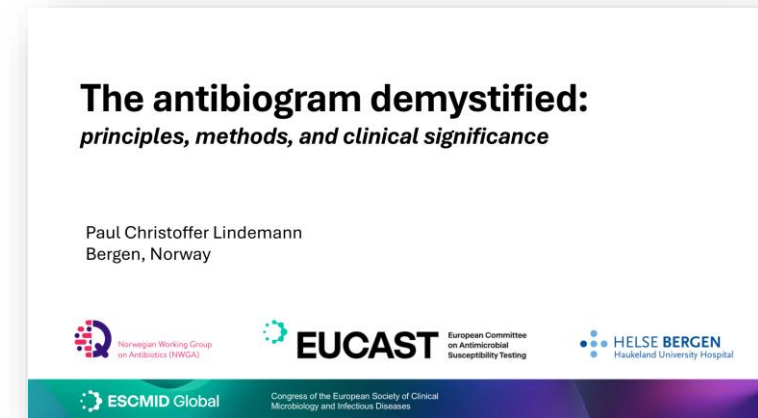


Resistenbestemmelse enkelt forklart; *Prinsipper og klinisk betydning*

Paul Christoffer Lindemann
Bergen, Norge



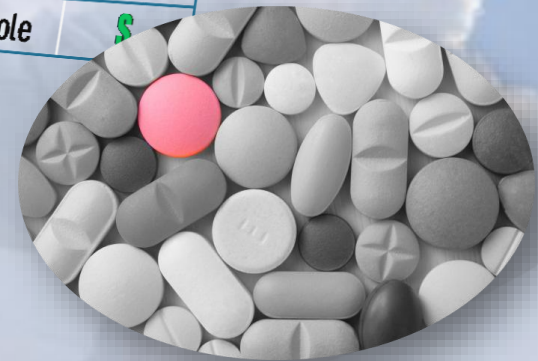
NSAS Webinar 10. September 2026

Antibiogrammet

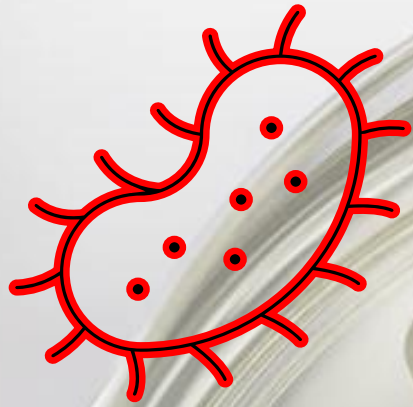
- Utbredt – og misforstått
- Påvirker både terapivalg og resistensutvikling
- En brikke i det diagnostiske puslespillet – ikke en fasit



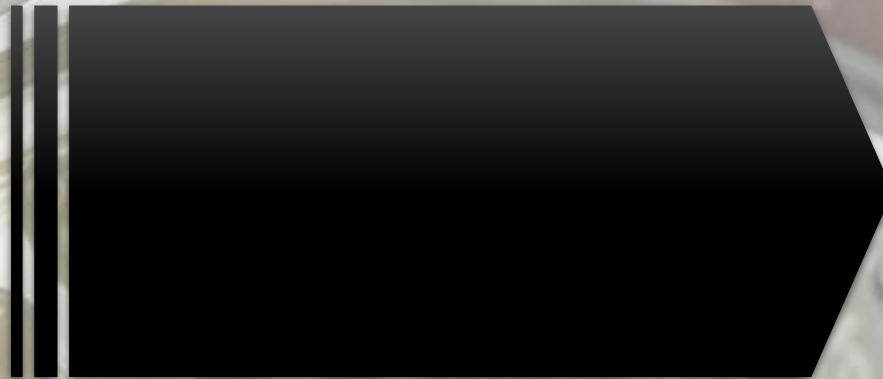
Antibiotic	S/I/R
Ampicillin	R
Amoxicillin-clavulanic acid	S
Piperacillin-tazobactam	I
Cefotaxime	R
Ceftazidime	R
Cefepime	S
Meropenem	S
Ciprofloxacin	I
Gentamicin	R
Trimethoprim-sulfamethoxazole	S



Hva er et antibiogram?



