



Haemophilus influenzae
og betalaktamer –
the never ending story?

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NordicAST WS 2016

Del 2 (DS)

- Betalaktamresistens
 - Mekanismer og terminologi
 - Genotype vs fenotype
 - Seleksjon

BLNAR/BLPACR-sangen

Versjon 2.0, 2016-05-03

(rPBP3-sangen)

Haemophilus influenzae infeksjoner
For eksempel meningitt og pneumoni
Bør behandles med aminopenicilliner
Når isolatet er av følsom kategori

Beta-Laktamase Negativ

Ampicillin, ampicillin Sensitiv

Oh oh oh BLNAS

Beta-laktamase negativ

Resistens som forårsakes av enzymer
Kalles beta-laktamase-produksjon
Mekanismen virker kun på penicilliner
Og klavulansyre gir full inhibisjon

Beta-Laktamase Positiv

Ampicillin, ampicillin Resistent

Oh oh oh **BLPAR**

Beta-laktamase positiv

Resistens kan også skyldes mutasjoner

I et gen som koder for PBP3

Detaljerte screening-rekommendasjoner

Finner du på NordicAST.org

Beta-**L**aktamase **N**egativ

Ampicillin, ampicillin **R**esistent

Oh oh oh **BLNAR**

Beta-laktamase negativ

Spørsmål:

Hvis man finner begge mekanismer

Hva er riktig terminologi?

Beta-Laktamase Positiv

Amoksicillin-Clavulanat Resistent

Oh oh oh BLPACR

Beta-laktamase positiv

Men:

BLNAS, BLPAR, BLNAR og BLPACR

Er basert på upresis fenotypi

(Jeg har derfor foreslått en helt ny terminologi)

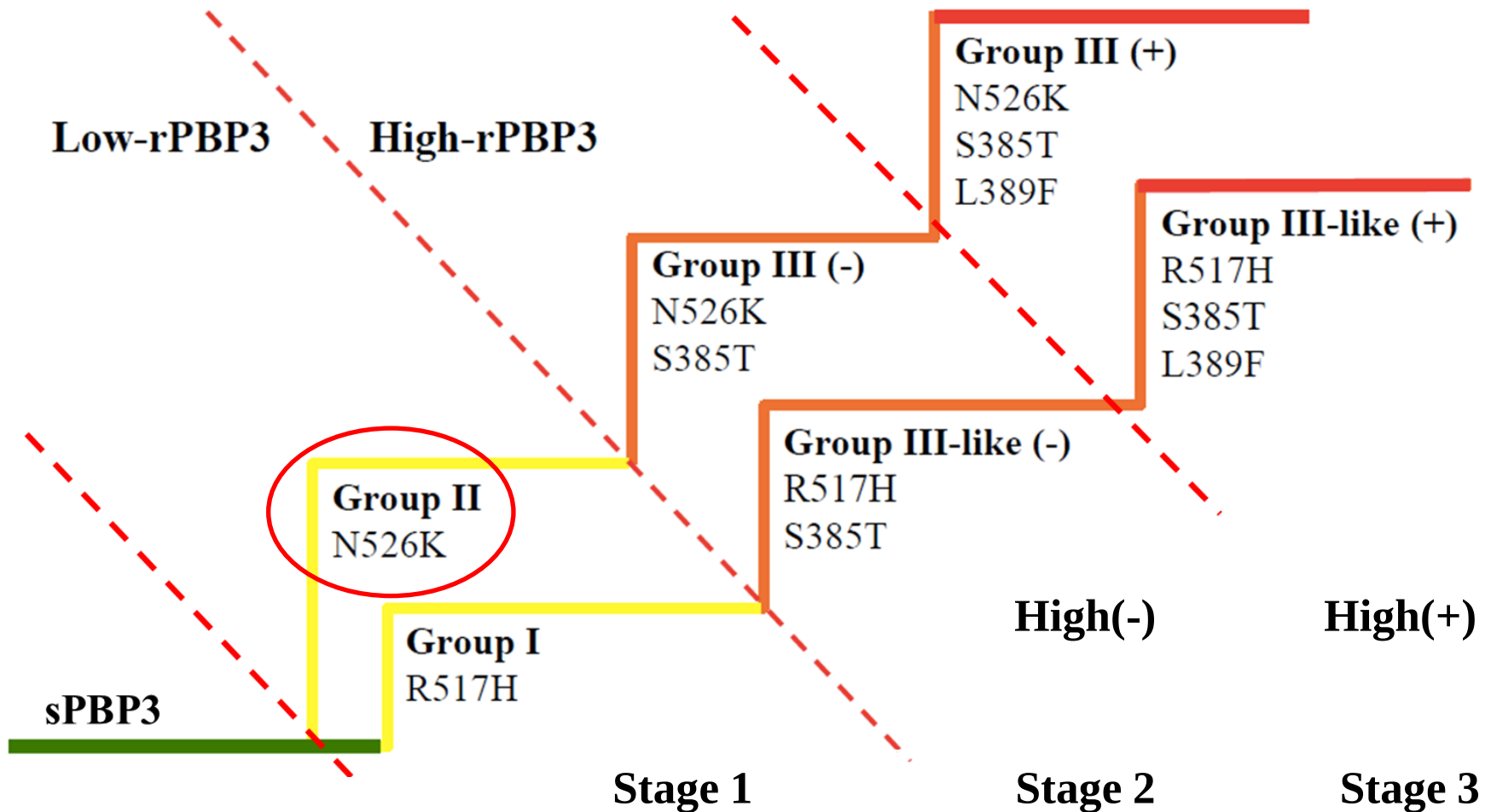
Genotype rPBP3

Resistens som skyldes endret PBP

Oh oh oh nummer 3

Genotype rPBP3

Genotype rPBP3



Genotype vs fenotype: Andel S

Low

High(-)

