Rijksinstituut voor Volksgezondheid
en Milieu
*Ministerie van Volksgezondheid,
Welzijn en Sport*

The need for cooperation from a One Health perspective to restrain the threat of AMR

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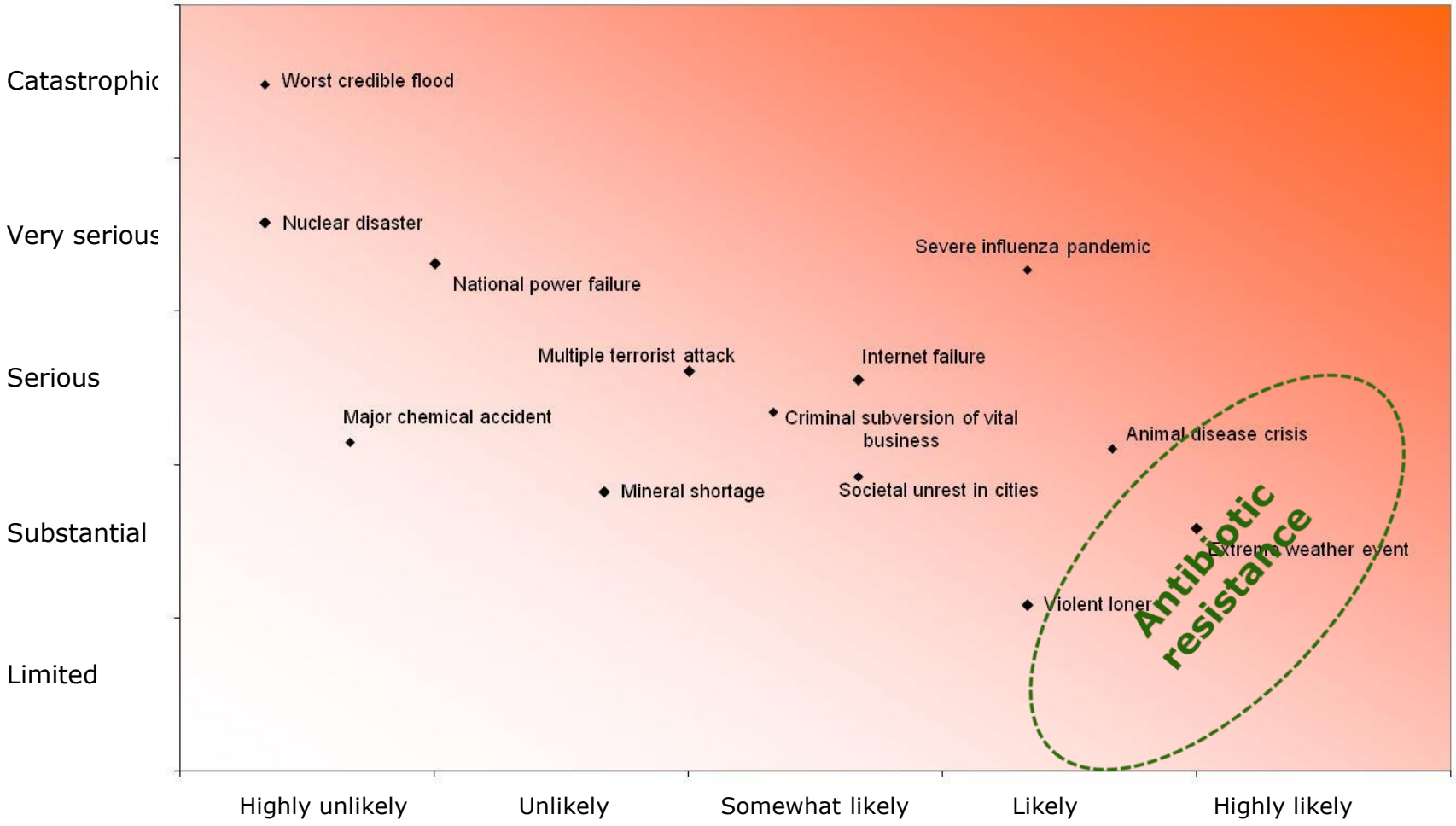
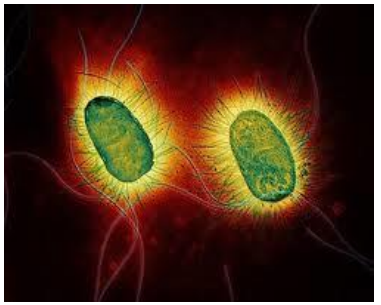
National Risk diagram



