
Antimicrobial Resistance in the Baltic Region

Thursday 16 March 14.30 – 16.00

Chair: Barbro Olsson-Liljequist

WG1 members: Paul Naaber (EE), Arta Balode (LV), Edvins
Miklasevids (LV), Jolanta Miciuleviciene (LT)

Peet Tull (ECDC)



Surveillance of antibiotic resistance – why, how, when and by whom?

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Sigtuna conference 2000 (1)

ANTIBIOTIC RESISTANCE

- **Problem statement**

Infectious diseases do not recognize geographical borders. Microbial antibiotic resistance is increasing worldwide and lack of effective treatment has resulted in increased morbidity and mortality of infectious diseases.

- **Overall objective**

Correct antibiotic policy saves lives and money. Therefore there is a need to make a strategy for the prudent use of antibiotics to ensure that we also in the future will be able to cure infections.

- **Recommendations**

Every country should develop a national policy programme for the correct use of antibiotics. Important elements of a programme are:



Sigtuna conference 2000 (2)

A. National antibiotic resistance surveillance

- standardization and quality assurance of laboratory monitoring of antibiotic resistance
- means for data collection, analysis and report procedures

B. Guidelines for the prudent use of antibiotics in humans and animals

- availability of essential drugs
- treatment recommendations for important bacterial diseases

C. Hospital infection control

- antibiotic and infection control teams consisting of infectious disease specialists, microbiologists and pharmacists at local hospitals



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Antibiotic Susceptibility Testing, AST

What is it?

- Methods for in vitro testing of the antibacterial activity of an antibiotic against clinical isolates of bacteria
- Indicate success (S) or failure (R) of antibiotic treatment based on microbiological findings!



AST - How to perform it?

- **Quantitative methods (MIC, mg/L)**
 - Agar dilution
 - Broth dilution
 - Etest
- **Qualitative method (S I R)**
 - Disk diffusion
 - Breakpoint methods

Must always be standardised!

AST - Why performing it?

- Guidance for treatment of the individual patient
- Background information for empirical treatment
- Means of detecting new resistance
 - For epidemiological investigations
 - Accumulated data might lead to changes in empiric treatment

Clinicians should request it!

AST - Who should perform it?

- **All clinical microbiology laboratories**
 - As an important part in the care of patients
- **Microbiological reference/referral laboratories**
 - Confirming susceptibility / resistance in clinical isolates using reference and genetic methods
 - Quality assessment and assurance
 - National surveillance of AMR
 - Education

Agreement on a national basis!

Surveillance systems

- **EARSS:** European Antimicrobial Resistance Surveillance System
- **ResNet:** Swedish national surveillance and quality assurance
- **Notifiable diseases** (MRSA, VRE, PRP)