High(+)

	sPBP3 (n=80) [465]	1 st stage rPBP3 (n=113) [465]	2 nd stage rPBP3 (n=14) [466]	3 rd stage rPBP3 (n=16) [466]
Agents				
Ampicillin	98.8	40.7 ^a	7.1 ^b	0.0 ^b
Amoxicillin	97.5	46.0 ^a	0.0 ^b	0.0 ^b
Cefuroxime ^c	87.5	44.2	0.0	0.0
Cefotaxime	98.8	93.8	28.6	0.0
Ceftriaxone			100.0	12.5
Cefixime			7.1	0.0
Cefepime			14.3	0.0
Ceftaroline			28.6	0.0
Meropenem ^d	100.0	80.5	85.7	50.0
Meropenem ^e	100.0	100.0	100.0	100.0
Imipenem			100.0	100.0

No data

>90%

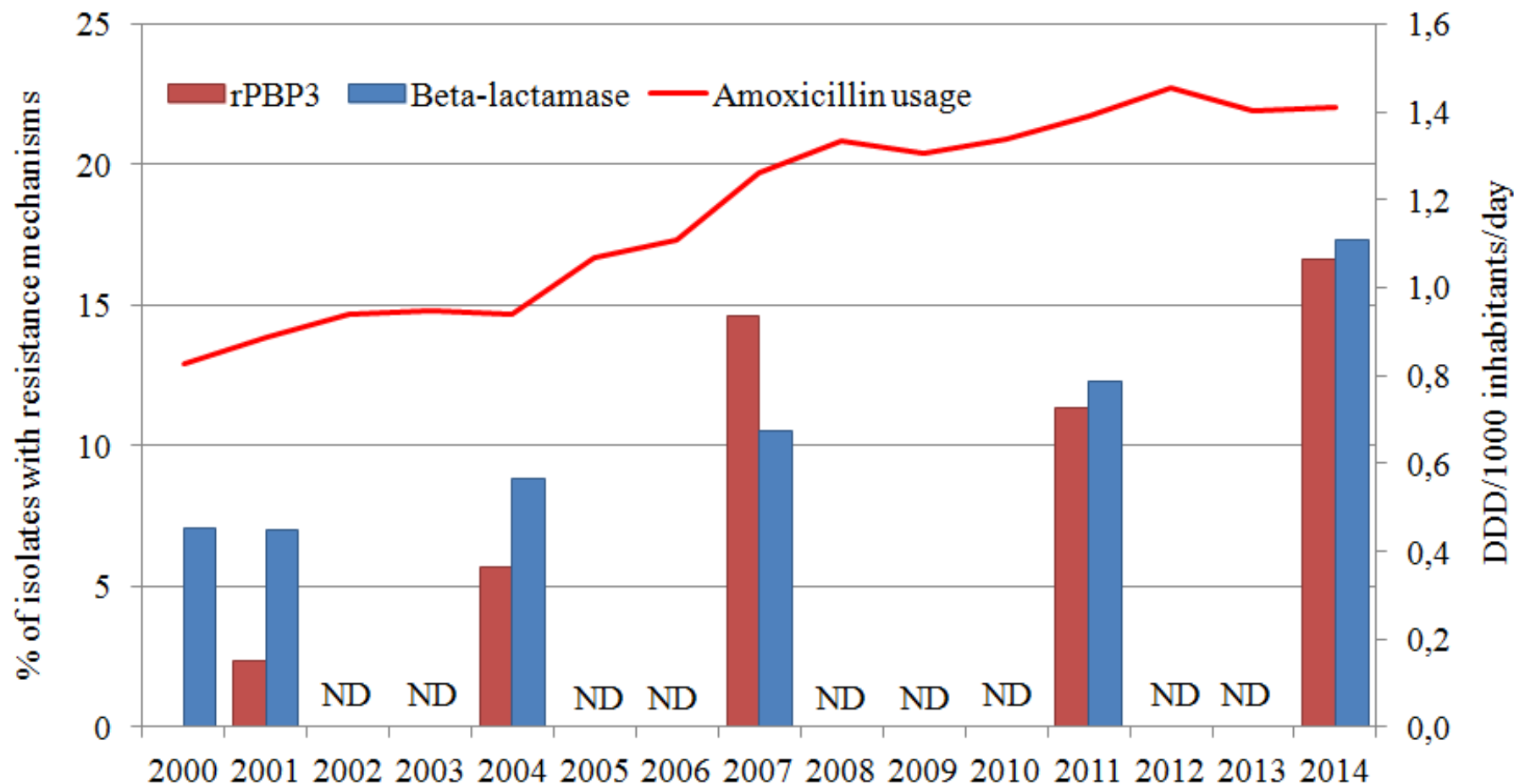
50-90%

25-50%