Topics

- What are the main features of this threat?
- Why is it so difficult to tackle this problem?
- Which strategies do we need and what are our priorities? → One Health policy and AMR programme



Objective Dutch AMR programme

1. Reduction of carriership, infections and mortality due to HRMO
2. 50% reduction of 'unnecassary used' antibiotics
3. 50% reduction of avoidable health care associated infections

What constitutes the threat of AMR?

Hospitals

- MRSA, CRE, VRE, Cdiff, ….
- A-teams for infection prevention and outbreak control
- Search and Destroy
- Continuous attention on new types or variants (surveillance and analysis)

Nursery homes

- Occurrence not well known
- Infection prevention needs attention
- Older and vulnerable people (at risk)
- Population is aging

What constitutes the threat of AMR?

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Transmission of resistance genes

Animals → humans

Whole genome sequencing: analysis of genetic transfer

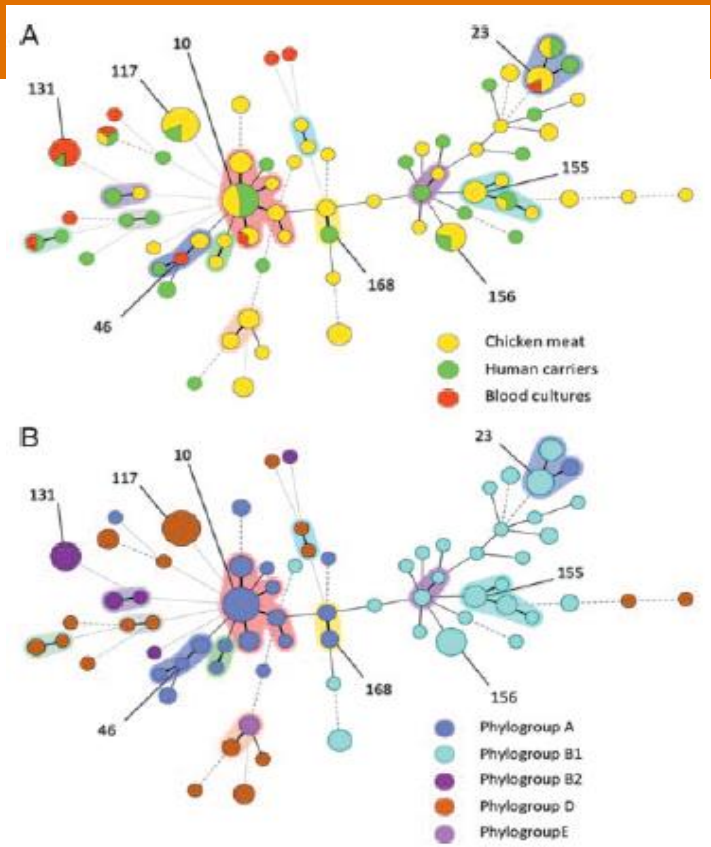
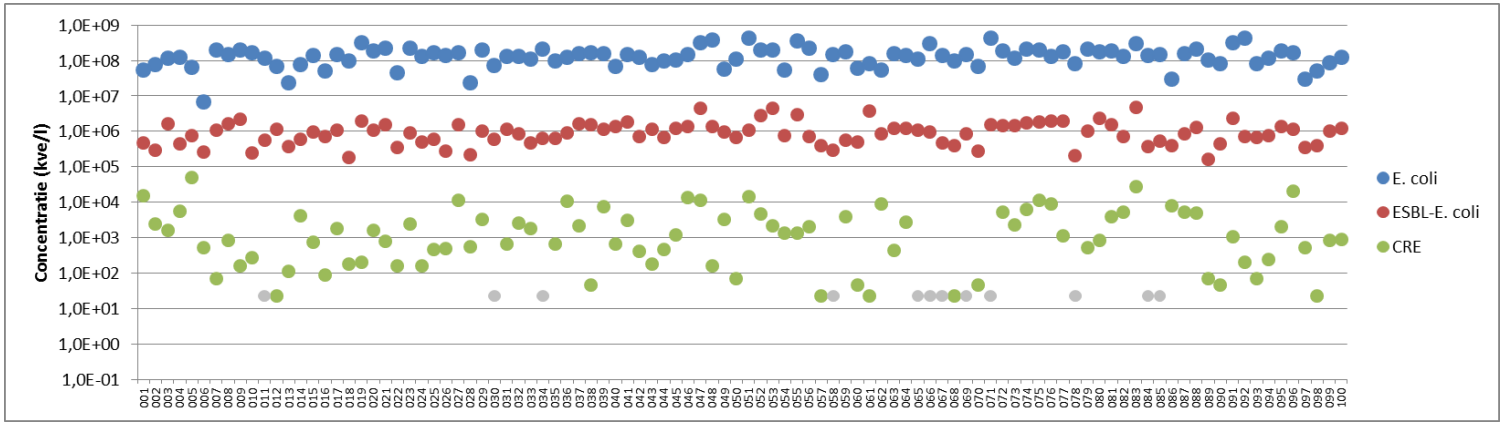


