EUCAST EUROPEAN COMMITTEE ON ANTIMICROBIAL SUSCEPTIBILITY TESTING

Hôpital du Jura

Nous pour vous !

«up to date» nouvelles en infectiologie

"It really boils down to this: that all life is interrelated. We are all caught in an inescapable network of mutuality, tied into a single garment of destiny. Whatever affects one directly, affects all indirectly."

King M.L., Jr. Harper; New York: 1968. The trumpet of conscience.

Michèle Birrer
Infectiologue
michele.birrer@h-ju.ch

Hôpital du Jura

Nous pour vous !

Antibiogrammes et Eucast

Que se cache derrière les interprétations S-I-R des antibiotiques

Luce Bertaiola Monnerat

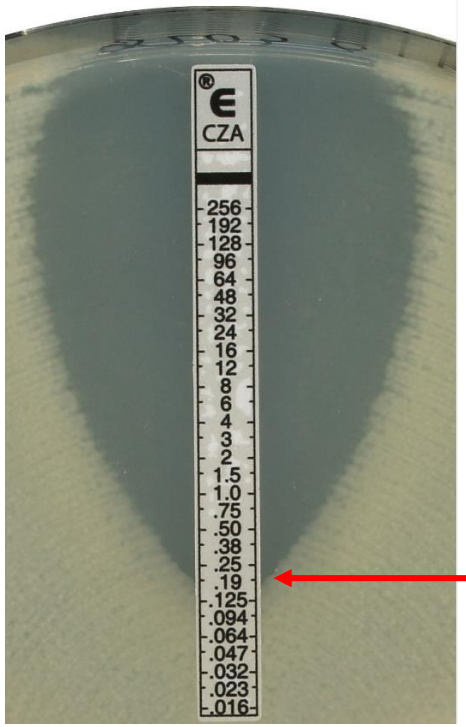
Adjointe au responsable du laboratoire

Spécialiste FAMH en microbiologie

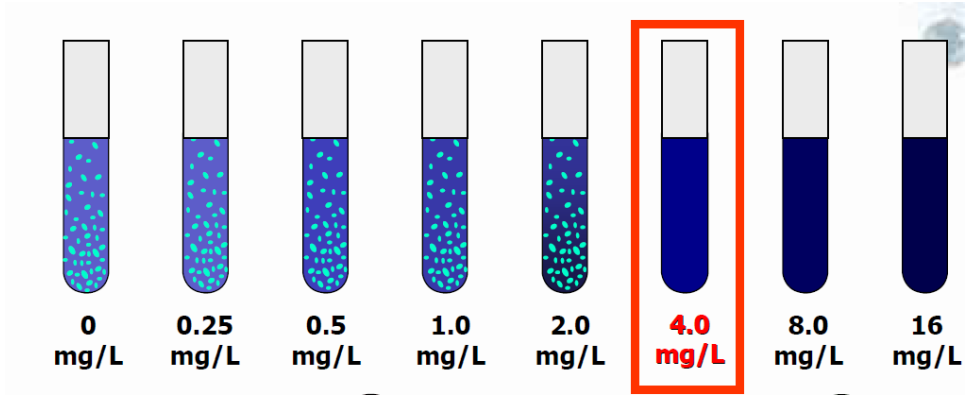
Antibiogramme: méthodes disponibles

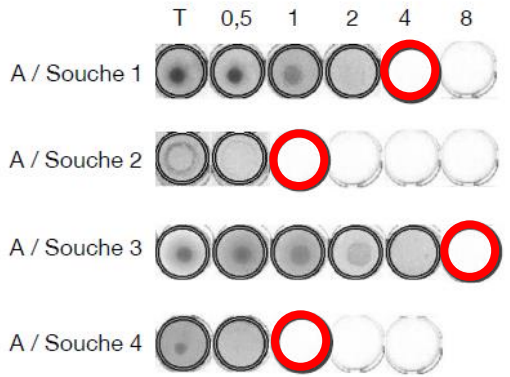
- bandelettes à gradient (Etest)
- macrodilution
- microdilution

concentrations minimales inhibitrices (CMI) = concentration la plus faible pour laquelle il y a inhibition de la croissance bactérienne



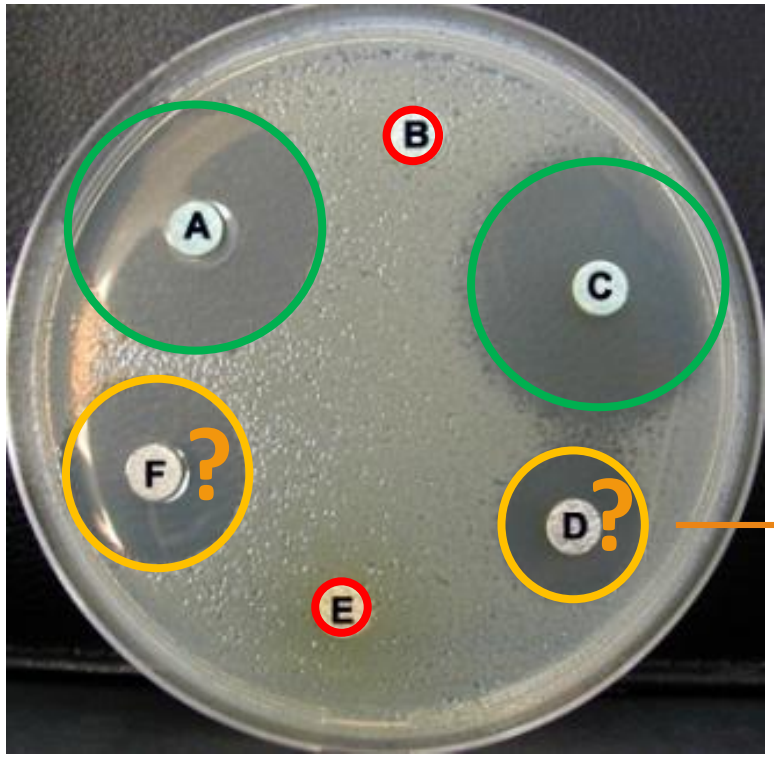
0.19 µg/ml





Antibiogramme: méthodes disponibles

diffusion en milieu gélosé → **diamètres (mm)**



Standardisation ?

Comment juger les CMI ou les diamètres?

EUCAST nous informe sur les **concentrations** ou **diamètres** dits **critiques**

*Enterobacterales**

EUCAST Clinical Breakpoint Tables v. 12.0, valid from 2022-01-01

Expert Rules and Intrinsic Resistance Tables

An MIC breakpoint of S ≤ 0.001 mg/L is an arbitrary, "off scale" breakpoint (corresponding to a zone diameter breakpoint of "S ≥ 50 mm") which categorises wild-type organisms (organisms without phenotypically detectable resistance mechanisms to the agent) as "Susceptible, increased exposure" (I). For these organism-agent combinations, never report "Susceptible, standard dosing regimen" (S).

MIC determination (broth microdilution according to ISO standard 20776-1 except for mecillinam and fosfomycin where agar dilution is used)
Medium: Mueller-Hinton broth (for cefiderocol, see https://www.eucast.org/eucastguidancedocuments/)
Inoculum: $5x10^5$ CFU/mL
Incubation: Sealed panels, air, 35±1°C, 18±2h
Reading: Unless otherwise stated, read MICs at the lowest concentration of the agent that completely inhibits visible growth. See "EUCAST Reading Guide for broth microdilution" for further information.
Quality control: *Escherichia coli* ATCC 25922. For agents not covered by this strain and for control of the inhibitor component of beta-lactam inhibitor combinations, see EUCAST QC Tables.

Disk diffusion (EUCAST standardised disk diffusion method)
Medium: Mueller-Hinton agar
Inoculum: McFarland 0.5
Incubation: Air, 35±1°C, 18±2h
Reading: Unless otherwise stated, read zone edges as the point showing no growth viewed from the back of the plate against a dark background illuminated with reflected light. See "EUCAST Reading Guide for disk diffusion" for further information.
Quality control: *Escherichia coli* ATCC 25922. For agents not covered by this strain and for control of the inhibitor component of beta-lactam inhibitor-combination disks, see EUCAST QC Tables.

*** Recent taxonomic studies have narrowed the definition of the family Enterobacteriaceae. Some previous members of this family are now included in other families within the Order *Enterobacterales*. Breakpoints in this table apply to all members of the *Enterobacterales*.**

Penicillins[1]	MIC breakpoints (mg/L)			Disk content (µg)	Zone diameter breakpoints (mm)		
	S ≤	R >	ATU		S ≥	R <	ATU
Benzylpenicillin	-	-			-	-	
Ampicillin[1]	8	8		10	14[A]	14[A]	
Ampicillin-sulbactam[1]	8[2]	8[2]		10-10	14[A]	14[A]	
Amoxicillin[1]	8	8		-	Note[B]	Note[B]	
Amoxicillin-clavulanic acid[1]	8[3]	8[3]		20-10	19[A]	19[A]	19-20
Amoxicillin-clavulanic acid (uncomplicated UTI only)	32[3]	32[3]		20-10	16[A]	16[A]	
Piperacillin	8	8		30	20	20	
Piperacillin-tazobactam	8[4]	8[4]	16	30-6	20	20	19
Ticarcillin	8	16		75	23	20	
Ticarcillin-clavulanic acid	8[3]	16[3]		75-10	23	20	
Temocillin (infections originating from the urinary tract), *E. coli*, *Klebsiella* spp. (except *K. aerogenes*) and *P. mirabilis*	0.001	16		30	50[C]	17[C]	

Notes
Numbered notes relate to general comments and/or MIC breakpoints.
Lettered notes relate to the disk diffusion method.

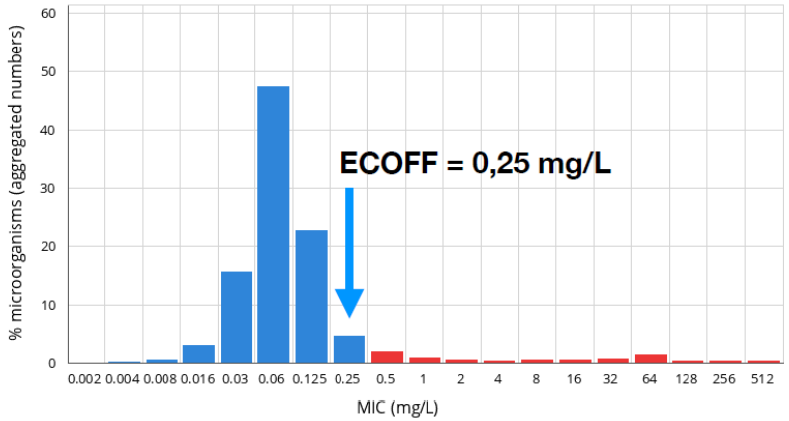
1. Aminopenicillin breakpoints in *Enterobacterales* are based on intravenous administration. For oral administration the breakpoints are relevant for urinary tract infections only. Breakpoints for other infections are under review.
2. For susceptibility testing purposes, the concentration of sulbactam is fixed at 4 mg/L.
3. For susceptibility testing purposes, the concentration of clavulanic acid is fixed at 2 mg/L.
4. For susceptibility testing purposes, the concentration of tazobactam is fixed at 4 mg/L.
5. Agar dilution is the reference method for mecillinam MIC determination.

A. Ignore growth that may appear as a thin inner zone on some batches of Mueller-Hinton agars.
B. Susceptibility inferred from ampicillin.
C. Ignore isolated colonies within the inhibition zone.

