Detecting and Eliminating Bacteria UsinG Information Technology

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The debugIT Project in short

- Funded by the European Community's Seventh Framework Program under grant agreement n° FP7–217139 (7M€)
- Project period: from Jan 1st, 2008 to December 31st, 2011
- 11 Partners (next slide)

The Partners

- **Agfa HealthCare**, Belgium (coordinator)
- **empirica** Gesellschaft für Kommunikations- und Technologieforschung mbH, Germany
- **Gama Sofia** Ltd., Bulgaria
- **INSERM** - Institut National de la Santé et de la Recherche Médicale, France
- Internetový Pristup Ke Zdravotním Informacím Pacienta (**IZIP**), Czech Republic
- **Linköpings Universitetet**, Sweden
- **TEILAM** - Technologiko Expedeftiko Idrima Lamias, Greece
- **UCL** - University College London, United Kingdom
- **Les Hôpitaux Universitaires de Genève**, Switzerland
- **Universitätsklinikum Freiburg**, Germany
- **Université de Genève**, Switzerland

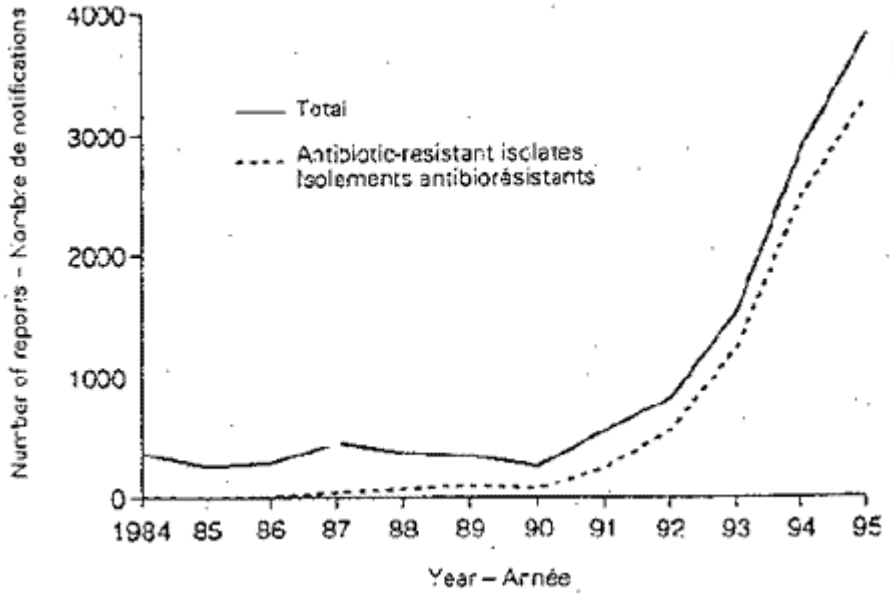
The Problem (1)

- Infectious diseases and antibiotic resistance of pathogens are dramatically increasing: "*We are losing the war against infectious diseases and pathogens*"
- Patterns of antibiotic usage greatly affect the number of resistant organisms which develop.
  - overuse of broad-spectrum antibiotics
  - incorrect diagnosis
  - use of antibiotics as livestock food additives for growth promotion
  - counterfeited drugs
- The dimension of the problem
  - Antimicrobial drugs are a leading cause (about 30%) of adverse drug events
  - As much as 50% of antimicrobial drug use is inappropriate
  - >70% of bacteria that cause healthcare-associated infections (HAIs) are resistant to at least one of the drugs most commonly used