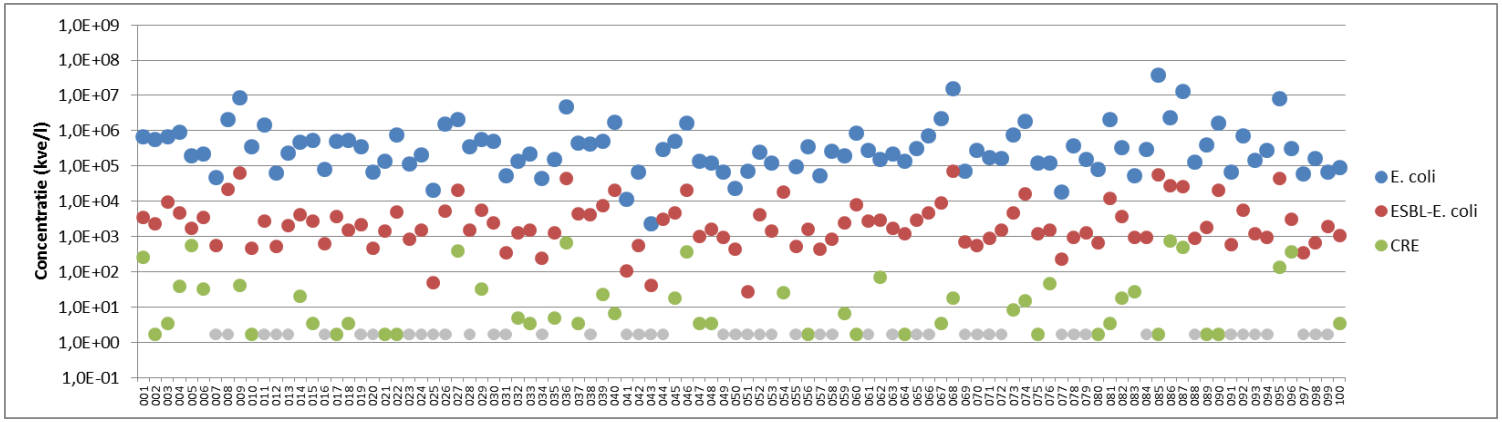
Figure 1. Minimal spanning tree based on multilocus sequence typing of extended-spectrum β-lactamase–producing *Escherichia coli* isolates. *A*, The 3 source groups: chicken meat (yellow), human carriers (green), and blood cultures (red). *B*, The phylogenetic groups: A (dark blue), B1 (light blue), B2 (cyan), D (brown), and E (purple). Representative sequence types are shown as numbers. Black connecting lines indicate single-locus variants; gray connecting lines indicate double-locus variants; dashed connecting lines indicate strains with ≥3 loci that are different; and shadowing indicates that >2 sequence types belong to 1 clonal complex.