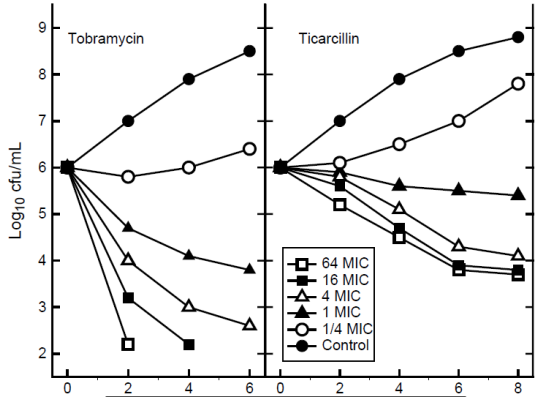
EUCAST = European Committee on Antimicrobial Susceptibility Testing

Détermination des concentrations et diamètres critiques

- **Approche bactériologique:** *ECOFF*

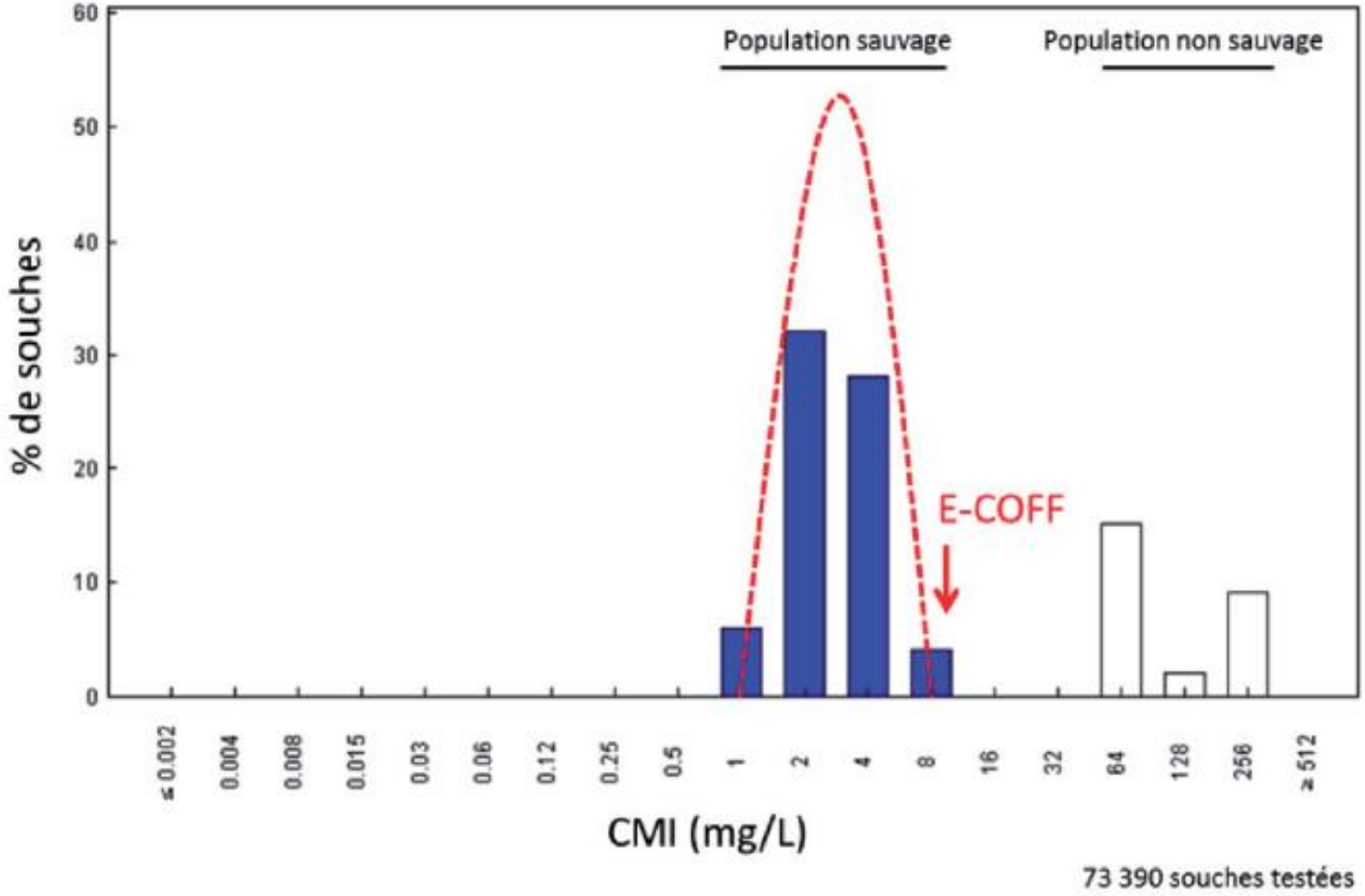


- **Approche pharmacodynamique :** PK/PD

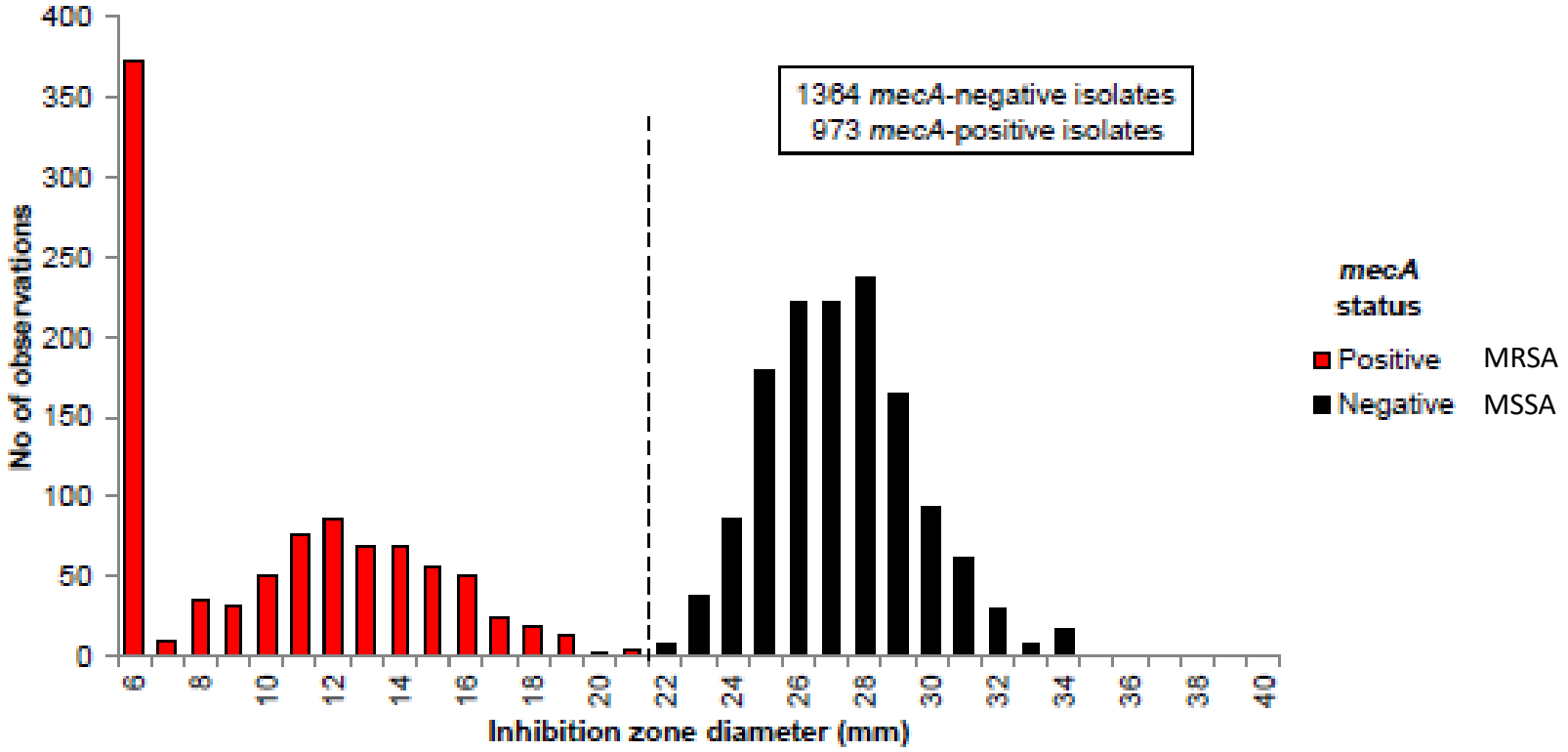


- **Approche clinique:** valeurs de CMI seuil au-delà desquelles l'échec est probable.

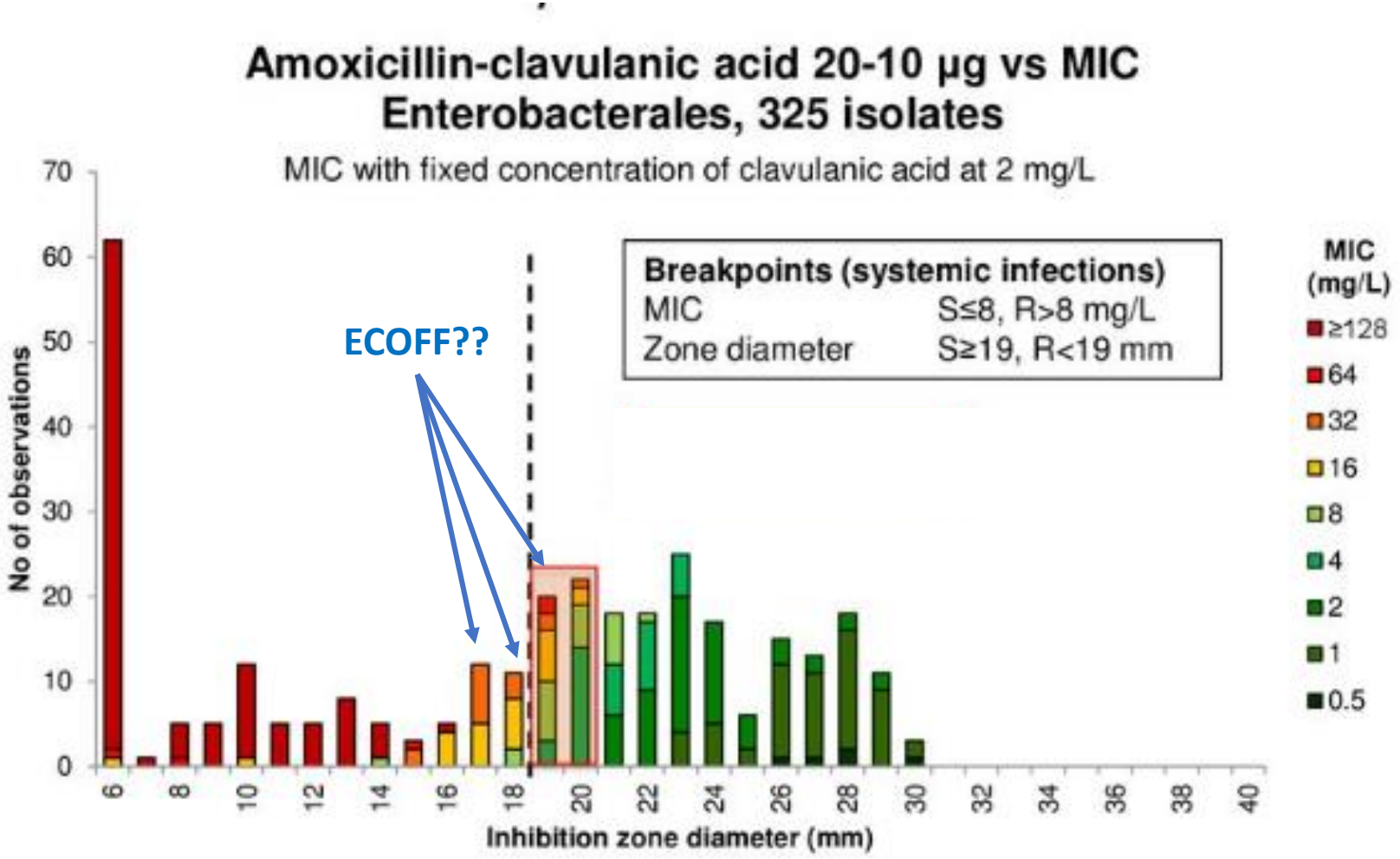
ECOFF: epidemiological cut-off



Cefoxitin 30 µg vs. *mecA* status
S. aureus from 11 published studies



Breakpoints
Zone diameter (screen) S≥22, R<22 mm


Amoxicillin-clavulanic acid 20-10 µg vs MIC
Enterobacterales, 325 isolates
MIC with fixed concentration of clavulanic acid at 2 mg/L
Breakpoints (systemic infections)
MIC S≤8, R>8 mg/L
Zone diameter S≥19, R<19 mm
ECOFF??
No of observations
Inhibition zone diameter (mm)
MIC (mg/L)
≥128
64
32
16
8
4
2
1
0.5