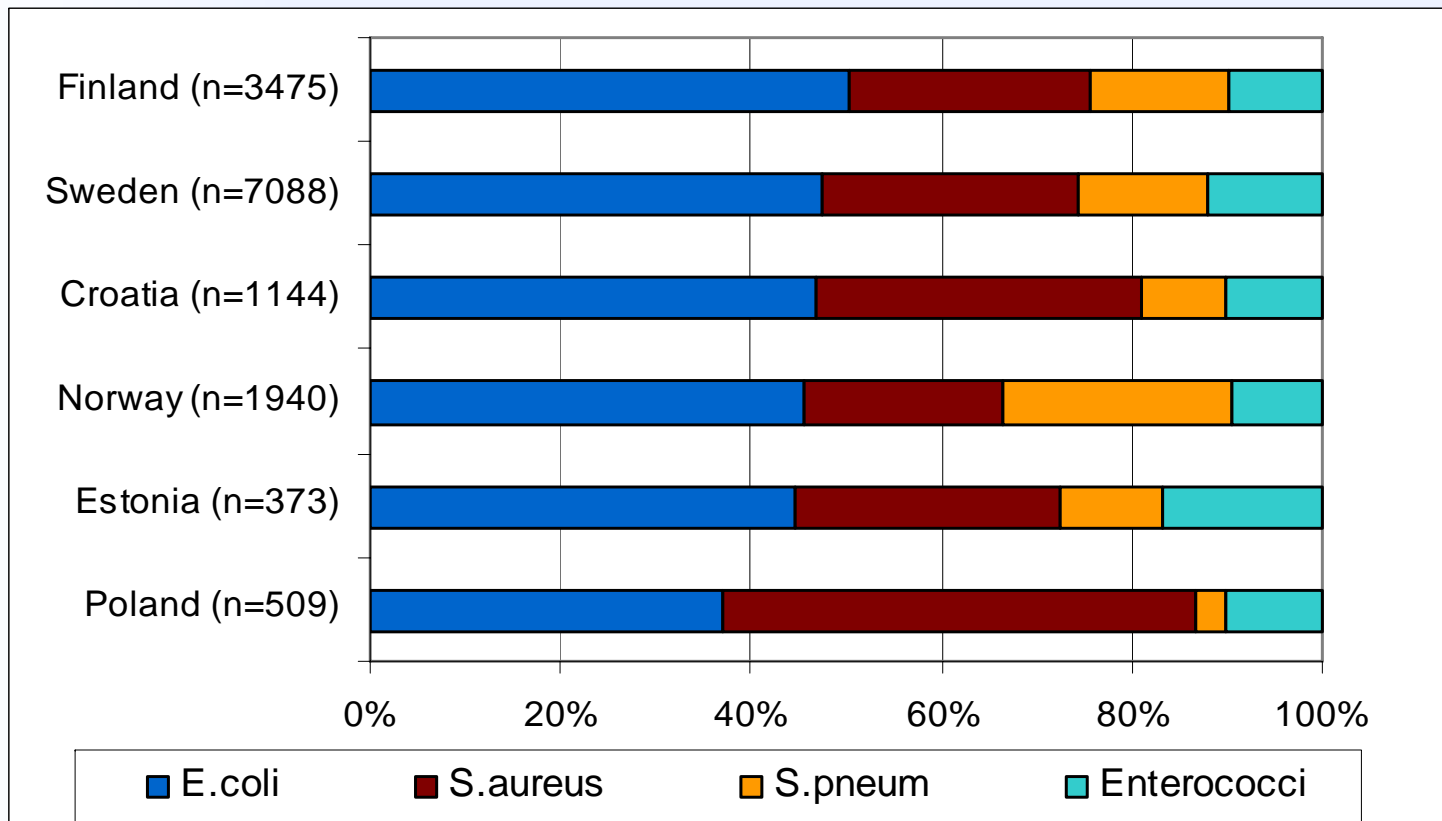


EARSS: invasive isolates of 5 bacterial species from consecutive clinical samples

- **Representative data:** Clinical laboratories serving at least **20%** of national population
- **Bias:** When comparing data between countries some bias may be present. Bias can be due to differences in case mix and hospital specialities or may be introduced as a result of different routines between countries