<25%

Amoxicillin: Forbruk og resistens

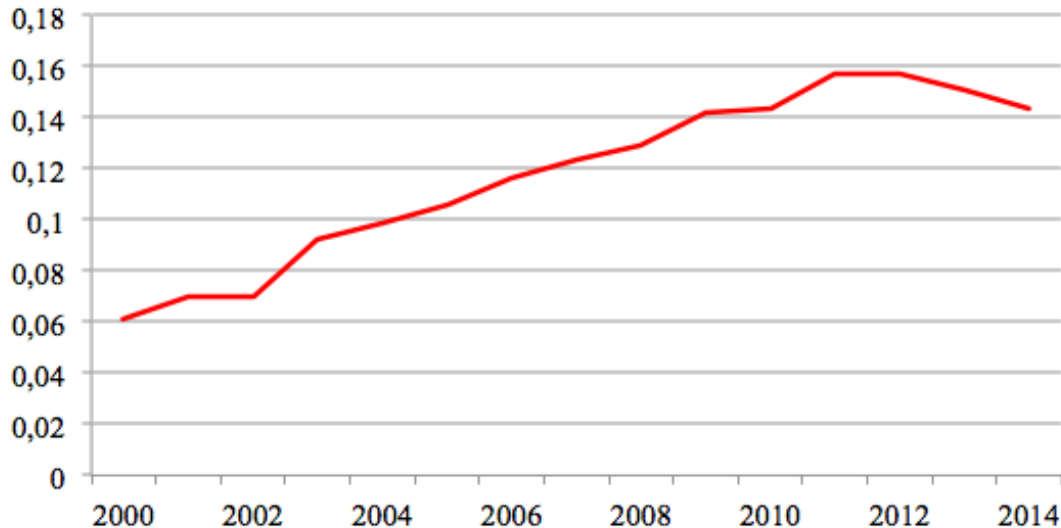
67% økning 2000-2012



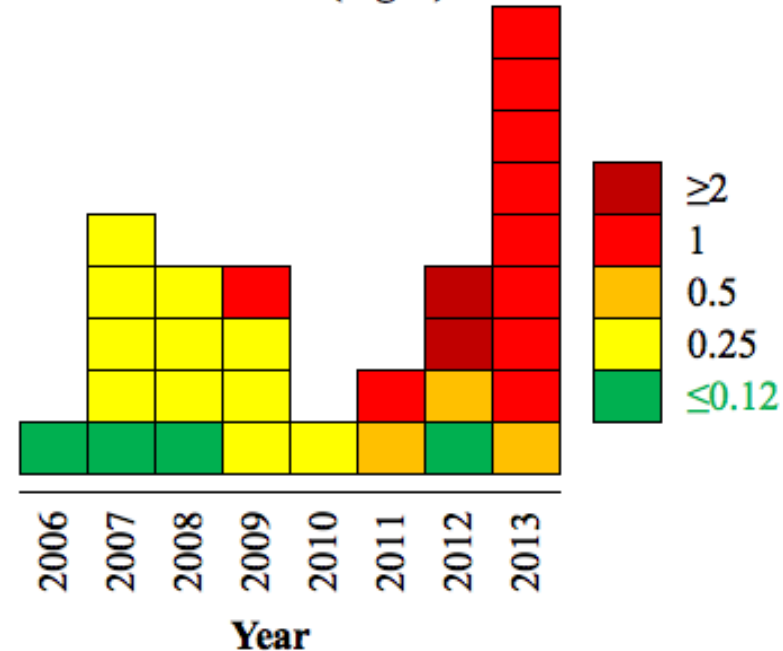
Cefotaxim: Forbruk og resistens

158% økning 2000-2012

3. generasjons cefalosporiner



Cefotaxime MIC (mg/L)



Skaare et al. Eurosurveillance 2014

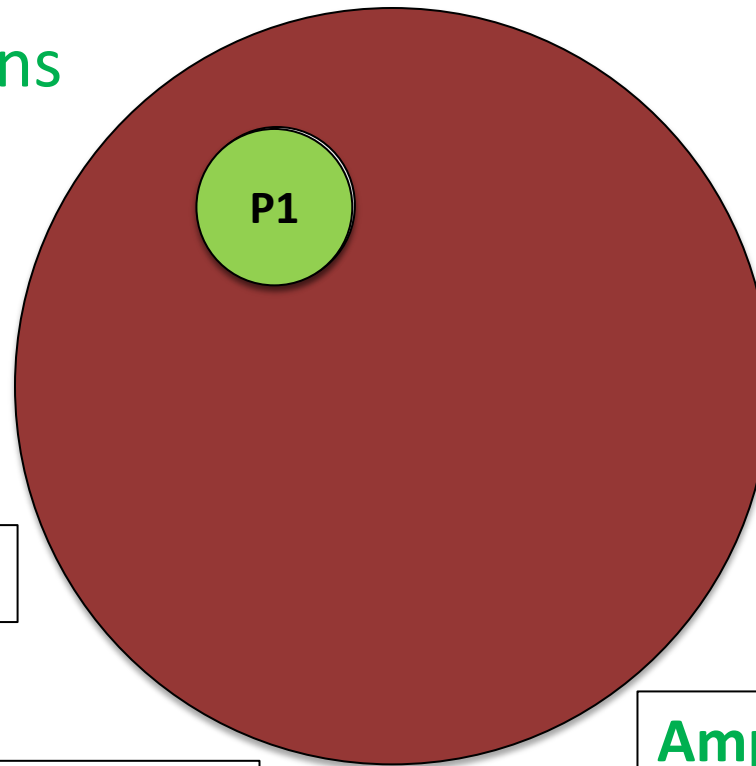
Del 4 (DS)

- Resistensbestemmelse
 - NordicAST testalgoritme
 - Ampicillin: BMD MIC vs Etest vs lappediffusjon
 - Screeninglapper

Testalgoritme

Scenario 1:

Ingen resistens
'BLNAS'



