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Detecting and Eliminating Bacteria Using Information Technology





The Project in short

FP7 funded project (Framework Program 7)

Research initiative from the European Union

DebugIT project proposal was ranked first in its call

Start: Jan 1st, 2008

End: December 31st, 2011

11 Partners

11 Work packages

Total EU funding of the project 7M€





The Partners

- 1 Agfa Agfa HealthCare N.V.
- 2 HUG Les Hôpitaux universitaires de Genève
- 3 UNIGE Université De Genève
- 4 LIU LINKÖPINGS UNIVERSITET
- 5 EMP Empirica
- 6 UCL University College London
- 7 INSERM Institut National de la Santé et de la Recherche Médicale
- 8 UKLFR Universitätsklinikum Freiburg
- 9 TEILAM TECHNOLOGIKO EKPEDEFTIKO IDRIMA LAMIAS
- 10 IZIP IZIP A.S.
- 11 GAMA Gama/Sofia Ltd.





Clinical context

Antibiotic resistance is a consequence
of evolution via natural selection

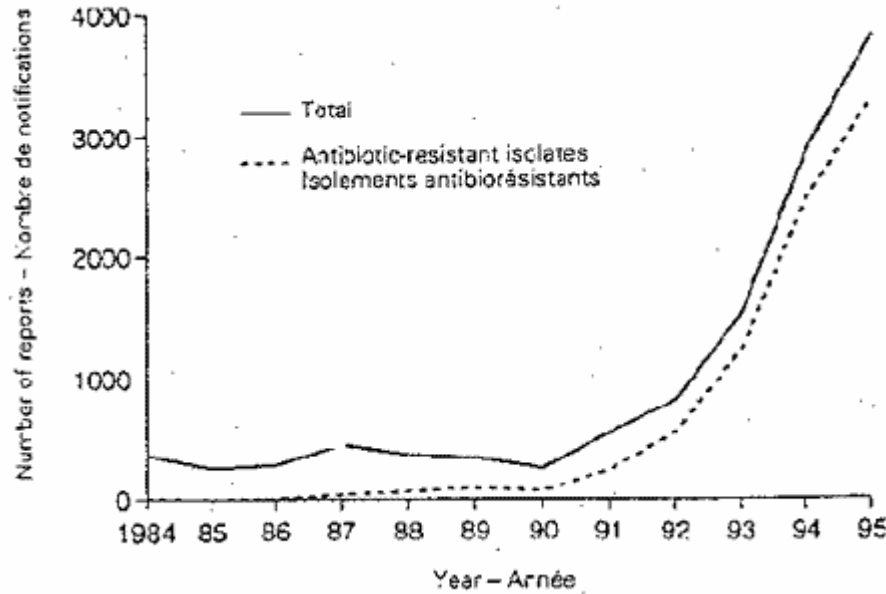
Antibiotic action is an environmental pressure

- patterns of antibiotic usage greatly affect the number of resistant organisms developing
- overuse of broad-spectrum antibiotics
- incorrect diagnosis
- unnecessary prescriptions
- improper use of antibiotics
- use of antibiotics as livestock food additives for growth promotion
- counterfeited drugs

