

Benefits of Point Prevalence Surveys on Health care Associated Infections and Antibiotic Use

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Agenda



- Background
- Aims of the ECDC PPS on HCAI and ABU
- Pilot ECDC PPS
 - Methodology
 - Feasibility
 - Results
- Examples of targets for quality improvements
- Conclusions



**"If you cannot
measure it,
you cannot
improve it"**

**Lord Kelvin,
1824-1907**



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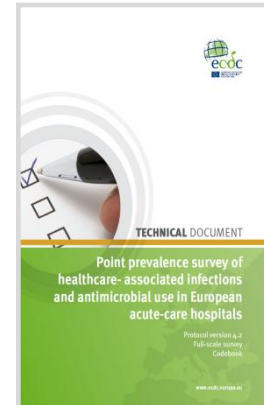
Background



- **July 2008- IPSE (Improving Patient Safety in Europe) was transferred to ECDC.**
 - External ECDC evaluation of IPSE recommended that:
 - “The European HAI surveillance needs to cover other types of nosocomial infections besides surgical site infections and ICU-acquired infections in order to estimate and monitor the complete HAI disease burden”, and
 - “Since the implementation of an expanded continuous incidence surveillance is very resource demanding, hospital-wide PPSs are efficient approaches to address it.”
- **ECDC reviewed 17 national/regional PPSs of HAI and ABU in European countries (ECDC AER 2008).**
 - Major methodological differences between the protocols made data comparison or pooling at the EU level impossible and emphasized the need for an agreed EU protocol
- **January 2009 - (joint expert meeting) recommended:**
 - PPS for HAI and ABU in hospitals
 - The use of IPSE/HELICS case definitions (+ CDC case definitions where they don't exist)
 - Integration of the main variables of the ESAC hospital-PPS protocol on ABU
- **Further meetings in June 2009, September 2009 and 24-25 February 2010.**



Background (2)



- **June 2010 - pilot PPS protocol finalized and launched**
 - Available: <https://extranet.ecdc.europa.eu/hainet>
- **June 2010 until October 2010: pilot PPS**
 - Subcontracted to University of Antwerp, in collaboration with the Institut de Veille Sanitaire, France, and the Scientific Institute of Public Health, Brussels
 - Objectives of the ECDC-pilot-PPS:
 - to test and finalize a protocol to describe and estimate the prevalence of HAI and AU in participating hospitals stratified by patients' characteristics or invasive procedures
 - to provide a standardized tool for hospitals to identify targets for quality improvement
- **November 2011 - Preliminary results presented in Workshop 3 of the Belgian EU presidency. Agreed that all Member States*:**
 - Perform a first national PPS (3 possible periods): May-June 2011, September-October 2011 and May-June 2012), and
 - Organize at least one repeated national PPS every 5 years after that.



*Goossens, Lancet Infect Dis 2011, April 7th



Aims of the ECDC PPS on HAI and ABU



1. To **estimate** the total **burden** (prevalence) of HAI and **antimicrobial use** in acute care hospitals in the EU
2. To describe patients, invasive procedures, infections (sites, micro-organisms incl limited AMR markers) and **antimicrobials** prescribed (compounds, indications)
3. To **disseminate results** to those who need to know at local, regional, national and EU level
4. To provide a standardised tool for hospitals to **identify targets for quality improvement**



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METHODOLOGY



- **Unit-based protocol:**
 - Denominator data: aggregated at ward level; for all patients present in the ward at 8:00AM and not discharged at the time of the survey; HAI data **and/or** ABU data, together with basic patient variables for each patient with an HAI and/or receiving an antimicrobial agent
- **Patient-based protocol:**
 - Denominator: all patients present in the ward at 8:00AM and not discharged at the time of the survey; collecting risk factors for each patient, **infected or not**; HAI data and/or ABU data collected on the same form
- Ideally one day; preferably less than 2 weeks
- Exclusion: long-term care wards; outpatient departments; emergency rooms; day cases (e.g. Surgery)
- Most participants used a web-based tool provided by UA for data collection and validation.



Simplified Form of European PPS Healthcare-Associated Infections and Antimicrobial Use – Patient based



Patient data (patients with HAI and/or antimicrobial only)

Hospital code

Ward name (abbr.)/Unit Id

Patient Counter: _____

Age in years: ____ yrs; Age if < 1 year old: ____ months

Sex: M F

Date of hospital admission: ____ / ____ / ____ (dd/mm/yyyy)

Consultant/Patient Specialty: _____

Patient receives **antimicrobial(s)**: ☐ No ☐ Yes

Patient has **active HAI**: ☐ No ☐ Yes

Antimicrobial (generic or brand name)	Route	Indication	Diagnosis (site)	Reason in notes

	HAI 1	HAI 2	HAI 3			
Case definition code						
Relevant device in situ before onset	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Unknown	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Unknown	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Unknown			
Present at admission	<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input type="radio"/> No			
Date of onset	____ / ____ / ____	____ / ____ / ____	____ / ____ / ____			
Origin of infection	<input type="radio"/> current hospital <input type="radio"/> other hospital <input type="radio"/> other origin/ unk	<input type="radio"/> current hospital <input type="radio"/> other hospital <input type="radio"/> other origin/ unk	<input type="radio"/> current hospital <input type="radio"/> other hospital <input type="radio"/> other origin/ unk			
If BSI: source						
	MO-code	R	MO-code	R	MO-code	R
Microorganism 1						
Microorganism 2						
Microorganism 3						



Patient Based – Risk Factors



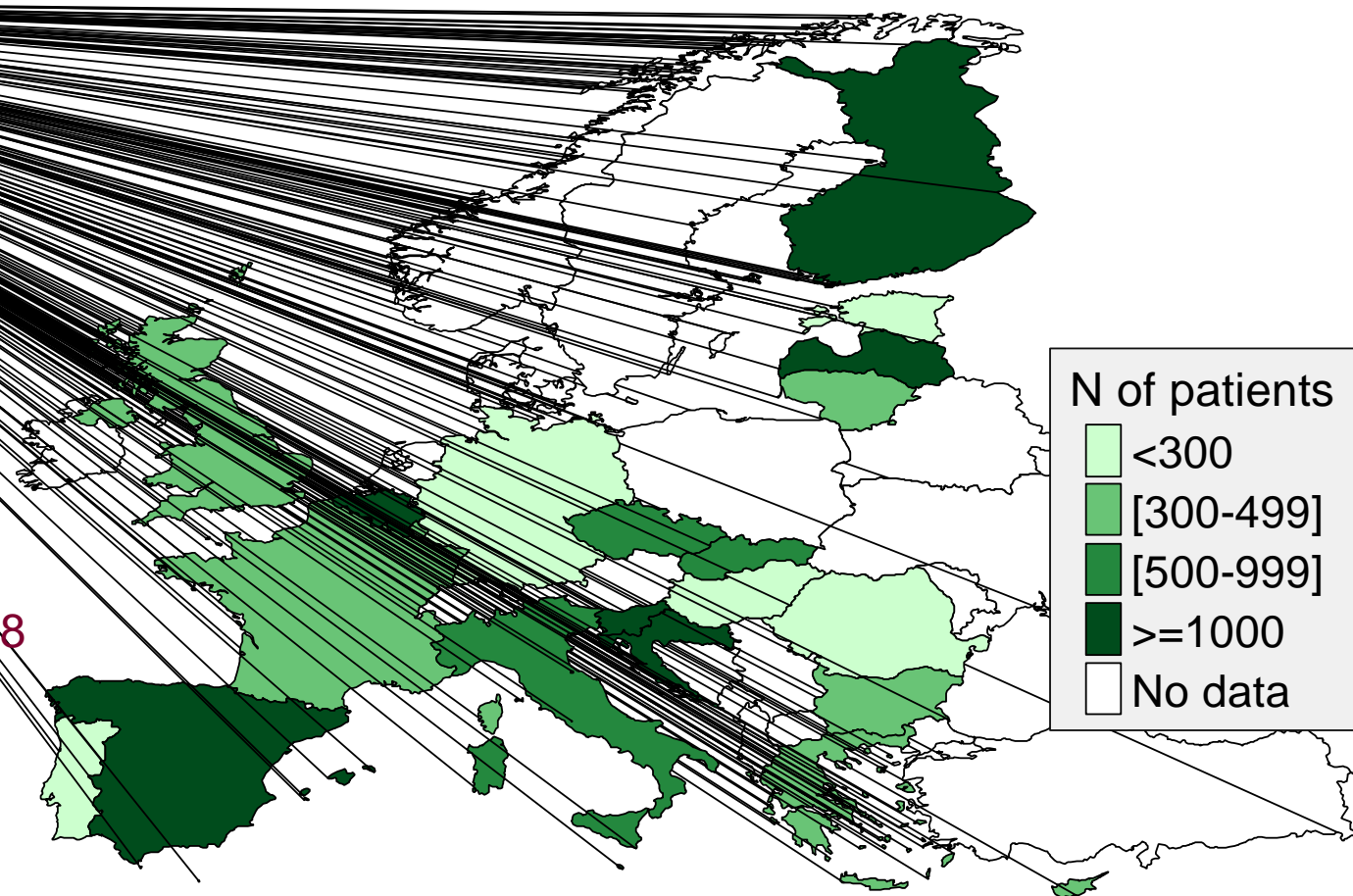
- Surgery since admission
- McCabe score:
 - Non-fatal disease (expected survival at least 5 years)
 - Ultimately fatal disease (between 1 year and 5 years)
 - Rapidly fatal disease (expected death within 1 year)
 - Unknown
- Central vascular catheter
- Peripheral vascular catheter
- Urinary catheter
- Intubation



