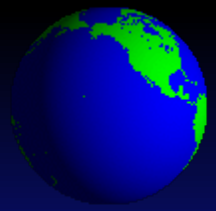
EUCAST
EUROPEAN COMMITTEE ON ANTIMICROBIAL SUSCEPTIBILITY TESTING
European Society of Clinical Microbiology and Infectious Diseases

EUCAST in Europe 2011



Gunnar Kahlmeter
Chairman of EUCAST

ESCMID EUROPEAN SOCIETY OF CLINICAL MICROBIOLOGY AND INFECTIOUS DISEASES

ecdc EUROPEAN CENTRE FOR DISEASE PREVENTION AND CONTROL

Methods for susceptibility testing

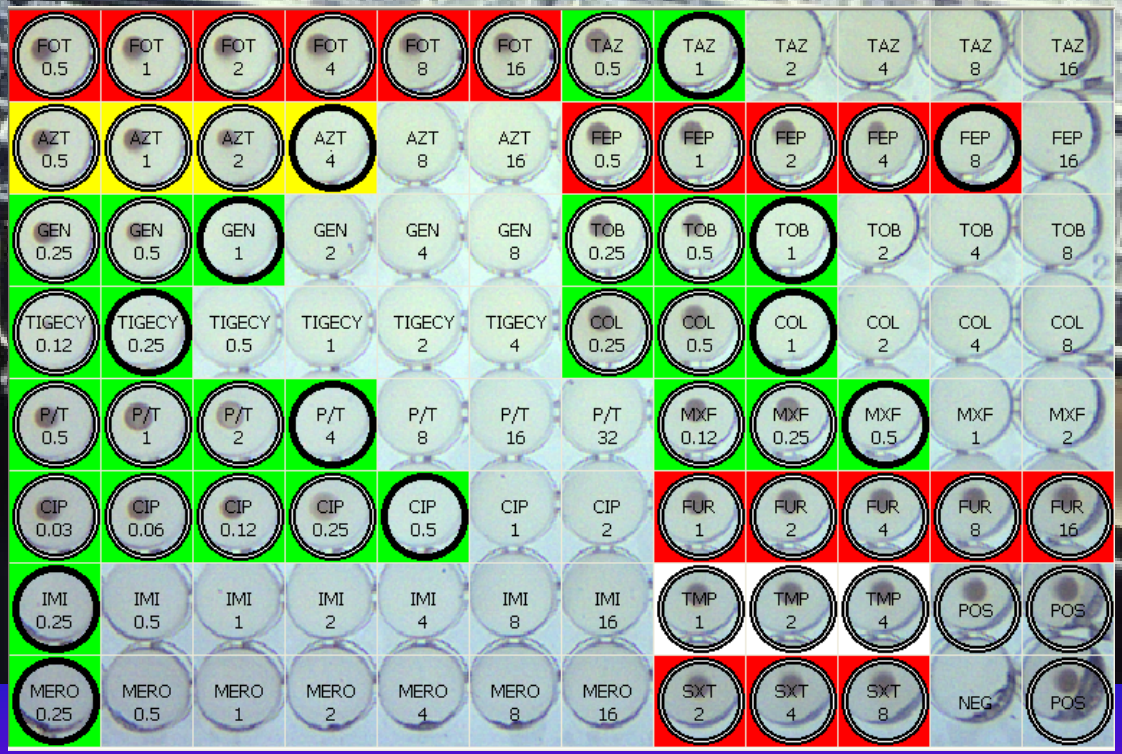
- **Phenotypic test methods**
  based on **antimicrobial activity (MIC)** and **breakpoints**
  - MIC, disk diffusion, automated systems like Phoenix, Vitek2, Microscan
  - **Predicts susceptibility and resistance**
  - **Quantifiable**
- **Genotypic test methods**
  based on the detection of a **resistance gene** or its **product**
  - mecA, vanA, vanB, ….PBP2, … betalactamase detection….
  - **Predicts resistance, not sensitivity**
  - **Not quantifiable**
  - **Useful for epidemiological purposes**
- **By deduction** – ”expert rules”
  - If mecA-positive then report betalactam antibiotics R – or soon not?
    If ESBL-positive, then report betalactam antibiotics R – but not any longer!
    If erythromycin-resistant, then report roxithro- and clarithromycin R;
  - **Some rules predict susceptibility, others resistance.**
  - **Not reliable!**
  - **Not quantifiable!**

Phenotypic susceptibility testing is centred around

MIC

Breakpoints

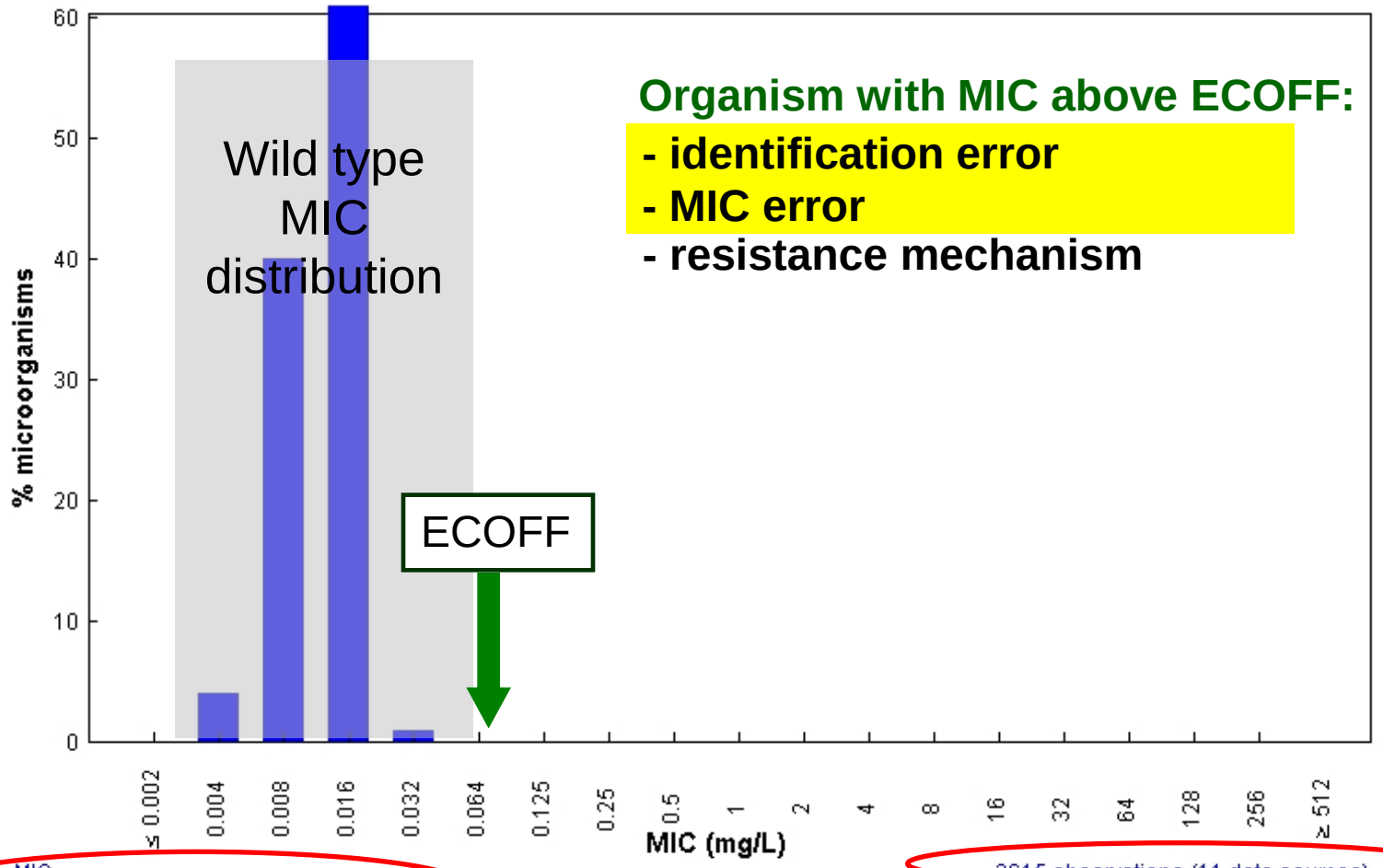
From 2007 there is international agreement on an ISO-standard for MIC-determination of non-fastidious organisms in broth.