Patogen



Undersøkelse

S

I

R

Tolkning

Hva er et antibiogram?

S

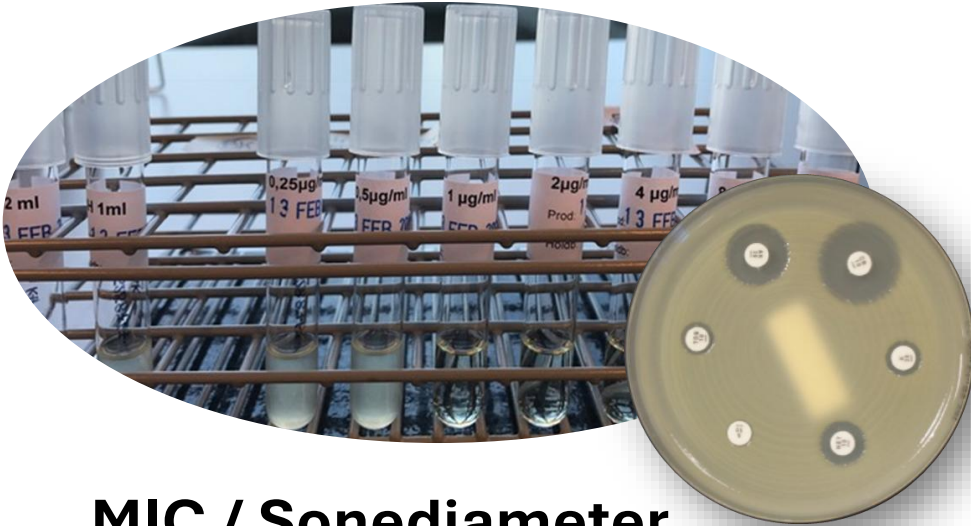
Høy sannsynlighet for **terapeutisk suksess...**

I

R

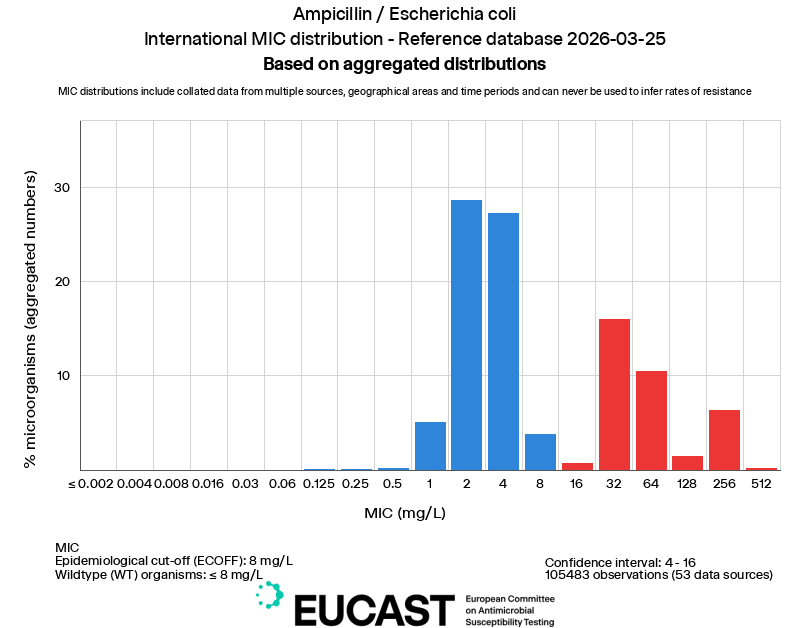
Høy sannsynlighet for **terapisvikt...**