Number of Patients Included in Pilot PPS



- 23 countries,
- 66 hospitals,
- Light: 16
- Standard: 50
- N of patients: 19,888





Healthcare Workers Involvement



	Distribution among hospitals		Distribution among category	
	N	%	Data Collection	Data entry
Infection control nurse	25	64%	25	9
Infection control physician or eq.	31	79%	31	12
Ward nurse	18	46%	18	0
Ward physician	15	38%	15	0
Infectious disease physician	12	31%	12	3
Hospital microbiologist	6	15%	6	3
MD specialist trainee	10	26%	10	2
Hospital pharmacist	6	15%	6	1
Infection control link nurse	5	13%	5	1
Data nurse	4	10%	3	2
Nurse aid	1	3%	0	1
MD students	1	3%	1	0
Other hospital staff	10	26%	6	6
National coordination staff	13	33%	12	6
Regional coordination staff	5	13%	5	2
Other	6	15%	4	3



FEASIBILITY ANALYSIS



Workload Data Collection



- Unit-based protocol (UB)
 - Data collection: ≈ 11 min/patient
- Patient-based protocol (PB)
 - Data collection: ≈ 14 min/patient
- **UB vs PB: 11 min vs 14 min per patient**
 - **For 100 patients: 2wd2h vs 2wd7h (wd=working day=8h)**
- **Per 100 patients: Δ 5h**



RESULTS



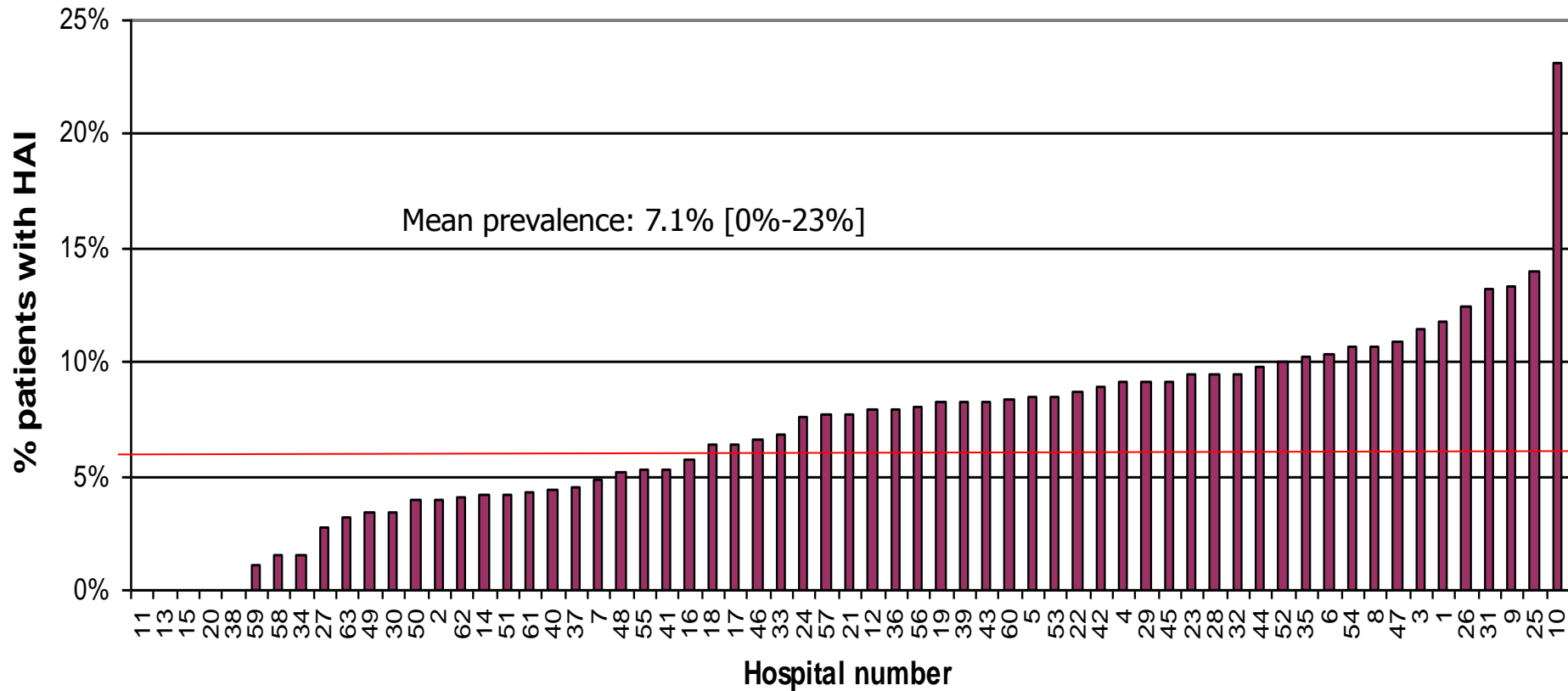
General Results



- Overall prevalence of patients with HAI (n=1,408/19,888 patients): 7.1%.
- Prevalence of ABU (n=6,875): 34.6%
- Positive microbiology analysis (1,531 patients with HAI): 59.1%
- Carbapenem resistance among Enterobacteriaceae: 3.2%
- HAI was independently associated with:
 - length of hospital stay (until infection date if HAI),
 - number of invasive devices,
 - surgery since admission,
 - McCabe score, and
 - specialty