Benzylpenicillin / Streptococcus pyogenes

EUCAST MIC Distribution - Reference Database

MIC distributions include collated data from multiple sources, geographical areas and time periods and can never be used to infer rates of resistance



Organism with MIC above ECOFF:

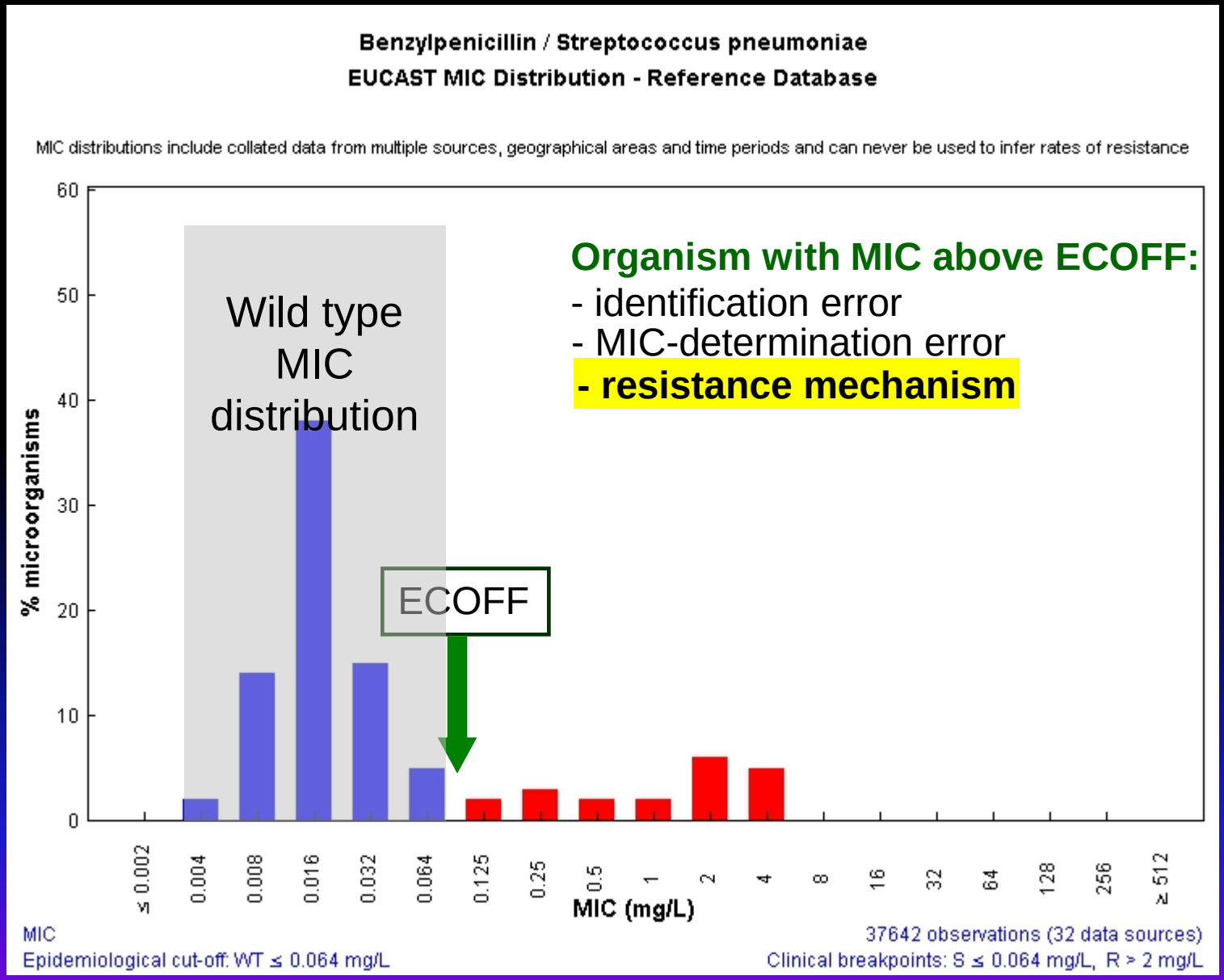
- **identification error**
- **MIC error**
- **resistance mechanism**

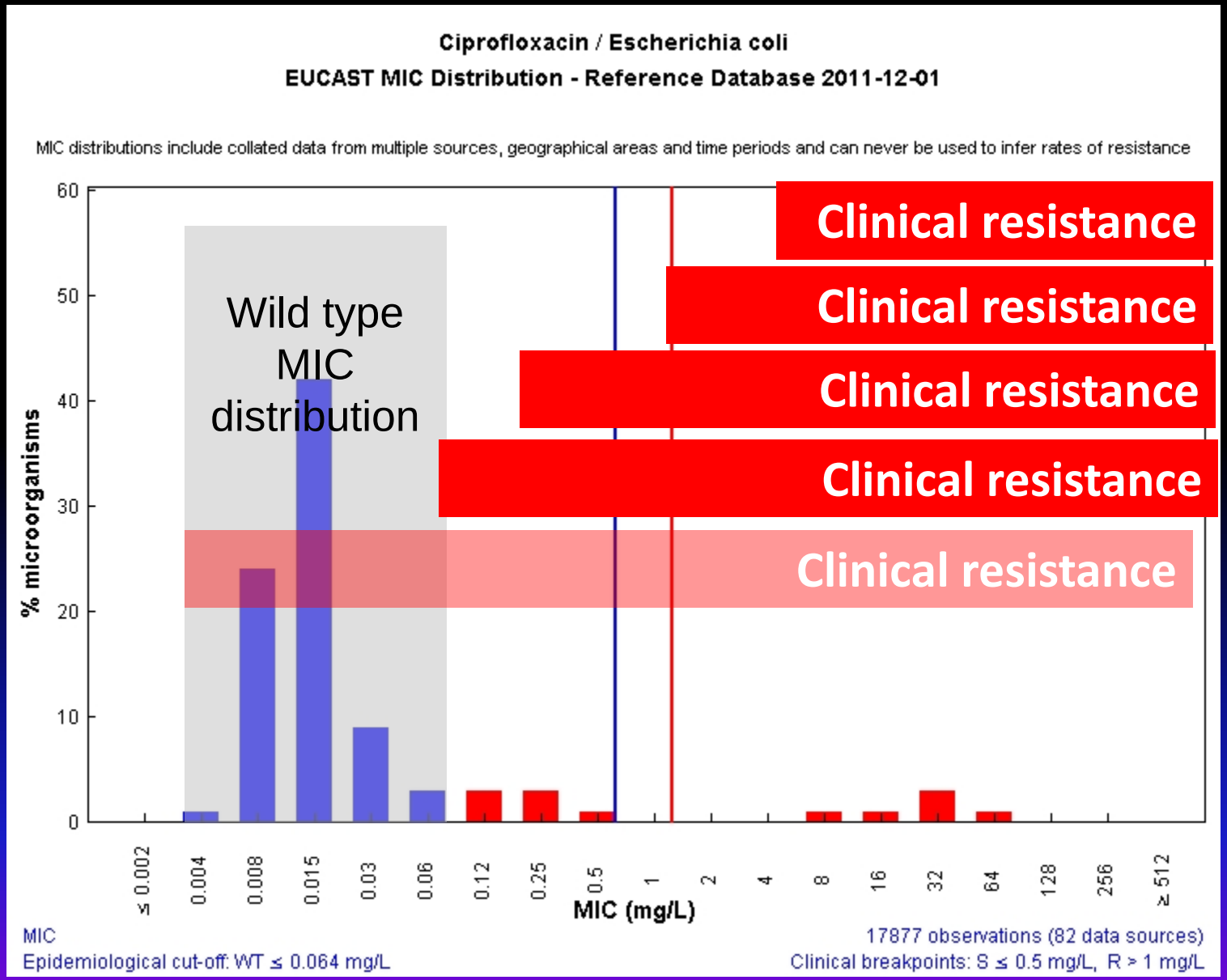
MIC

Epidemiological cut-off: WT ≤ 0.064 mg/L

3615 observations (11 data sources)

