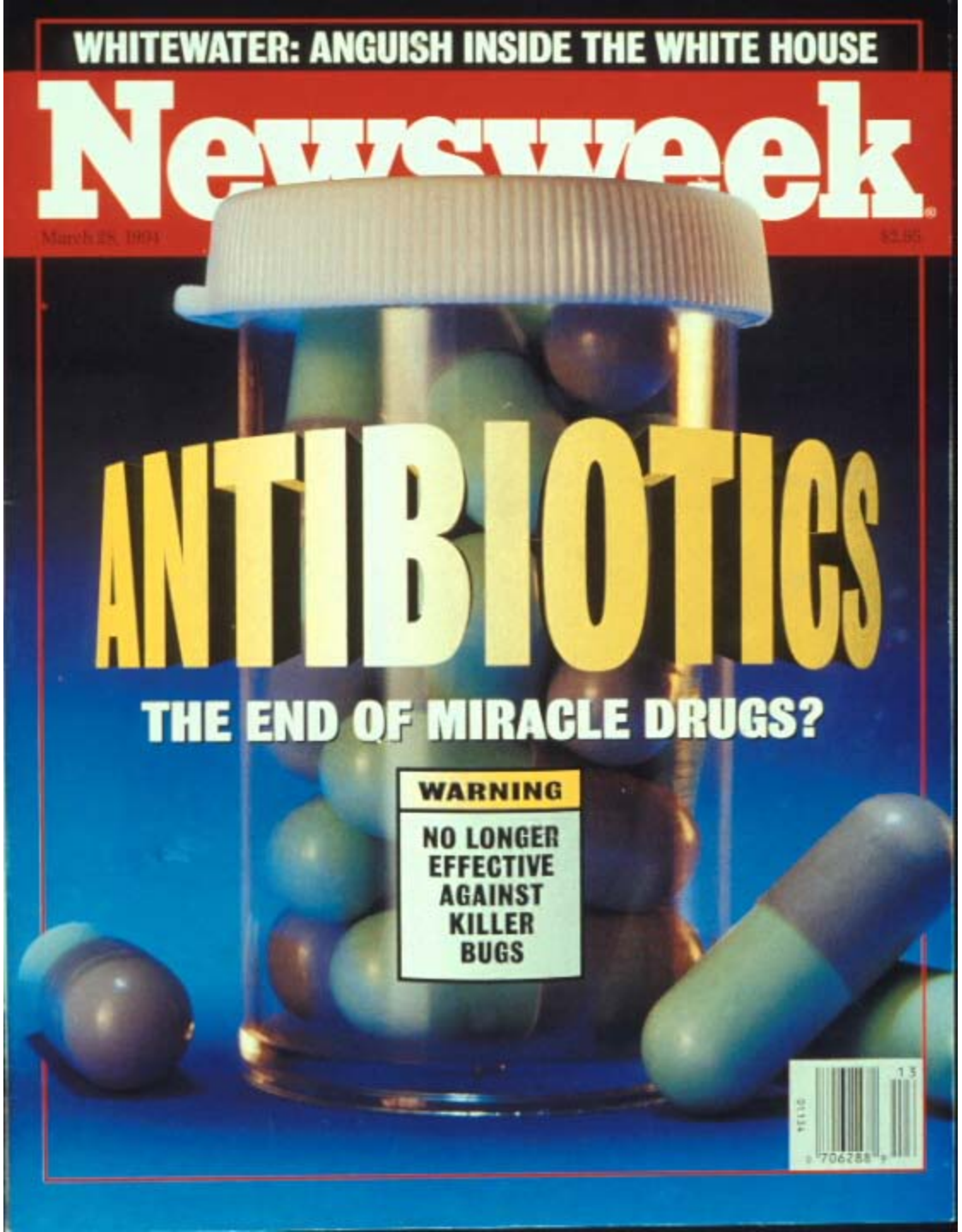


Patients with pneumonia and bacteria in the blood



Penicillin increased the chance of survival from 10% to 90%

Adapted from Austrian *et al.*
Ann. Int. Med 1964; 60, 759


WHITEWATER: ANGUISH INSIDE THE WHITE HOUSE
Newsweek
March 28, 1994
$2.95
ANTIBIOTICS
THE END OF MIRACLE DRUGS?
WARNING
NO LONGER EFFECTIVE AGAINST KILLER BUGS

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Antibiotic resistance - a rhetorical problem ?