Approche pharmacodynamique : PK/PD

approche mixte, pharmacocinétique, pharmacodynamique et bactériologique

La "logique PK/PD" des *breakpoints*

Infections expérimentales animales	… et chez l'Homme
• Choix du modèle animal • Déterminer le paramètre PK/PD d'intérêt : - plusieurs posologies - plusieurs fractionnements des doses - plusieurs voies d'administration - plusieurs genres bactériens - plusieurs niveaux de sensibilité (CMI) → paramètre clé → sa valeur seuil minimale requise (bactériostase, bactéricidie ; 1 log, 2 logs…)	• Pharmacocinétique : - plusieurs posologies - plusieurs voies d'administration • Bactériologie : choix des bactéries ? - grandes études épidémiologiques - fourchette des CMI testées • Simulations de Monte-Carlo *Probability of target attainment* (PTA)

Un antibiotique, selon ses modalités de bactéricidie dynamique, est :

Temps-dépendant | **Concentration-dépendant**

Les paramètres PK/PD pertinents, potentiellement prédictifs de l'efficacité et/ou de la prévention de la résistance sont :

% T > CMI | **PIC/CMI**

ASC/CMI

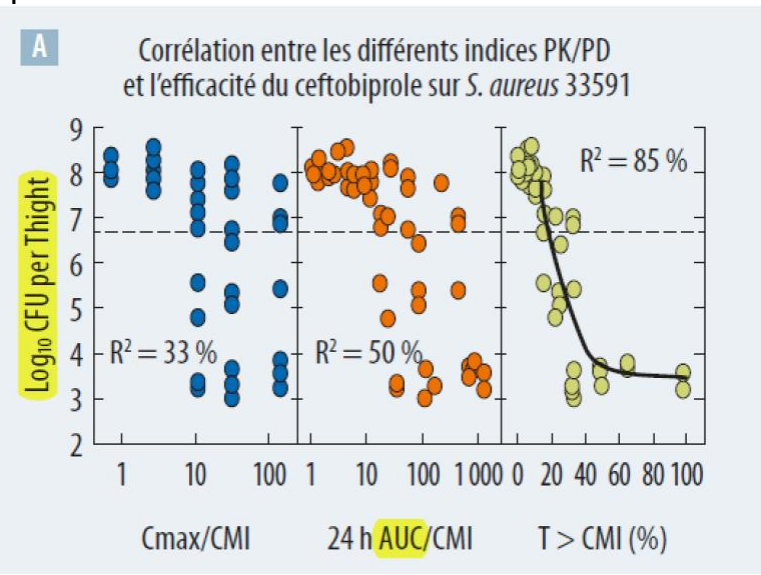
Ces paramètres deviennent prédictifs à la condition qu'ils atteignent des **prérequis**, a minima, en fonction de la CMI

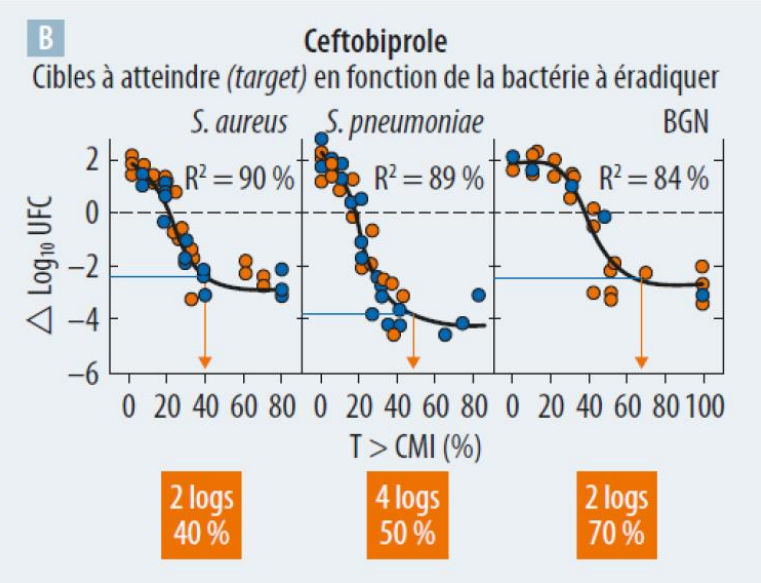
ASC/CMI = 600 (glycopeptides)
PIC/CMI = 10 (aminosides)

La valeur de ce prérequis est en fonction de **l'effet anti-bactérien** demandé à l'antibiotique

T > CMI = x % de l'intervalle (bêta-lactamines), x fixé par :

- Bactériostatique ?
- 1 log bactéricidie ?
- 2 logs bactéricidie





Approche clinique

Effect of Piperacillin-Tazobactam vs Meropenem on 30-Day Mortality for Patients With *E coli* or *Klebsiella pneumoniae* Bloodstream Infection and Ceftriaxone Resistance

A Randomized Clinical Trial

Patrick N. A. Harris, MBBS, Paul A. Tambyah, MD, [...], and David L. Paterson, MBBS, PhD

Impact of borderline minimum inhibitory concentration on the outcome of invasive infections caused by Enterobacteriaceae treated with β-lactams: a systematic review and meta-analysis

E. Torres, M. Delgado, A. Valiente, Á. Pascual & J. Rodríguez-Baño

European Journal of Clinical Microbiology & Infectious Diseases **34**, 1751–1758 (2015) | Cite this article

503 Accesses | **6** Citations | **1** Altmetric | Metrics

Abstract

Minimum inhibitory concentrations (MICs) have been used to denote susceptibility in vitro and to guide clinical practice. Our objective was to investigate whether the clinical outcomes of patients with invasive infections caused by Enterobacteriaceae treated with β-lactams were worse among those with a borderline susceptible MIC according to European Committee on Antimicrobial Susceptibility Testing (EUCAST) breakpoints than those with a lower MIC. Studies reporting MICs of β-lactams used for infection and clinical outcome were identified through a systematic literature search. Isolates were classified as "highly susceptible" (HS, those with MIC ≤1 dilution below the susceptibility breakpoint for the antibiotic used) and "borderline susceptible" (BS, isolates with MIC at the susceptibility breakpoint) using EUCAST

Cefepime therapy for monomicrobial bacteremia caused by cefepime-susceptible extended-spectrum beta-lactamase-producing Enterobacteriaceae: MIC matters

Nan-Yao Lee [1], Ching-Chi Lee, Wei-Han Huang, Ko-Chung Tsui, Po-Ren Hsueh, Wen-Chien Ko

Affiliations + expand

PMID: 23090931 DOI: 10.1093/cid/cis916

Abstract

Background: Extended-spectrum ß-lactamase (ESBL)-producing Enterobacteriaceae isolates are important clinical pathogens. In addition, the efficacy of cefepime for such infections is controversial.

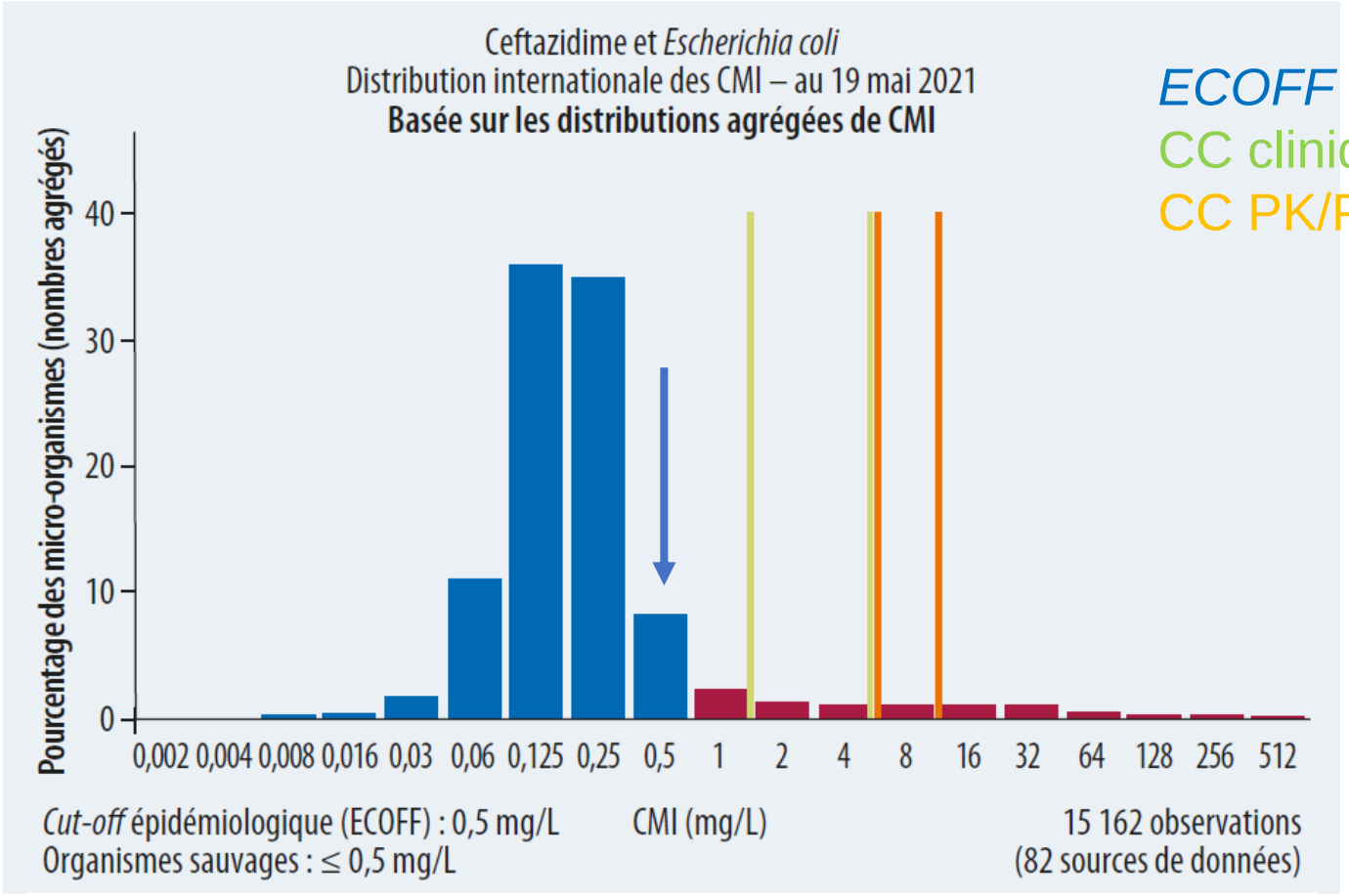
Methods: We performed a retrospective study of monomicrobial bacteremia caused by ESBL producers at 2 medical centers between May 2002 and August 2007. The patients definitively treated with in vitro active cefepime (cases) were compared with those treated with a carbapenem (controls) in a propensity score-matched analysis to assess therapeutic effectiveness. The 30-day crude mortality is the primary endpoint.