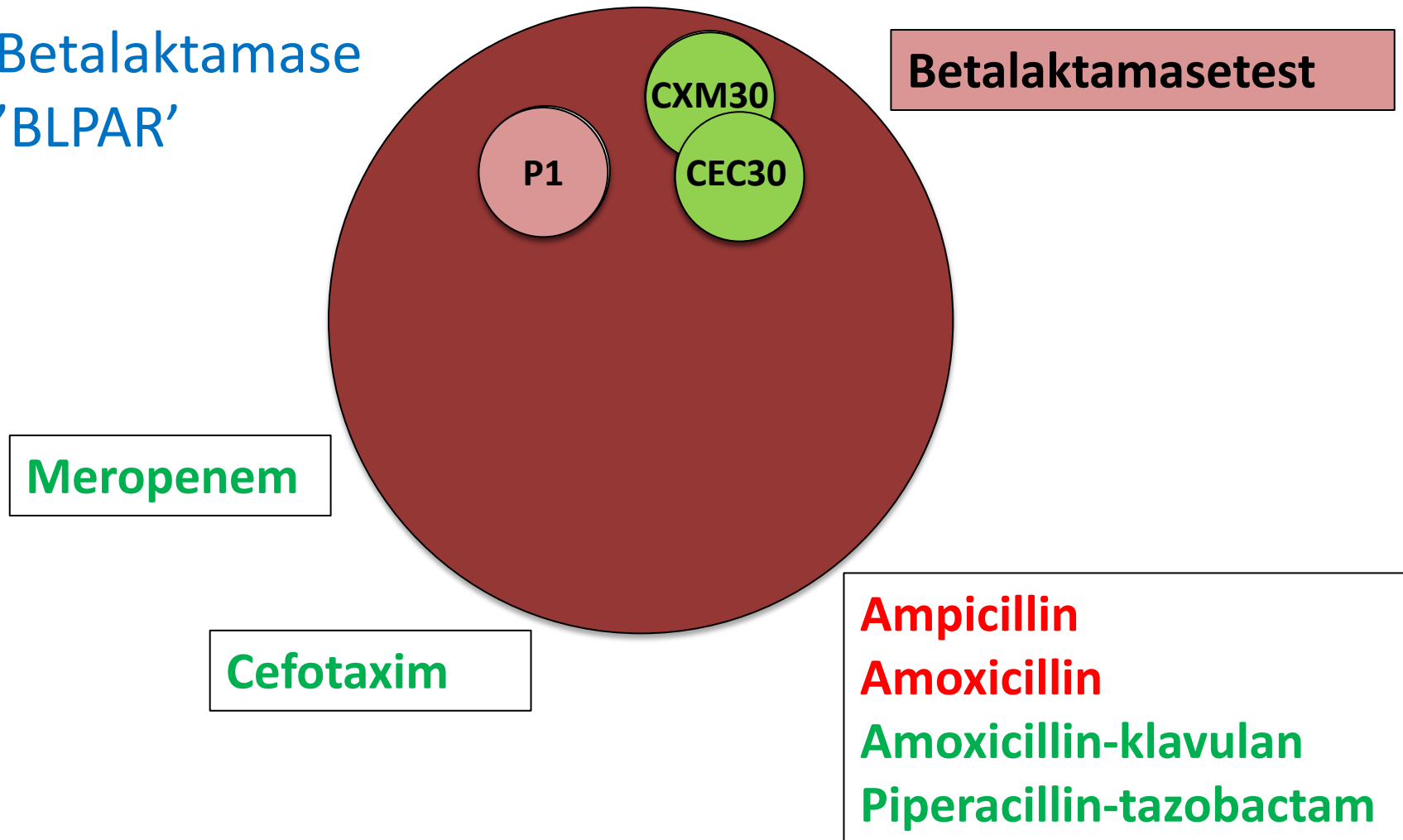
Meropenem

Cefotaxim

Ampicillin
Amoxicillin
Amoxicillin-klavulan
Piperacillin-tazobactam

Testalgoritme

Scenario 2: Betalaktamase 'BLPAR'



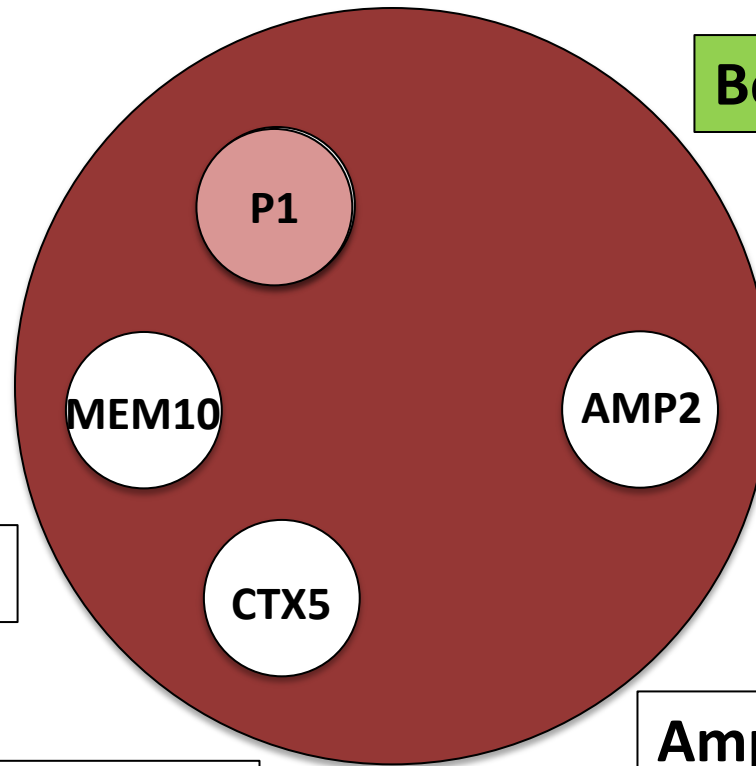
Testalgoritme

Scenario 3:

rPBP3

'BLNAR'