- Compared to other health problems, we are ***not*** talking about a specific disease

- Instead, we are talking about a medical product that is ***no longer working*** against bacteria causing ***many*** common infectious diseases

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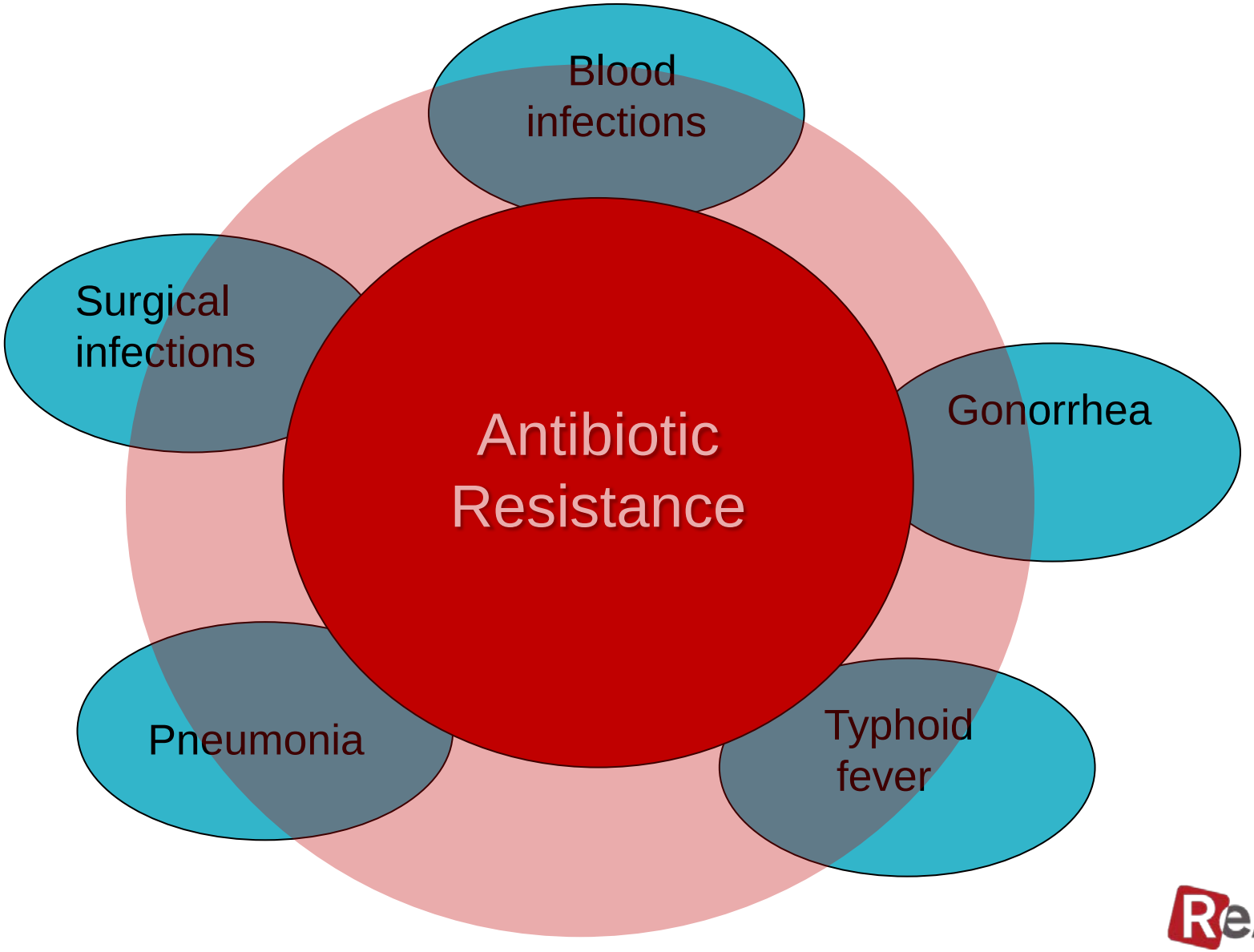
Common diseases- becoming non-treatable