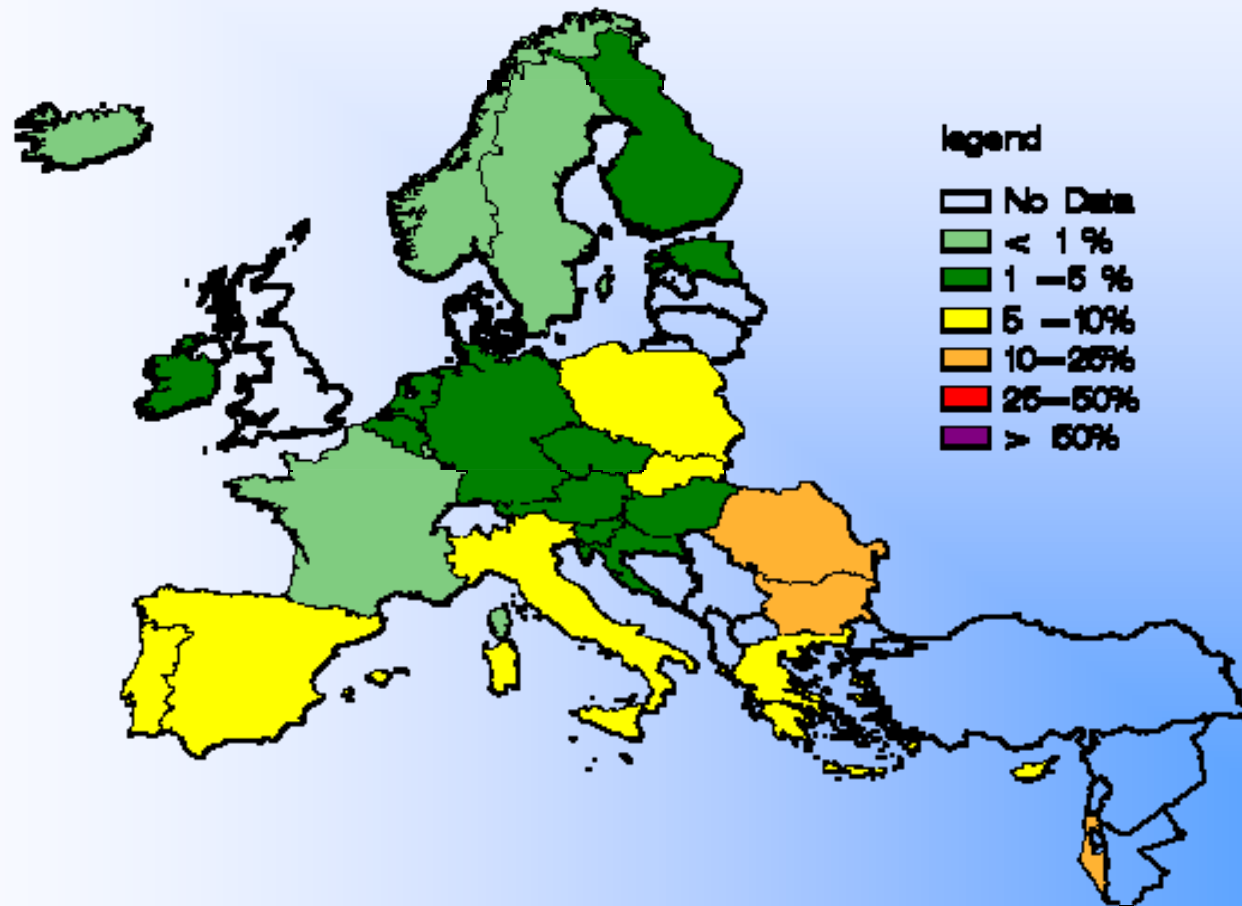


Proportion of bacterial species among invasive isolates reported to EARSS 2004



E.coli with ESBL in Europe 2004

Proportion of 3rd gen. ceph. resistant E. coli isolates in participating countries in 2004
(a) EARSS



E.coli with ESBL in blood and urine samples, Sweden 2004

Blood (EARSS): E.coli from 21 labs, n = 3372

- Cefotaxime-R, n = 33 (1,0%)

- **16 ESBL; 15 CTX-M-type, 1 SHV-type (0,5%)**

Urine (ResNet): E.coli from 29 labs, n = 3135

- Cephalosporin-R, n = 33 (1,1%)

- **only 3 ESBL, all CTX-M-type (0,1%)**



ResNet - Microsoft Internet Explorer

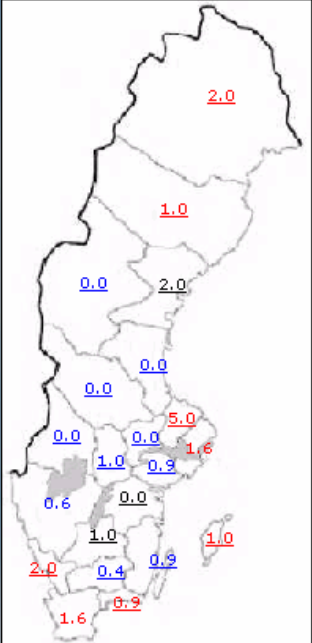
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Bakåt

Adress <http://www4.smittskyddsinstitutet.se/ResNet/showAntib100.jsp> Gå till Länkar

Meny Logga in

Andel resistenta - Sverige



Län	Andel resistenta	Län	Andel resistenta
Blekinge	0.9	- Medilab	2.0
Dalarna	0.0	- St Göran Nova Medical AB	1.7
Gotlands	1.0	- Huddinge sjukhus	0.0
Gävleborg	0.0	Södermanland	0.9
Halland	2.0	Uppsala	5.0
Jämtland	0.0	Värmland	0.0
Jönköping	1.0	Västerbotten	1.0
Kalmar	0.9	Västernorrland	2.0
Kronoberg	0.4	Västmanland	0.0
Norrbottn	2.0	Västra Götaland	0.6
Skåne	1.6	- Borås	1.0
- Lund	3.2	- Göteborg	0.0
- Kristianstad	0.0	- Skövde	1.0
- Malmö	1.7	- Uddevalla	0.5
SMI	-	Örebro	1.0
Stockholm	1.6	Östergötland	0.0
- Karolinska sjukhuset	2.7		
Sverige: 1.1			