Betalaktamasetest



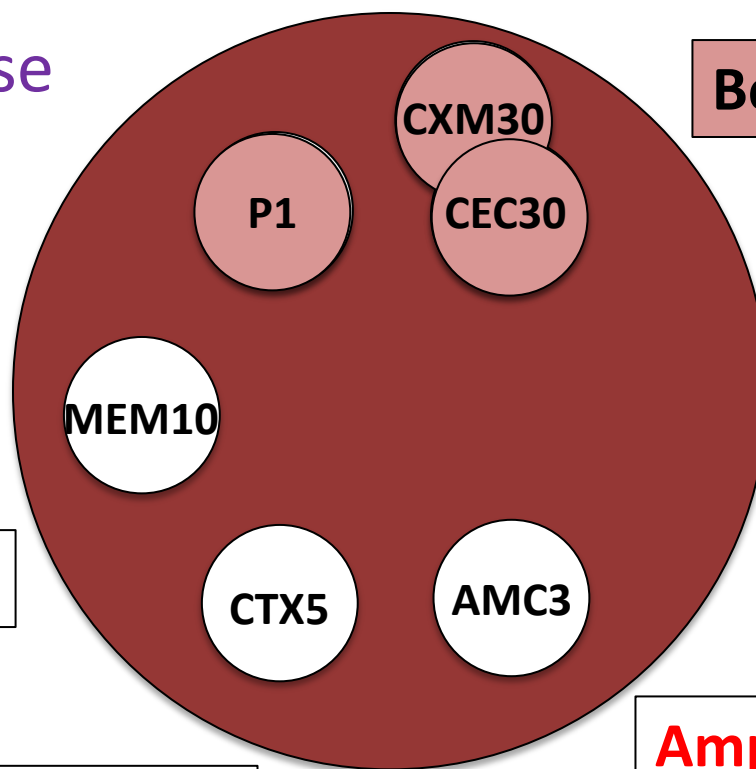
Meropenem

Cefotaxim

**Ampicillin
Amoxicillin
Amoxicillin-klavulan
Piperacillin-tazobactam**

Testalgoritme

Scenario 3:
Betalaktamase
og rPBP3
'BLPACR'