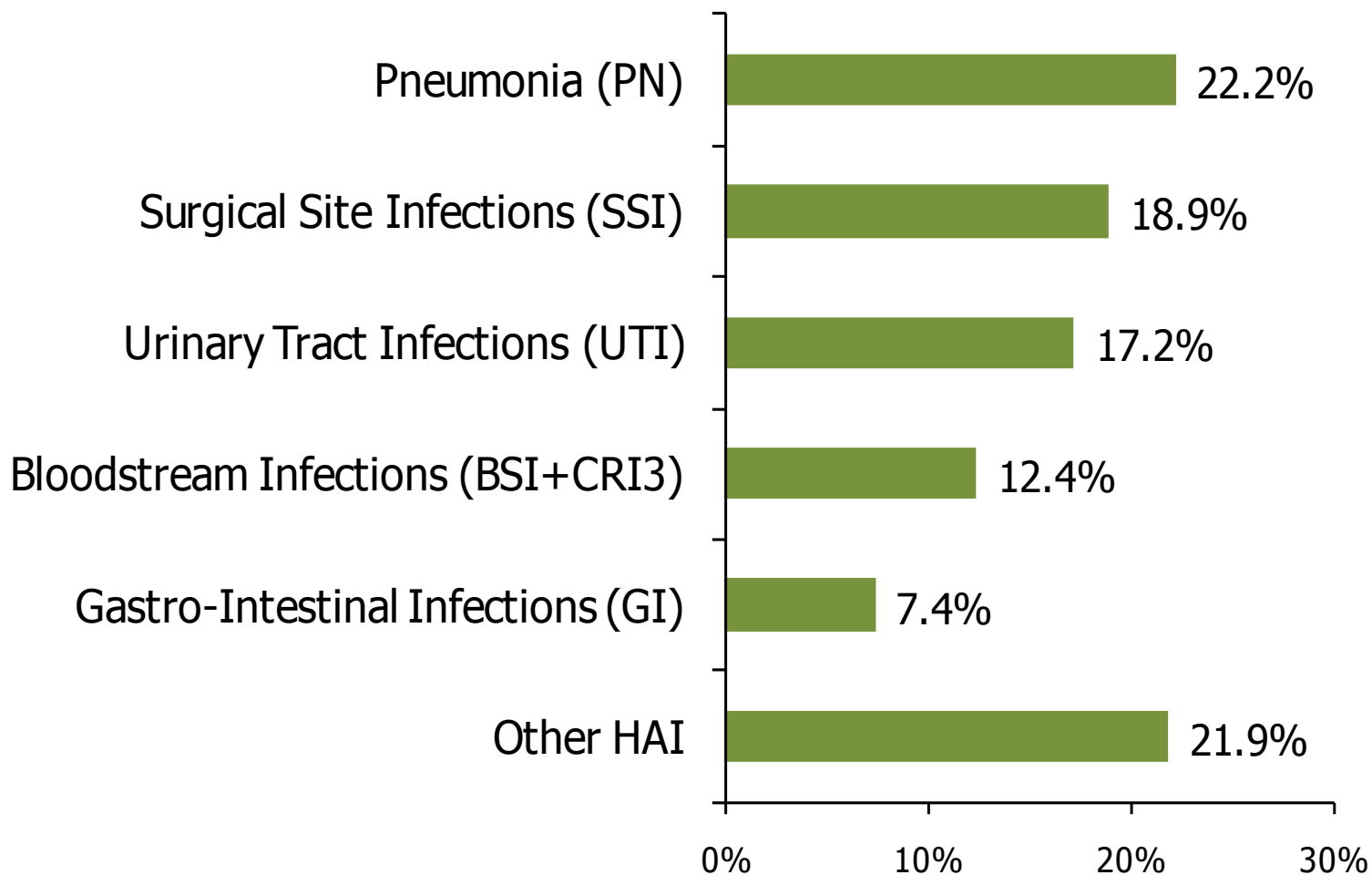


Prevalence (%) of HAI by hospital



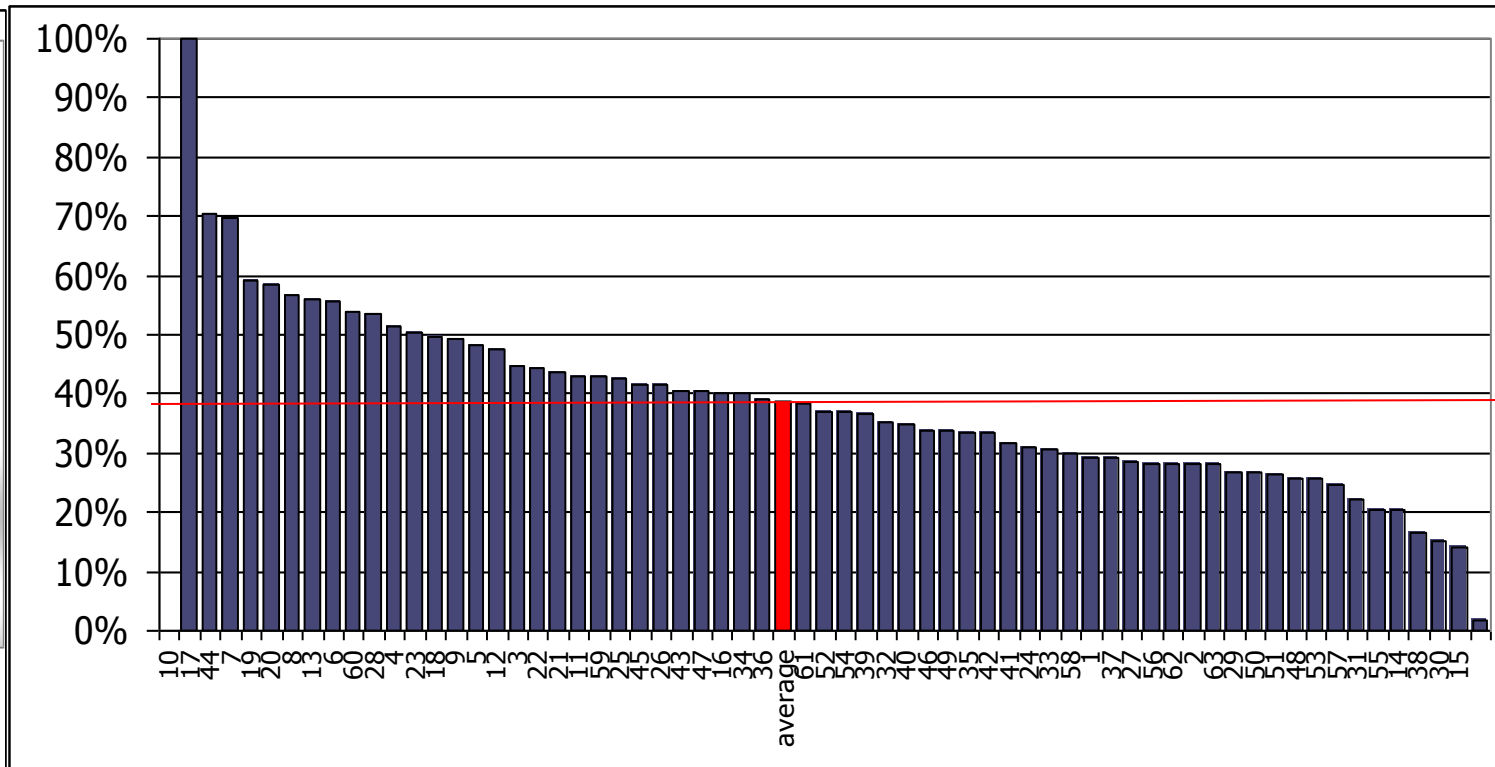
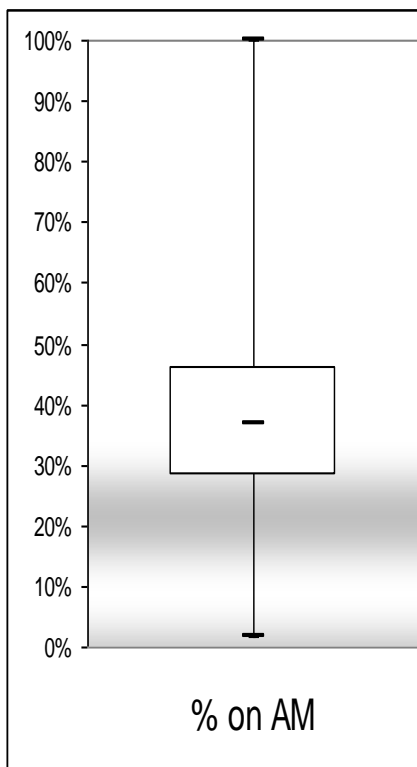