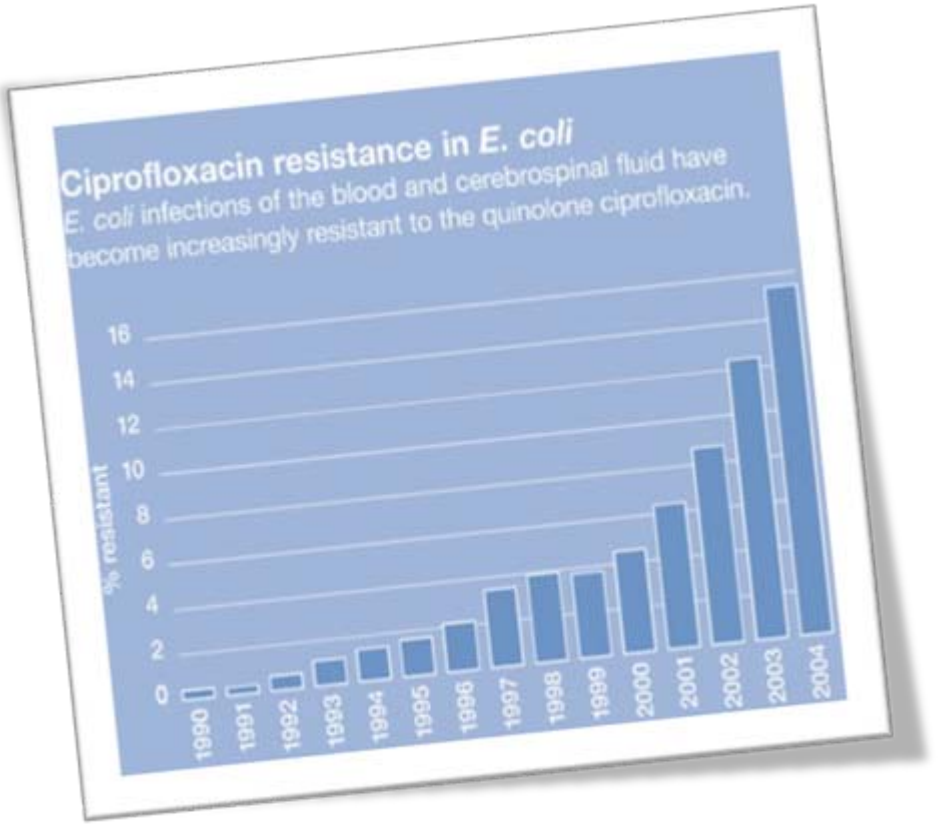
Stanley & Pestonik (2005) Pharmacotherapy 25 (8)

The Problem (2)

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



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

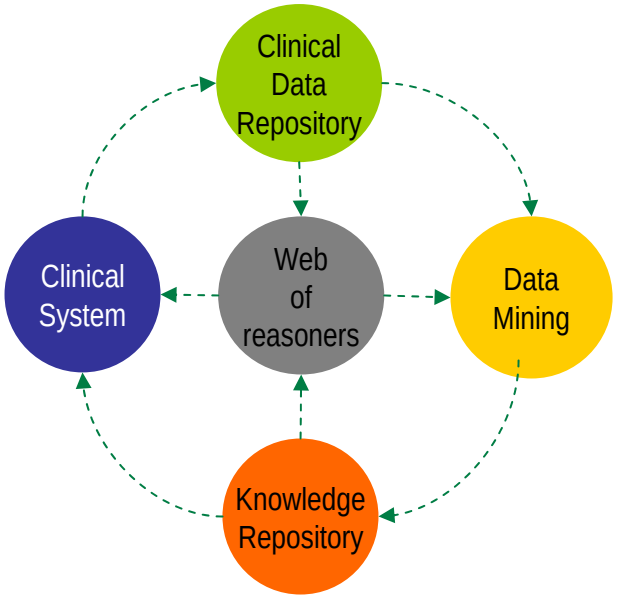


The debugIT Response

- the debugIT project
  - collects routinely stored data from clinical systems
  - learns by applying advanced data mining techniques
  - stores the extracted knowledge in repositories
  - applies the knowledge for decision support and monitoring

Medical Reasoning

- A powerful web of reasoning engines completes the framework
- They combine rule based and statistical inferencing and use the clinical data and the acquired/existing medical knowledge as input sources
- They steer both the clinical system for decision support & monitoring and the data mining for data and algorithm selection



Conclusion

- By it's very nature the system is to be scalable and fractal, such that it can be used from very low local levels to high strategic global levels
- DebugIT makes a proof of concept of a generic translational framework focused on a specific clinical problem
- Outcome will be:
  - Better quality healthcare
  - More patient safety
  - Less costs

Thank you ...

More info ?

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