Clinical breakpoints: S ≤ 0.25 mg/L, R > 0.25 mg/L


Benzylpenicillin / Streptococcus pneumoniae
EUCAST MIC Distribution - Reference Database
MIC distributions include collated data from multiple sources, geographical areas and time periods and can never be used to infer rates of resistance
% microorganisms
60
50
40
30
20
10
0
Wild type MIC distribution
ECOFF
Organism with MIC above ECOFF:
- identification error
- MIC-determination error
- resistance mechanism
≤ 0.002
0.004
0.008
0.016
0.032
0.064
0.125
0.25
0.5
1
2
4
8
16
32
64
128
256
≥ 512
MIC (mg/L)
MIC
Epidemiological cut-off: WT ≤ 0.064 mg/L
37642 observations (32 data sources)
Clinical breakpoints: S ≤ 0.064 mg/L, R > 2 mg/L


Ciprofloxacin / Escherichia coli
EUCAST MIC Distribution - Reference Database 2011-12-01
MIC distributions include collated data from multiple sources, geographical areas and time periods and can never be used to infer rates of resistance
% microorganisms
60
50
40
30
20
10
0
Wild type MIC distribution
Clinical resistance
Clinical resistance
Clinical resistance
Clinical resistance
Clinical resistance
≤ 0.002
0.004
0.008
0.015
0.03
0.06
0.12
0.25
0.5
1
2
4
8
16
32
64
128
256
≥ 512
MIC (mg/L)
MIC
Epidemiological cut-off: WT ≤ 0.064 mg/L
17877 observations (82 data sources)
Clinical breakpoints: S ≤ 0.5 mg/L, R > 1 mg/L

Breakpoints can fail in several ways!

- Fail to predict failure (undercall resistance)
  - CLSI piperacillintazobactam breakpoints in Pseudomonas
- Fail to predict success (overcall resistance)
  - Penicillin breakpoints in *S.pneumoniae* in pneumonia
- Fail to be useful (lack of correlation with either success or failure or fail to achieve reproducibility)
  - Breakpoints dividing WT populations – eg. previous Erythromycin breakpoints in H.influenzae

EUCAST was formed in 1996 and reformed in 2001.

Committee	Country	Disk Diffusion test?
EUCAST 	Europe	Yes
CLSI 	USA	Yes

*EUCAST is the umbrella for national breakpoint committees in Europe: BSAC, CA-SFM, CRG, DIN, NWGA & SRGA.

ecdc
EUROPEAN CENTRE FOR DISEASE PREVENTION AND CONTROL

ESCMID
EUROPEAN SOCIETY OF CLINICAL MICROBIOLOGY AND INFECTIOUS DISEASES

National Breakpoint Committees
D, F, N, NL, S, UK,

EUCAST
EUROPEAN COMMITTEE ON ANTIMICROBIAL SUSCEPTIBILITY TESTING
European Society of Clinical Microbiology and Infectious Diseases

EUCAST General Committee
All European Countries + ISC/FESCI

EUCAST Steering Committee
BSAC, CA-SFM, CRG, DIN, NWGA, SRGA
And 2 reps from the General Committee*

EUROPEAN MEDICINES AGENCY
SCIENCE MEDICINES HEALTH

Subcommittees
Antifungals
Anaerobes
Expert Rules

Expert groups
Neisseria
Helicobacter
C.difficile
etc…

***Currently: Estonia and Austria**

EUCAST and CLSI are different

EUCAST

- Profession together with regulatory authorities
- Funded by ESCMID, ECDC and national breakpoint committees.
- Industry consultative role.
- Decision by consensus.
- Five meetings per year.
- EUCAST=EMEA brpt committee.
- Clinical breakpoints and ECOFFs
- Rationale for decisions published
- Documents free of charge (on web)

CLSI

- Industry, the profession, advisory regulators.
- Funded by industry and sales of output.
- Industry part of decision process
- Decision by vote.
- Two meetings per year.
- CLSI technical standing with FDA.
- Clinical breakpoints
- Rationale for decisions not published.
- Documents for sale

Tools for determining **CLINICAL BREAKPOINTS**

1. Dose or doses
2. Target organisms
3. Individual MIC-distributions for target organisms
   - breakpoints must not divide MIC-distributions of WT target organisms
4. Resistance mechanisms in target organisms
5. Clinical indications
6. Pharmacokinetics (Cmax, AUC, T½, Protein binding, Vd..)
7. Pharmacodynamic properties (peak conc/MIC, AUC/MIC, TA, MCs)
8. Clinical outcome (clinical outcome vs. MIC)
9. Epidemiological cutoffs, Pk/Pd-breakpoints and clinical data together determine the **CLINICAL BREAKPOINT**

EUCAST and CLSI breakpoints are different

	Antibiotics	Identical breakpoints		
	compared	S and R	Only S	Only R
Enterobacteriaceae	33	3	4	3
Pseudomonas spp.	16	1	5	2
Acinetobacter spp.	10	1	4	2
Staphylococcus spp.	27	4	6	2
Enterococcus spp.	6	0	2	3
Strept A, B, C and G	13	2	2	2
S. pneumoniae	24	3	2	5
Other streptococci	9	0	0	2
Haemophilus spp.	25	0	3	0

CLSI vs. EUCAST

All EUCAST breakpoints were determined AC

- EUCAST: Breakpoints must be reviewed at intervals
  - Extension of indications
  - Extension of target organisms
  - New resistance mechanisms
  - New drug in class
  - New clinical experience
  - New dosing or administration
  - Time

EUCAST
- breakpoints for new drugs with EMA

- Daptomycin √
- Tigecycline √
- Doripenem √
- Glycopeptides (two ongoing)
- Cefalosporine (activity against MRSA)
- Anti-Mtb (two agents to be started)

- Cefalosporine w. activity against MRSA (withdrawn)
- Fluoroquinolone (withdrawn)
- Diaminopyrimidine (withdrawn)

- Extensions of indications (currently none)

EMA = European Medicines Agency

EUCAST and the harmonisation process

Reviewed 2002 – 2009:

- Aminoglycosides
- Carbapenems & aztreonam (2nd review)
- Cephalosporins iv (2nd review)
- Cephalosporins oral
- Fluoroquinolones
- Glycopetides (2nd review)
- Macrolides and lincosamines
- Miscellaneous antimicrobials
- Penicillins
- Tetracyclines

- Antifungal drugs (Candidae & Aspergillus)
  - fluconazole, voriconzole, posaconazole anidulafungin, amfotericin B.

Topical agents:

Mupirocin (LLR/HLR)
Retapamulin (ECOFF)

Drugs being addressed:

Cefalothin (ECOFF)
Cefazoline (ECOFF)
Cefoperazone (ECOFF)
Sulbactam (alone)
Kanamycin
Streptomycin
Josamycin
Spiramycin
....

Lack of data for older drugs!

Miscellaneous organisms

Consultation with expert groups on breakpoints and methods

- Neisseria meningitidis (review) - 2011
- Moraxella catarrhalis (finalized) - 2011 √
- Helicobacter pylori (finalized) - 2011 √
- Clostridium difficile (finalized) - 2011 √
- Listeria monocytogenes (finalized) - 2011 √
- Campylobacter (ongoing) - 2011
- Pasteurella multocida (ongoing) - 2012
- Corynebacteria (ongoing) - 2012
- Legionella pneumophila (ongoing) - 2012
- Burkholderia cepacia (started) - 2012
- …

EUCAST expert rules
v 2.0 (2011)

- **Intrinsic resistance – "don´t test, report resistant or not at all.**
- **Exceptional phenotype – "Don´t believe it if you see one!"**
  - **Exceptional resistance (ex. Penicillin resistance in S. pyogenes)**
  - **Exceptional susceptibility (ex. Ampicillin susceptibility in K. pneumoniae)**
- **Interpretive reading (Expert Rules): IF - THEN**
  - IF mecA-positive, THEN report all betalactam antibiotics R (?!?)
  - IF ESBL-positive, THEN report betalactam antibiotics R (no longer valid!)