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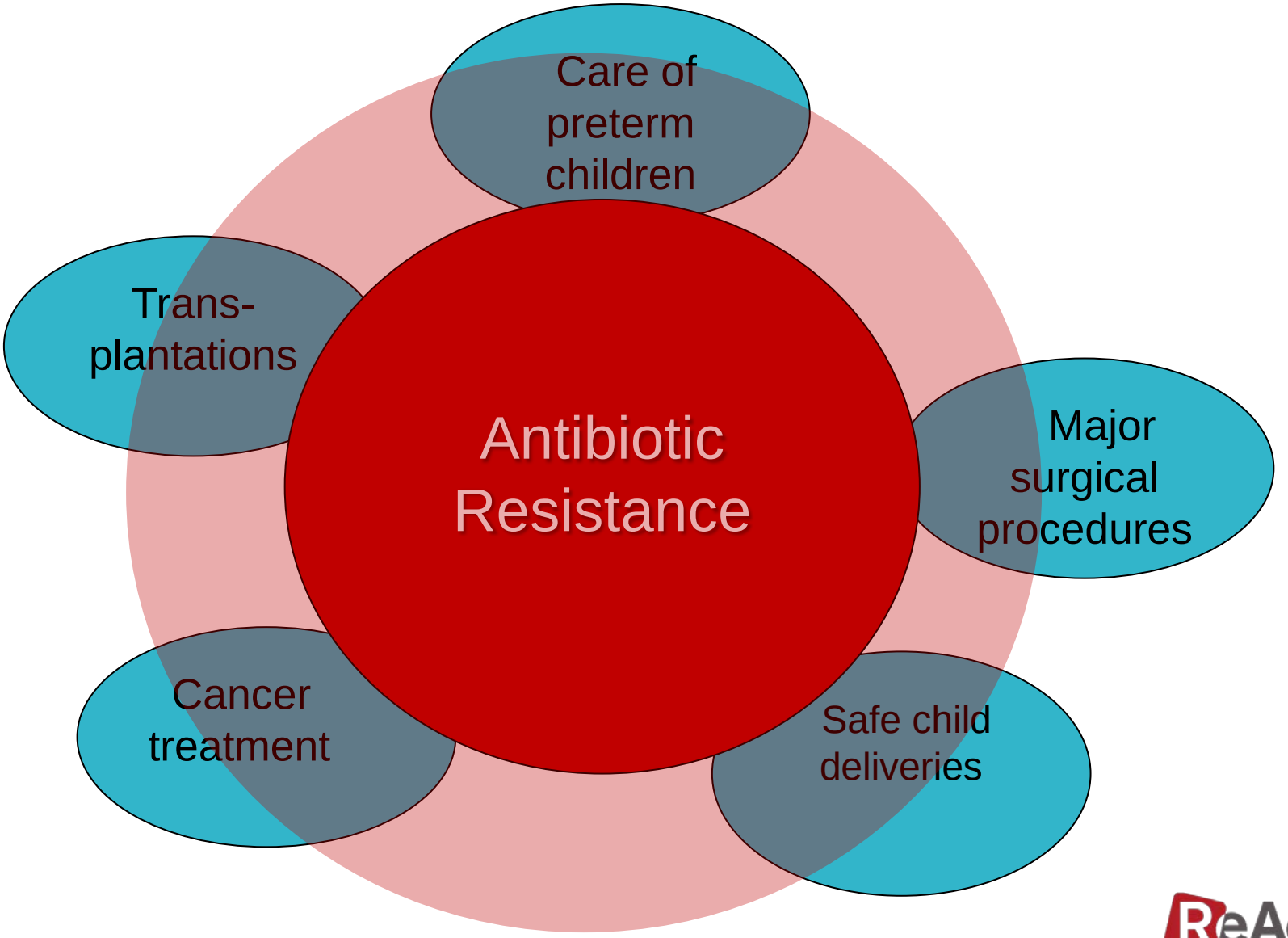
In addition, many *medical procedures* are affected and threatened by ABR



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Who is affected by ABR?

Everyone !

However ……

→… vulnerable populations with the highest infectious disease burden pays the highest price

→… these populations are also the ones that have least access to current and future interventions to manage antibiotic resistance

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Some parts of the world have already run out of effective antibiotics

Muhimbili hospital, Dar es Salaam Tanzania

The mortality rate from Gram-negative bloodstream infection in children (43,5 %) was more than double that of malaria.

Blomberg et al. BMC Infect Dis. 2007

About 70% of neonatal systemic infections can not be treated with the antibiotics recommended by WHO….

Lancet 2005; 365: 1175–88

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COST IMPLICATIONS OF GROWING ANTIBIOTIC RESISTANCE ARE HUGE

Typhoid fever

Cost of antibiotics for non-resistant cases	**$3-5**
Cost of antibiotics for resistant cases	
Azithromycin	**$35-42**
Oral cephalosporins (cefixime)	**$37-42**
Parenteral cephalosporins (ceftriaxone)	**$84-104**

Average Treatment Costs for Typhoid (US$)
Child weighing 20 kg using standard treatment guidelines

Source: AKU Pharmindex 2004 & WHO guidelines 2003

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The MDG:s

- Eradicate extreme poverty and hunger
- Achieve universal primary education
- Promote gender equality and empower women
- Reduce child mortality
- Improve maternal health
- Combat HIV/AIDS, malaria and other diseases
- Ensure environmental sustainability
- Develop a global partnership for development

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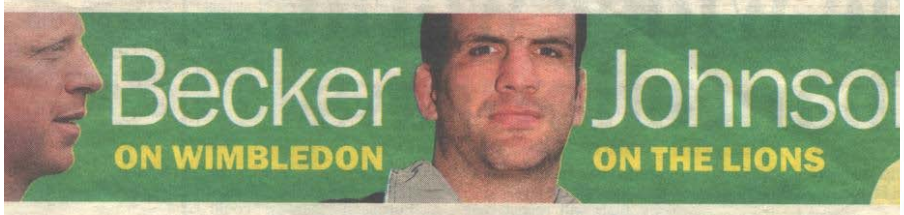
THE TIM