Distribution of Most Frequent HAI Types



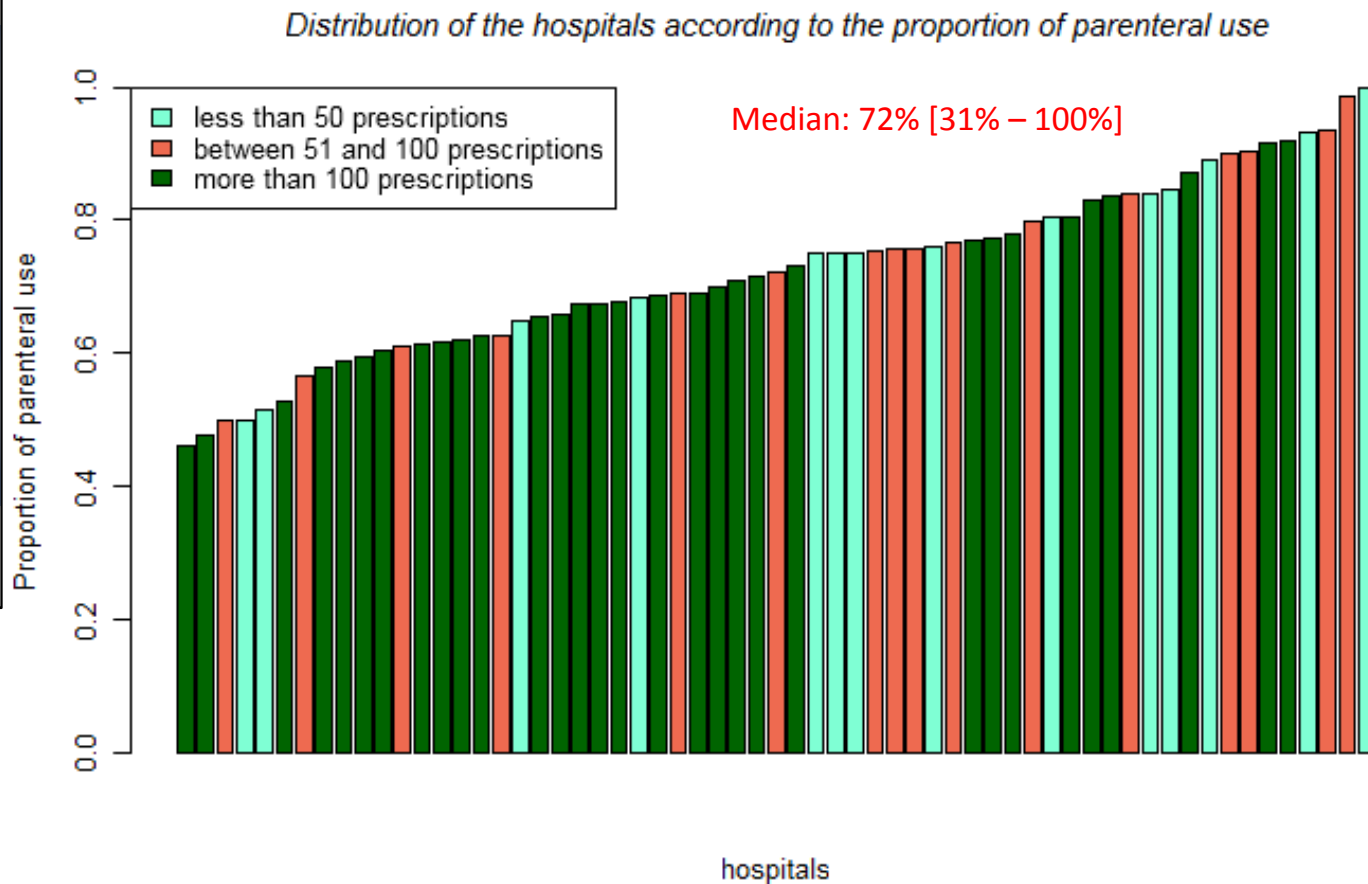
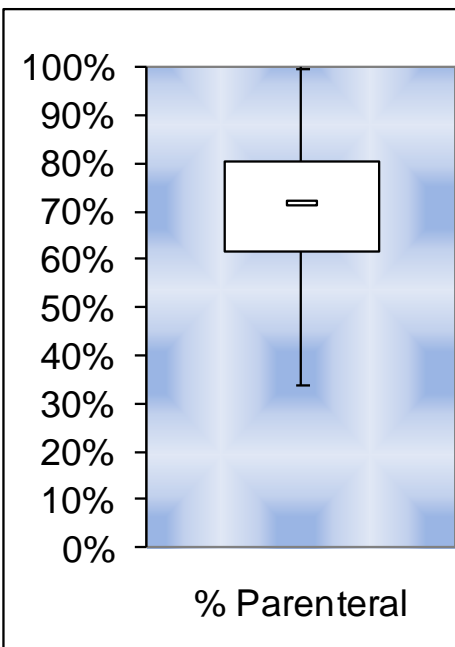


Prevalence (%) of AB use by Hospital



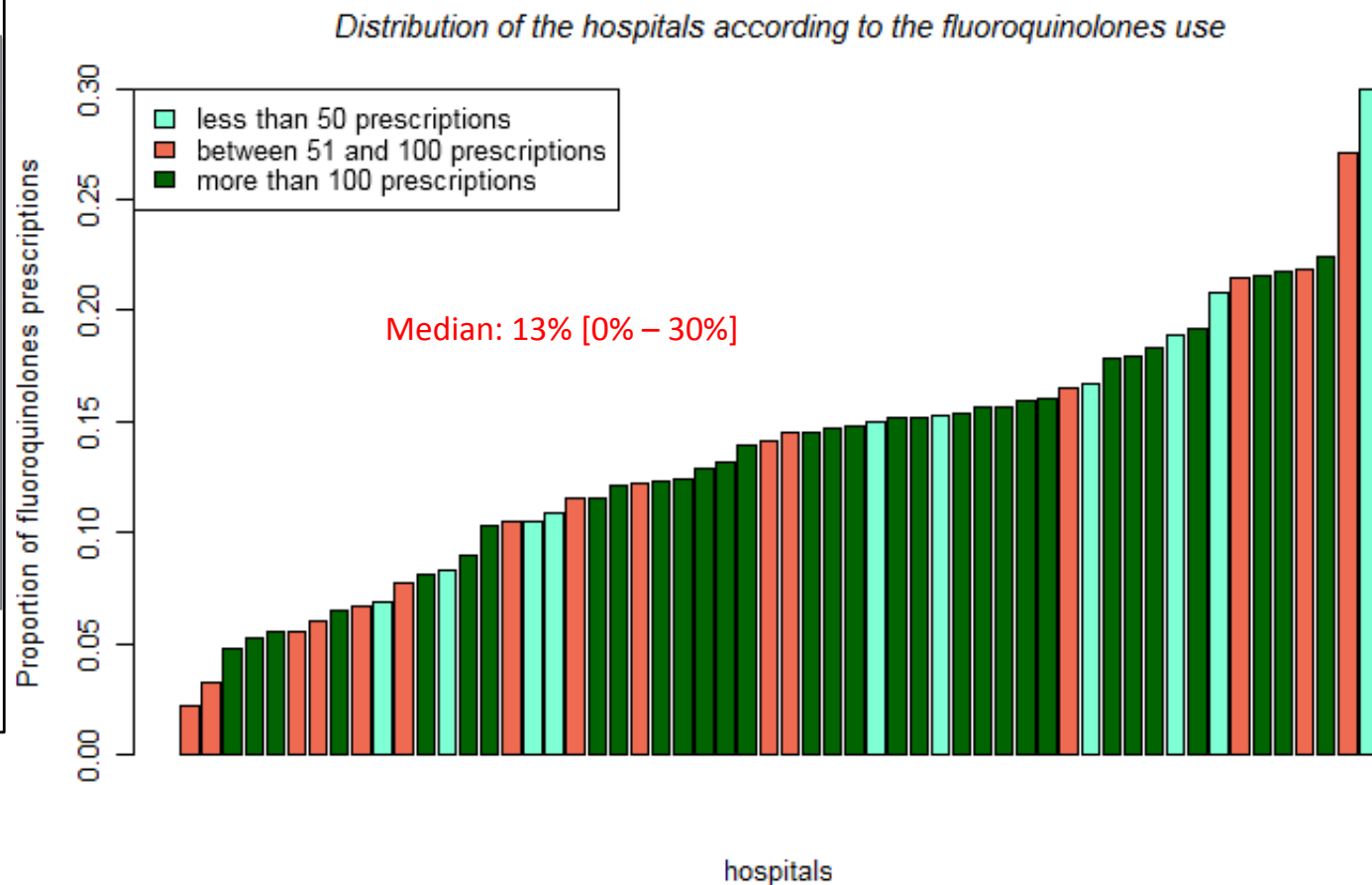
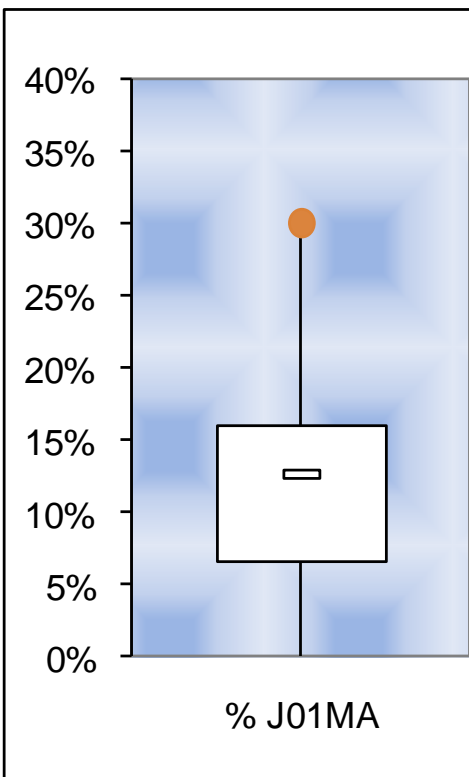