Expert rules are useful but may be unreliable!

EUCAST subcommittees

- **Expert rules and interpretive reading**
  - Major revision (v 2.0) now available
  - Published in CMI 2011


EUCAST EUROPEAN COMMITTEE ON ANTIMICROBIAL SUSCEPTIBILITY TESTING
European Society of Clinical Microbiology and Infectious Diseases

EUCAST Expert rules in antimicrobial susceptibility testing, version 2, January 2011

Expert rules in antimicrobial susceptibility testing
Version 2.0, 2011

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Comments and suggestions for additions to the next version of this document should be sent to the EUCAST Scientific Secretary (see http://www.eucast.org for contact details)

- **Antifungal susceptibility testing**
  - Candida and Aspergillus breakpoints for fluconazole, voriconazole, posaconazole, anidulafungin and amfotericin B.

- **Anaerobe susceptibility testing**
  - Finalised: drugs in need of breakpoints defined; breakpoints determined
  - Ongoing: Methodological development

- Under discussion: **Subcommittee on the detection of resistance mechanisms of clinical and/or epidemiological importance.**

EUCAST
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www.eucast.org

- Organization
- EUCAST News
- Clinical breakpoints
- Expert rules
- MIC - distributions and QC
- Zone diameter distributions
- EUCAST disk diffusion test
- Frequently Asked Questions (FAQ)
- Meetings
- EUCAST Presentations
- Documents
- Information for industry
- Links

- Website changes

search term Search

QUICK NAVIGATION

The European Committee on Antimicrobial Susceptibility Testing - EUCAST

EUCAST is a standing committee jointly organized by ESCMID, ECDC and European national breakpoint committees. EUCAST deals with breakpoints and technical aspects of phenotypic in vitro antimicrobial susceptibility testing and

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supported by a General Committee with representatives from European and other countries, FESCI and ISC. The Steering Committee also consults on EUCAST proposals with experts within the fields of infectious diseases and microbiology, pharmaceutical companies and susceptibility testing device manufacturers.

EUCAST has a subcommittee on antifungal susceptibility testing. Subcommittees on expert rules for antimicrobial susceptibility testing and antimicrobial susceptibility testing of anaerobes have completed their tasks and have been disbanded.

Most antimicrobial MIC breakpoints in Europe have been harmonised by EUCAST. Breakpoints for new agents are set as part of the licensing process for new agents through EMA. EUCAST breakpoints are available in devices for automated susceptibility testing but with some limitations, depending on the system. A disk diffusion susceptibility test method calibrated to EUCAST MIC breakpoints is also available.

EUCAST invites anyone with an interest in antimicrobial agents in general and antimicrobial breakpoints in particular to contact EUCAST, ESCMID or one of the

Remember to activate your free 2011 membership with the newly-founded ESCMID

EUCAST News

01 Dec 2011
EUCAST breakpoint table 2.0

01 Nov 2011
Consultation on Aspergillus breakpoints for posaconzole
Download

01 Nov 2011
Consultation on Aspergillus breakpoints for itraconazole
Download

29 Oct 2011
New EUCAST Expert Rules now online

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Technical notes
Posters
Other Documents
Relevant external documents
Reports
Information for industry
Links

Website changes

The European Committee on Antimicrobial Susceptibility Testing – EUCAST

search term Search
... Rationale Documents

Rationale Documents from EUCAST

The following Rationale Documents (see General Information on Rationale Documents) are currently available from EUCAST:

General Information on Rationale Documents

Amikacin v 1.2
Ciprofloxacin v 1.9
Colistin v 1.0
Daptomycin v 1.0
Doripenem v 1.0
Doxycycline v 1.0
Ertapenem v 1.3
Fluconazole v 1.0
Gentamicin v 1.2
Imipenem v 1.3
Levofloxacin v 1.5
Linezolid v 1.0
Meropenem v 1.5
Metronidazole v 1.0
Minocycline v 1.0
Moxifloxacin v 2.3
Mupirocin v 1.0
Netilmicin v 1.1

Organization
Clinical breakpoints
Expert rules
MIC distributions
Zone diameter distributions
EUCAST disk diffusion test
- General information
- Implementation guide
- Breakpoint tables
- Disk diffusion methodology
- EUCAST QC Tables
- Older versions of tables

Meetings
EUCAST Presentations
Documents
Information for industry
Links

Website changes

search term Search
... Disk diffusion methodology

EUCAST Disk Diffusion Test Methodology

EUCAST has developed a disk diffusion test based on MH-media and calibrated to EUCAST clinical breakpoints. The zone diameter breakpoints are tentative during 2010 and several are in preparation. Regular updates will be published during 2010.

- Preparation of media for disk diffusion
- EUCAST Disk Diffusion - Manual (v. 1.0 Dec 18, 2009)
- EUCAST Disk Diffusion - Slide Show (v. 1.1 Jun 3, 2010)
- EUCAST Disk Diffusion - Reading Guide (v. 1.0 Apr 30, 2010)

- Zubereitung der Medien(2009)
- EUCAST Blättchendiffusionstest - Handbuch (v. 1.0 Dec 18, 2009)
- EUCAST Blättchendiffusionstest - Diashow (v. 1.1 Jun 3, 2010)
- EUCAST Blättchendiffusionstest - Ablesehilfe (v 1.0, Jun 3, 2010)

- Preparación del medio para el estudio de sesibilidad con discos (v 1.1)
- Descripción del método de disco (v 1.1)
- EUCAST: método de difusión con discos para el

EUCAST breakpoint table

Arkiv Redigera Visa Infoga Format Verktyg Data Fönster Hjälp Adobe PDF

	A	B	C	D	E	F	G	H
44								
45	**Carbapenems**	**MIC breakpoint**		**Disk**	**Zone diameter**		**Notes**	
46		**S ≤**	**R>**	**content**	**S ≥**	**R<**	Numbers for comments on MIC breakpoints	
47								
48	**Doripenem**	1	4	**10**	24	18		
49	**Ertapenem**	0.5	1	**10**	25	22		
50	**Imipenem**[1]	2	8	**10**	21	15	**1**. *Proteus* and *Morganella* species are considered poor targets for imipenem.	
51	**Meropenem**	2	8	**10**	22	16		
52								
53								
54	**Monobactams**	**MIC breakpoint**		**Disk**	**Zone diameter**		**Notes**	
55		**S ≤**	**R>**	**content**	**S ≥**	**R<**	Numbers for comments on MIC breakpoints	
56								
57	**Aztreonam**[1]	1	8	**30**	25	21	**1**. The aztreonam breakpoints for Enterobacteriaceae will detect resistance mediated by most ESBLs and other clinically important beta-lactamases in Enterobacteriaceae. However, some strains that produce ESBLs appear susceptible or intermediate with these breakpoints. For epidemiological or infection control purposes laboratories may want to use a test which specifically screens for the presence of ESBLs.	
58								
59								
60	**Fluoroquinolones**	**MIC breakpoint**		**Disk**	**Zone diameter**		**Notes**	
61		**S ≤**	**R>**	**content**	**S ≥**	**R<**	Numbers for comments on MIC breakpoints	
62								
63	**Ciprofloxacin**[1]	0.5	1	**5**	22	19	**1**. *Salmonella* spp - there is clinical evidence for ciprofloxacin to indicate a poor response in systemic infections caused by *Salmonella spp* with low-level fluoroquinolone resistance (MIC>0.064 mg/L). The available data relate mainly to *S. typhi* but there are also case reports of poor response with other *Salmonella* species.	
64	**Levofloxacin**	1	2	**5**	22	19		
65	**Moxifloxacin**	0.5	1	**5**	20	17		
66	**Nalidixic acid (screen)**	Note[2]	Note[2]	**30**	16[A]	16[A]	**2**/**A**. Nalidixic acid may be used to screen for fluoroquinolone resistance in Enterobacteriaceae. The zone diameter breakpoint correlates to an MIC value of 16 mg/L in most Enterobacteriaceae. If *Salmonella* spp. are resistant report resistant to all fluoroquinolones. If other Enterobacteriaceae are resistant, then test the agent in question.	
67	**Norfloxacin**	0.5	1	**10**	22	19		
68	**Ofloxacin**	0.5	1	**5**	22	19		
69								
70								
71	**Aminoglycosides**[1]	**MIC breakpoint**		**Disk**	**Zone diameter**		**Notes**	
72		**S ≤**	**R>**	**content**	**S ≥**	**R<**	Numbers for comments on MIC breakpoints	
73							**1**. Aminoglycoside breakpoints are based on once-daily administration of high aminoglycoside dosages. Most often aminoglycosides are given in combination with beta-lactam agents.	
74	**Amikacin**	8	16	**30**	16	13		
75	**Gentamicin**	2	4	**10**	17	14		
76	**Netilmicin**	2	4	**10**	15	12		
77	**Tobramycin**	2	4	**10**	15	12		
78								
79								
80	**Glycopeptides**	**MIC breakpoint**		**Disk**	**Zone diameter**		**Notes**	
81		**S ≤**	**R>**	**content**	**S ≥**	**R<**	Numbers for comments on MIC breakpoints	