No. 68421 ■ THURSDAY JUNE 23 2005 ■ www.timesonline.co.uk ■ 55p



m-seekers nger protest

ls of Zimbabwean eekers in detention egan a hunger strike ain's decision to send k to face torture bert Mugabe's regime.
age 3

cellor's call

Brown called on the ight to end its onist ambitions and radical economic needed to turn it from loc into a global force.
age 2

New strains of superbug hit hospitals

THE NEWSPAPER FOR THE NEW MILLENNIUM

THE EXPRESS

www.express.co.uk

FRIDAY NOVEMBER 5, 1999 35p

At 65, she's the world's most beautiful woman

The incredible Sophia Loren • See Page 15

HOSPITALS FEAR OVER SUPERBUG EPIDEMIC

Vulnerable patients in danger from deadly bacteria running riot on wards

EXCLUSIVE BY ANTHONY BEVINS AND RACHEL ELLIS

THE spread of a deadly superbug in British hospitals is reaching epidemic proportions, a leading scientist warned yesterday.

Over the past nine years, there has been a 12-fold increase in the incidence of the bug known as MRSA, which is resistant to all but the most powerful antibiotics.

In Scotland, Wales and the West Midlands, increases have been even more dramatic. Dr David Livermore, of the Public Health Laboratory Service, told The Express that the soaring number of cases was due to epidemic strains 15 and 16, particularly virulent forms of the bacteria which can be transmitted from patient to patient simply on the back of someone's hand.

Hospitals have been warned to step up infection control measures. Doctors and nurses are being reminded to wash their hands between patients, and GPs have been told to curb their prescribing of antibiotics, which only helps the bugs develop resistance. MRSA can be fatal, particularly to seriously ill and elderly patients, but there are no official figures on the number of deaths caused by the bug and it is rarely identified as the cause on death certificates.

Potentially fatal blood poisoning caused by MRSA has increased from less than three per cent before 1991 to 37 per cent so far in 1999, Dr Livermore said.

"What we are talking about is this hospital bacteria that can cause serious infection, sometimes fatal - the deaths mostly in those who've got very severe underlying disease

TURN TO PAGE 4, COLUMN 1

ONLY THIS DOG KNOWS THE TRUTH ABOUT GERI'S GINGER ROMANCE

EXCLUSIVE INTERVIEW • SEE PAGE 3

Burden of multidrug-resistant bacteria in the EU

Attributable deaths	approx.	25,000 / year
Extra hospital days	approx.	2.5 million / year
Total costs	approx.	€ 1.5 billion / year

Limitation: these are underestimates.

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ReAct facts

A fact sheet from ReAct - Action on Antibiotic Resistance, www.reactgroup.org
May 2012

Burden of Antibiotic Resistance

Antibiotic resistance (ABR) poses an increasing threat to human health across the world. No country can escape from the medical and economic impacts from this serious problem.

Certain bacteria such as multi-resistant Gram-negative bacteria are particularly worrisome.[1] In the US, two thirds of deaths due to bacterial infections are caused by Gram-negative bacteria.[2]

Common diseases resulting from these bacteria are e.g. blood stream infections, urinary tract infections, post-operative wound infections and intra-abdominal infections.

The lack of effective antibiotics for treating these infections will increasingly lead to serious health problems and premature deaths.

The consequences of antibiotic resistance affects patients' lives but also reaches far beyond the individual patient affecting health care systems and societies across the world.

Within just a few years, we may very well be faced with unimaginable setbacks, medically, socially and economically unless we react now.

The ongoing pandemic spread of resistant bacteria illustrates that the problem can only be addressed through international cooperation.

The studies in this fact sheet were published between 2005 and 2012.

PATIENT GROUPS ESPECIALLY AFFECTED BY ABR

Newborns and children

- ESBL-producing bacteria are frequently causing infections in newborns. In an Indian hospital, *Klebsiella* and *E. coli* were the most common Gram-negative bacteria among infants with BSIs. About 33% of ESBL-infections were deadly in spite of available newer antibiotics and other supportive care.[3]
- In a study from Pakistan, 37 of 78 newborns (less than 6 days old) with infections due to *Acinetobacter* died within a short time frame. 71% of the bacteria were resistant to all antibiotics except polymyxin.[4]
- In an outbreak in India caused by NDM-1 *E. coli*, 4 newborn babies contracted blood stream infections (BSIs). All four died.[5]
- Three premature babies in a German neonatal ward died due to an outbreak of ESBL-producing *Klebsiella pneumoniae* from an unknown source.[6]
- In a study of Tanzanian children, the BSI rate was as high as 13.9%. One third of these children died. The death rate from Gram-negative BSI (43.5%) was more than double that of malaria (20.2%). One significant risk factor for death was treatment with ineffective antibiotics due to antibiotic resistance.[7]