AMR in the environment

(HR)MO levels in wastewater (ca 100 sewage treatment plants)



Influent

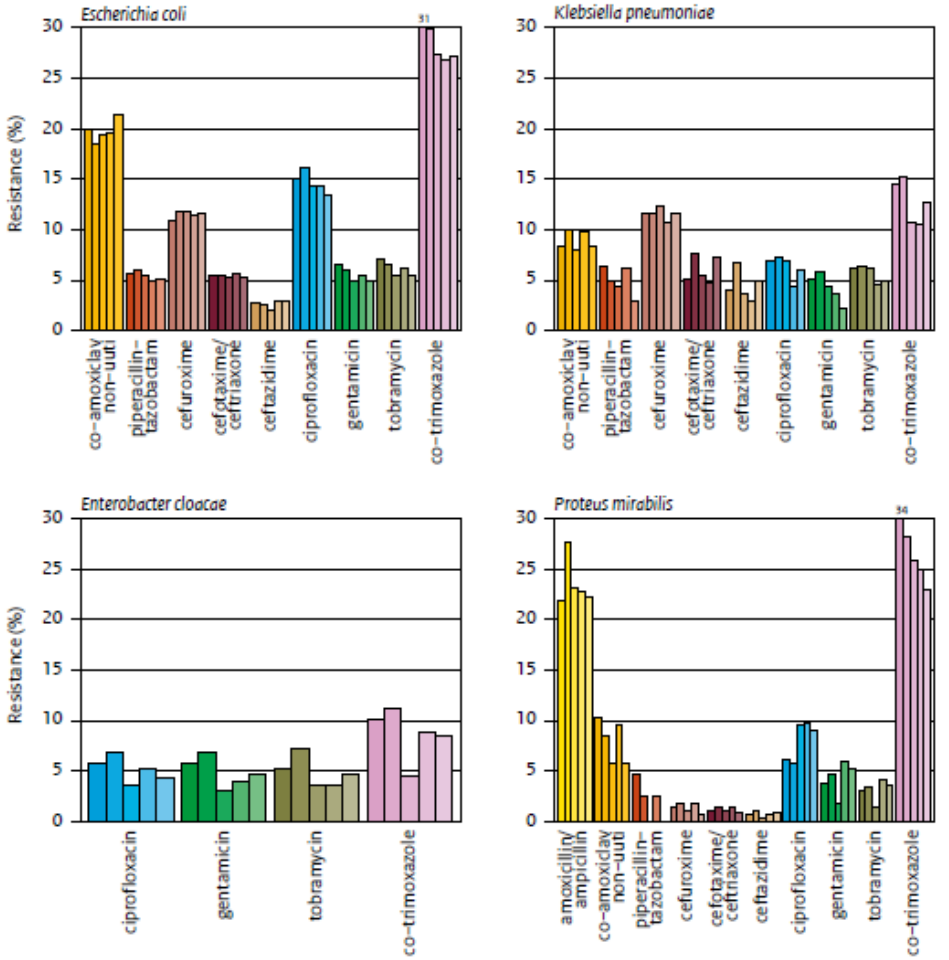


Effluent

Surveillance

Trends in antibiotic resistance (prevalence of four different Multi-resistant micro-organisms)