Stäng

Helskärm

Stäng helskärm

Start | 5 Internet Explorer | status: Disconnected | ... | Microsoft PowerPoint - [... | Microsoft Excel - EUC... | 100% | 12:49

EUCAST tables

–

dash

Susceptibility testing not recommended – do not report or report “R” without testing.

Intrinsic resistance (or intrinsic insufficient activity).

EUCAST tables

IE

(insufficient evidence)

The susceptibility category (S, I or R) of organisms without resistance mechanisms cannot be determined.

Do not report or report “IE with an MIC” - categorical interpretation not possible.

Links in EUCAST breakpoint table

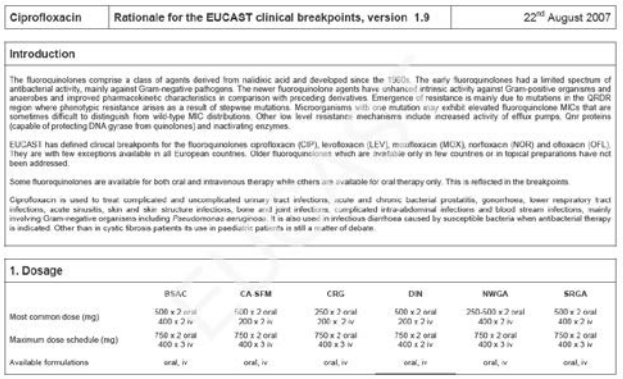
Arkiv Redigera Visa Infoga Format Verktyg Data Fönster Hjälp Adobe PDF

	A	B	C	D	E	F	
44							
45	**Carbapenems**						
46							
47							
48	Doripenem						
49	Ertapenem						
50	Imipenem[1]						
51	Meropenem	2	8	**10**	22	16	
52							
53							
54	**Monobactams**	**MIC breakpoint**		**Disk**	**Zone diameter**		**Notes**
55		**S ≤**	**R>**	**content**	**S ≥**	**R<**	Numbers for comments on MI
56							
57	**Aztreonam**[1]	1	8	**30**	25	21	**1**. The aztreonam breakpoints for En clinically important beta-lactamases susceptible or intermediate with thes
58							
59							
60	**Fluoroquinolones**	**MIC breakpoint**		**Dis**			
61		**S ≤**	**R>**	**cont**			
62							
63	Ciprofloxacin[1]	0.5	1	5			
64	Levofloxacin	1	2	5			
65	Moxifloxacin	0.5	1	5			
66	**Nalidixic acid (screen)**	Note[2]	Note[2]	**30**	16[A]	16[A]	**2/A**. Nalidixic acid may be used to screen for fluor breakpoint correlates to an MIC value of 16 mg/L in resistant to all fluoroquinolones. If other Enterobac
67	Norfloxacin	0.5	1	**10**	22	19	
68	Ofloxacin	0.5	1	**5**		19	
69							
70							
71	**Aminoglycosides**[1]	**MIC bre**					
72		**S ≤**					
73							
74	Amikacin	8					
75	Gentamicin	2					
76	Netilmicin	2					
77	Tobramycin	2					
78							
79							
80	**Glycopeptides**	**MIC breakpoint**		**Disk**	**Zone diameter**		**Notes**
81		**S ≤**	**R>**	**content**	**S ≥**	**R<**	Numbers for comments on MIC breakpoints

Click on antibiotic for **Rationale Document**

Click on MIC breakpoint for **MIC distributions**

Click on zone breakpoint for **zone diameter distributions**



Ciprofloxacin	Rationale for the EUCAST clinical breakpoints, version 1.9	22nd August 2007

Introduction

The fluoroquinolones comprise a class of agents derived from nalidixic acid and developed since the 1960s. The early fluoroquinolones had a limited spectrum of antibacterial activity, mainly against Gram-negative pathogens. The newer fluoroquinolone agents have enhanced intrinsic activity against Gram-positive organisms and anaerobes and improved pharmacokinetic characteristics in comparison with preceding derivatives. Emergence of resistance is mainly due to mutations in the QRDR region where phenotypic resistance arises as a result of stepwise mutations. Microorganisms with one mutation may exhibit elevated fluoroquinolone MICs that are sometimes difficult to distinguish from wild-type MIC distributions. Other low level resistance mechanisms include increased activity of efflux pumps, Qnr proteins (capable of protecting DNA gyrase from quinolones) and inactivating enzymes.

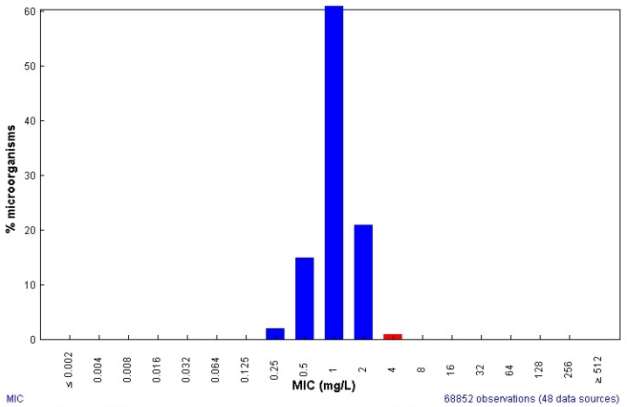
EUCAST has defined clinical breakpoints for the fluoroquinolones ciprofloxacin (CIP), levofloxacin (LEV), moxifloxacin (MOX), norfloxacin (NOR) and ofloxacin (OFL). They are with few exceptions available in all European countries. Older fluoroquinolones which are available only in few countries or in topical preparations have not been addressed.

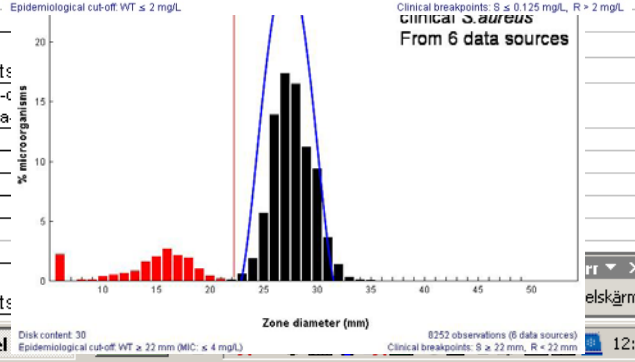
Some fluoroquinolones are available for both oral and intravenous therapy while others are available for oral therapy only. This is reflected in the breakpoints.

Ciprofloxacin is used to treat complicated and uncomplicated urinary tract infections, acute and chronic bacterial prostatitis, gonorrhoea, lower respiratory tract infections, acute sinusitis, skin and skin structure infections, bone and joint infections, complicated intra-abdominal infections and blood stream infections, mainly involving Gram-negative organisms including *Pseudomonas aeruginosa*. It is also used in infectious diarrhoea caused by susceptible bacteria when antibacterial therapy is indicated. Other than in cystic fibrosis patients its use in paediatric patients is still a matter of debate.