© 2008 Jaspar Bassé, Mozambique. Courtesy of Photoshare

Transplantation and cancer patients

- In Spain, among 416 patients undergoing transplantations of kidneys, 58 were infected with multi drug resistant (MDR) bacteria, most often Gram-negative. BSIs occurred in 14% of those. Death or graft loss was significantly more frequent among those with MDR infections (19% vs. 8%).[8]
- In the US, an outbreak of *K. pneumoniae* carbapenemase-producing infections among liver transplant recipients killed two patients. A larger outbreak involving 24 patients soon followed the two initial cases in the ward.[9]
- In another study from the US, recent organ

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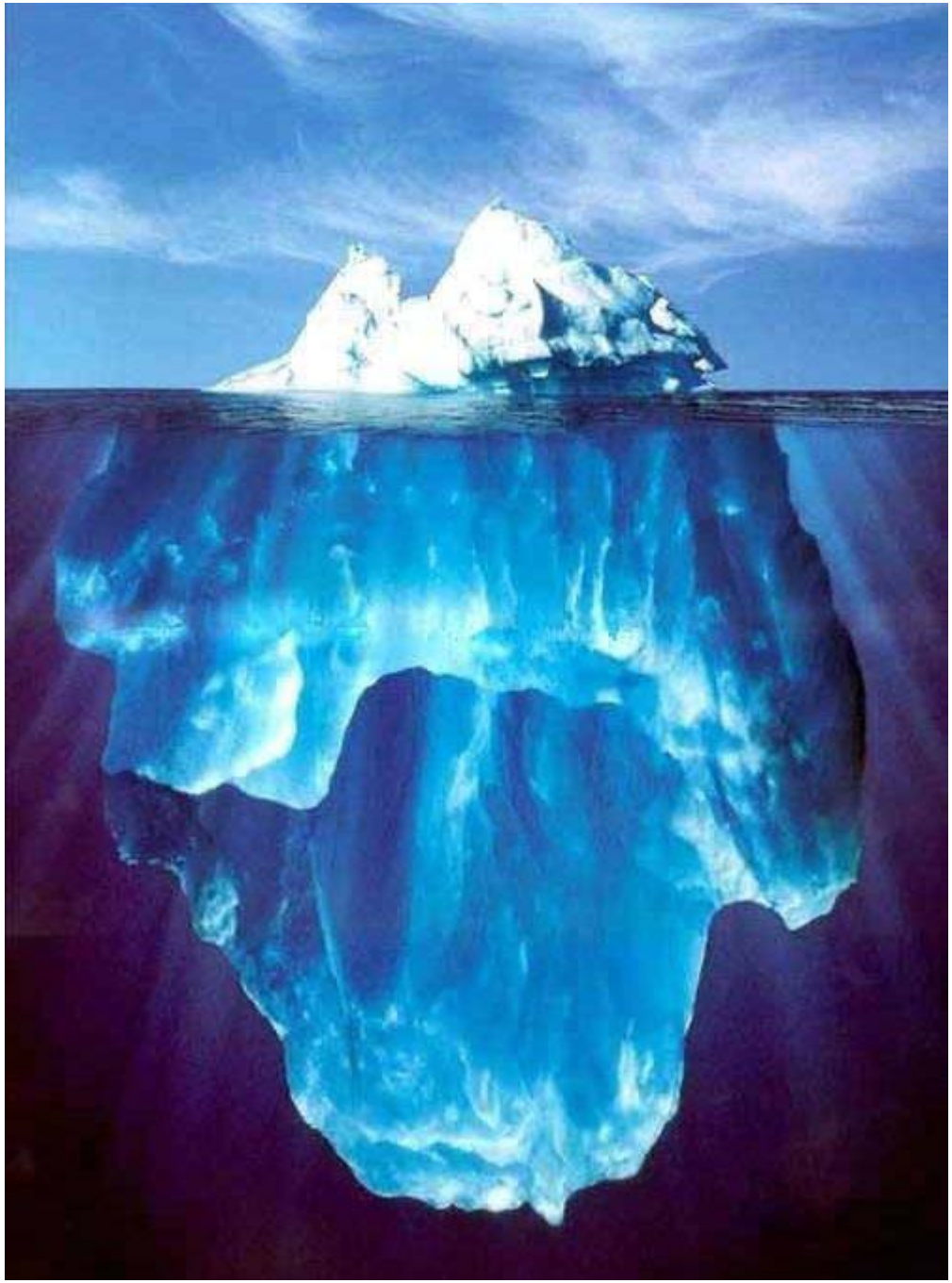

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How did we end up here?