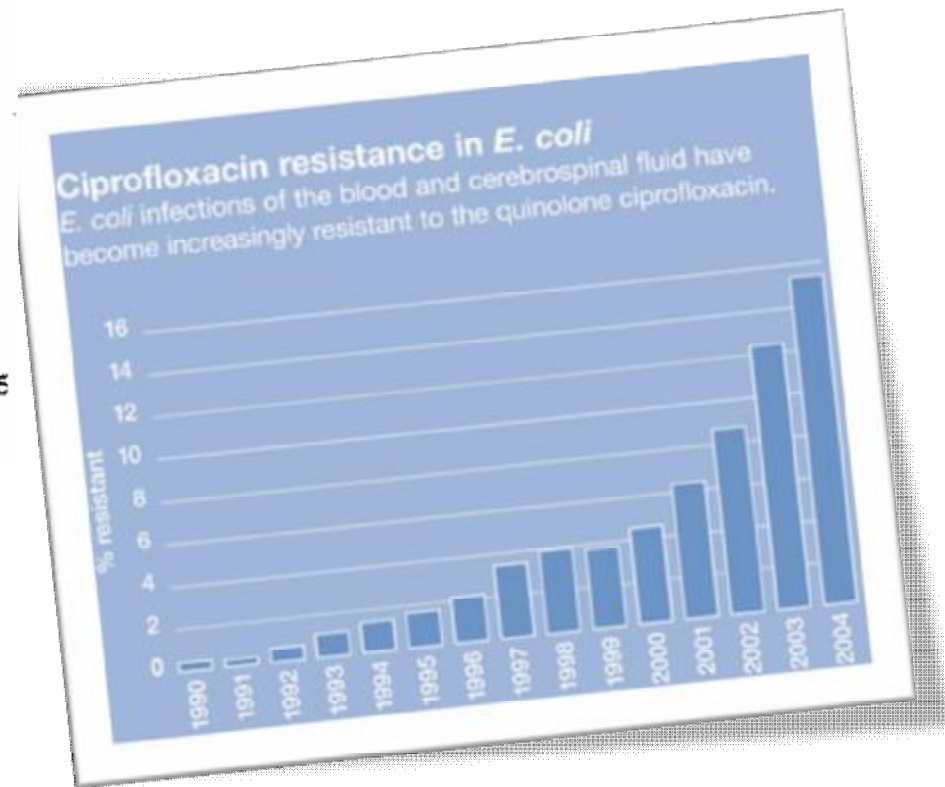


Clinical context

antibiotic resistance in Salmonella typhimurium DT104, England and Wales, 1984-1995