Proportion of Parenteral Use



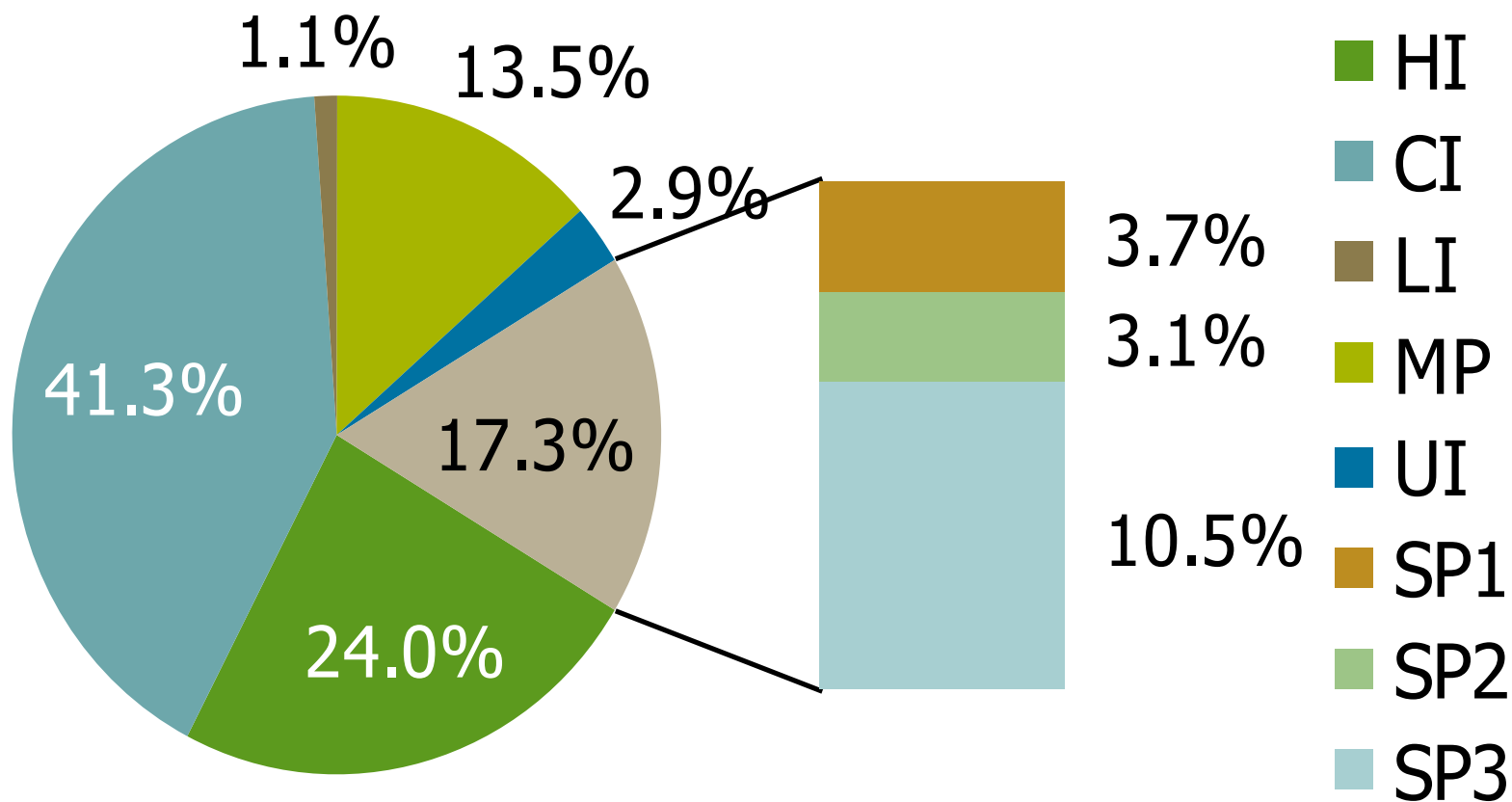


Proportion of Quinolones





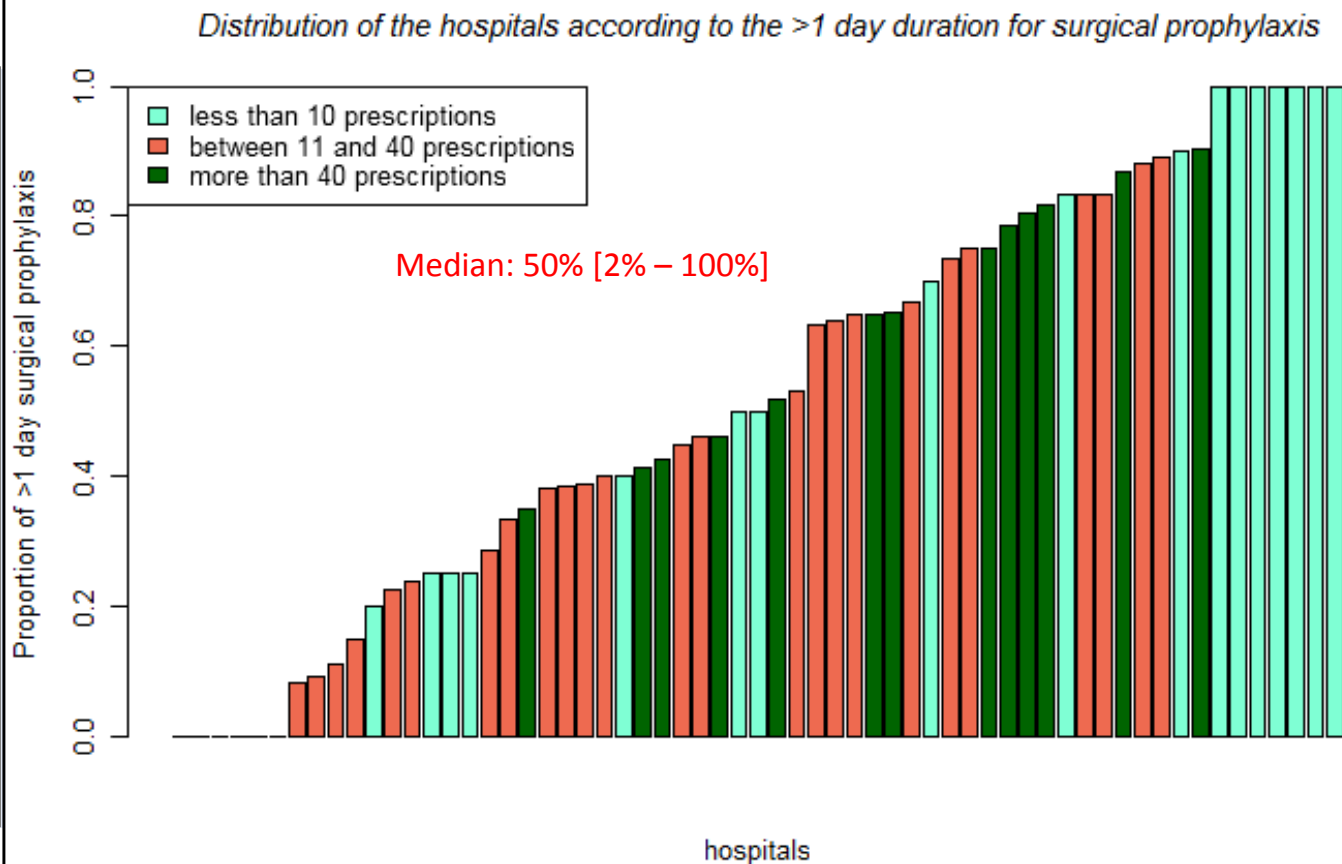
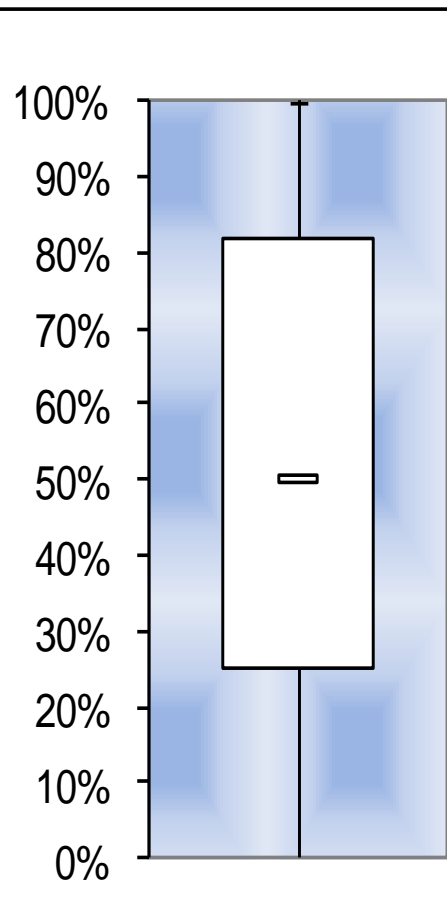
Indications of Antibiotic Use



SP=surgical prophylaxis; MP=medical prophylaxis; CI-HI-LI=treatment intention of community-acquired infection (CI), hospital-acquired infection (HI) or long-term or chronic care-acquired infection (LI); UI=unknown indication



Surgical Prophylaxis (>1 day)