- The indiscriminate use of antibiotics
- The rapid dynamics of gene transfer between bacteria and the global spread of resistance
- Poor sanitation and hygiene
- Alarming decline in antibiotics development

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smecta


RELEVEN

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

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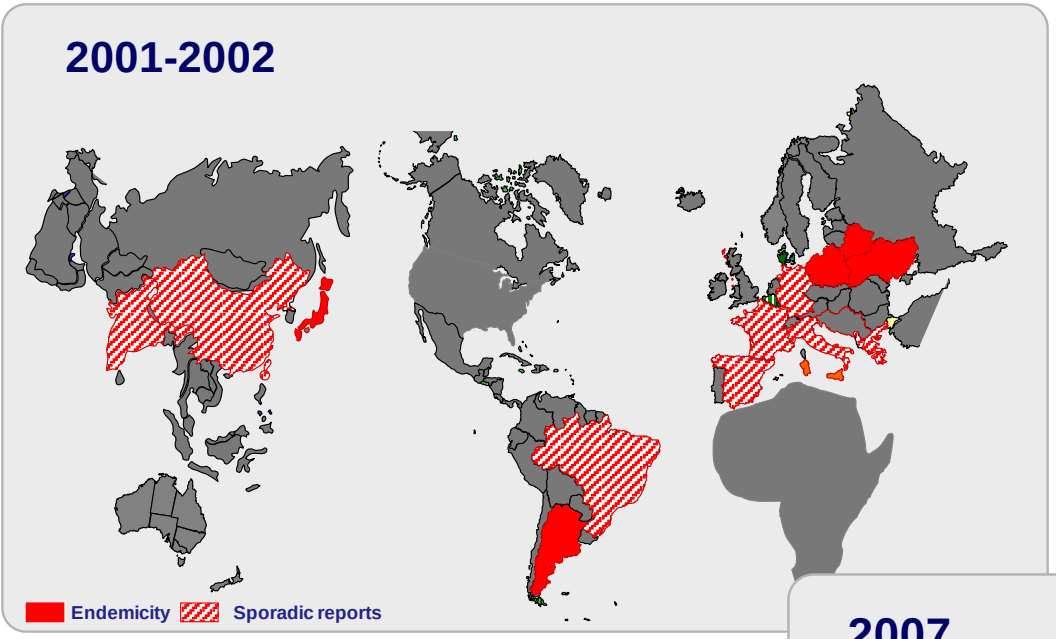
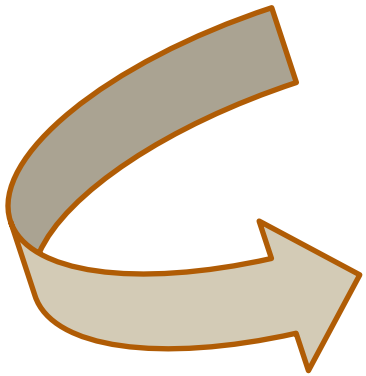
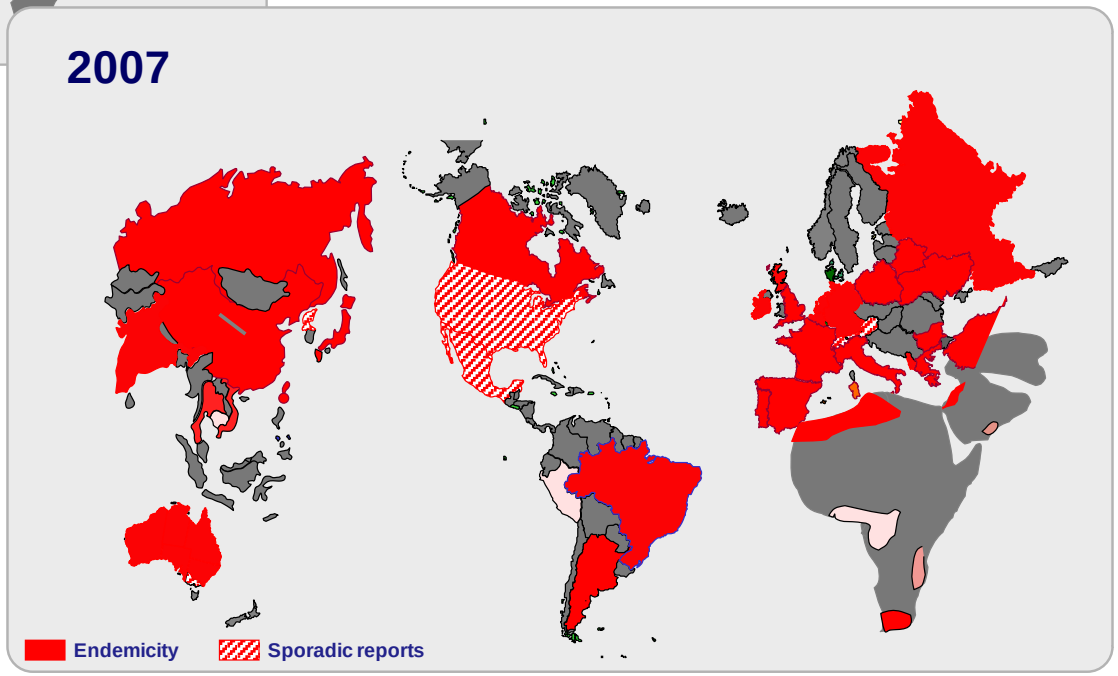
ESBL (CTX-M) producing *Enterobacteriaceae*