1. Dosage

	BSAC	CA-SFM	CRG	DIN	NWGA	SRGA
Most common dose (mg)	500 x 2 oral 400 x 2 iv	500 x 2 oral 200 x 2 iv	250 x 2 oral 200 x 2 iv	500 x 2 oral 200 x 2 iv	250-500 x 2 oral 400 x 2 iv	500 x 2 oral 400 x 2 iv
Maximum dose schedule (mg)	750 x 2 oral 400 x 3 iv	750 x 2 oral 400 x 3 iv	750 x 2 oral 400 x 3 iv	750 x 2 oral 400 x 2 iv	750 x 2 oral 400 x 3 iv	750 x 2 oral 400 x 3 iv
Available formulations	oral, iv	oral, iv	oral, iv	oral, iv	oral, iv	oral, iv





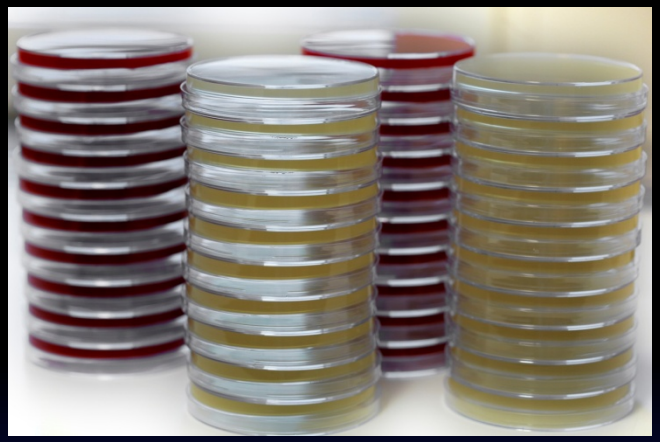
Start | 5 Internet Explorer | status: Disconnected | ... | Microsoft PowerPoint - [... | Microsoft Excel | 12:49

Disk diffusion methods
EUCAST vs. CLSI

- Both methods are based on Mueller-Hinton agar, but there are differences in:
  - **Disk potency**
    - Several disk contents are lower in EUCAST
  - **Medium**
    - EUCAST: **MH** and **MH-F**
    - CLSI: MH, HTM and Sheep blood.
  - **Incubation time**
    - EUCAST: **16-20 h** for all organisms
    - CLSI: 16-18 or 20-24 h

EUCAST susceptibility testing media

- **MH**
  Mueller-Hinton agar
  Enterobacteriaceae
  Acinetobacter spp.
  Pseudomonas spp.
  Staphylococcus spp.
  Enterococcus spp.