Results: A total of 178 patients were eligible for the study. Patients who received cefepime (n = 17) as definitive therapy were more likely to have a clinical failure (odds ratio [OR] 6.2; 95% confidence interval [CI], 1.7-22.5; P = .002), microbiological failure (OR 5.5; 95% CI, 1.3-25.6; P = .04), and 30-day mortality (OR 7.1; 95% CI, 2.5-20.3; P < .001) than those who received carbapenem therapy (n = 161). Multivariate regression revealed that a critical illness with a Pitt bacteremia score ≥ 4 points (OR 5.4; 95% CI, 1.4-20.9; P = .016), a rapidly fatal underlying disease (OR 4.4; 95% CI, 1.5-12.6; P = .006), and definitive cefepime therapy (OR 9.9; 95% CI, 2.8-31.9; P < .001) were independently associated with 30-day crude mortality. There were 17 case-control pairs in the propensity scores matched analysis. The survival analysis consistently found that individuals who received cefepime therapy had a lower survival rate (log-rank test, P = .016).

Table 1. Clinical outcome in 42 patients with ESBL-producing *Klebsiella* spp. or *E. coli* bacteraemia and treated with cephalosporin monotherapy

Outcome	MIC ≤ 1 mg/L	MIC 2 mg/L	MIC 4 mg/L	MIC 8 mg/L
Success	81%	67%	27%	11%
Failure	19%	33%	73%	89%

Concentrations critiques « bactériologiques »



ECOFF = 0,5 mg/L
CC cliniques = 1 et 4 mg/L
CC PK/PD = 4 et 8 mg/L

Cephalosporins[1]	MIC breakpoints (mg/L)	
	S ≤	R >
Cefaclor	-	-
Cefadroxil (uncomplicated UTI only)	16	16
Cefalexin (uncomplicated UTI only)	16	16
Cefazolin (infections originating from the urinary tract), *E. coli*, and *Klebsiella spp.* (except *K. aerogenes*)	0.001[2]	4[2]
Cefepime	1	4
Cefiderocol	2[3]	2[3]
Cefixime (uncomplicated UTI only)	1	1
Cefotaxime (indications other than meningitis)	1	2
Cefotaxime (meningitis)	1	1
Cefoxitin (screen only)[4]	Note[4]	Note[4]
Cefpodoxime (uncomplicated UTI only)	1	1
Ceftaroline	0.5	0.5
Ceftazidime	1	4

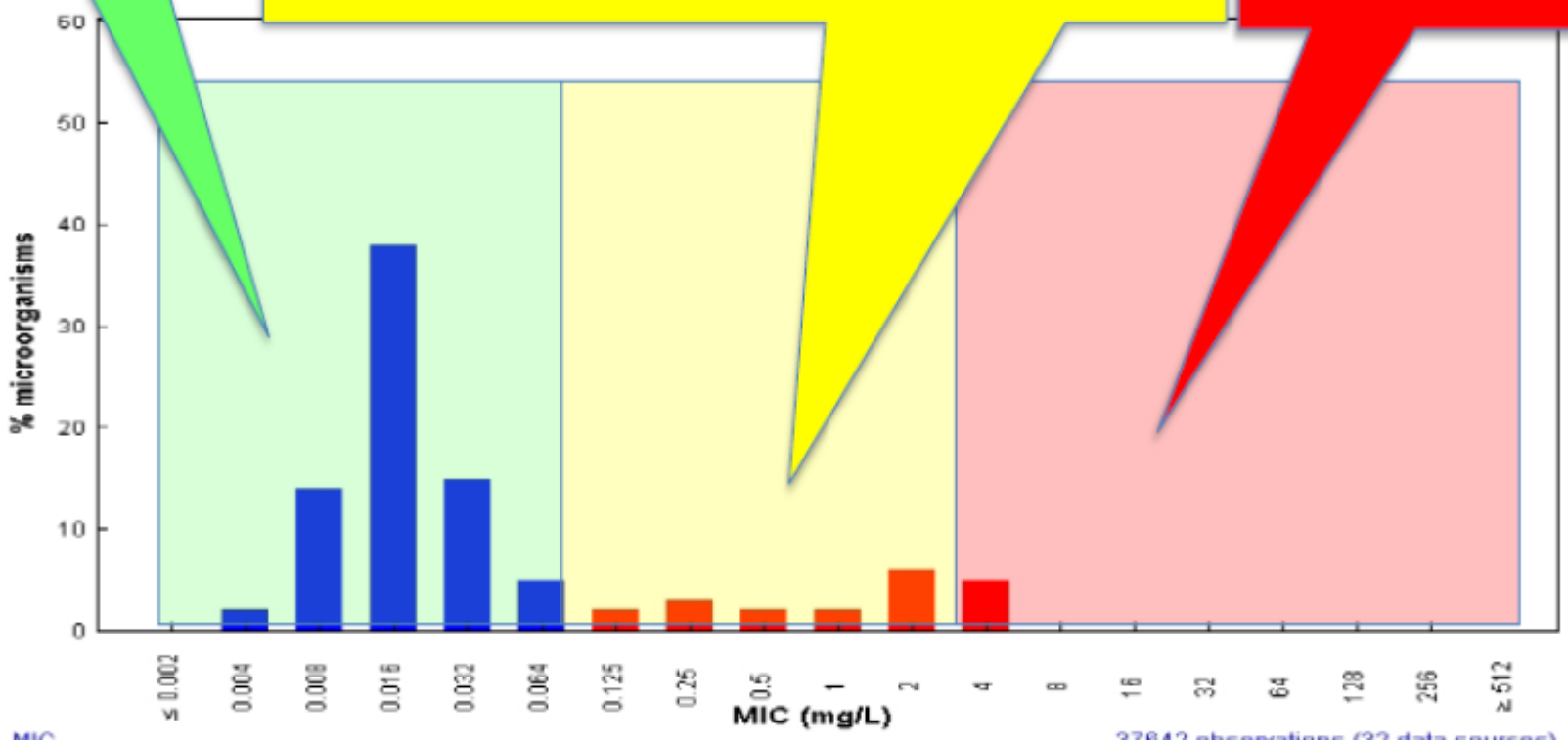
Ancienne définition

Susceptible

Intermediate

Uncertain effect.
Buffer zone for technical variation.
For a high dose.
Where concentrated for pharmacokinetic reasons.

Resistant



Définition de l'ancienne catégorie « I »

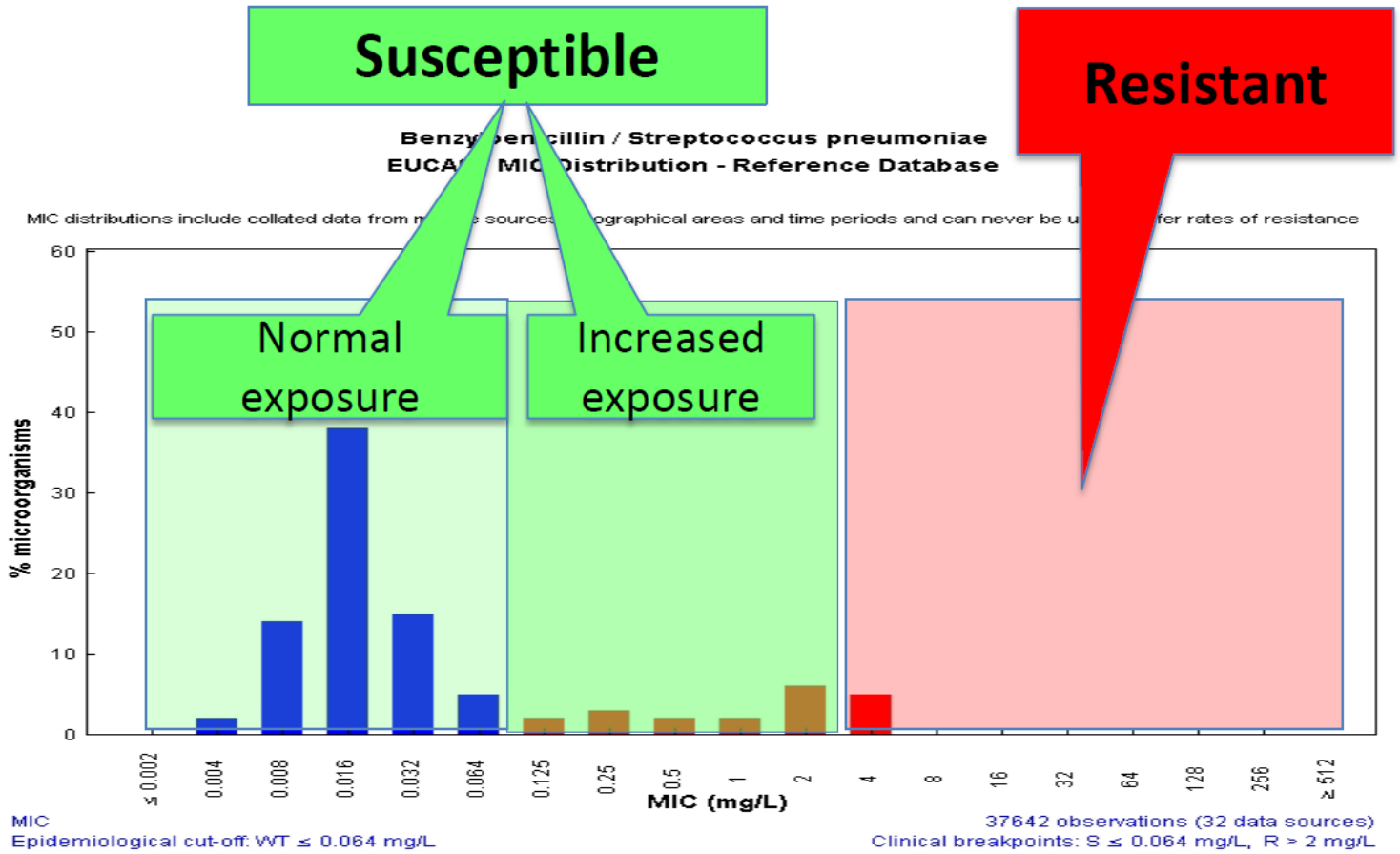
"A microorganism is defined as intermediate by a level of antimicrobial agent activity associated with **uncertain therapeutic effect**. It implies that an infection due to the isolate may be appropriately treated in body sites **where the drugs are physiologically concentrated** or when a **high dosage of drug can be used**; it also indicates a **buffer zone that should prevent small, uncontrolled, technical factors** from causing major discrepancies in interpretations."