Resistensbestemmelse



MIC / Sonediameter

- Referansemetode vs surrogatmetoder
- Standardisering
- Kvalitetskontroll



Tolkning

	MIC	 EUCAST	
Tetracyklin <i>Staphylococcus</i> spp.	2	R	S
Vancomycin <i>Enterococcus</i> spp.	8	R	I
Tedizolid <i>Streptococcus anginosus</i>	0.5	S	R

EUCAST BP-table v 16.0
CLSI M100 ED36:2026

Forbehold ved tolkning



S

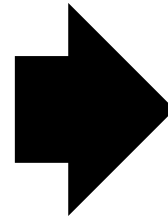
I

R

I – den mest misforståtte bokstaven

 EUCAST		Klinikere
Susceptible, Increased exposure Følsom ved økt eksponering	Intermediate Intermediær	I = R I don't know I don't care Not Intended for use I will not use ID consultants only Ikke bruk
Bruk – sikre optimal eksponering	Ikke entydig definert	Forvirret?

WT <i>P. aeruginosa</i>:	
Piperacillin-tazobactam	
Ceftazidim	
Aztreonam	
Meropenem	S
Ciprofloxacin	



MEROPENEM



EFFECTIVE ANTIBIOTIC THERAPY

FOR SERIOUS INFECTIONS

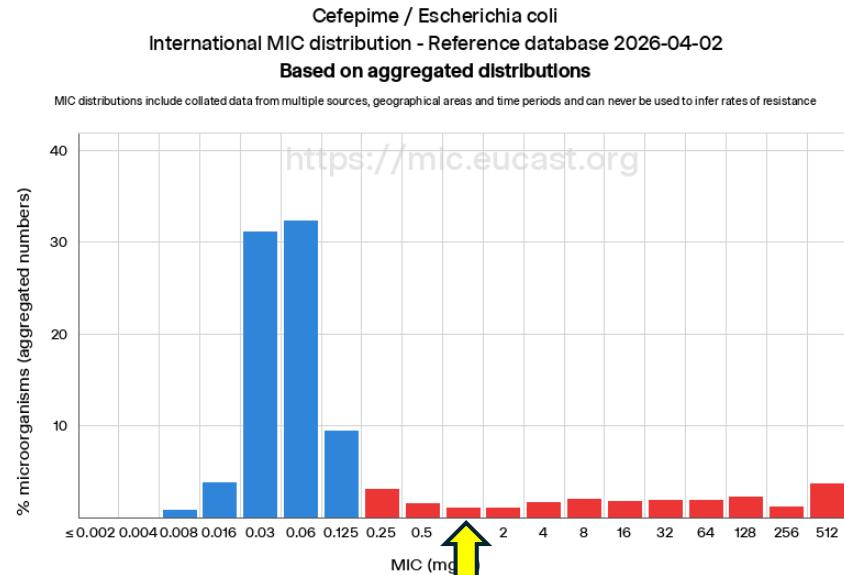
Antibiotic	S/I/R
Ampicillin	R
Amoxicillin-clavulanic acid	S
Piperacillin-tazobactam	I
Cefotaxime	R
Ceftazidime	R
Cepefime	S
Meropenem	S
Ciprofloxacin	I
Gentamicin	R
Trimethoprim-sulfamethoxazole	S