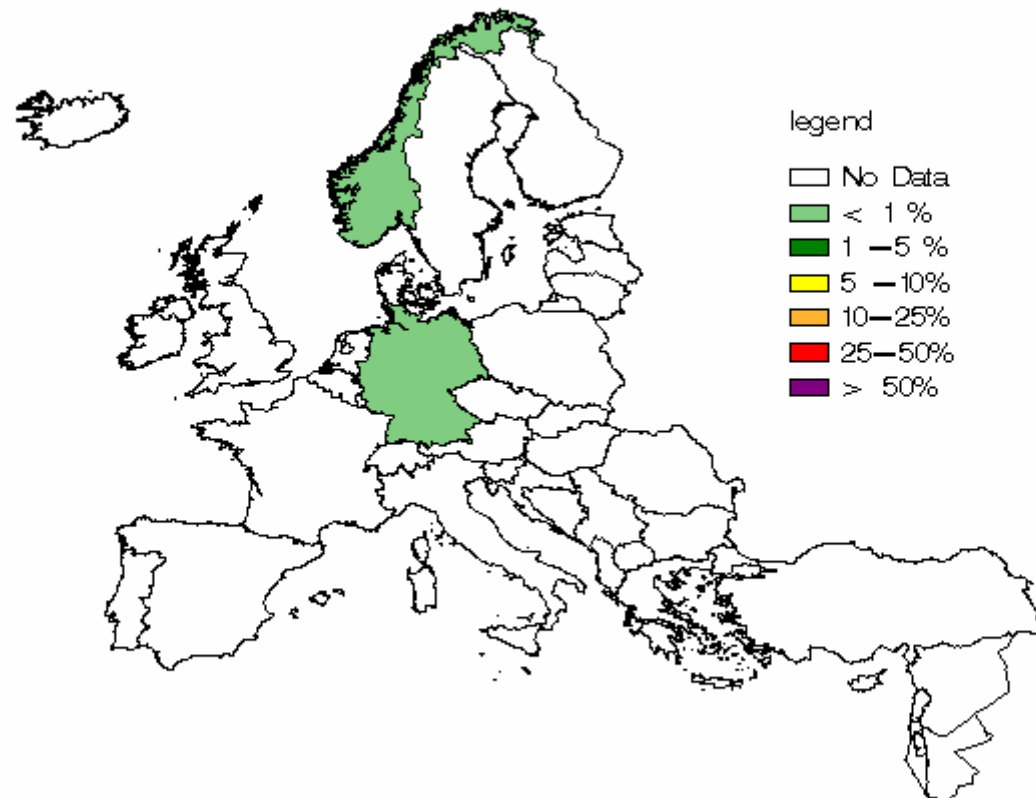


*WHO Weekly Epidemiological Record,
Vol 71, No 18, 1996*



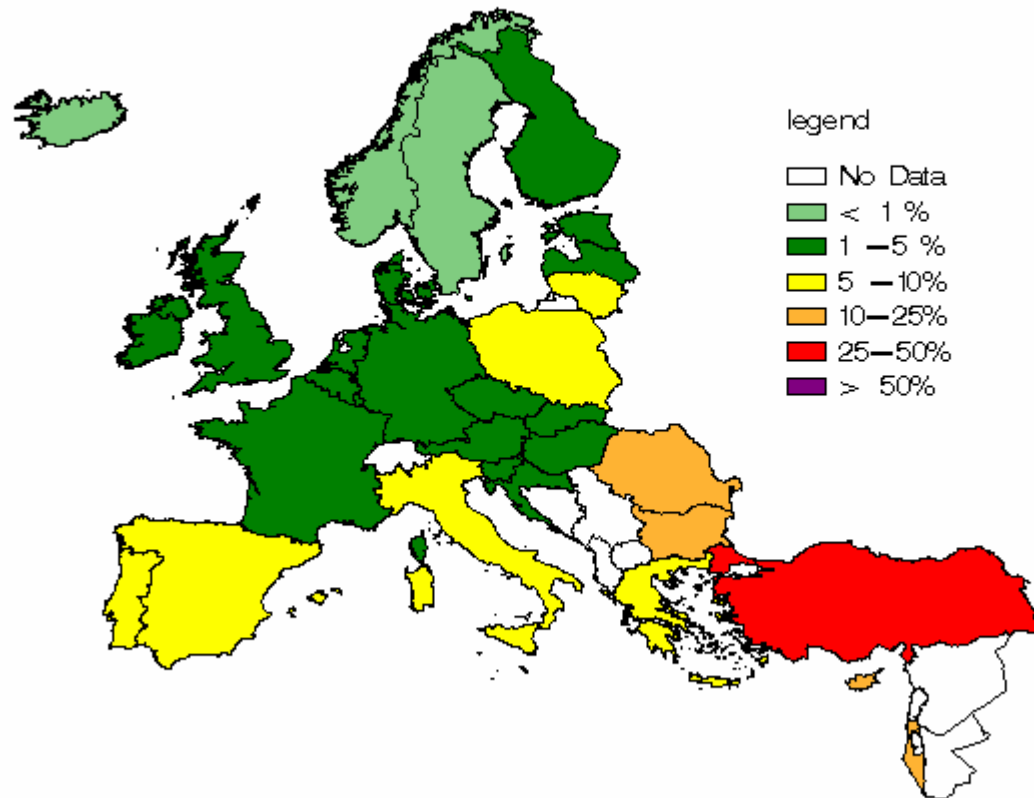
Clinical context

Proportion of 3rd gen. oeph. resistant E. coli isolates in participating countries in 1999
 (c) EARSS



Clinical context

Proportion of 3rd gen. ceph. resistant E. coli isolates in participating countries in 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007
(c) EARSS



A race against evolution can only be lost
new solutions have to be found

This has become a new war !
New Antibiotics can not keep
up with the bacterial resistance