ECOFF

Sensible à forte exposition

Zone d'incertitude technique

<u>En 2019</u>: nouvelle définition de «I»



Nouvelle définition du «I»

I – Susceptible, increased exposure: A microorganism is categorised as *Susceptible, Increased exposure** when there is a high likelihood of therapeutic success because exposure to the agent is increased by adjusting the dosing regimen or by its concentration at the site of infection.

* Exposure is a function of how the mode of administration, dose, dosing interval, infusion time, as well as distribution, metabolism and excretion of the antimicrobial agent will influence the infecting organism at the site of infection.

Les 3 définitions actuelles de S-I-R

6. EUCAST breakpoints are used to categorise results into three susceptibility categories:
S - Susceptible, standard dosing regimen: A microorganism is categorised as *Susceptible, standard dosing regimen,* when there is a high likelihood of therapeutic success using a standard dosing regimen of the agent.
I - Susceptible, increased exposure: A microorganism is categorised as *Susceptible, increased exposure* * when there is a high likelihood of therapeutic success because exposure to the agent is increased by adjusting the dosing regimen or by its concentration at the site of infection.
R - Resistant: A microorganism is categorised as *Resistant* when there is a high likelihood of therapeutic failure even when there is increased exposure.
*Exposure is a function of how the mode of administration, dose, dosing interval, infusion time, as well as distribution and excretion of the antimicrobial agent will influence the infecting organism at the site of infection.

La probabilité de succès ou échec thérapeutique

exposition du germe

dosage de l'antibiotique

Mise en place de la nouvelle définition de «I» en décembre 2020 à l'H-JU

Antibiogrammes : nouvelle définition de la catégorie « I » (Intermédiaire) selon Eucast 2020

Dès le 1er décembre 2020, le laboratoire fait une mise à jour des interprétations Eucast (European Committee on Antimicrobial Susceptibility Testing). Le principal changement concerne la nouvelle définition de la catégorie « I » ainsi que des nouvelles recommandations de dosages.

Nouvelles définitions des catégories :

	Interprétation de la catégorie	Signification
S	SENSIBLE avec une dose standard	Succès thérapeutique avec une dose standard
I	SENSIBLE avec une haute dose/exposition	Succès thérapeutique avec une haute dose/exposition
R	RESISTANT	Echec thérapeutique

Conséquences: P. aeruginosa multi-sensible aux B-lactamines est rendu I à toutes les B-lactamines

EXPECTORATIONS 1

Bactériologie générale

Gram :

Leucocytes	> 25 / champ	Bacilles Gram négatif	Quelques
Cocci gram positif	Assez nombreux	Cellules épithéliales	< 25 / champ
Bacilles Gram positif	Rares	Fusiformes	Quelques

CULTURE

Pseudomonas aeruginosa	Rares	Réf. n°1
Aspergillus fumigatus	Assez nombreux	
Flore rhino-pharyngée	Assez nombreuse	

ANTIBIOGRAMME Germe n°	1
Pipéracilline + Tazobactam	I
Ceftazidime	I
Céfépime	I
Imipénème	I
Amikacine	S
Tobramycine	S
Ciprofloxacine	I
Lévofloxacine	I

R = Resistant S = Sensible I = Sensible à une exposition/dose supérieure d'antibiotique

EUCAST EUROPEAN COMMITTEE ON ANTIMICROBIAL SUSCEPTIBILITY TESTING

P. aeruginosa multi-sensible (S) est rendu I aux bêta-lactamines et chinolones

depuis 2020

EXPECTORATIONS 1

Bactériologie générale

Gram :

Leucocytes	> 25 / champ	Bacilles Gram négatif	Quelques
Cocci gram positif	Assez nombreux	Cellules épithéliales	< 25 / champ
Bacilles Gram positif	Rares	Fusiformes	Quelques

CULTURE

Pseudomonas aeruginosa	Rares	Réf. n°1
Aspergillus fumigatus	Assez nombreux	
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ANTIBIOGRAMME Germe n°	1
Pipéracilline + Tazobactam	I
Ceftazidime	I
Céfépime	I
Imipénème	I
Amikacine	S
Tobramycine	S
Ciprofloxacine	I
Lévofloxacine	I

R = Resistant S = Sensible I = Sensible à une exposition/dose supérieure d'antibiotique

avant 2020

EXPECTORATIONS 1

Bactériologie générale

Gram :

Leucocytes	> 25 / champ	Cellules épithéliales	> 25 / champ
Cellules bronchiques	Non décelés	Bacilles Gram négatif	Quelques
Cocci gram positif	Quelques		

CULTURE

Pseudomonas aeruginosa	Assez nombreux	Réf. n°1
Flore rhino-pharyngée	Assez nombreuse	

ANTIBIOGRAMME Germe n°	1
Pipéracilline + Tazobactam	S
Ceftazidime	S
Céfépime	S
Imipénème	S
Méropénème	S
Amikacine	S
Gentamicine	S
Tobramycine	S
Ciprofloxacine	S
Lévofloxacine	S

?

Ce qui a changé, c'est la façon de rendre l'antibiogramme, pas la méchanceté de la bactérie!

Problème #1: antibiotic stewardship!

Overly broad-spectrum antibiotic treatment of wild-type *Pseudomonas aeruginosa* infections in relation to the EUCAST new definition of susceptibility testing categories, a retrospective multicentre cohort study

Clément Ourghanlian[1,2*], Vincent Fihman[3], Antoine Morel[4,5], Charlotte Lafont[4,5], Adrien Galy[1], Eimma Calimouttoupoulle[2], Paul-Louis Woerther[3,6] and Raphaël Lepeule[1]

Conclusions: This new definition can cause a negative impact on the use of overly broad-spectrum antibiotic treatment due to misunderstanding by clinicians. Its successful implementation requires adaptation of software for reporting antibiotic susceptibility, a sustained strong information campaign by microbiologists and support by an antimicrobial stewardship team.

JAC Antimicrob Resist. 2022.; CMI. 2021.; www.eucast.org

Problème #1: antibiotic stewardship!

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Conclusions: This new definition can cause a negat
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Impact of 2020 EUCAST criteria on meropenem prescription for the treatment of *Pseudomonas aeruginosa* infections: an observational study in a university hospital

Aline Munting • Jean Regina • José Damas • ... Benoît Guery • Laurence Senn • Benjamin Viala •
Show all authors

Results

Among the 264 patients included, 40 (15.2%) received meropenem, 3.4% (5/148) before EUCAST update versus 30.2% (35/116) after ($p < 0.001$). Supervision and counselling from IDs and the use of increased dosages of non-carbapenem

JAC Antimicrob Resist. 2022.; CMI. 2021.; www.eucast.org

Problème #1: antibiotic stewardship!

**Overly broad-spectrum antibiotic treatment of wild-type *Pseudomon*
new definitior**

Clément Ourghanli
Eimm

Conclusions: This new d
treatment due to misun
for reporting antibiotic s
by an antimicrobial stew

The European Committee on Antimicrobial Susceptibility Testing – EUCAST

15.07.2022

Selective susceptibility testing and reporting

EUCAST still receives comments from colleagues in clinical microbiology that when organisms are reported "I" (Susceptible, increased exposure"), clinical colleagues will favor agents for which the organism has been reported "S" (Susceptible, standard dose), thinking that an S is better than an I. One example most often brought forward is *Pseudomonas aeruginosa* where piperacillin-tazobactam, ceftazidime, ciprofloxacin, levofloxacin, imipenem (to mention some of the most common) will be reported "Susceptible, increased exposure", when the organism has no resistance mechanisms. There is a risk clinical colleagues favor meropenem, meropenem-vaborbactam, imipenem-relebactam, ceftolozane-tazobactam, ceftazidime-avibactam or cefiderocol because these are reported "Susceptible, standard dose" and that these agents are therefore unnecessarily over-used.

meropenem prescription for the
sa infections: an observational

ery • Laurence Senn • Benjamin Viala

3.4% (5/148) before EUCAST update versus 30.2%
the use of increased dosages of non-carbapenem

JAC Antimicrob Resist. 2022.; CMI. 2021.; www.eucast.org

Problème #1: antibiotic stewardship!

**Overly broad-spectrum antibiotic treatment of wild-type *Pseudomon*
new definitior**

Clément Ourghanli
Eimm

The European Committee on
Antimicrobial Susceptibility Testing – EUCAST

message #1: S et I = susceptible; seulement R = résistant

and reporting

EUCAST still receives comments from colleagues in clinical microbiology that when organisms are reported "I" (Susceptible, increased exposure"), clinical colleagues will favor agents for which the organism has been reported "S" (Susceptible, standard dose), thinking that an S is better than an I. One example most often brought forward is *Pseudomonas aeruginosa* where piperacillin-tazobactam, ceftazidime, ciprofloxacin, levofloxacin, imipenem (to mention some of the most common) will be reported "Susceptible, increased exposure", when the organism has no resistance mechanisms. There is a risk clinical colleagues favor meropenem, meropenem-vaborbactam, imipenem-relebactam, ceftolozane-tazobactam, ceftazidime-avibactam or cefiderocol because these are reported "Susceptible, standard dose" and that these agents are therefore unnecessarily over-used.

for the
ections: an observational

ery • Laurence Senn • Benjamin Viala

3.4% (5/148) before EUCAST update versus 30.2%
the use of increased dosages of non-carbapenem

JAC Antimicrob Resist. 2022.; CMI. 2021.; www.eucast.org

Problème #2
I = susceptible, increased exposure ➡ augmenter le dosage?

EXPECTORATIONS 1

Bactériologie générale

Gram :

Leucocytes	> 25 / champ	Bacilles Gram négatif	Quelques
Cocci gram positif	Assez nombreux	Cellules épithéliales	< 25 / champ
Bacilles Gram positif	Rares	Fusiformes	Quelques

CULTURE

Pseudomonas aeruginosa	Rares	Réf. n°1
Aspergillus fumigatus	Assez nombreux	
Flore rhino-pharyngée	Assez nombreuse	

ANTIBIOGRAMME Germe n°	1
Pipéracilline + Tazobactam	I
Ceftazidime	I
Céfépime	I
Imipénème	I
Amikacine	S
Tobramycine	S
Ciprofloxacine	I
Lévofloxacine	I