Betalaktamasetest

Meropenem

Cefotaxim

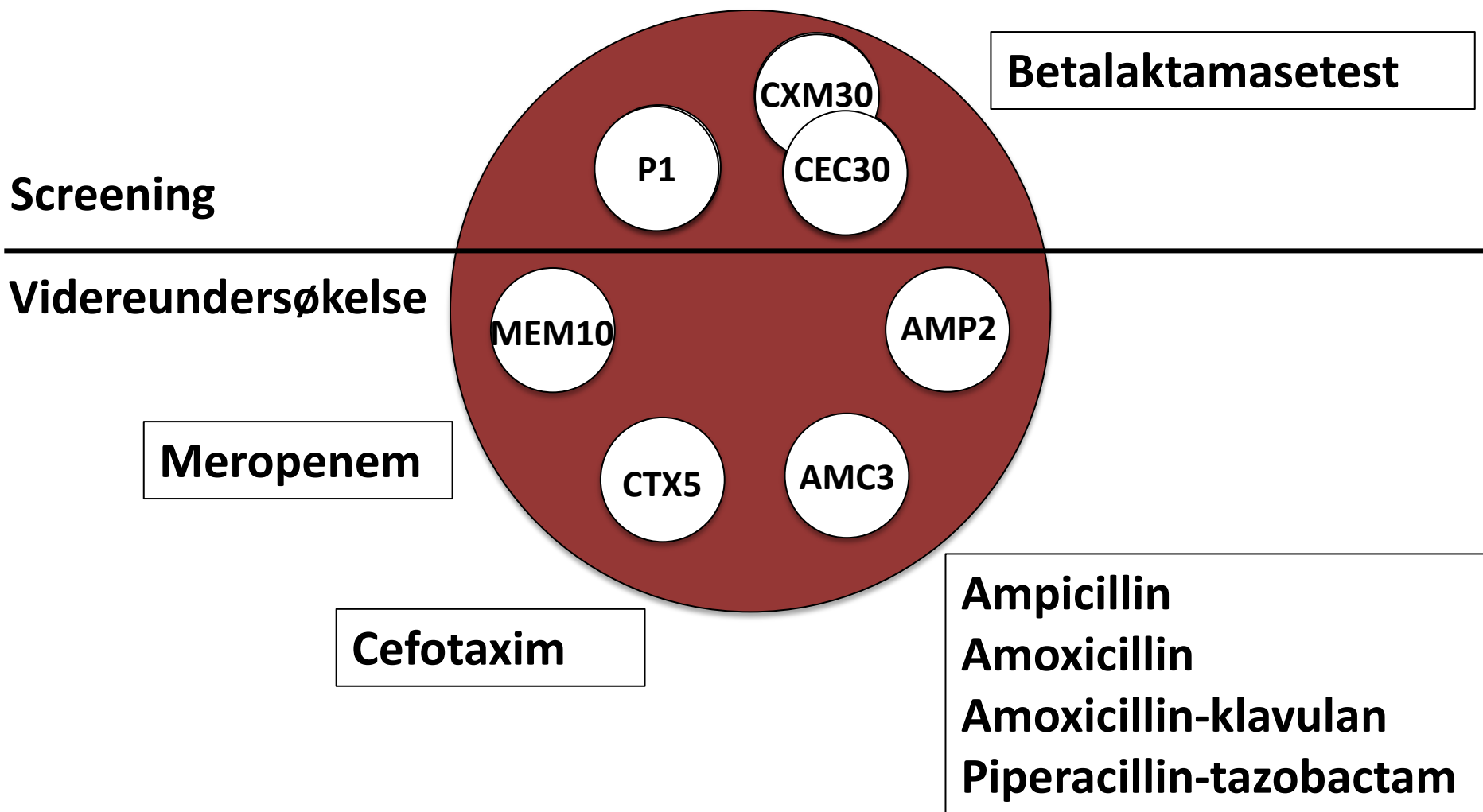
Ampicillin

Amoxicillin

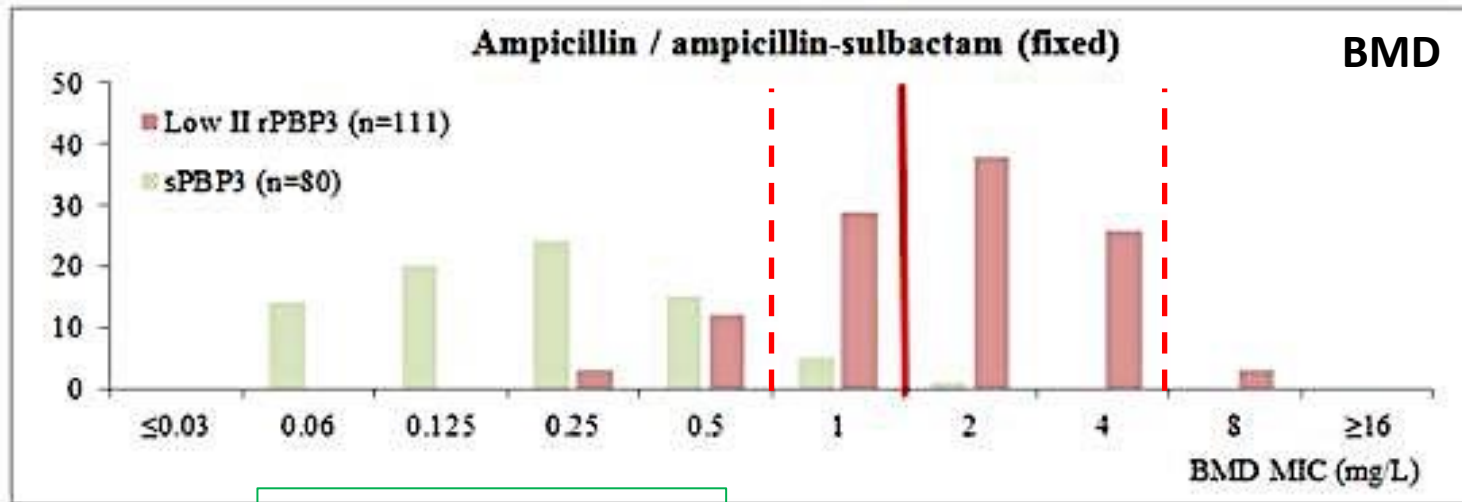
Amoxicillin-klavulan

Piperacillin-tazobactam