Art

Antibiotikum

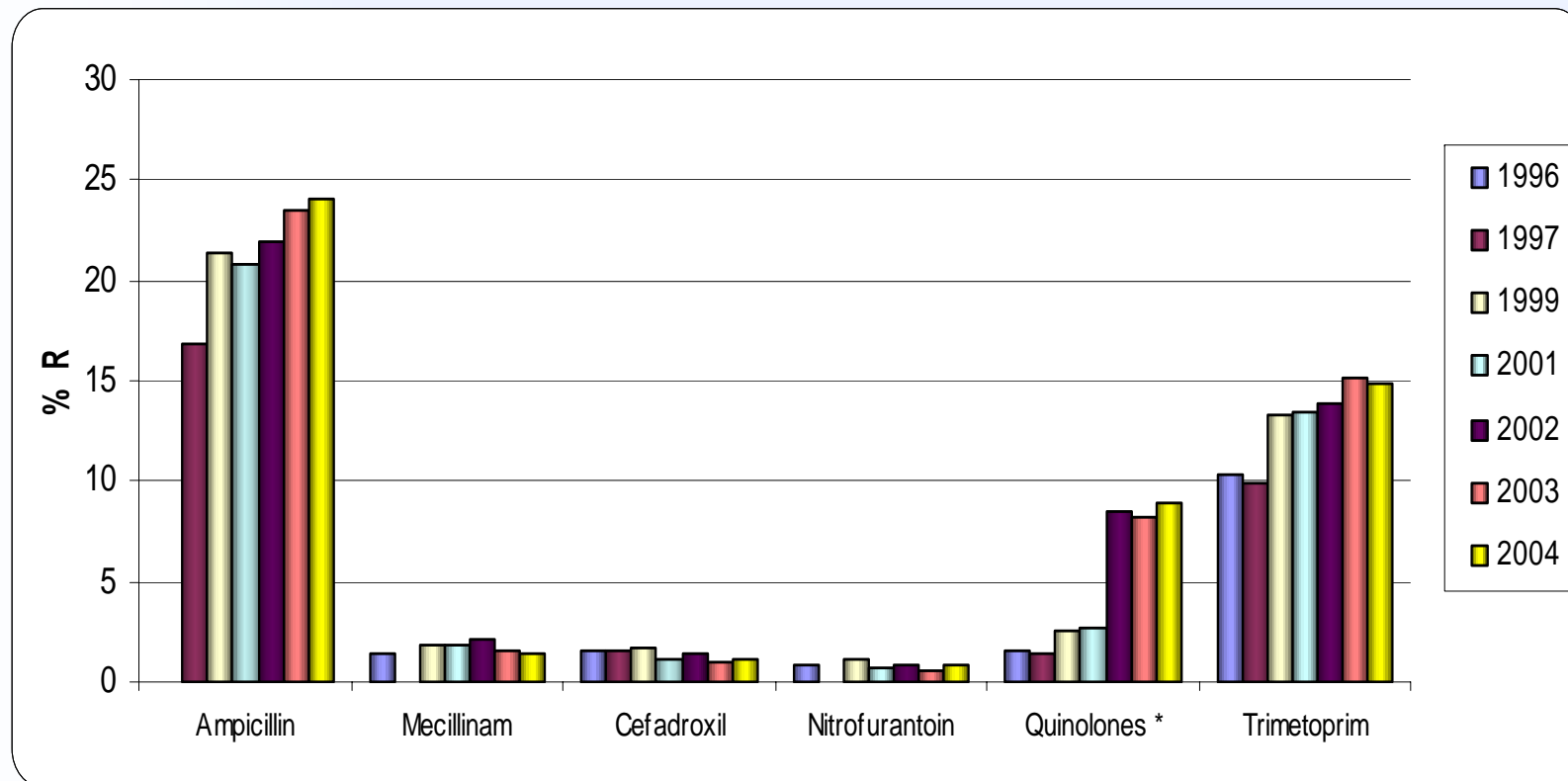
År Visa antal år framåt

Start

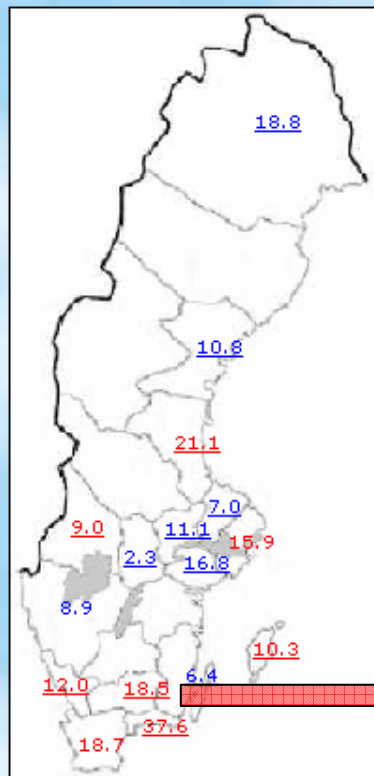
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E.coli in urine samples 2004 (ResNet)



Percentage resistant - Sweden



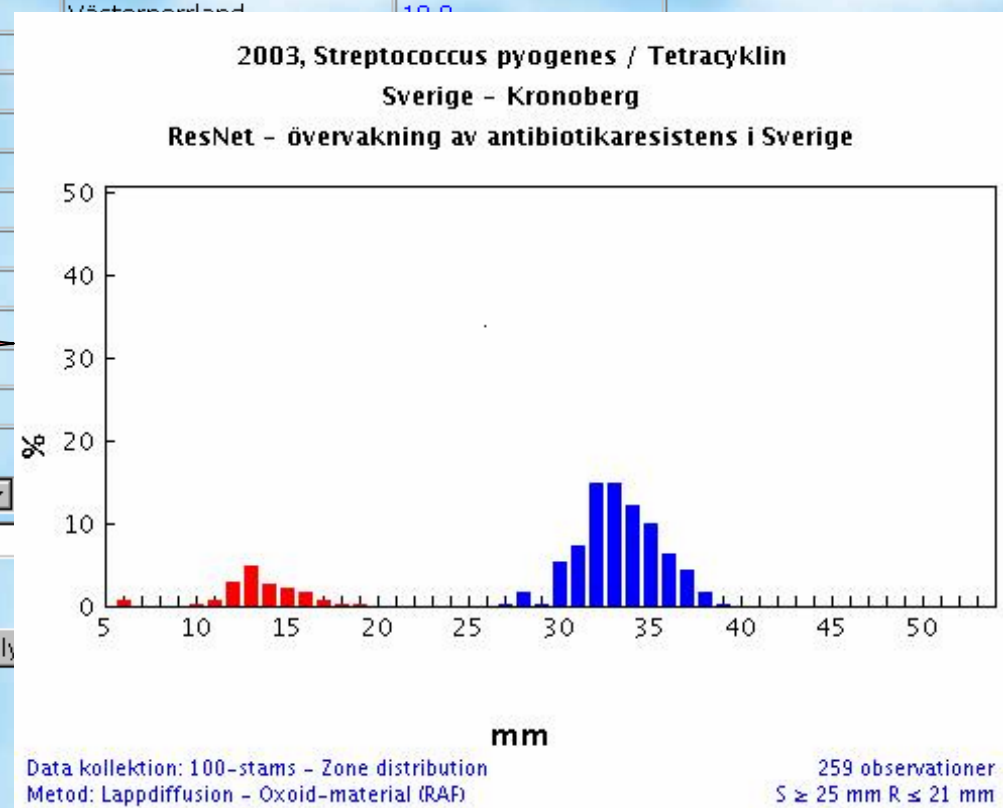
County	Percentage resistant	County	Percentage resistant
Blekinge	37.6	- Medilab	23.0
Dalarna	-	- St Görans Nova Medical AB	-
Gotland	10.3	- Huddinge sjukhus	9.8
Gävleborg	21.1	Södermanland	16.8
Halland	12.0	Uppsala	7.0
Jämtland	-	Värmland	9.0
Jönköping	-	Västerbotten	-
Kalmar	6.4	Västernorrland	10.0
Kronoberg	18.5		
Norrbottn	18.8		
Skåne	18.7		
- Lund	12.6		
- Kristianstad	-		
- Malmö	24.8		
SMI	-		
Stockholm	15.0		
- Karolinska sjukhuset	15.0		
Sweden: 13.8			

Species:

 Antibiotic:

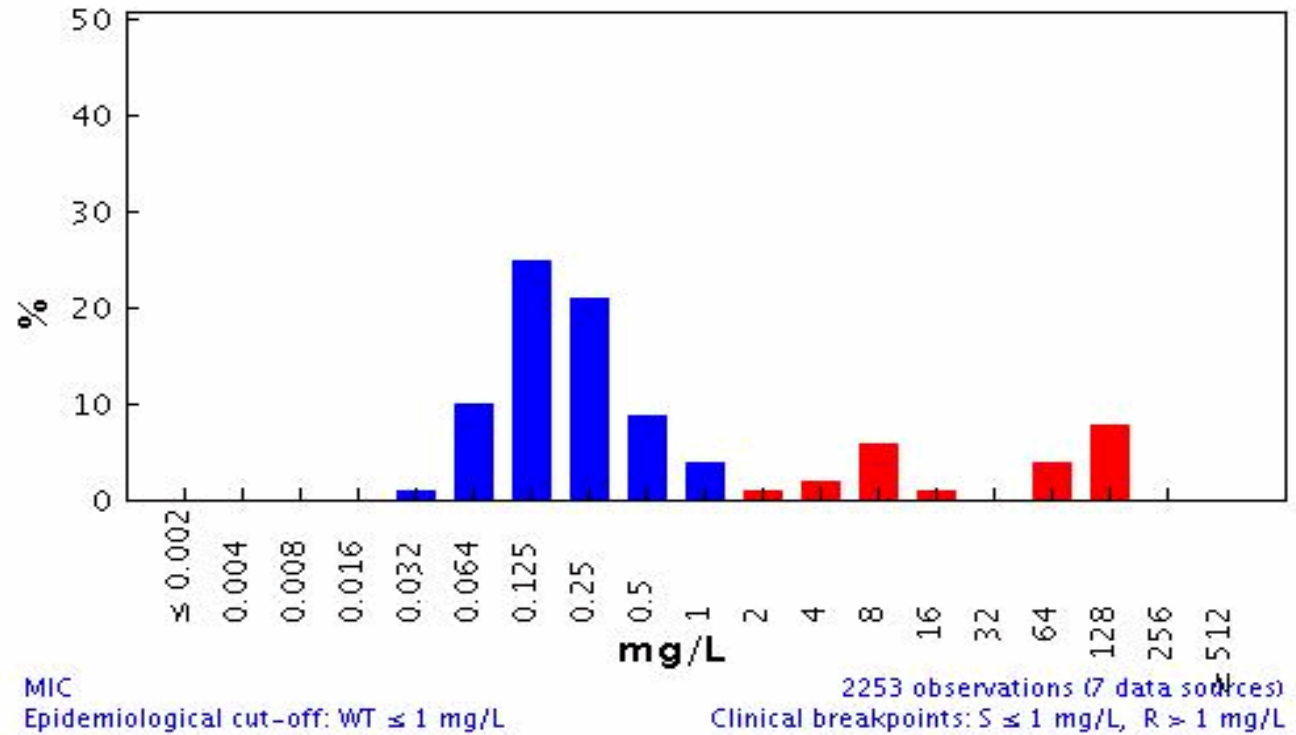
 Year:

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EUCAST – wildtype distributions of MICs (www.srga.org/eucastwt/WT_EUCAST.htm)

Ciprofloxacin / Acinetobacter spp
Antimicrobial wild type distributions of microorganisms – reference database
EUCAST



Antibiotics to test on invasive isolates (Swe)

	Gram-neg	Pseudomonas	Staph	Enterococci	Strept / Spn
Penicillin	Amp,Pip-taz	Pip-taz	Oxa/Cfx	Amp/Pip	Pen (oxa)
Ceph iv	Ctx, Caz	Caz			(Ctx)
Carbapenem	Imi, Mer	Imi,Mer		Imi	
Aminoglyco	Gen	Gen/Tob/Ami	Gen	Gen HL	
Trim/sulfa	T/S	(T/S)	T/S		T/S
Van/Tei			Van/Tei	Van/Tei	
Quinolone	Cip	Cip	(Cip)		Mox
Other			Fus, Cli, Rif		Ery,Cli,Tet



Conclusions about Surveillance of Antibiotic Resistance

- The tools are there: methods for routine susceptibility testing, databases, laboratory information systems (Whonet)
- More frequent sampling would provide more comprehensive data for empiric treatment (feedback from laboratories)
- More frequent sampling would provide more reliable data for comparison between laboratories / countries