THE DRUG DEVELOPMENT PIPELINE FOR ANTIBIOTICS HAS GONE DRY

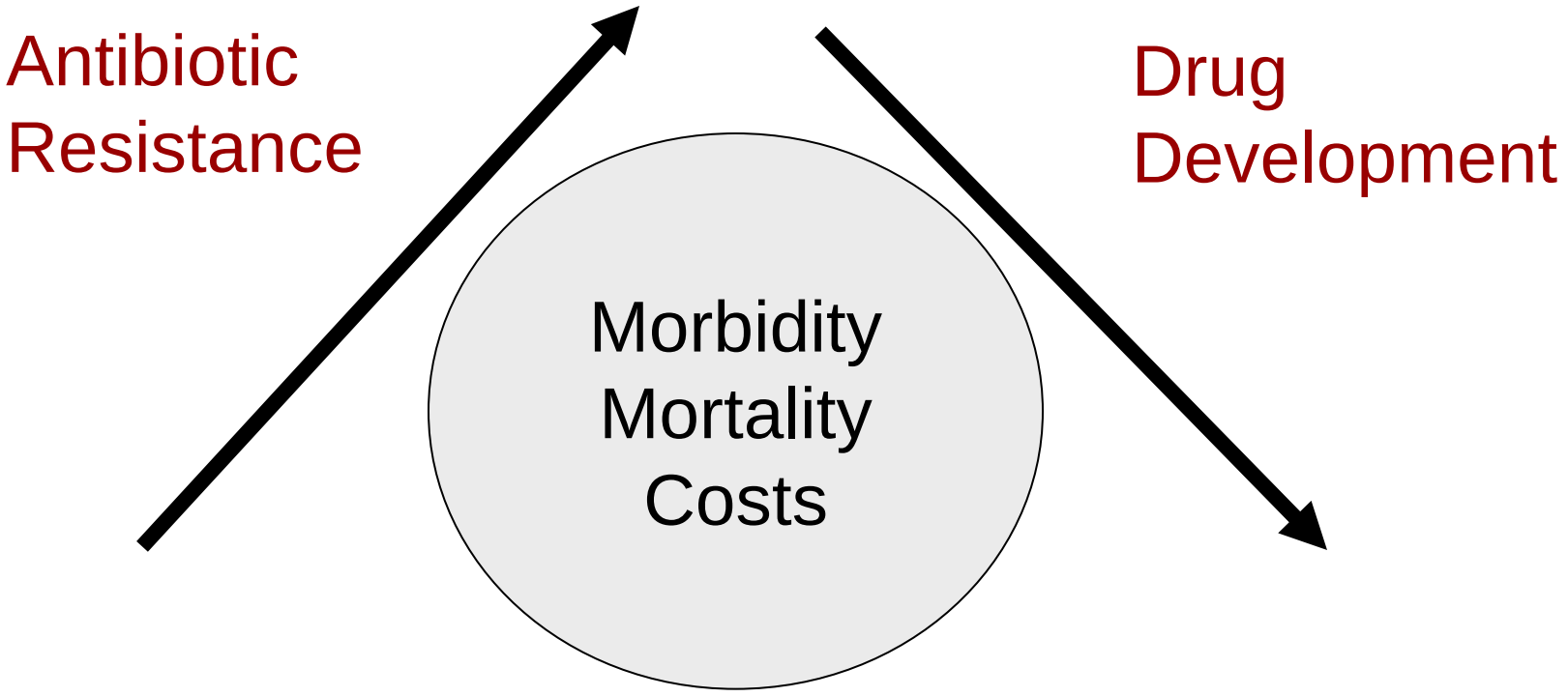
THE DRUG DEVELOPMENT PIPELINE FOR ANTIBIOTICS HAS GONE DRY

- The last … covered in 1987 !
- The … oming ineff… ce
- The pi… either the innovati… nercial interest to … iotics

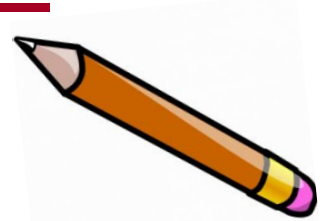
No new drugs for:

- Typhoid fever
- Shigella
- Gonorrhoea
- Urinary tract infections
- Blood infections
- .....
- .....