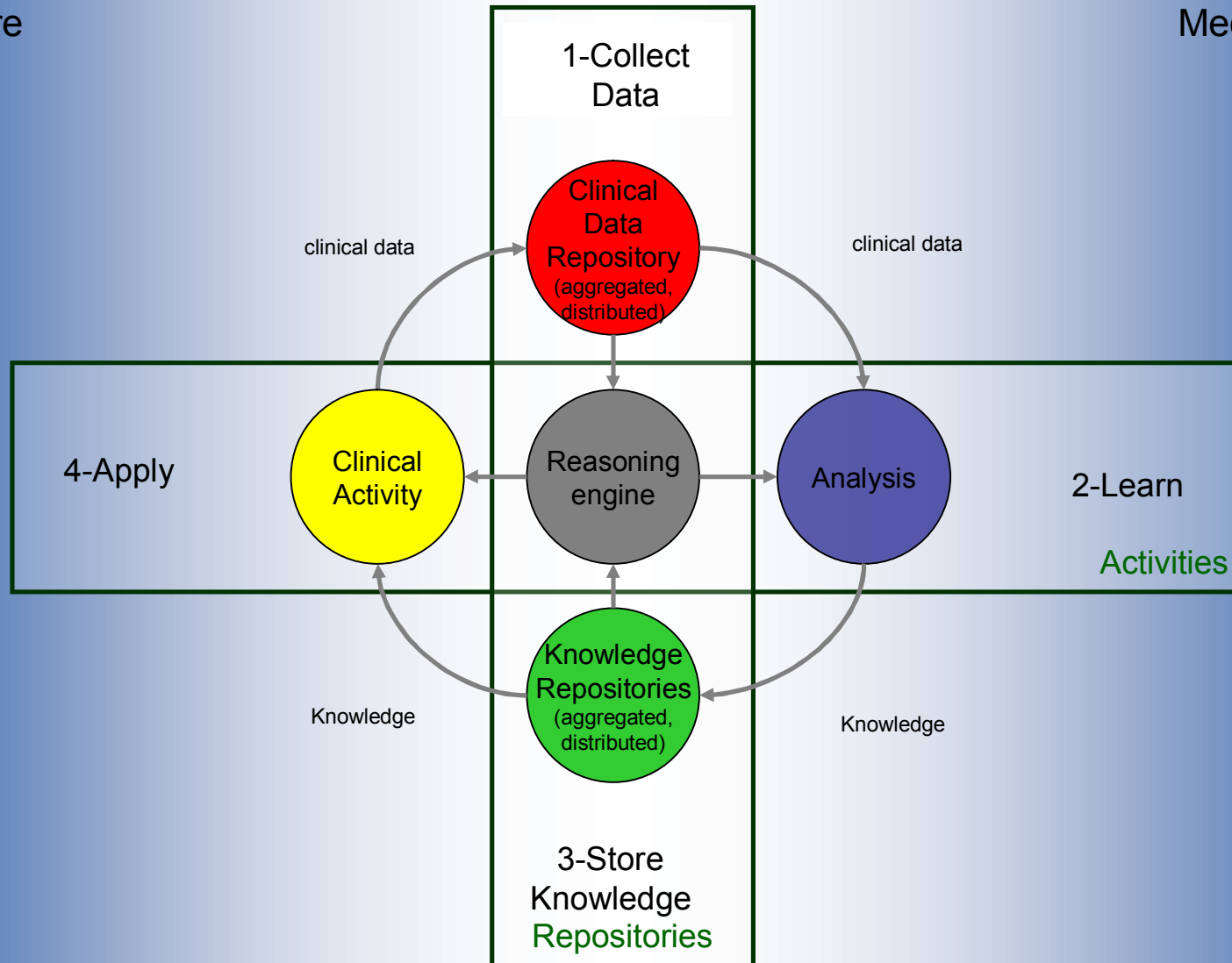


If this is a war: we need a new weapon
ITbiotics to help the Antibiotics

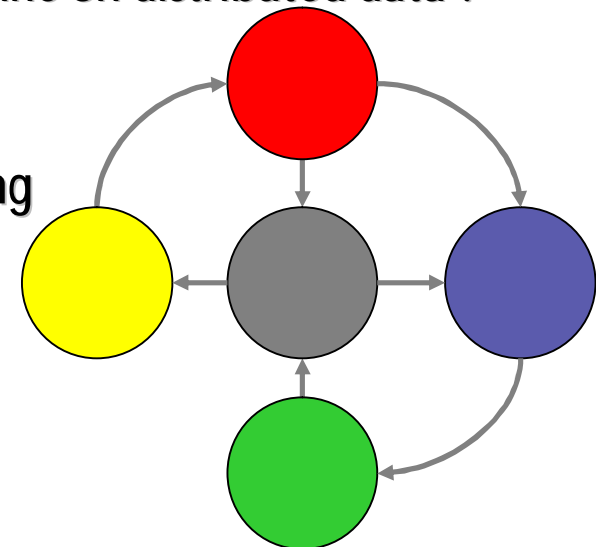
The Translational Framework

Clinical Care

Medical research



- **Technological**
 - Interoperability
 - Clinical Data Repository Formalism
 - Federated Data Mining
 - Collect everything and mine afterwards or mine on distributed data ?
 - Multimodal Data Mining
 - Structured, unstructured, images, ...
 - Data Mining steered by knowledge/reasoning
 - Federated Knowledge Repository
 - Multi format, multi source
 - Reasoning
 - Statistical + logical
 - Performance
 - Formalism and decidability



- **Functional**
 - Representation of Knowledge
 - Integration in Clinical Systems
 - Usability
- **Medical Research**
 - Strict clinical trials versus 'real data' mining
 - a "nice picture of a dirty world"
 - applicability and usefulness of results
 - the "context" problem