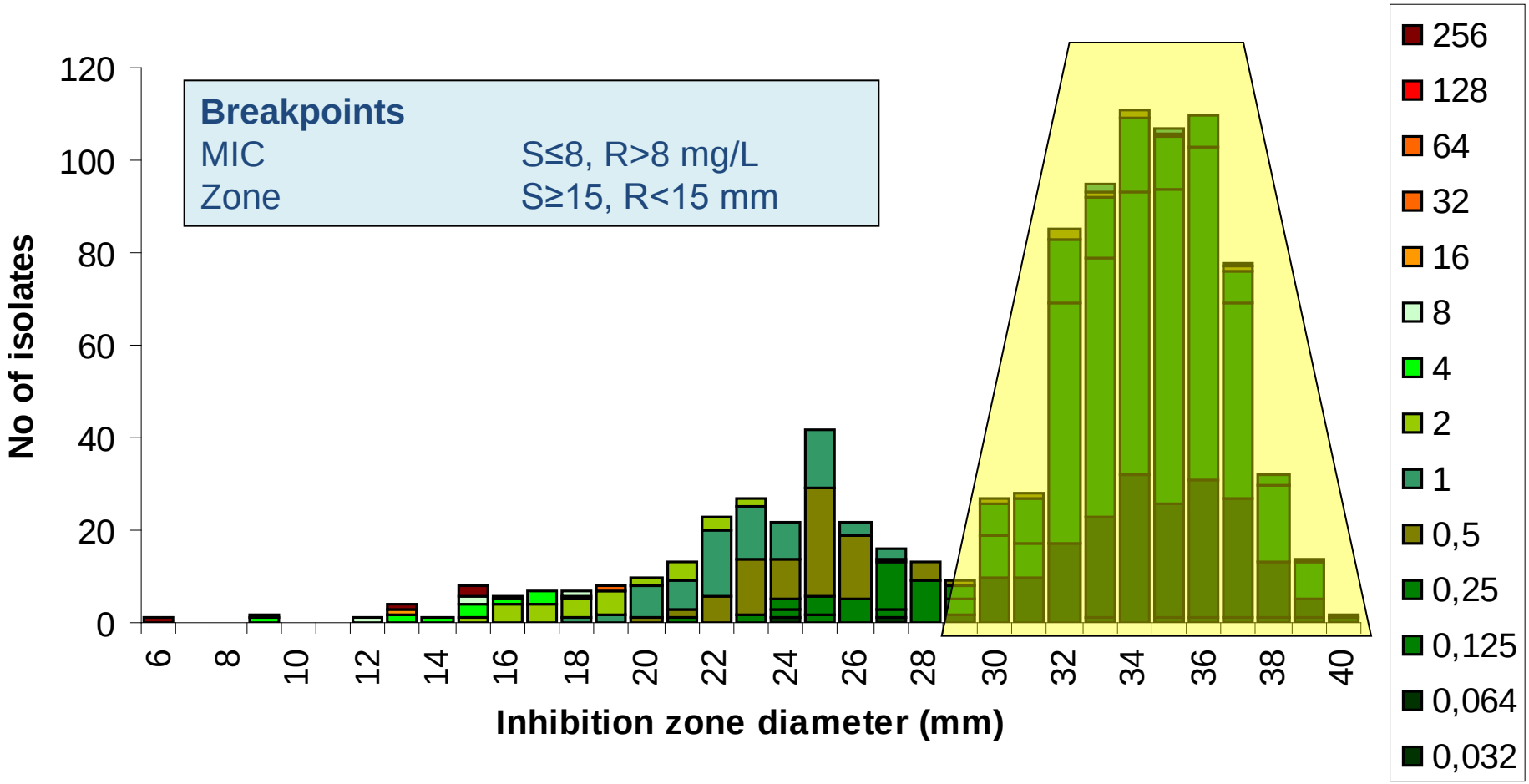


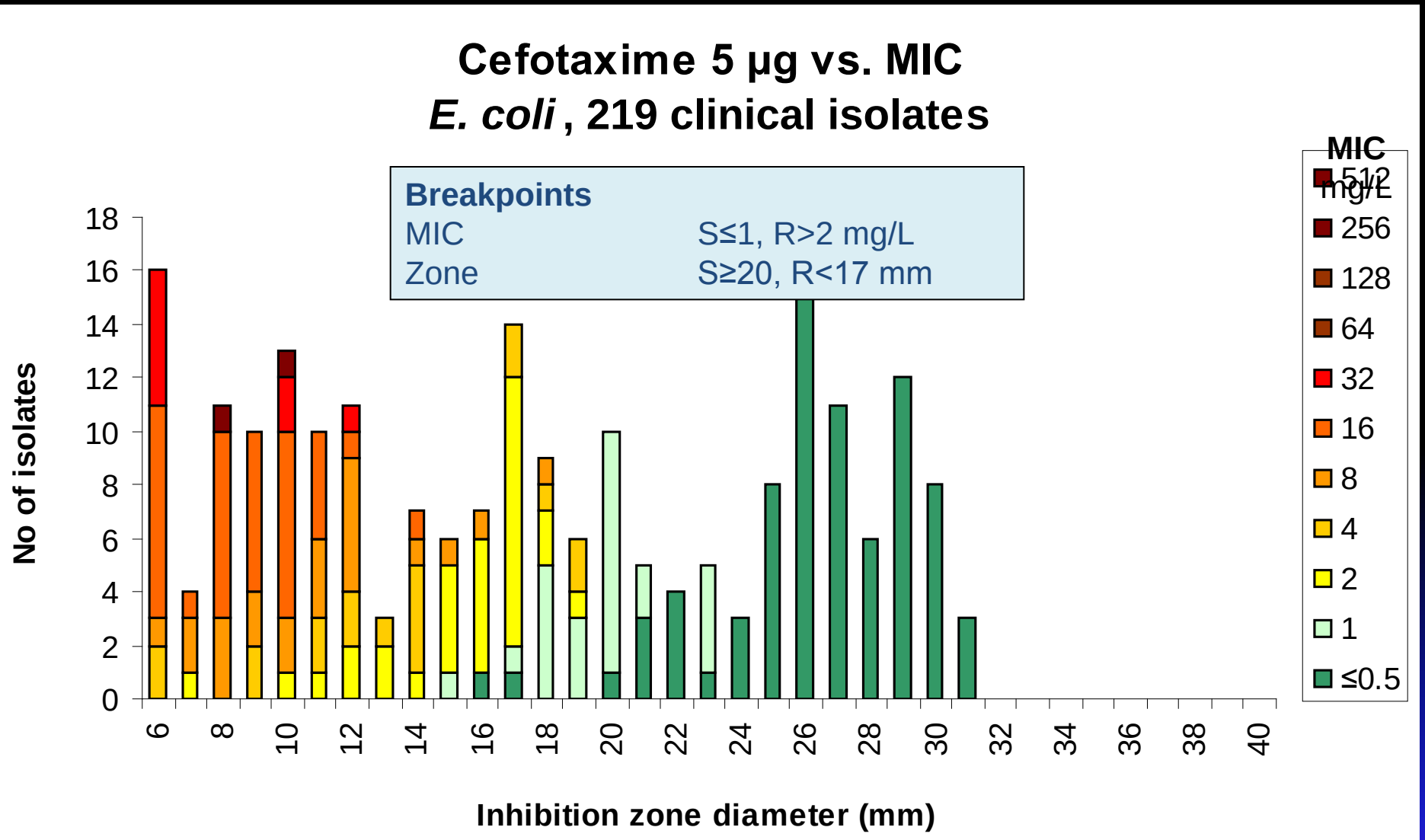
- **MH-F**
  Mueller-Hinton agar with 5% horse blood and 20 mg/L β-NAD
  Haemophilus influenzae
  Moraxella catarrhalis
  Streptococcus pneumoniae,
  Streptococci
  Campylobacter, Listeria, Corynebacterium, Pasteurella

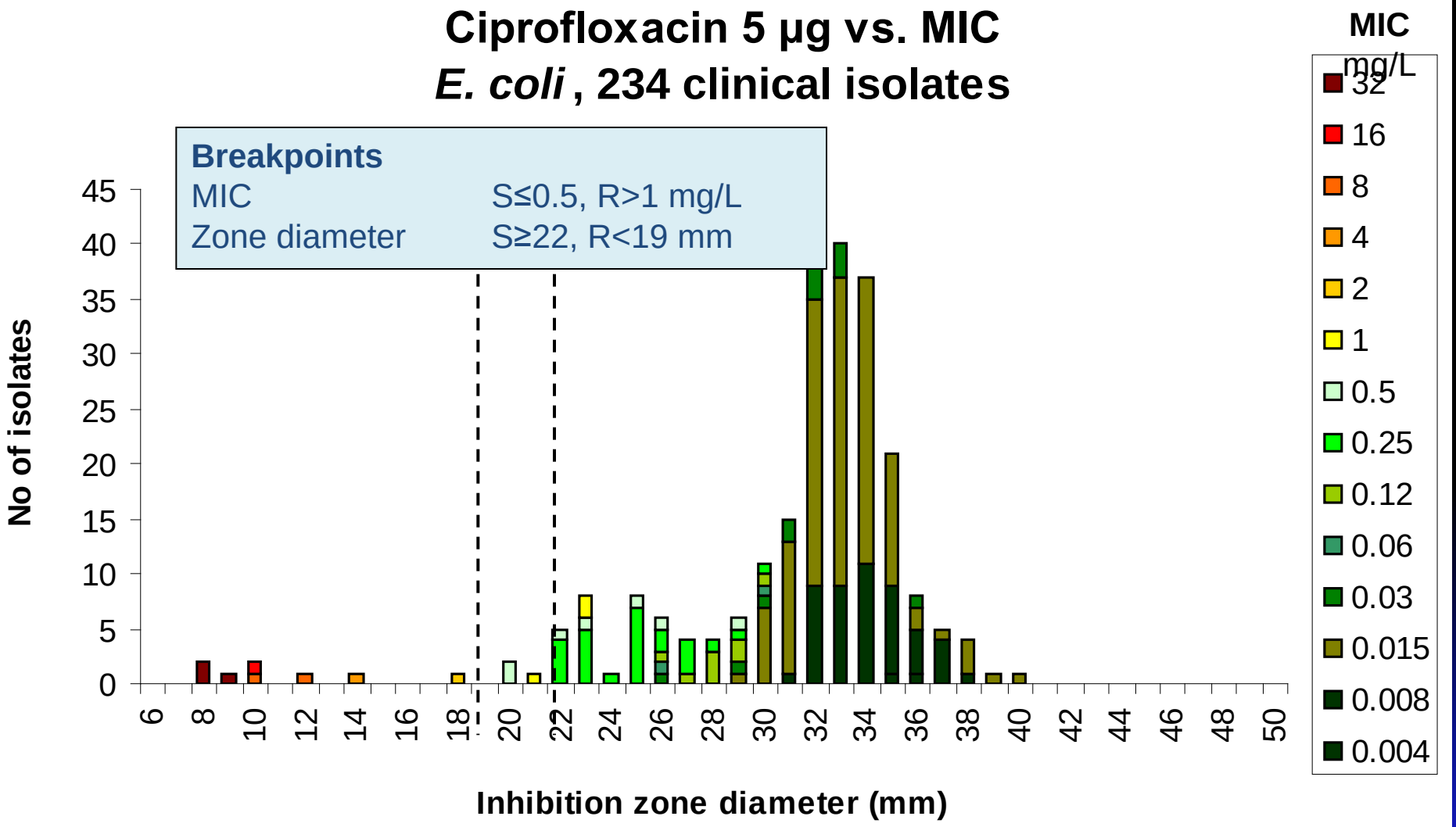
Correlating MIC to zone diameters

E. coli vs. *mecillinam*

931 isolates from the ECOSENS II Study




Cefotaxime 5 µg vs. MIC
E. coli , 219 clinical isolates
Breakpoints
MIC S≤1, R>2 mg/L
Zone S≥20, R<17 mm
MIC
mg/L
512
256
128
64
32
16
8
4
2
1
≤0.5
No of isolates
0
2
4
6
8
10
12
14
16
18
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
Inhibition zone diameter (mm)


Ciprofloxacin 5 µg vs. MIC
E. coli , 234 clinical isolates
Breakpoints
MIC S≤0.5, R>1 mg/L
Zone diameter S≥22, R<19 mm
No of isolates
Inhibition zone diameter (mm)
MIC mg/L
32
16
8
4
2
1
0.5
0.25
0.12
0.06
0.03
0.015
0.008
0.004

Automated systems for AST

Phoenix, BD

- EUCAST breakpoints in 2009
- Evaluations (3): 2009 – 2010
- EUCAST panels/cards
- Several bugs and drugs are missing

Vitek2, BM

- EUCAST breakpoints in 2010 but in need of major software update 2011 (April – June)
- Cards containing mixture of breakpoints
- Problems with concept “EUCAST breakpoints”
- Evaluations ongoing
- Several bugs and drugs are missing

Microscan, Siemens

- EUCAST breakpoints 2010
- Launch April 2010
- no known evaluation
- Breakpoints panels and concept declared
- Several bugs and drugs are missing

Thank you!