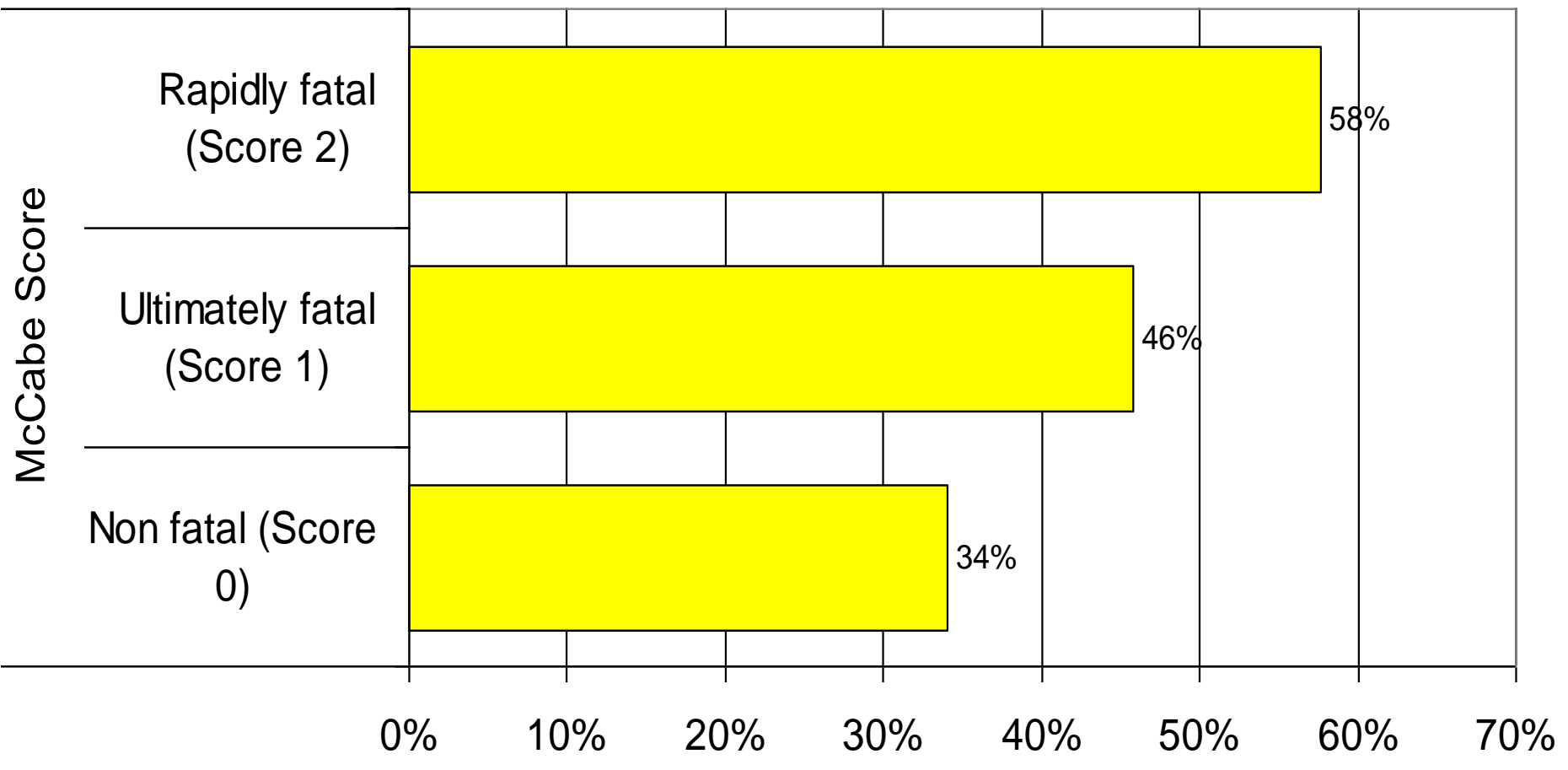




RESULTS BY RISK ACTORS

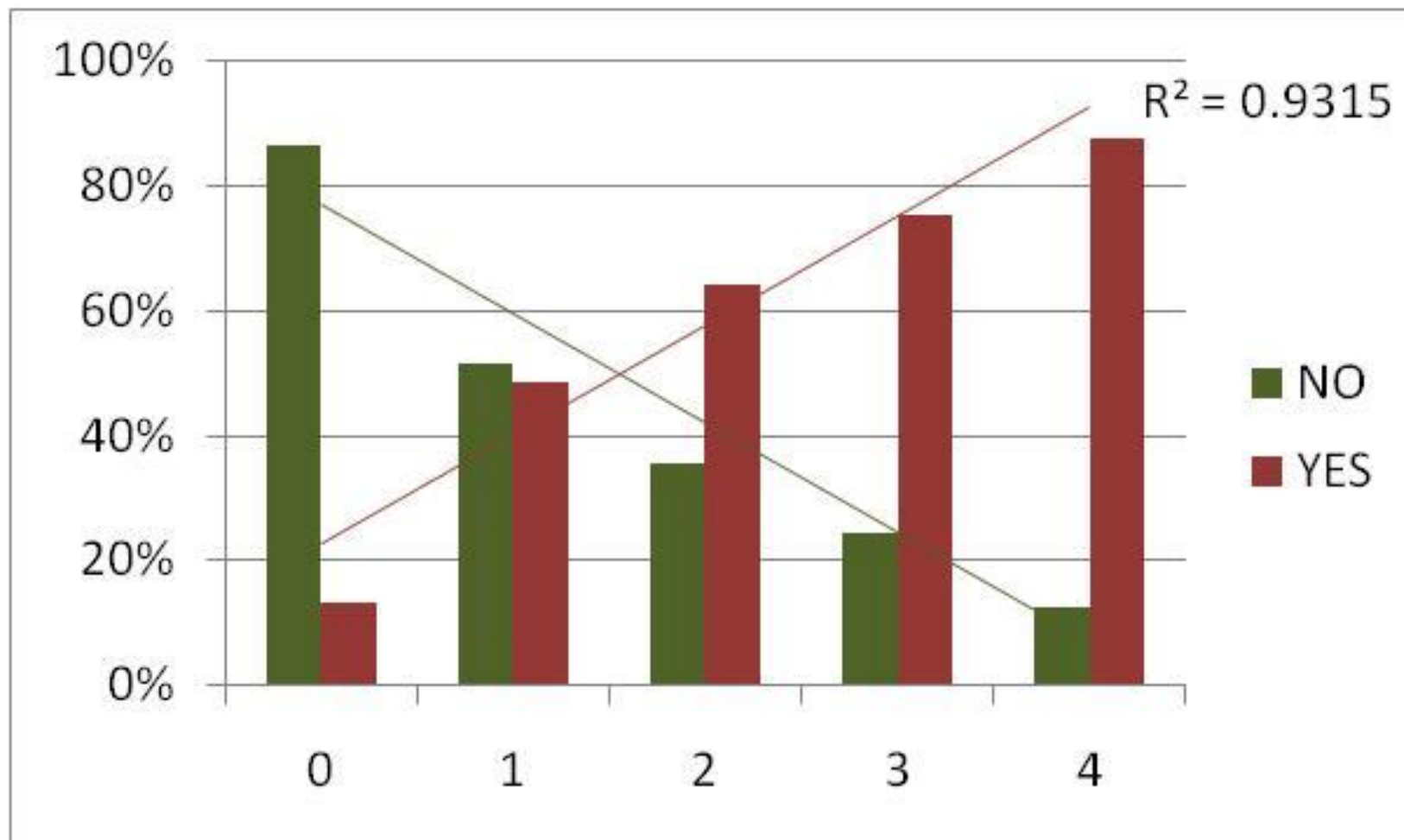
Patients on antibiotics (%) by McCabe Score

(Difference between McCabe scores was highly significant ($p < 0.001$))



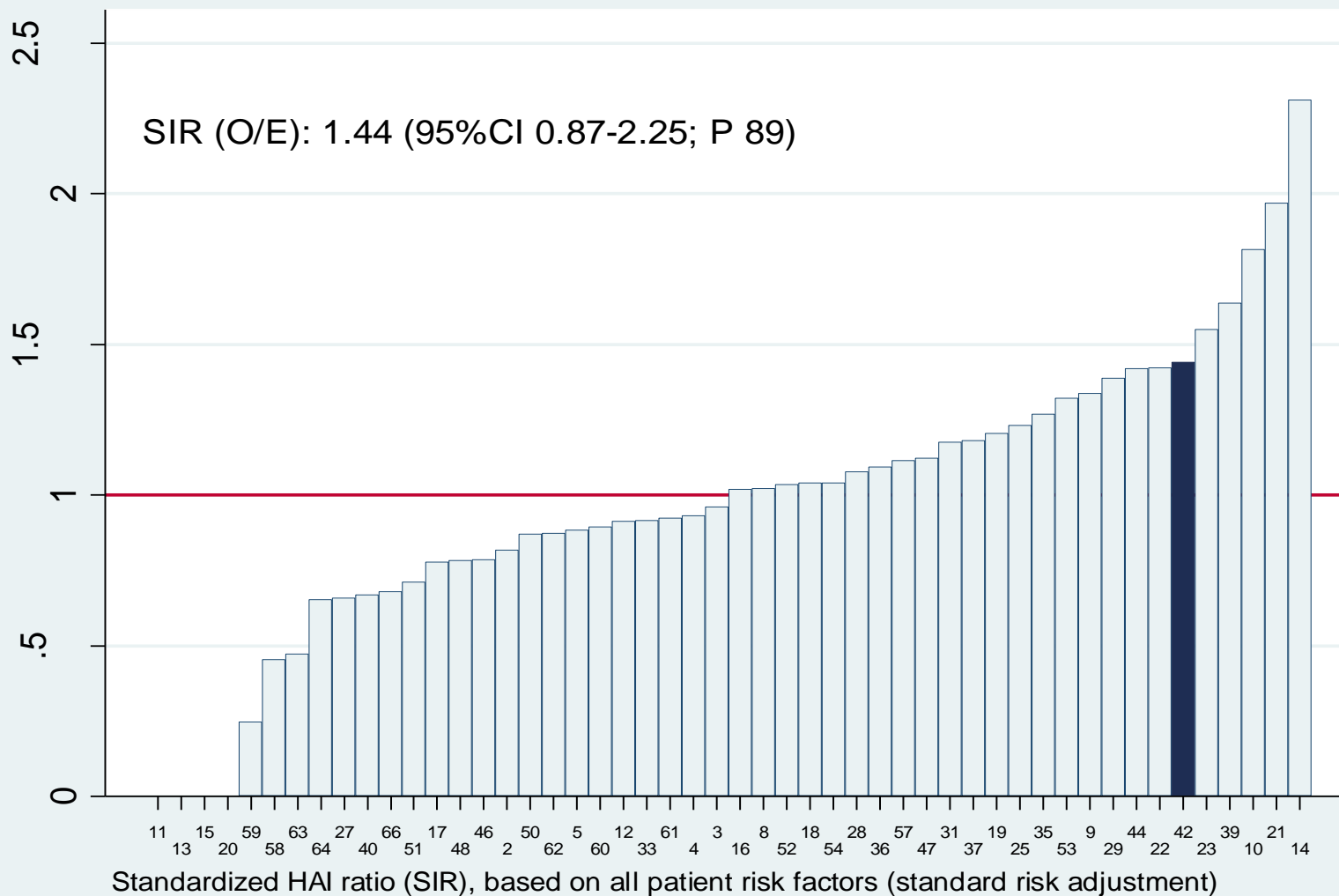


NUMBER OF RISK FACTORS & RX





Hospital Ranking according to Standardised Infection Ratio (O/E) Taking Differences in Case-mix into Account





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VD Scottish ESAC 2009 PPS

- Hospitals included: 31
- Patients included: 8,732
- Treated patients: 28%
- Areas of good practice:
 - Greater use of narrow spectrum antimicrobials compared to the rest of Europe
- Areas where improvement is required:
 - Indication documented: 76% (target: 95%)
 - Compliance with NHS Board guidelines: 58% (target: 95%)
 - Surgical prophylaxis greater than one day: 30%
 - Treated patients: 28%