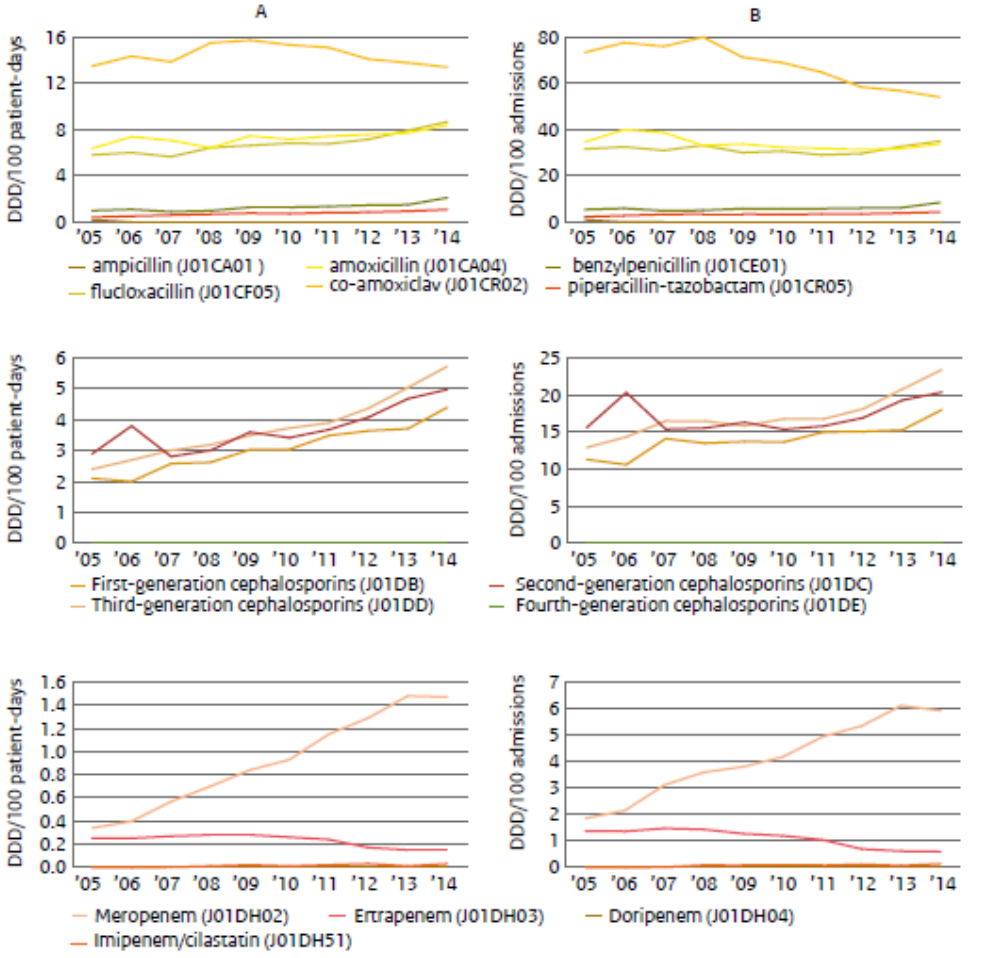
Figure 4.3.4.1 Trends in antibiotic resistance (from left to right 2011 to 2015) among clinical blood isolates of *E. coli*, *K. pneumoniae*, *E. cloacae*, *P. mirabilis*, and *P. aeruginosa* from patients admitted to inpatient departments (incl. intensive care units) in ISIS-AR.