Questions on EUCAST

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Questions on the EUCAST disk diffusion test

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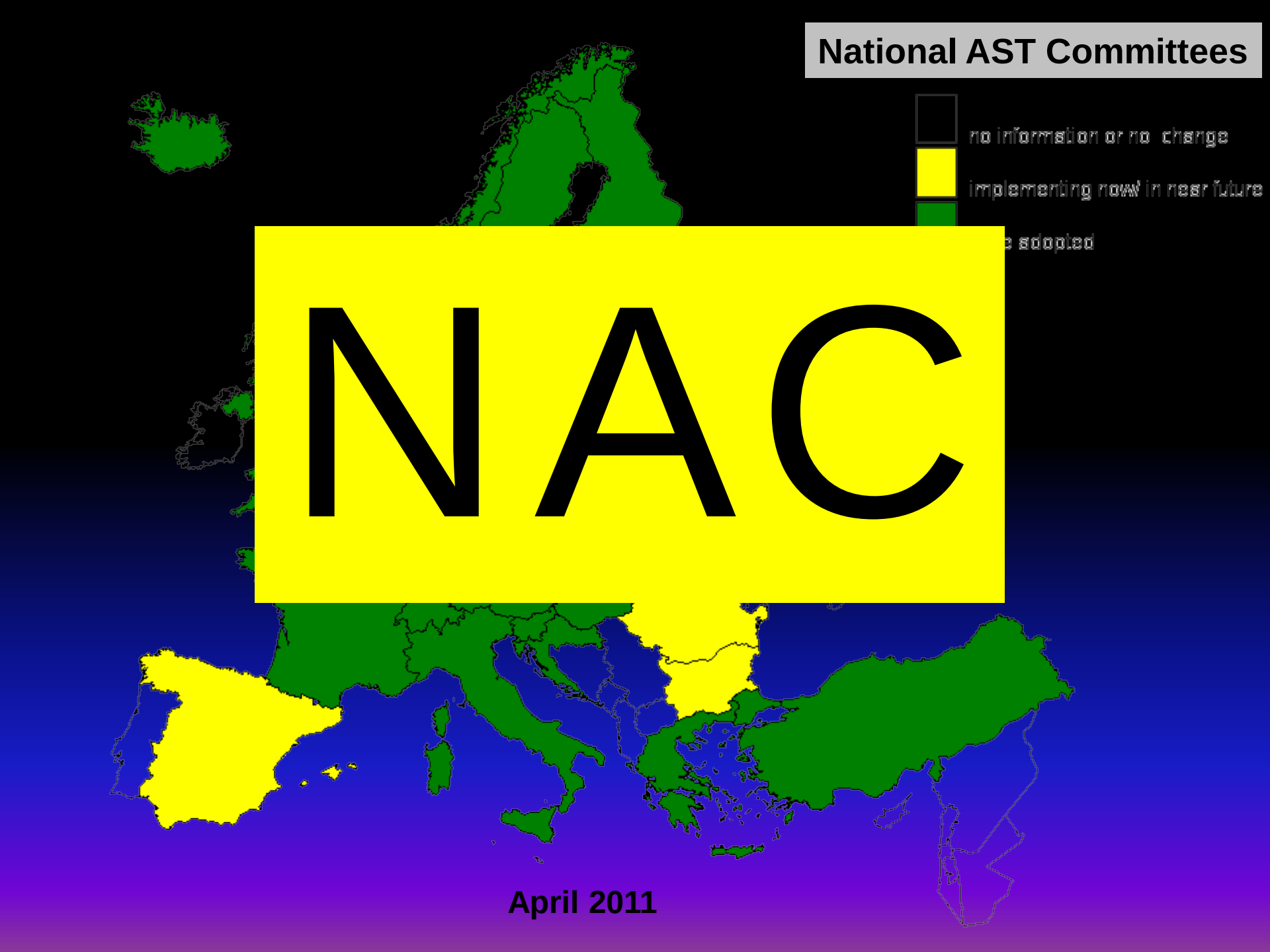
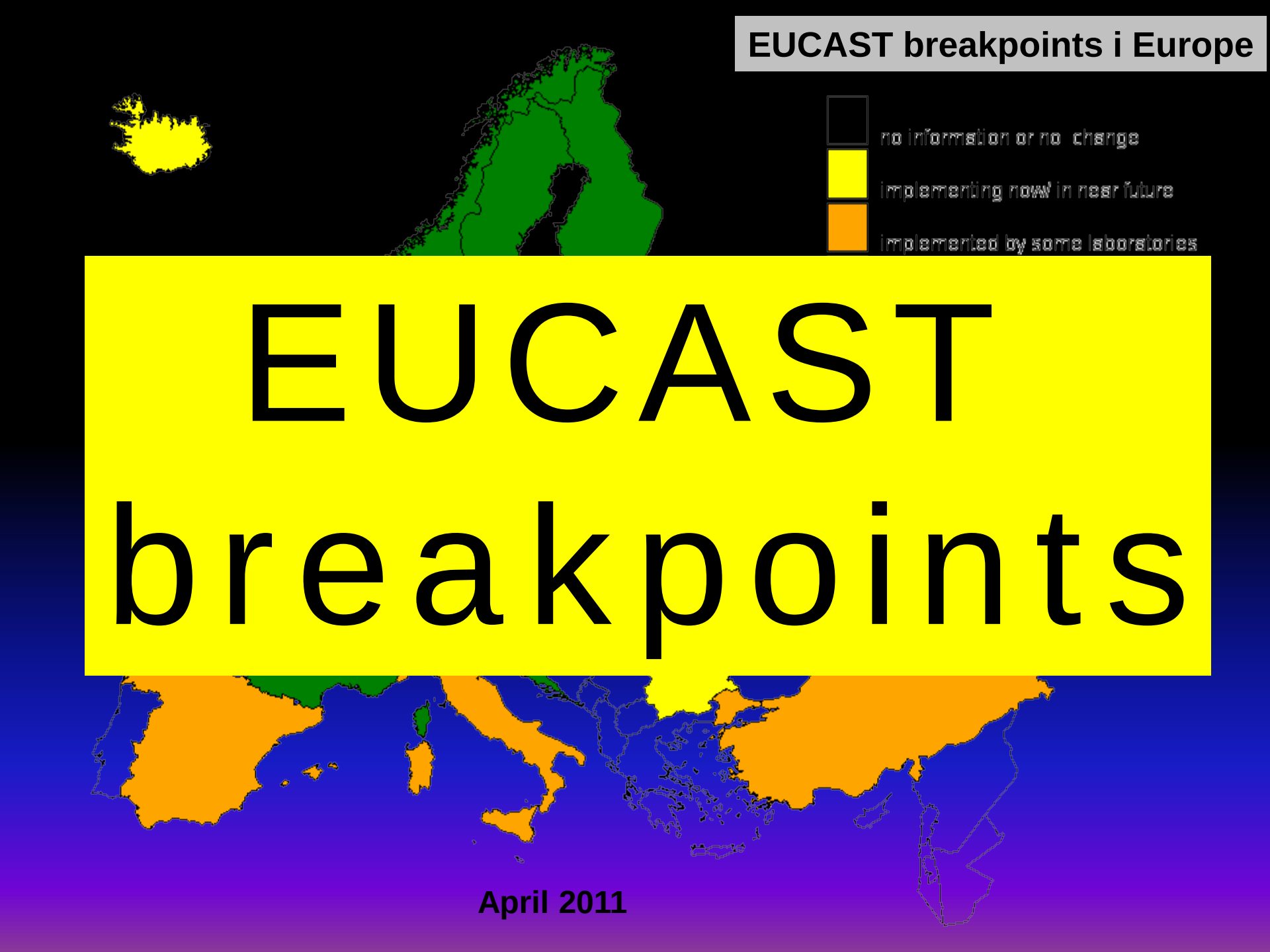
National AST Committees



NAC

April 2011


EUCAST breakpoints i Europe
no information or no change
implementing now/ in near future
implemented by some laboratories
EUCAST
breakpoints
April 2011