Antibiogrammet som et verktøy

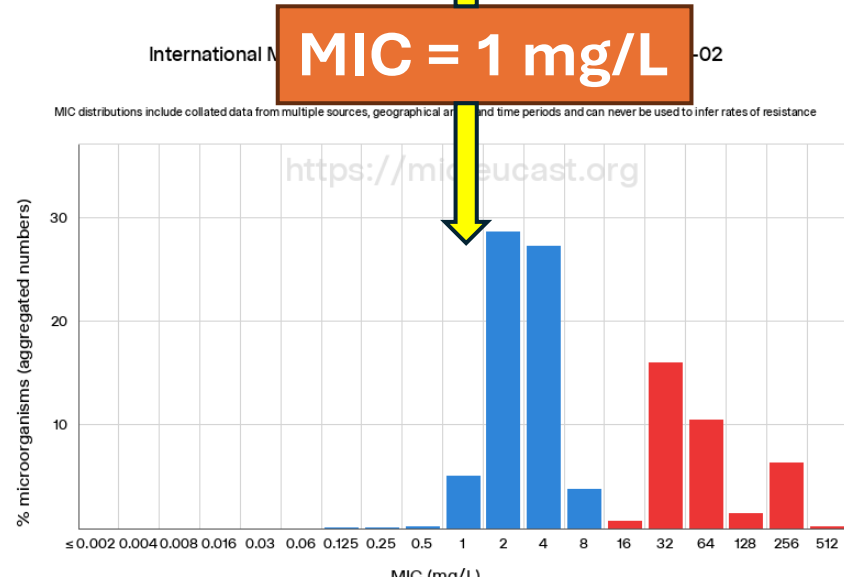


MIC: Rapportere, eller ikke rapportere?

Cefepime



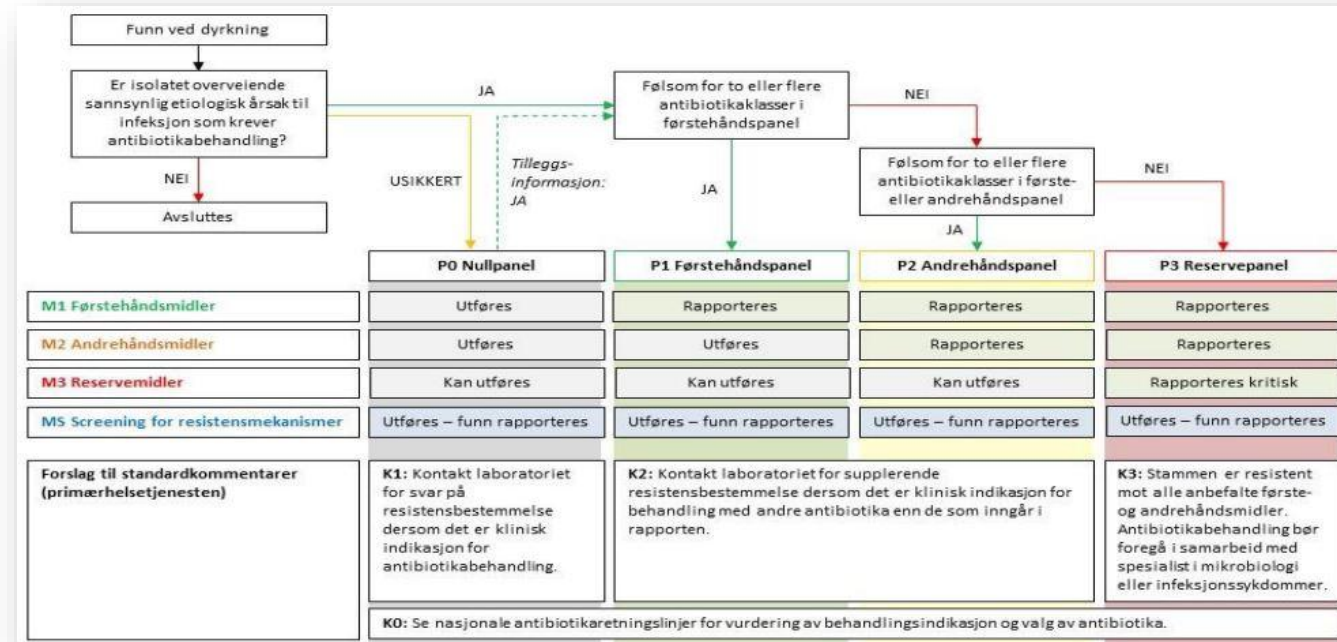
Ampicillin



- ✗ Det middelet med lavest MIC er best?
- ✗ Nyttig til bruke ved TDM?
- ✗ MIC = MIC = MIC?
- ✓ Et verktøy som kan være nyttig i de rette hender
- ✓ Burde ikke brukes til klinisk beslutning