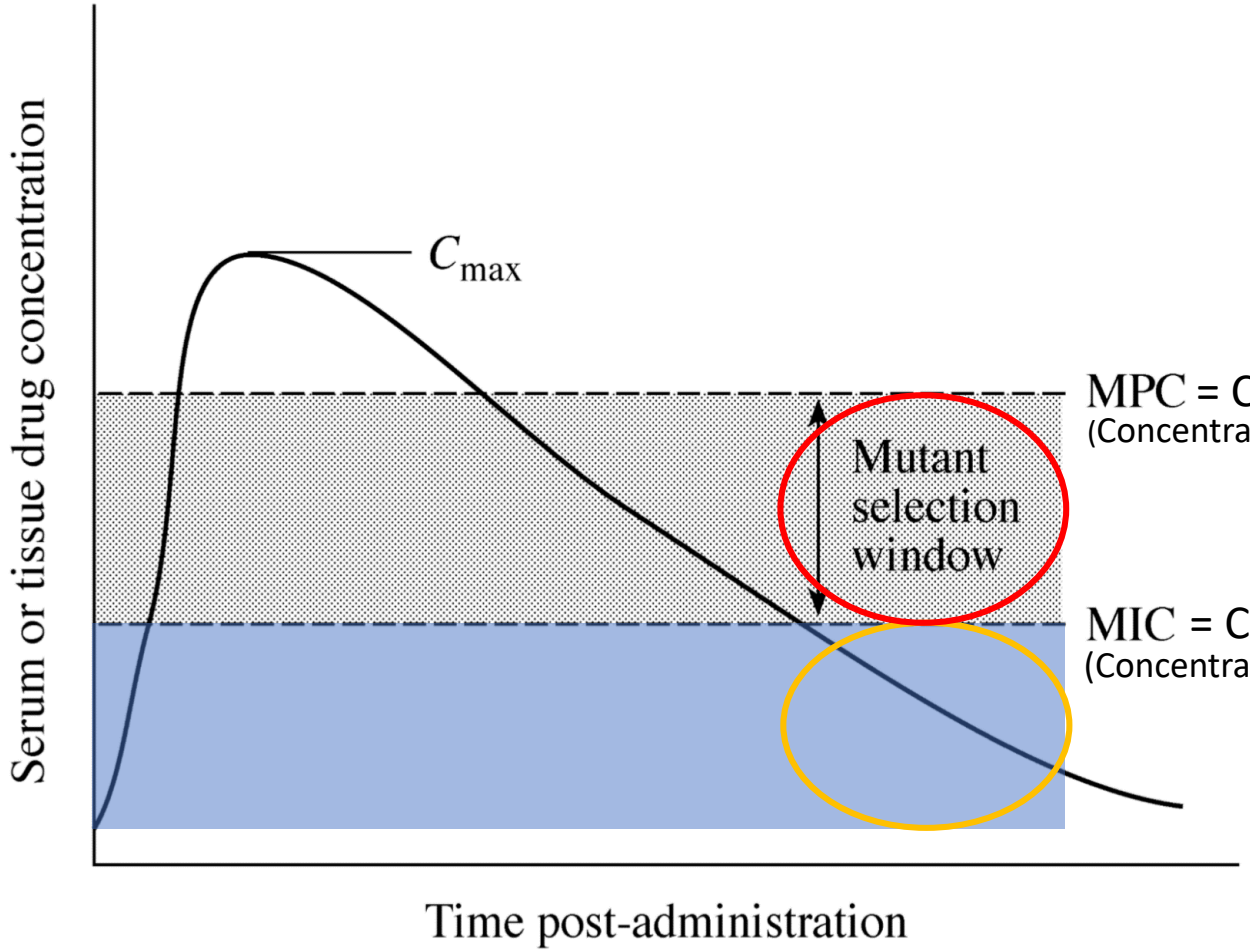
R = Resistant S = Sensible I = Sensible à une exposition/dose supérieure d'antibiotique

	Dosage standard	**Dosage élevé**
Céfépime	1g 3x/j i.v.	**2g** 3x/j i.v.
Ciprofloxacine	500mg 2x/j p.o.	**750mg** 2x/j p.o.

1. Antibiothérapie nécessaire?
2. Qu'est-ce que c'est une exposition «supérieure»?

Développement de résistance à un antibiotique

Concept «mutant selection window»



Nécessité de > 2 mutations simultanées

MPC = CPM
(Concentration de prévention des mutants résistants)

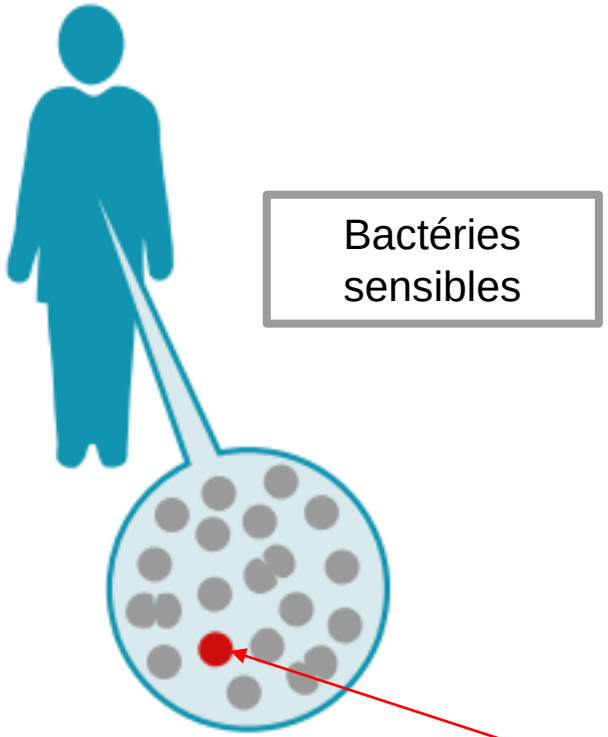
Sélection de bactéries résistantes

MIC = CMI
(Concentration minimale inhibitrice)

Développement de «de novo» résistances

Karl Drlica. JAC. 2003

Comment une antibiothérapie peut créer des resistances?

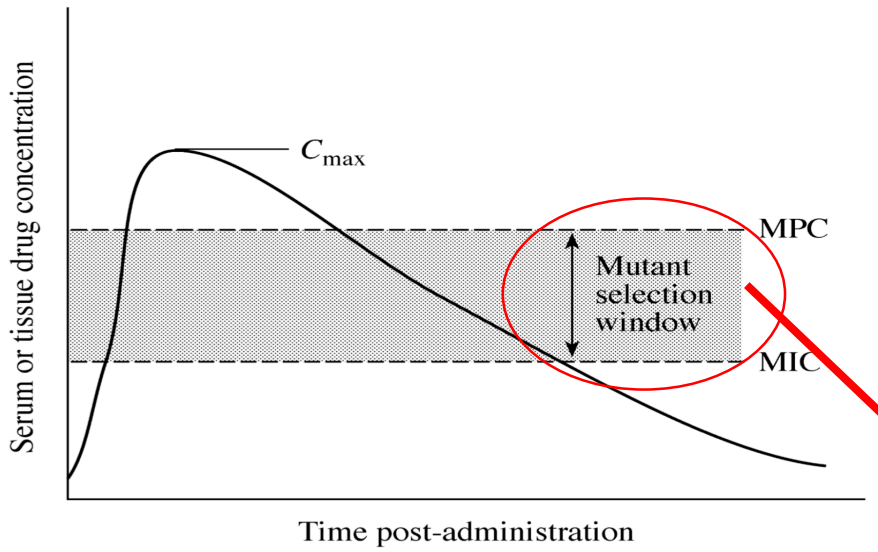


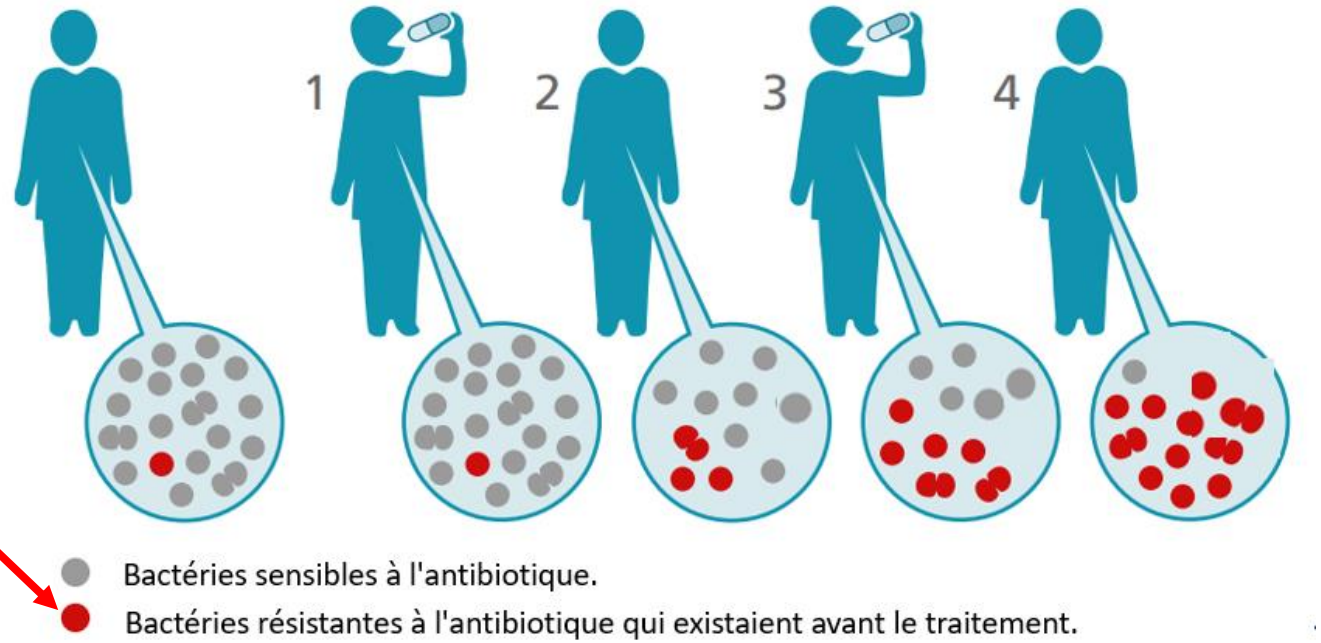
Bactéries sensibles

Bactéries résistantes

Pas en forme. En équilibre avec les autres bactéries.

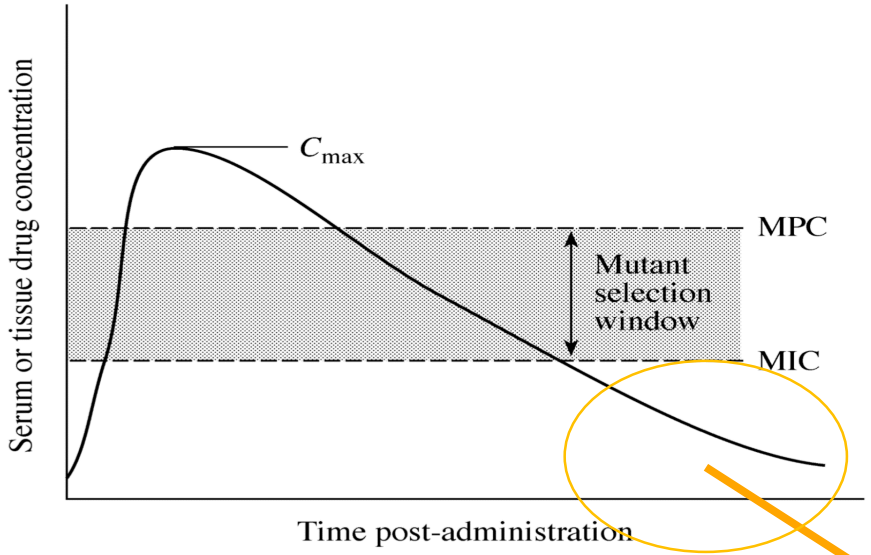
Comment une antibiothérapie peut créer des resistances?