Resistensoppsett

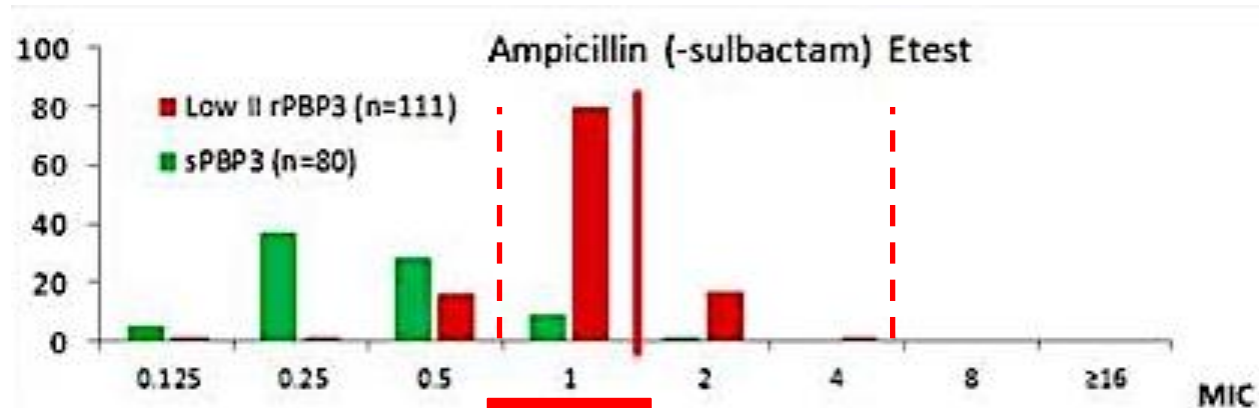


Ampicillin MIC



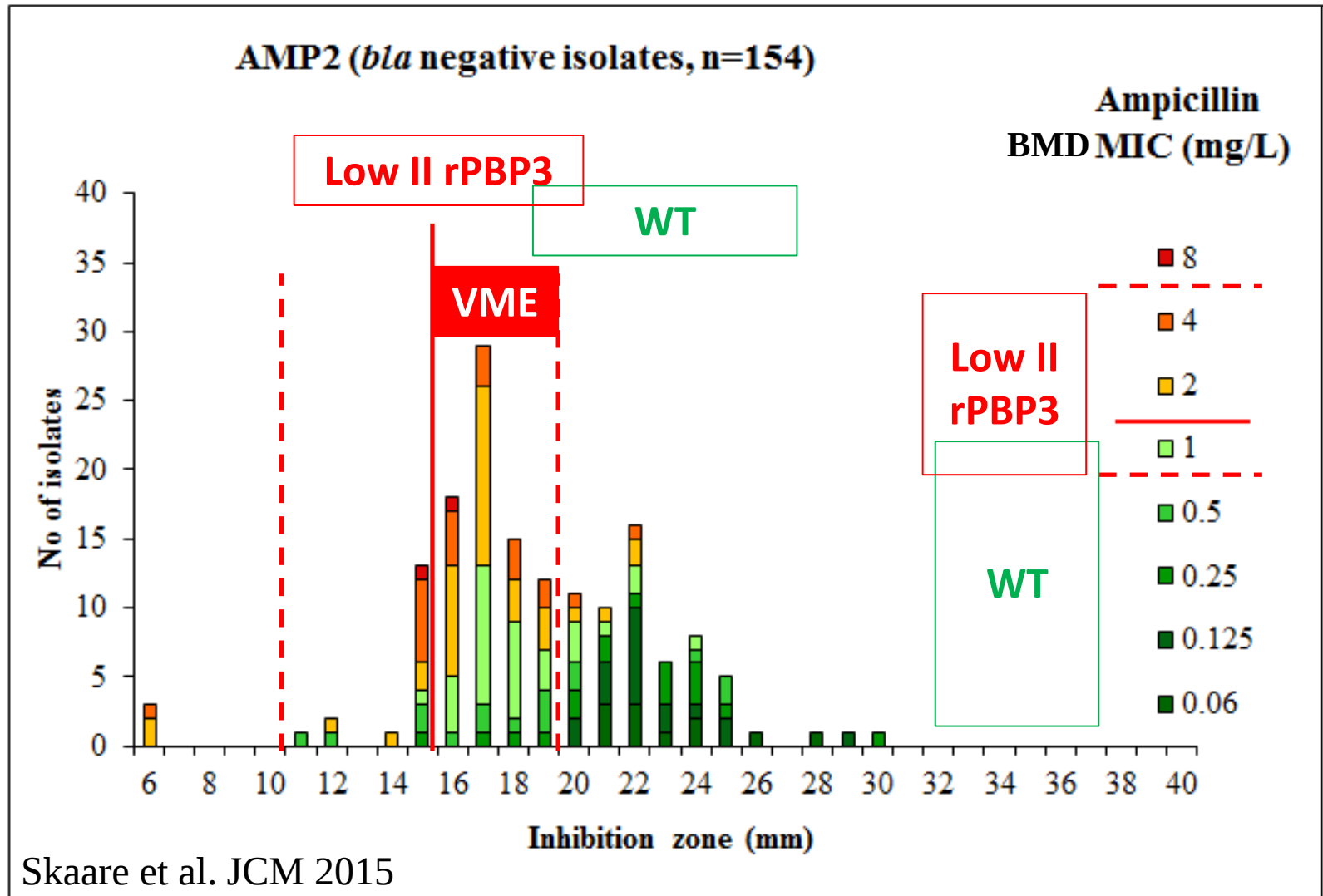
WT

Low II rPBP3



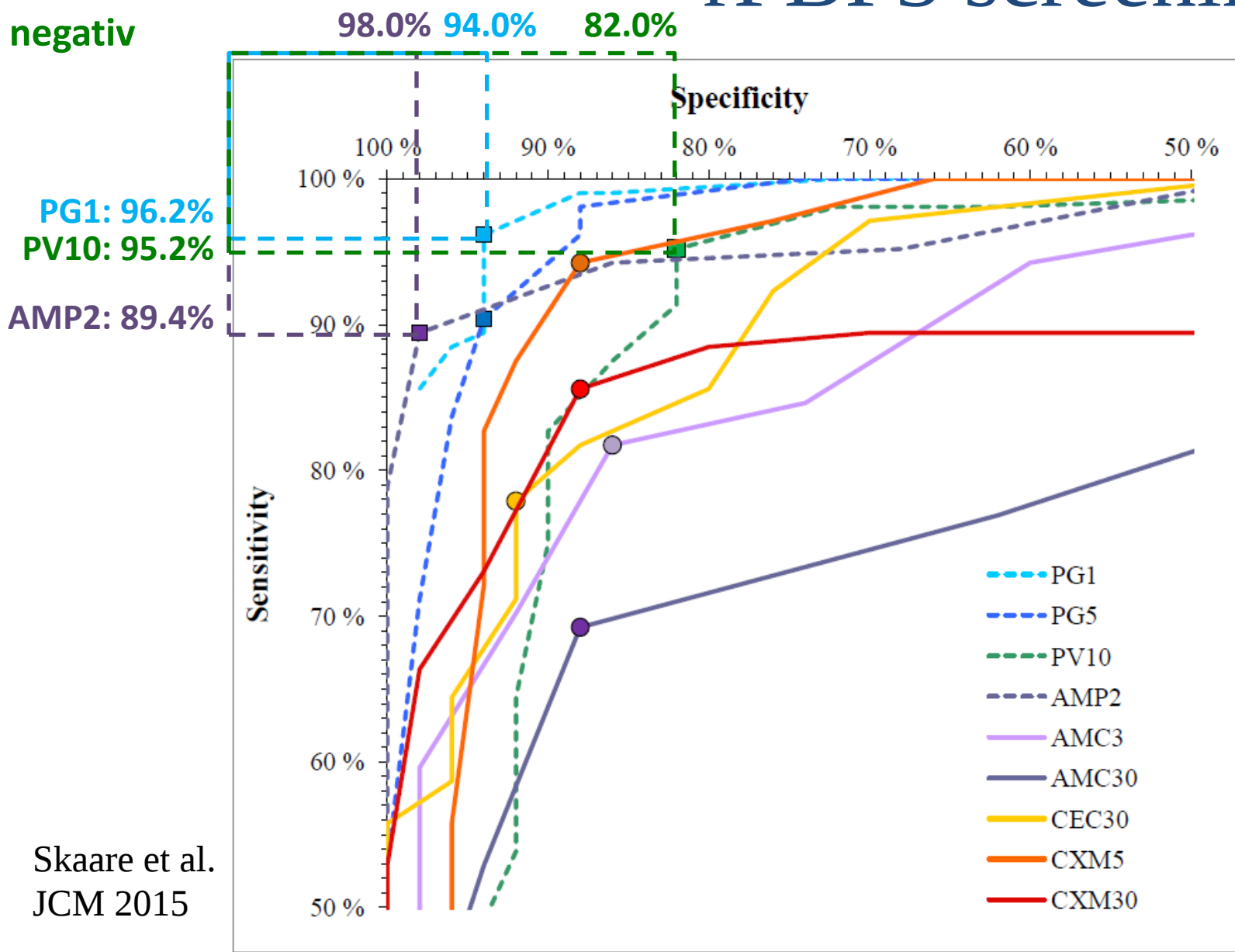
VME

Ampicillin lapp