Selektiv rapportering

- Veilede antibiotikabehandling
- Harmonisert med behandlingsretningslinjer
- Test alltid første- og andrehåndsmidler, rapportér det mest egnede



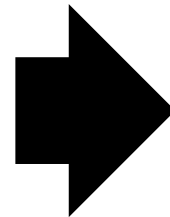
NWGA (www.afa-gruppen.no)

Antibiogrammets oppsett

- Mennesket (inkludert klinkere) er enkle vesen...

Antibiotic	S/I/R
Amox-clav	R
Ampicillin	R
Cefotaxime	S
Ceftazidime	S
Ciprofloxacin	I
Fosfomycin	S
Gentamicin	S
Mecillinam	S
Meropenem	S
Nitrofurantoin	S
Pip-tazo	I
Trimethoprim	R
Trim-sulfa	R

Alfabetisk

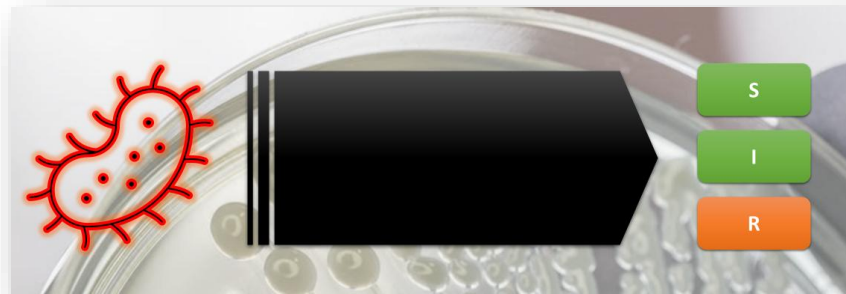


Antibiotic	S/I/R
Ampicillin	R
Mecillinam	S
Gentamicin	S
Trimethoprim	R
Trim-sulfa	R
Nitrofurantoin	S
Amox-clav	R
Pip-tazo	I
Cefotaxime	S
Ceftazidime	S
Ciprofloxacin	I
Fosfomycin	S
Meropenem	S

AWARE + S/I/R

Samme data – annen beslutning...

Mindre forvirret?



► En modell, ikke et fasitsvar

EUCAST	CLSI	Clinicians
Susceptible, Increased exposure	Intermediate	I = R I don't know I don't care Not Intended for use I will not use ID consultants only I know best
Use – ensure optimal exposure	Not clearly defined	Confused?

► Forstå S, I og R

Antibiotic	S/I/R	Antibiotic	S/I/R
Amox-clav	R	Ampicillin	R
Ampicillin	R	Mecillinam	S
Cefotaxime	S	Gentamicin	S
Ceftazidime	S	Trimethoprim	R
Ciprofloxacin	I	Trim-sulfa	R
Fosfomycin	S	Nitrofurantoin	S
Gentamicin	S	Amox-clav	R
Mecillinam	S	Pip-tazo	I
Meropenem	S	Cefotaxime	S
Nitrofurantoin	S	Ceftazidime	S
Pip-tazo	I	Ciprofloxacin	I
Trimethoprim	R	Fosfomycin	S
Trim-sulfa	R	Meropenem	S

Alphabetic

AWARE + S/I/R

► Et kraftig verktøy for å rettlede antibiotikabruk

Forståelse er grunnlaget...

Takk for oppmerksomheten!



Arbeidsgruppen for
antibiotikaspørsmål og metoder
for resistensbestemmelse (AFA)



EUCAST

European Committee
on Antimicrobial
Susceptibility Testing



HELSE BERGEN
Haukeland universitetssjukehus