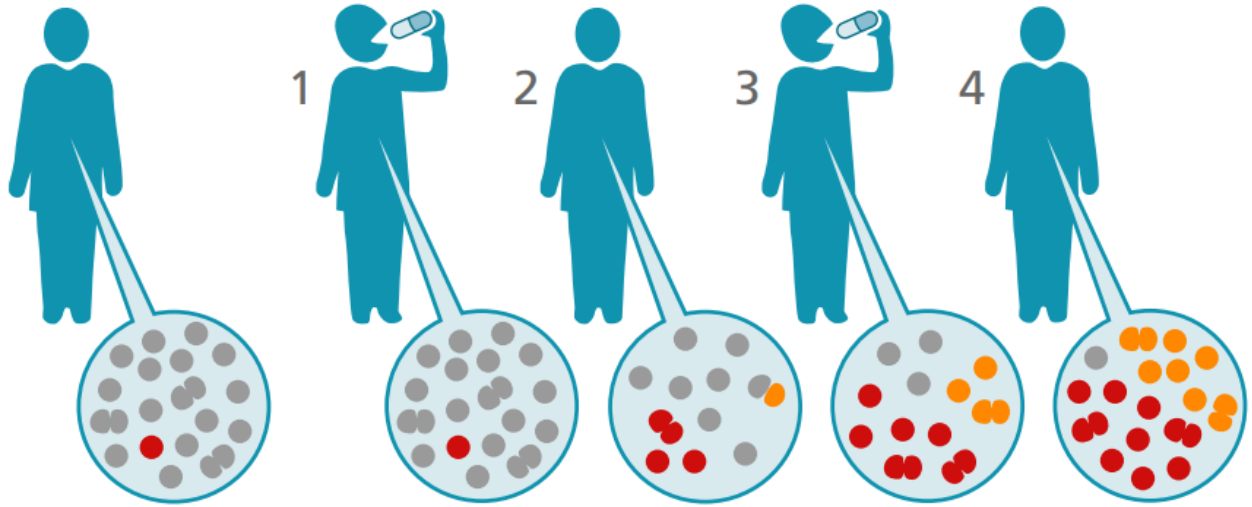




Principe de résistance: **SELECTION**

Comment une antibiothérapie peut créer des resistances?

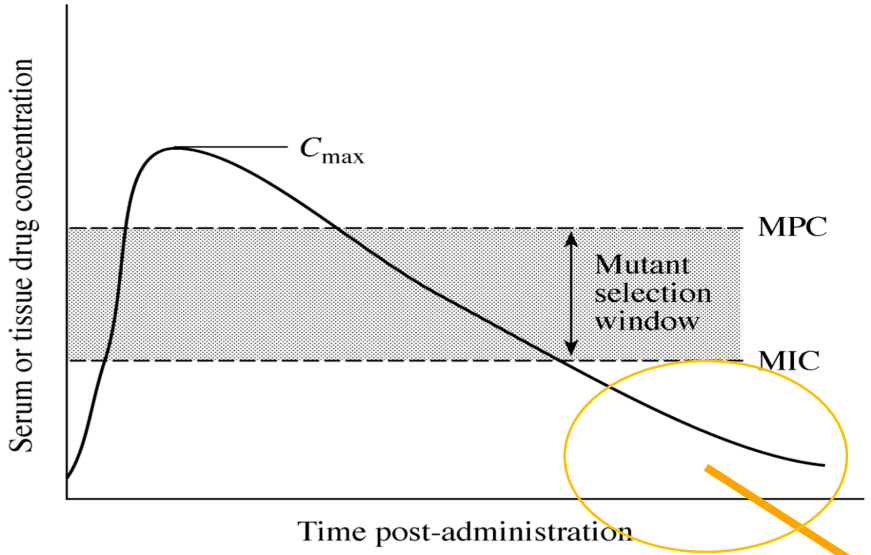


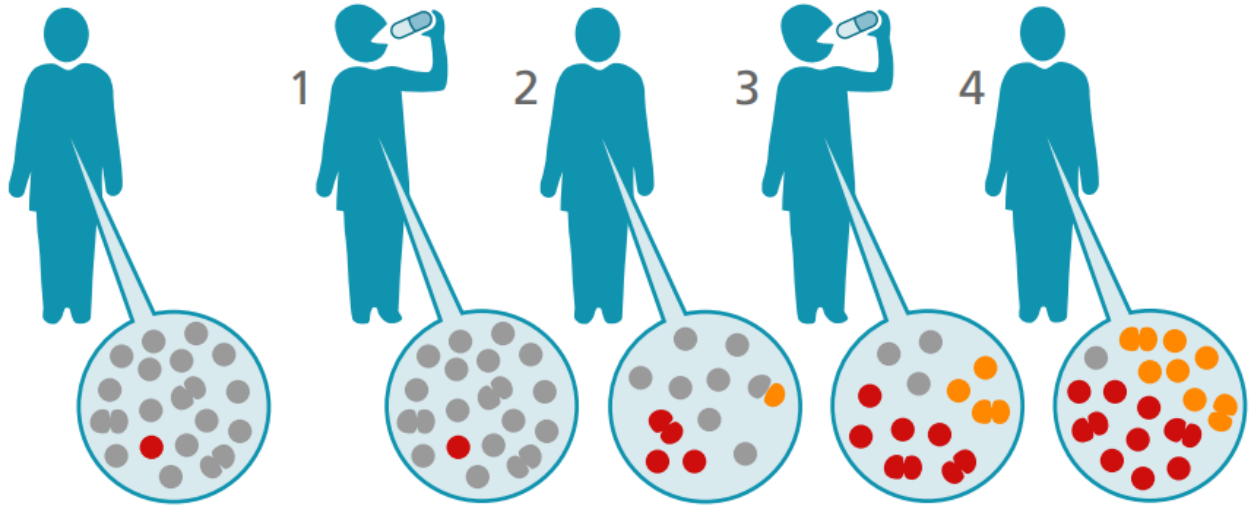


- Bactéries sensibles à l'antibiotique.
- Bactéries résistantes à l'antibiotique qui existaient avant le traitement.
- Bactéries résistantes apparues pendant le traitement (par mutation).

Karl Drlica. JAC. 2003

Comment une antibiothérapie peut créer des resistances?





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Principe de résistance: **NOUVELLE FORMATION (de novo mutation)**

Karl Drlica. JAC. 2003

Problème #2
I = susceptible, increased exposure ➡ augmenter le dosage?

EXPECTORATIONS 1

Bactériologie générale

Gram :

Leucocytes > 25 / champ

Cocci gram positif

message #2: c'est compliqué, but = succès thérapeutique sans toxicité

I: dosage élevé en fonction de l'infection (sévérité, localisation…)

	1
Pipéracilline + Tazobactam	I
Ceftazidime	I
Céfépime	I
Imipénème	I
Amikacine	S
Tobramycine	S
Ciprofloxacine	I
Lévofloxacine	I

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Réémergences: Diphthérie

RAPID COMMUNICATION

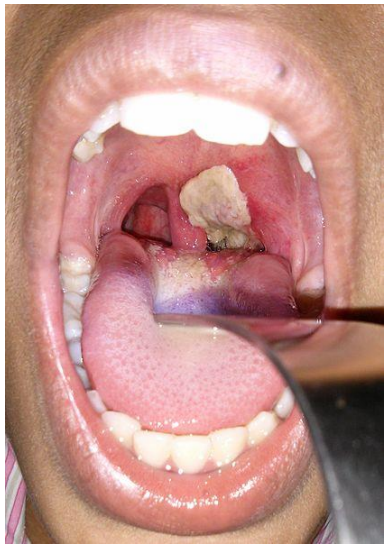
Ongoing toxin-positive diphtheria outbreaks in a federal asylum centre in Switzerland, analysis July to September 2022

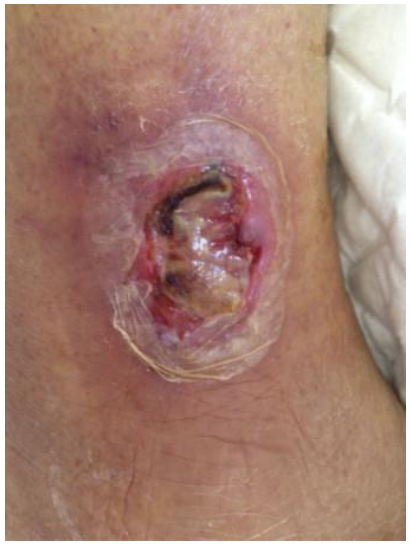
Jacob Kofler[1,*], Alban Ramette[2,*], Patricia Iseli[3], Lea Stauber[2], Jens Fichtner[1], Sara Droz[2], Annina Zihler Berner[2], Anna Bettina Meier[1], Michelle Begert[4], Sabine Negri[4], Anne Jachmann[1], Peter Michael Keller[2,**], Cornelia Staehelin[5,**], Barbara Grützmacher[1,**]

- 07/22 et 09/22 outbreaks de diphthérie dans un centre d'asylat à Berne
- 17 infections, median 16ans, origine Afghanistan
- 6 patients avec atteinte respiratoire, nécessitaient DAT (diphthérie anti-toxin), première fois en CH depuis les années 1970
- Analyse génomique montrait peu de monoclonalité
  - Très peu de transmission dans le centre d'asylat
  - Route de transmission sur la route de Balkan (?), plusieurs centre d'asylats incl. «shamsi camp» en serbie (surpeuplement, mauvaises installations sanitaires)
- Couverture vaccinale en suisse: 96%
- Assurer la protection vaccinale chez toute personne qui travaille avec les requérants d'asyle
- Occasion de revoir le statut vaccinale chez votre patient (rappel dT fait?)

Ongoing toxin-positive diphtheria outbreaks in a federal asylum centre in Switzerland. Jacob et al. Euro Surveill. 2022.
WHO. Diphtheria tetanus toxoid and pertussis immunisation coverage among 1-year-old (%). Geneva: WHO. (accessed online 11.11.22)

Diphthérie - portrait





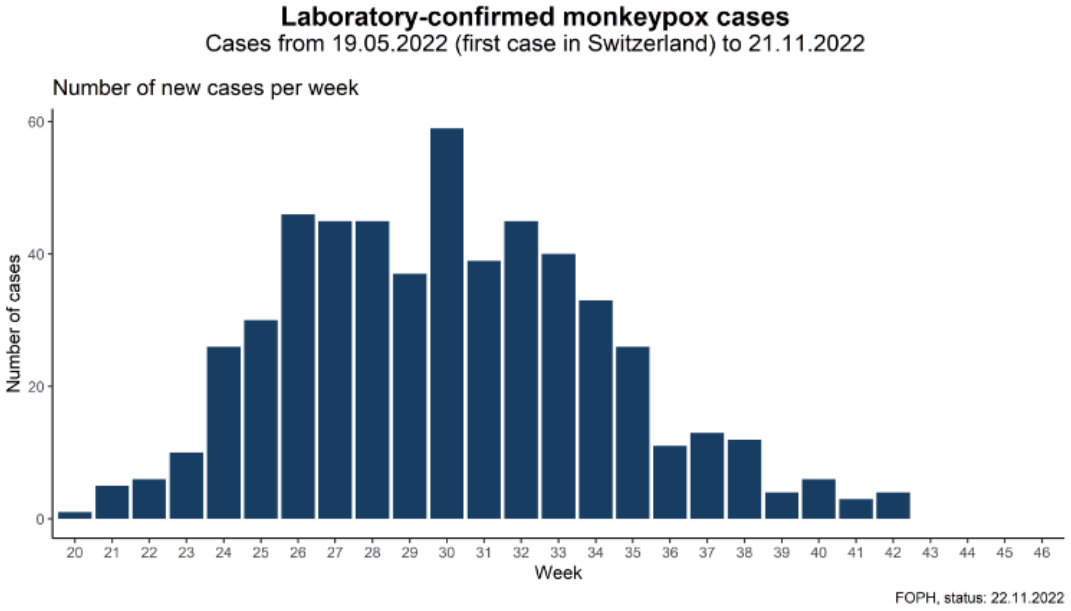
- *Corynebacterium diphtheriae*
- Maladie chez l'homme
- Transmission: gouttelettes (rare: contact)
- Temps d'incubation: 2-5 jours
- 2 infections (simplification)
  - Respiratoire: angine -> membranes -> asphyxie. Toxines -> affaiblissement cardiaque, paralysie, défaillance d'organes vitaux. Mortalité 10%.
  - Cutanée: fausses membranes sur plaie, lésion douloureuse, guérissant lentement
- Déclaration obligatoire en CH
- Vaccination
  - pas de diphthérie respiratoire autochtone en Suisse depuis > 1983 (?)
  - Vacciation efficace contre toxine mais pas du portage→ n'exclut pas une infection cutanée
- Rappel nécessaire pour maintenir la protection (24-64ans: x20ans; après: x10ans)

www.wikipedia.org; docplayer.org (Tropenmedizin, Hausarztpraxis, Flüchtlingsbetreuung)

Monkeypox (variole du singe)

22 November 2022, 9 am	New	Total since 21 May 2022
Laboratory-confirmed cases (people resident in Switzerland and Liechtenstein)	0	546

The last laboratory-confirmed case was reported on 21 October 2022.