Surveillance

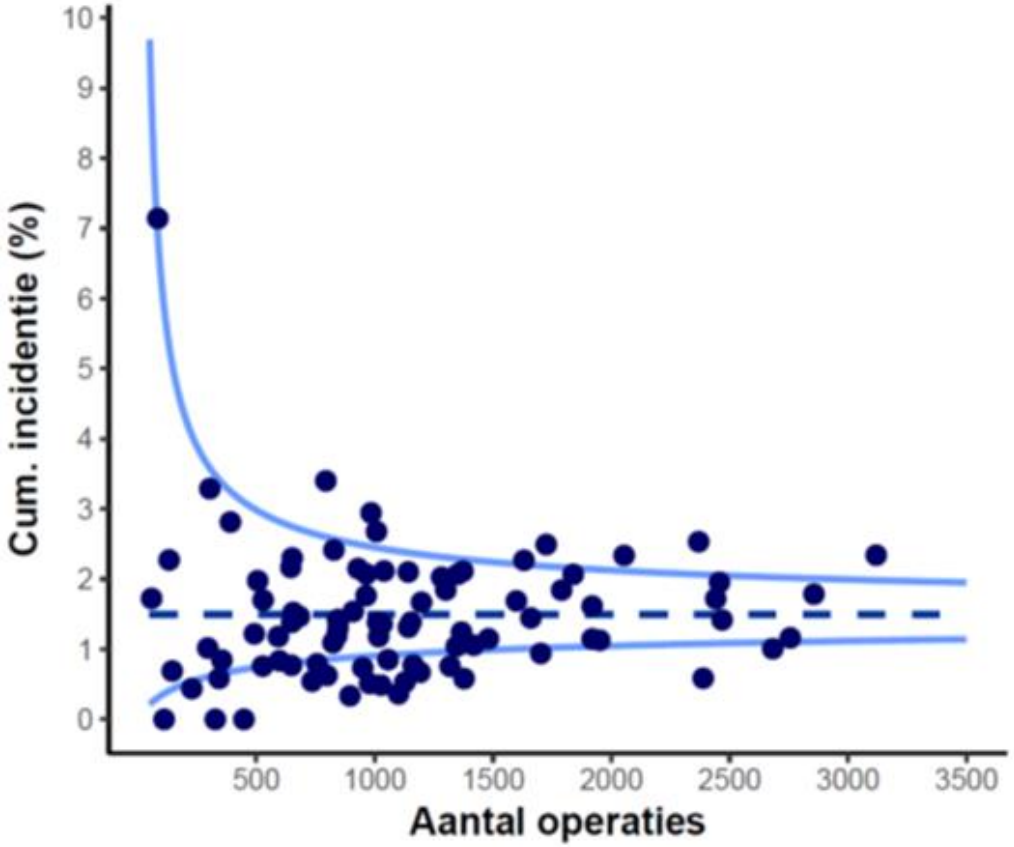
Trends in antibiotic use in hospitals

Figure 3.3 Use of beta-lactams in hospitals, expressed as DDD/100 patient-days (A) and DDD/100 admissions (B), 2005-2014 (Source:SWAB).