We are facing a public health crisis



Strategies to ~~stop~~ manage antibiotic ~~resistance~~



Prolong the lifespan of existing drugs

Rational Use

Better diagnostics

Prevent the spread of resistant bacteria

Improved hygiene

Infection control

Development of new antibiotics

New collaborative models

Controlled distribution and use of new future antibiotic

A new global system to preserve the effectiveness of antibiotics

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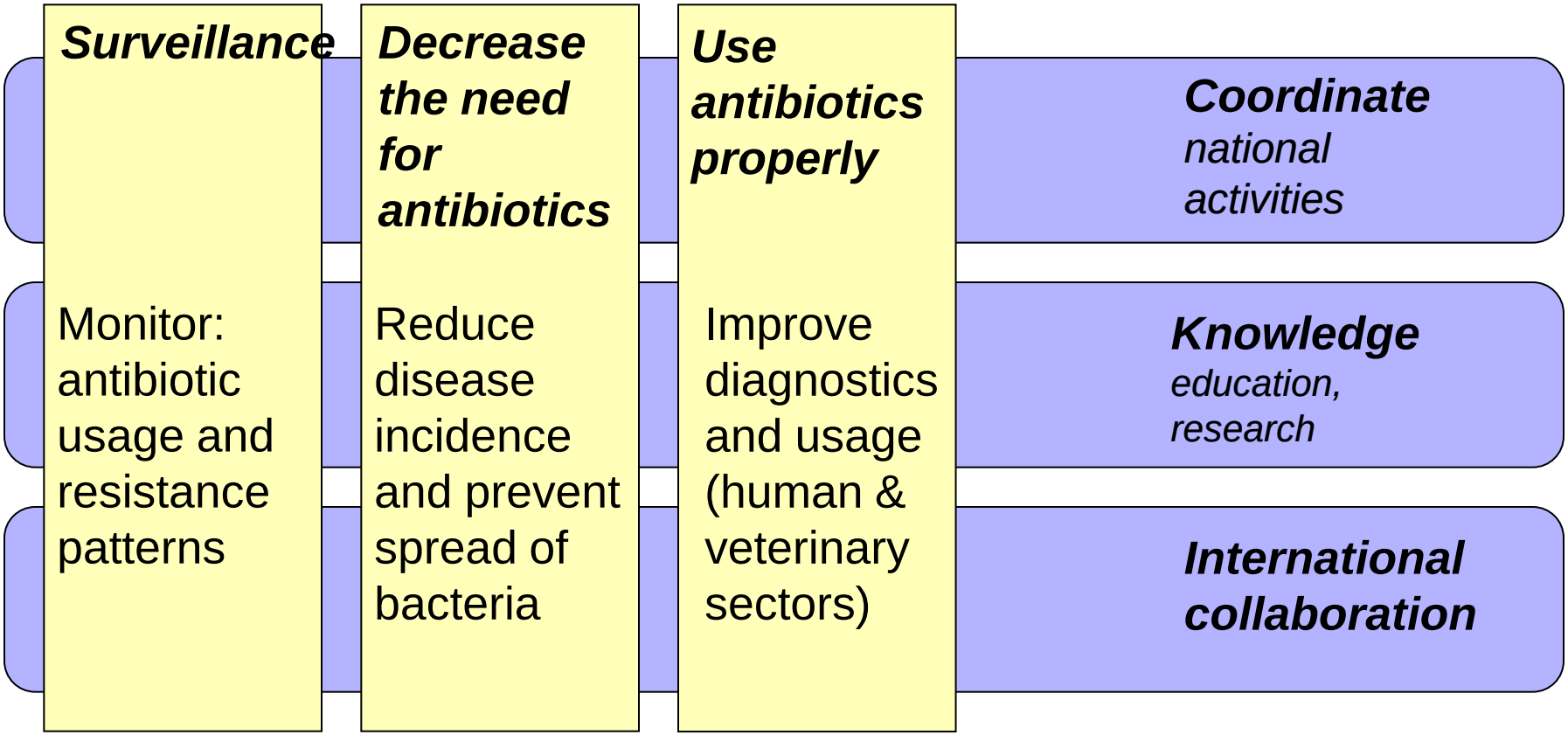
Develop national action plans on antibiotic resistance !



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Antibiotic Resistance

Caused by human activity and by over- consumption of a gobal resource

A failure of public policy & global governance, research prioritization and the current market system

It is a collective responsibility by governments, supranational organizations and individuals to take action

Nasa 1969: Earthrise over the moon from Apollo II

COMBAT DRUG RESISTANCE

No action today,
no cure tomorrow

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