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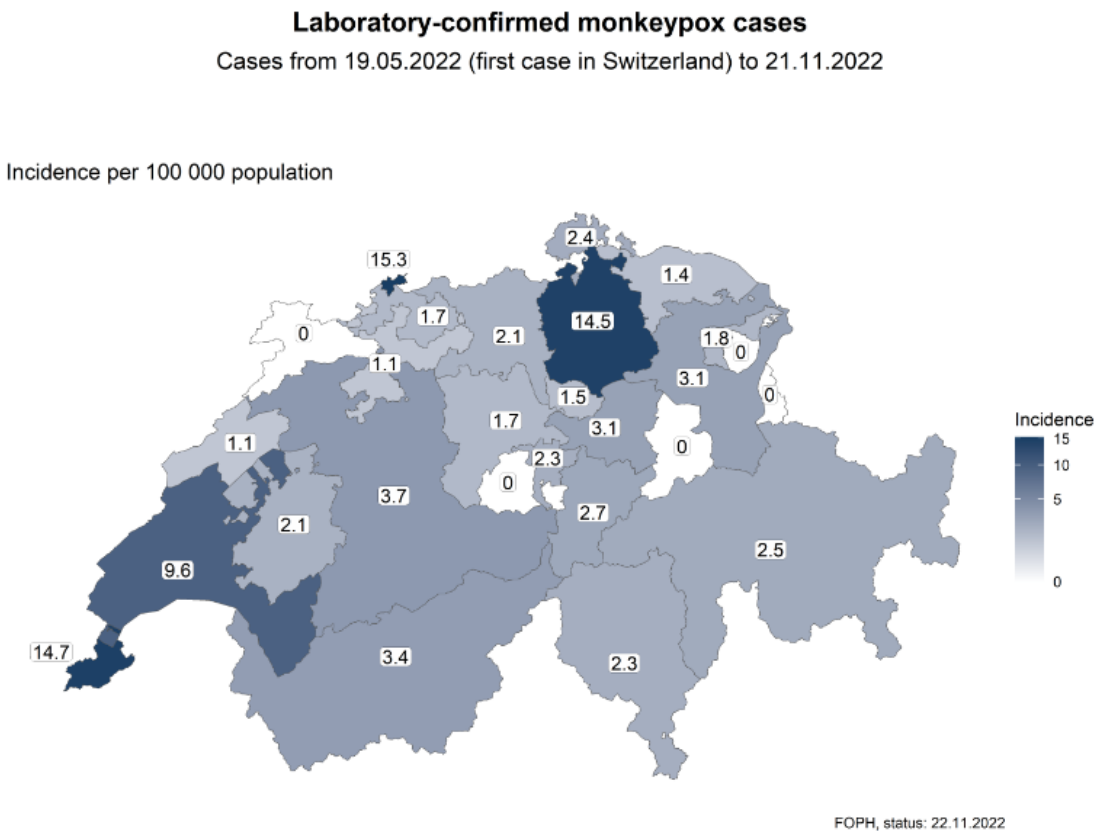
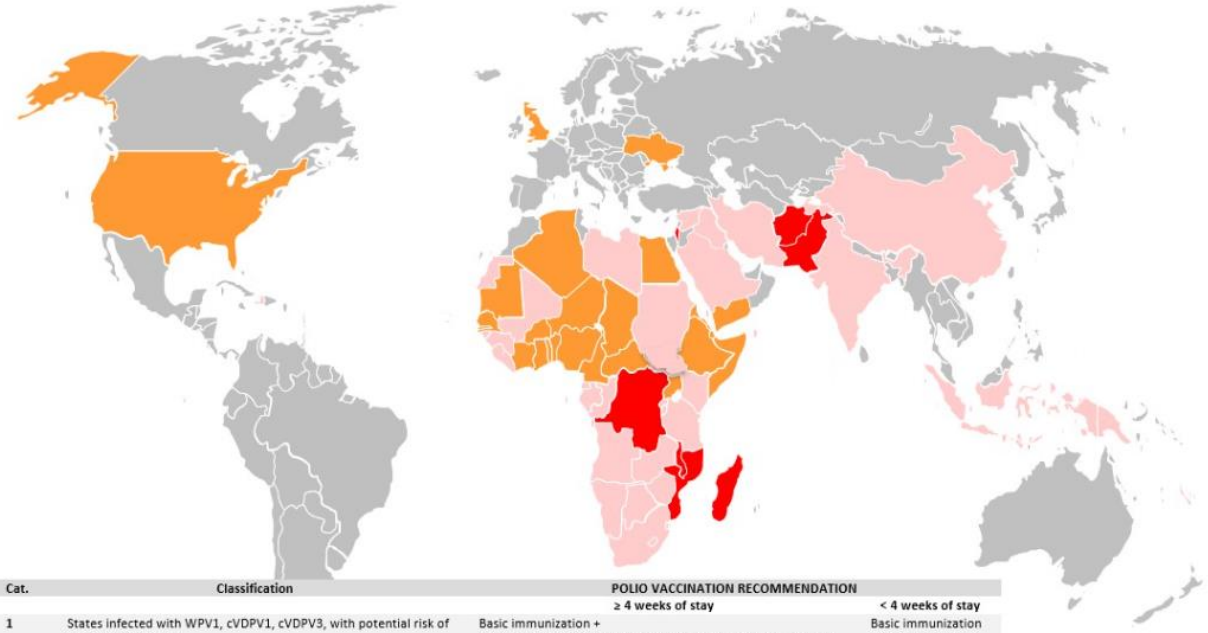


Réémergence: Poliomyélite

Poliomyelitis Vaccination –
Recommendation of the Swiss ECTM as of NOVEMBER 2022



	Cat.	Classification	POLIO VACCINATION RECOMMENDATION	
			≥ 4 weeks of stay	< 4 weeks of stay
RED	1	States infected with WPV1, cVDPV1, cVDPV3, with potential risk of international spread	Basic immunization + On departure from a country belonging to category 1, persons **must** have received a polio booster vaccine (IPV) no longer than 12 months ago. *	Basic immunization and booster every 10 years
ORANGE	2	States infected with cVDPV2, with or without evidence of local transmission	Basic immunization + On departure from a country belonging to category 2, persons are **strongly recommended** to have received a polio booster vaccine (IPV) no longer than 12 months ago.*	Basic immunization and booster every 10 years
ROSE	3	States no longer infected by WPV1 or cVDPV but which remain vulnerable to re-infection by WPV or cVDPV (according to WHO) **OR** that are classified as vulnerable to polio outbreaks by the Independent Monitoring Board and the Global Polio Eradication Initiative, and ECTM. Countries not visible but also included: Comoros, Haiti, Kiribati, Seychelles, South Sudan, Vanuatu. For Saudi Arabia: only recommended for pilgrims.	Basic immunization and booster every 10 years.	Basic immunization and booster every 10 years

*According to WHO IHR temporary polio vaccination recommendation as of 1 November 2022

Map created by Olivia Veit, ECTM, November, 2022.
Sources: WHO, Polioeradication, Independent Monitoring Board 2019

Statement of the Thirty-third Polio IHR Emergency Committee (who.int)

HIV news

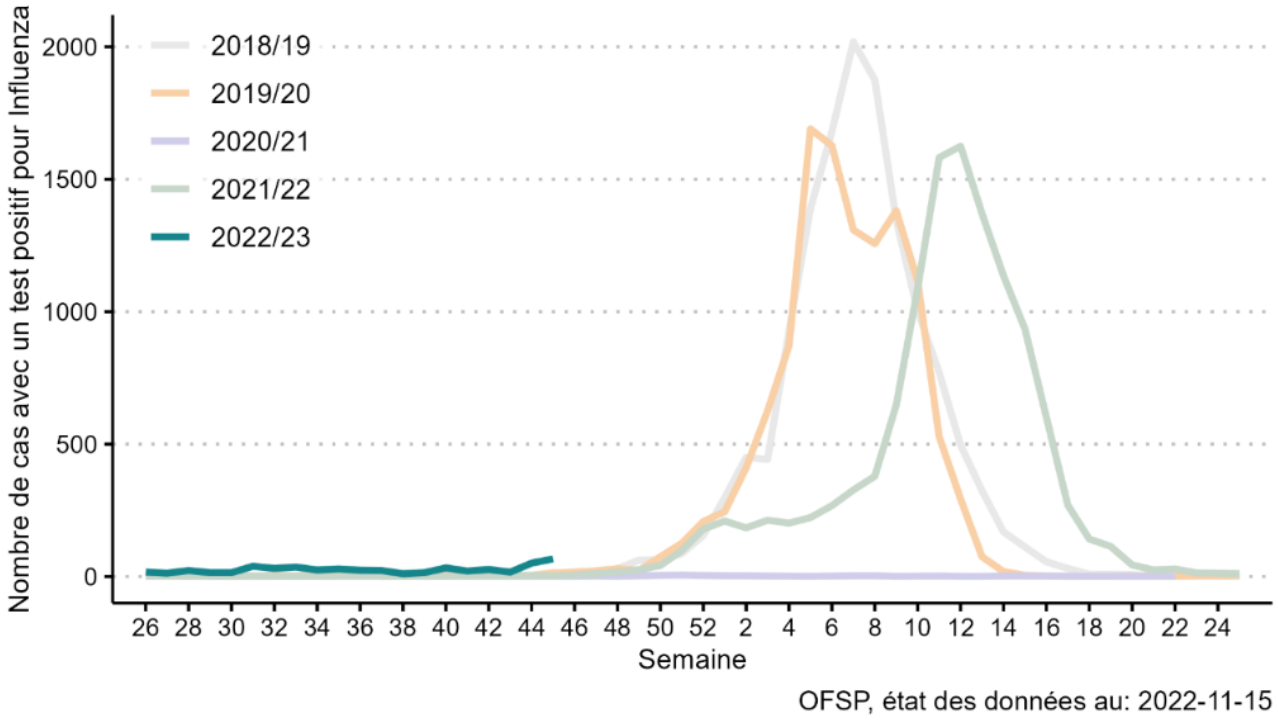
U=U

Undetectable
Equals Untransmittable

SWISS PREP ARED

Virus respiratoires saison 2022/23 – status quo

Grippe



Epidémiologie des virus respiratoires au sein du réseau de surveillance Sentinella