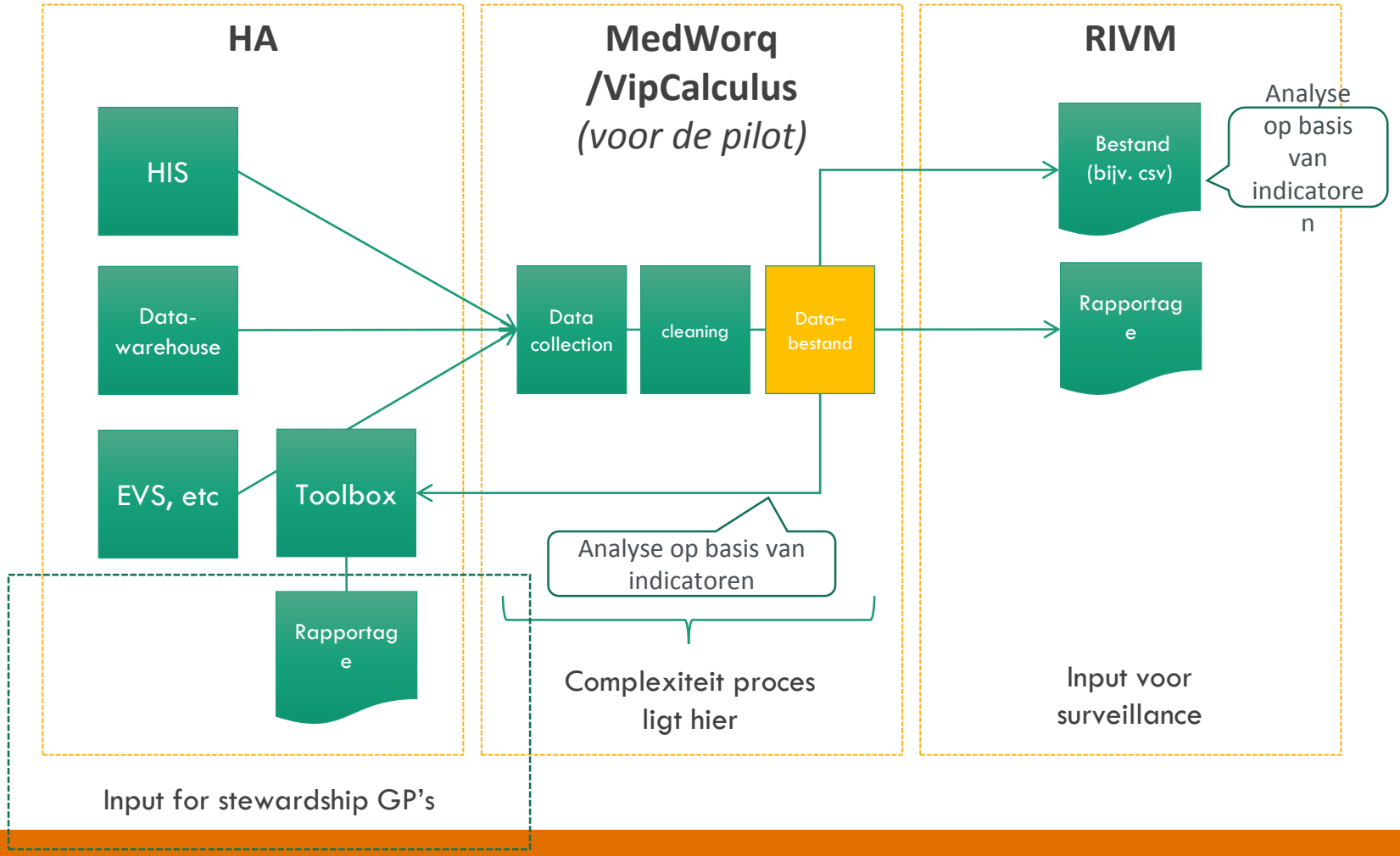
Surveillance

Health care associated infections

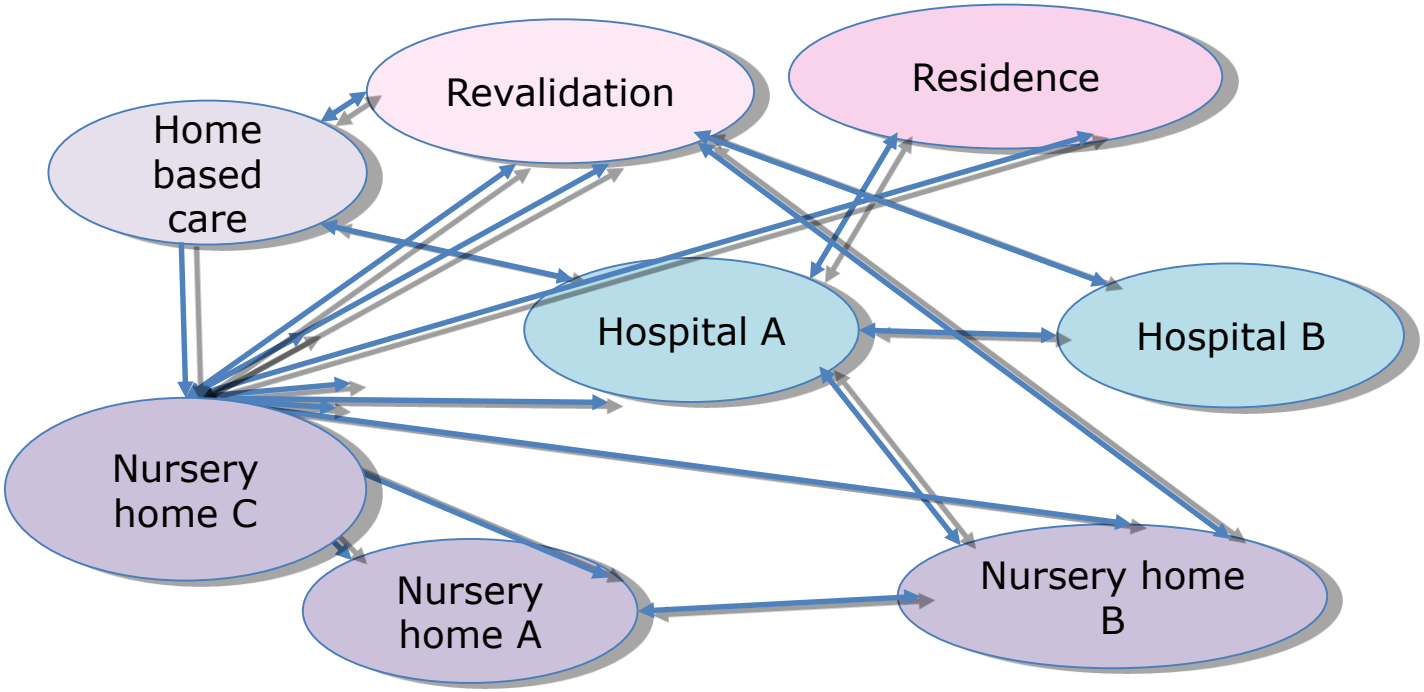


Incidence of surgery site infections (example: orthopedic)

Surveillance & stewardship



Enhancing cooperation



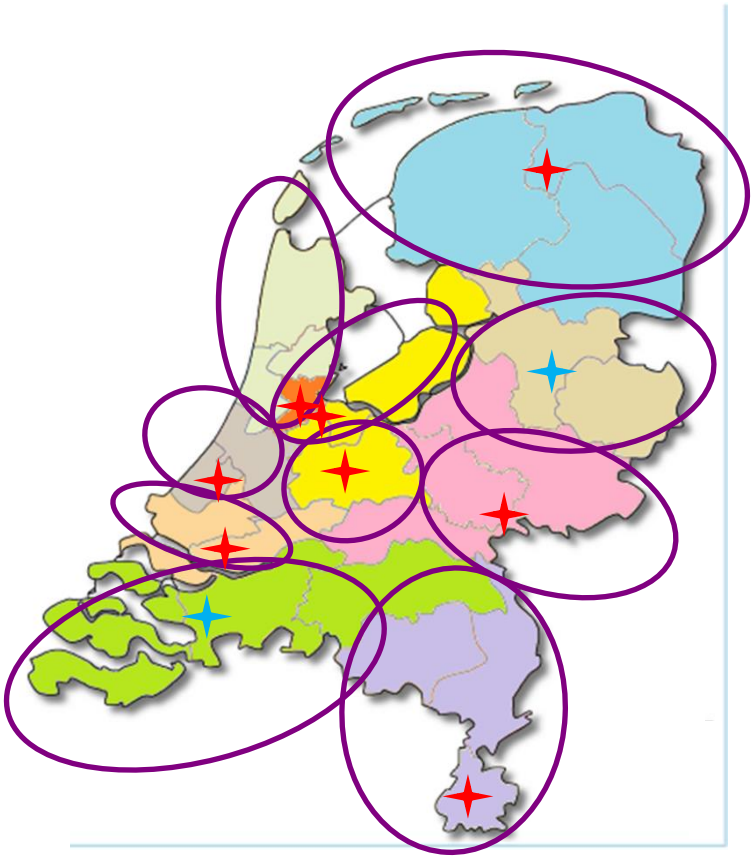
Importance of cooperation between professionals within healthcare, GP's and public health

AMR control on three levels:

- patient (cure)
- institution (quality of care)
- between care institutions and/or public health

Enhancing cooperation

10 regional networks



= University Medical Centre

= topclinical hospital

Institutions in each network

- Hospitals
- Medical microbiological laboratories (MML)
- Long care institutions
- Public Health Service
- GP’s

Team of professionals

Information to public and professionals, creating risk awareness

Summary Dutch One Health strategy

- Infection prevention, proper antibiotic use and outbreak control
- Adequate surveillance in all sectors (human health, animals, food, environment) → stewardship
- Enhancing cooperation between sectors, professionals, organizations and countries?
- Research and development: new antibiotics, therapeutics and treatment strategies, rapid diagnostics
- Communication and awareness
- International collaboration