Conclusion: better than European data but room for improvement



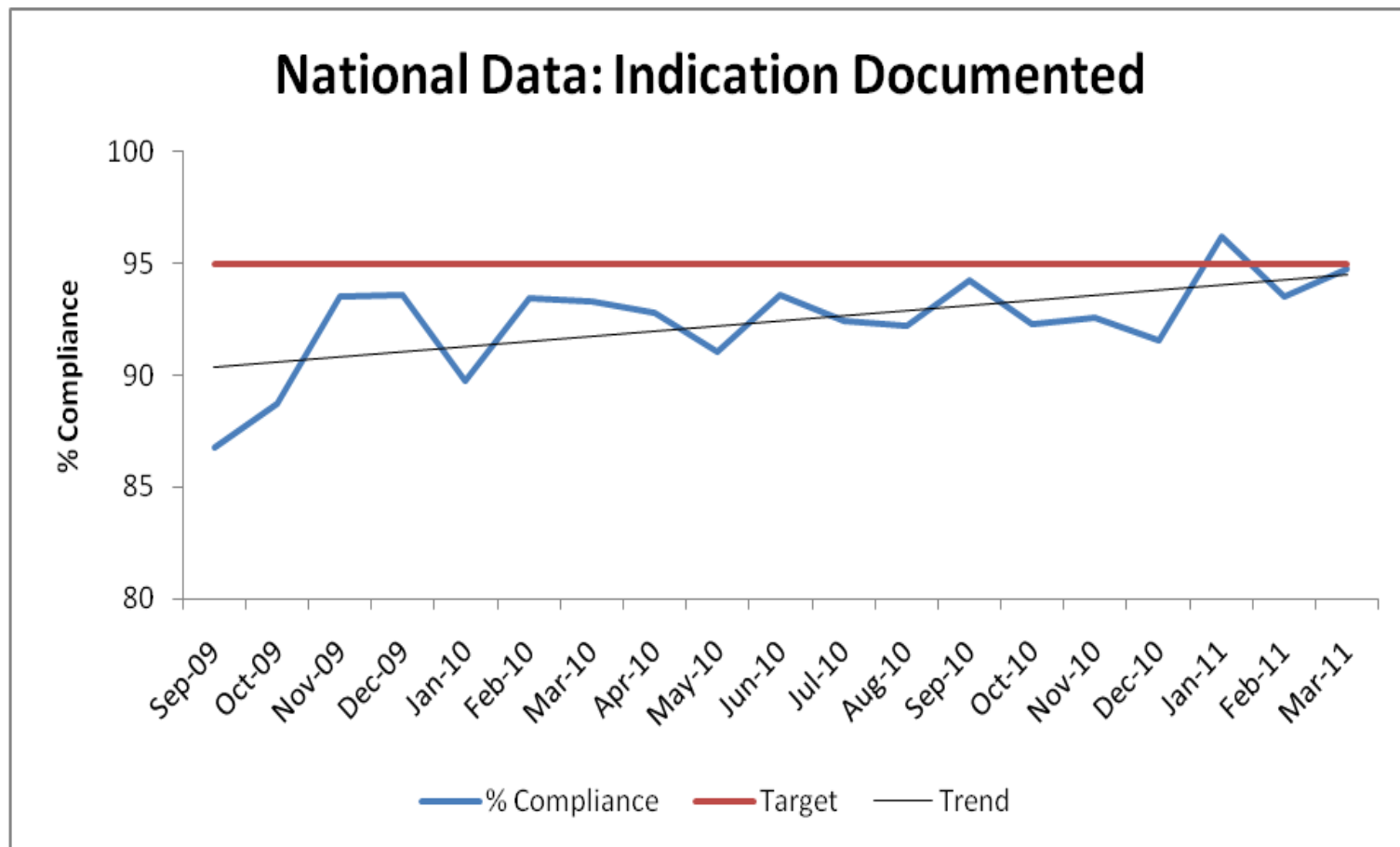
Implementation of Indicators



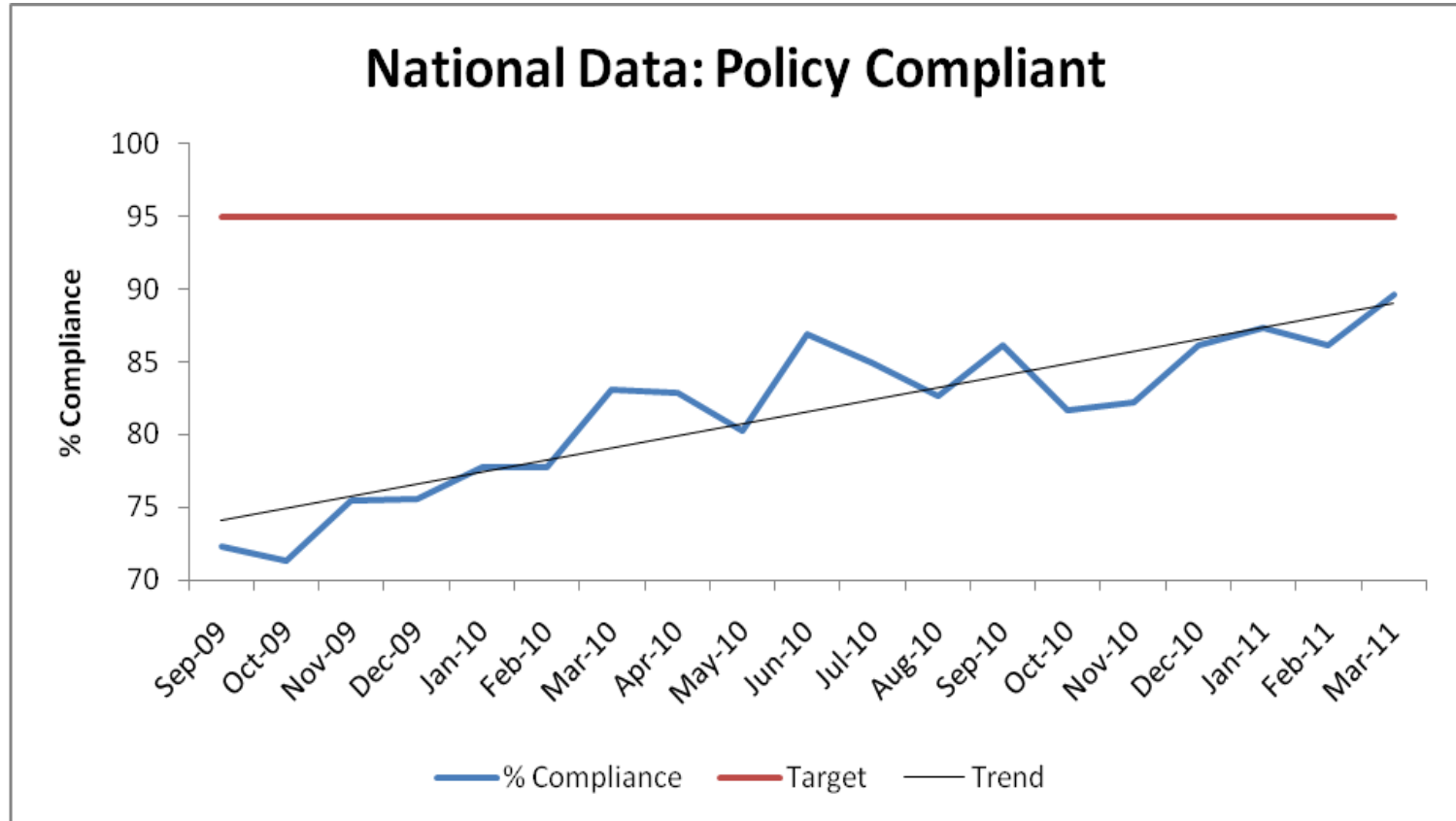
- Promotion of local policies through clinical engagement and staff education
- Data collection by Antimicrobial Management Team and/or clinical team – sample 20 patients per month
- Data recording, analysis and reporting using Institute for Healthcare Improvement Extranet
- Local feedback of results monthly and national reporting every 3 months



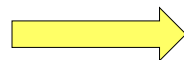
Results Scotland – Indication Documented



National compliance 93% and 7/14 NHS boards achieved target



National compliance 83% and 4/14 NHS boards achieved target



2011 - need to focus on improvement



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Conclusions



- The **new ECDC protocol** will provide reliable, standardised European, national and local data on HAI and AB use
- First PPS should be **completed by EAAD 2012** in all MS.
- Periodicity to estimate burden at European level **at least** once every 5 years.