Betalaktamase
negativ

rPBP3 screening

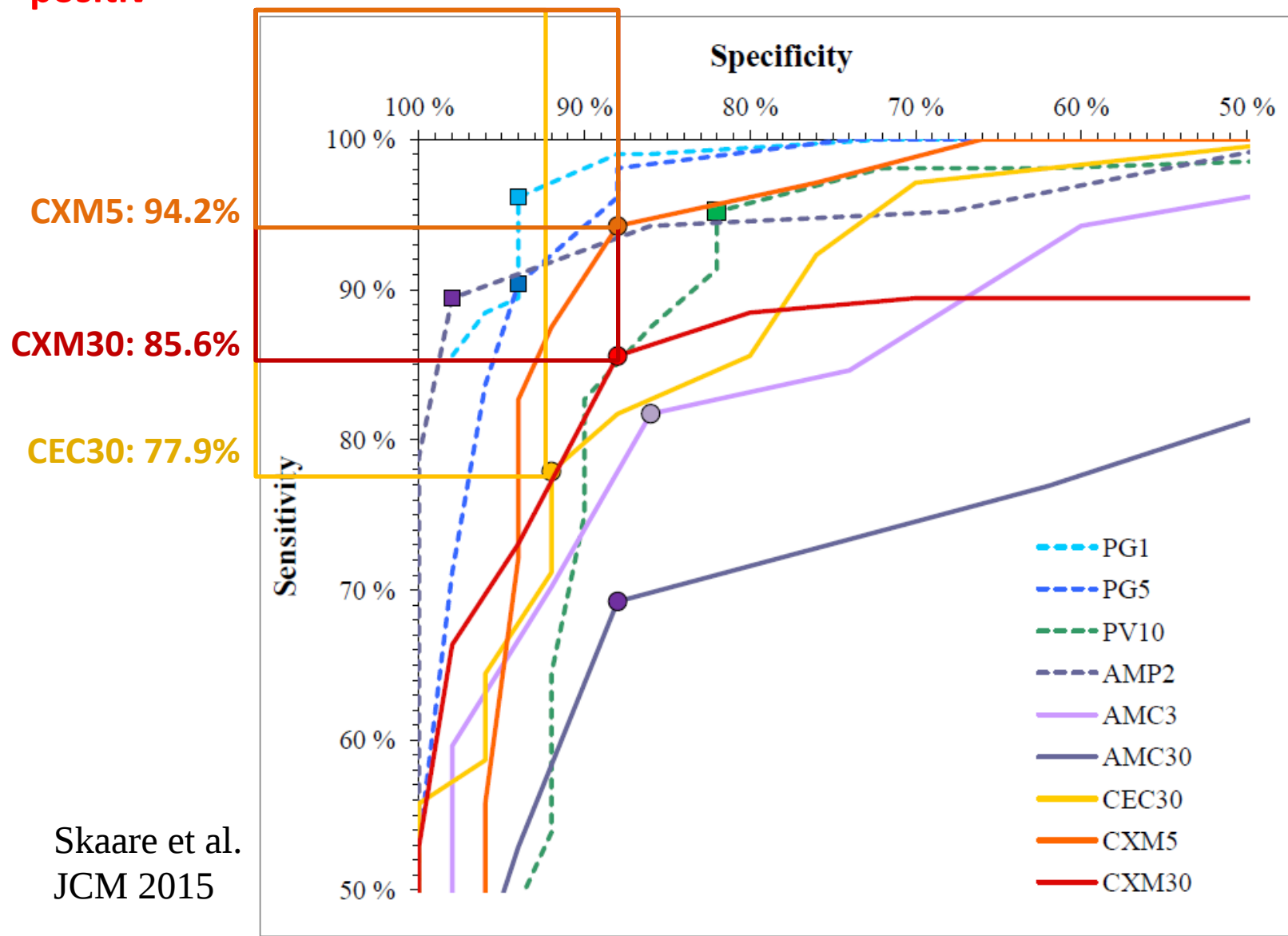


Skaare et al.
JCM 2015

rPBP3 screening

Betalaktamase
positiv

92.0% 88.0%



Skaare et al.
JCM 2015

Mange uløste problemer

