



La décontamination digestive sélective : doit-on vaincre nos réticences ?

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Liens d'intérêt

- ▶ Lecture: Gilead, Pfizer, MSD, Biomérieux, Bio Rad, Ficher and Paykel

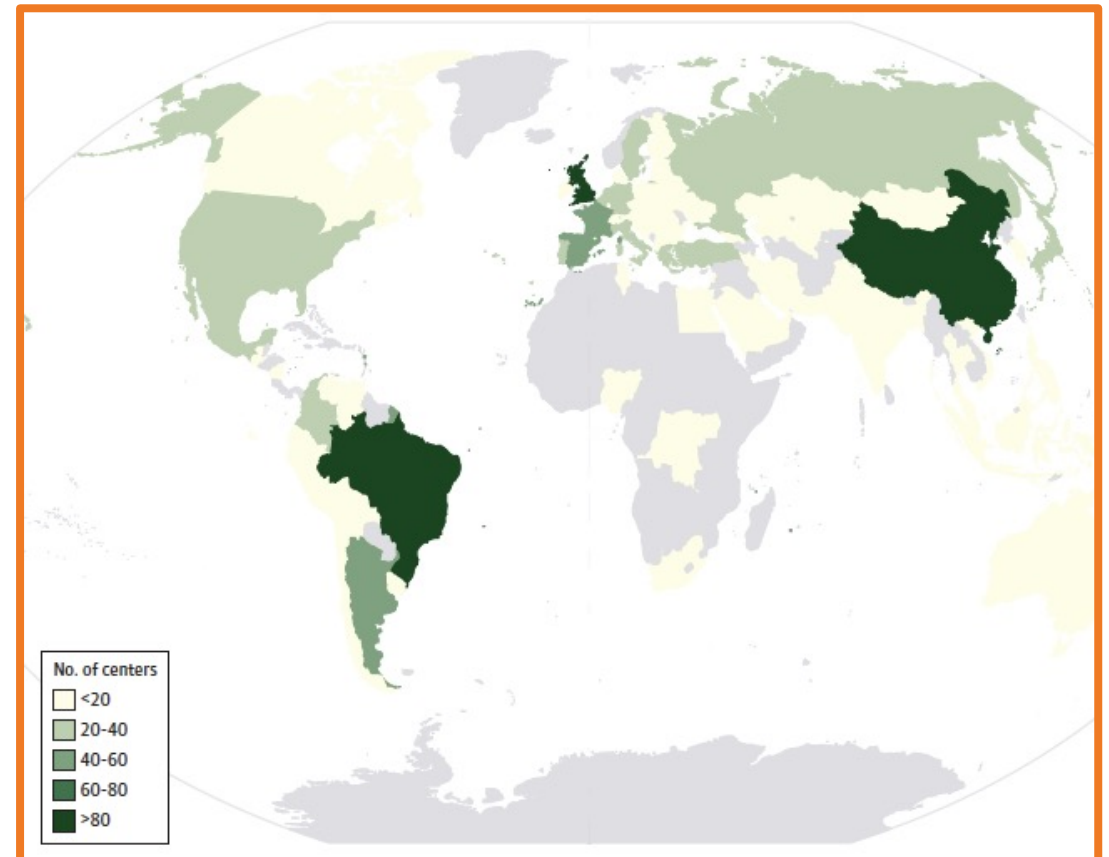
Plan

- ▶ Introduction
- ▶ Définitions et rationnel
- ▶ Efficacité de la DDS (selon incidence BMR)
- ▶ Antibiorésistance
- ▶ DDS et COVID-19
- ▶ Conclusions

Prevalence and Outcomes of Infection Among Patients in Intensive Care Units in 2017

Jean-Louis Vincent, MD, PhD; Yasser Sakr, MD, PhD; Mervyn Singer, MB, BS; Ignacio Martin-Loeches, MD; Flavia R. Machado, MD, PhD;

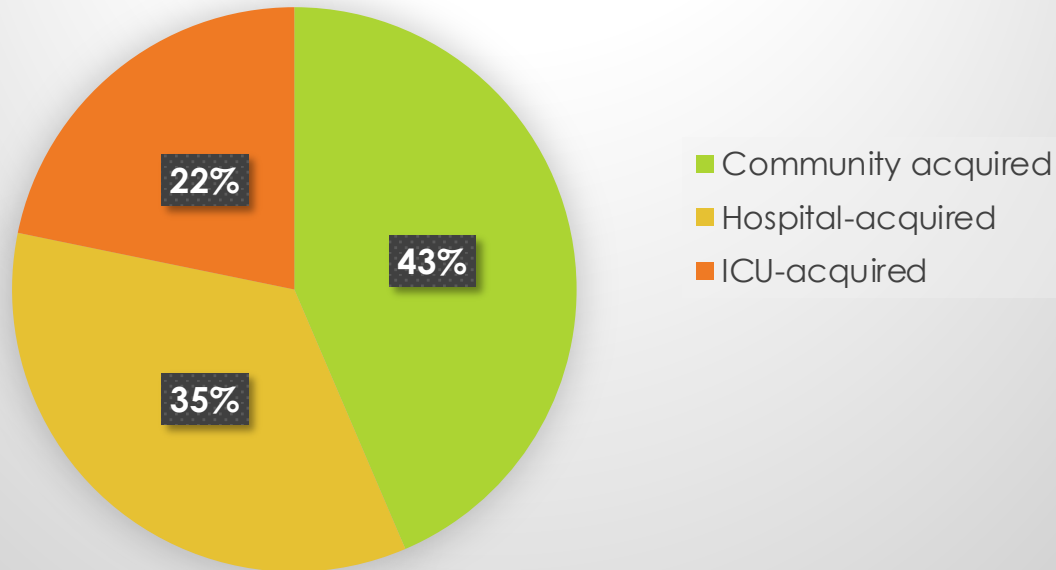
- ▶ Observational 24-hour point prevalence study
- ▶ Longitudinal follow-up, 1 150 centers, 88 countries
- ▶ 15 165 patients hospitalized in the ICU >24h
- ▶ 8135 (54%) patients with suspected or confirmed infection



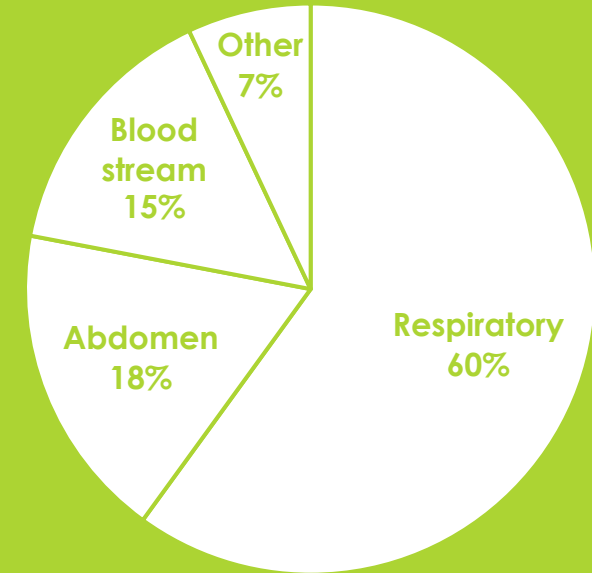
Prevalence and Outcomes of Infection Among Patients in Intensive Care Units in 2017

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Type of infection



SITE OF INFECTION



ICU-acquired infection independently associated with **higher risk of mortality** compared with community-acquired infection

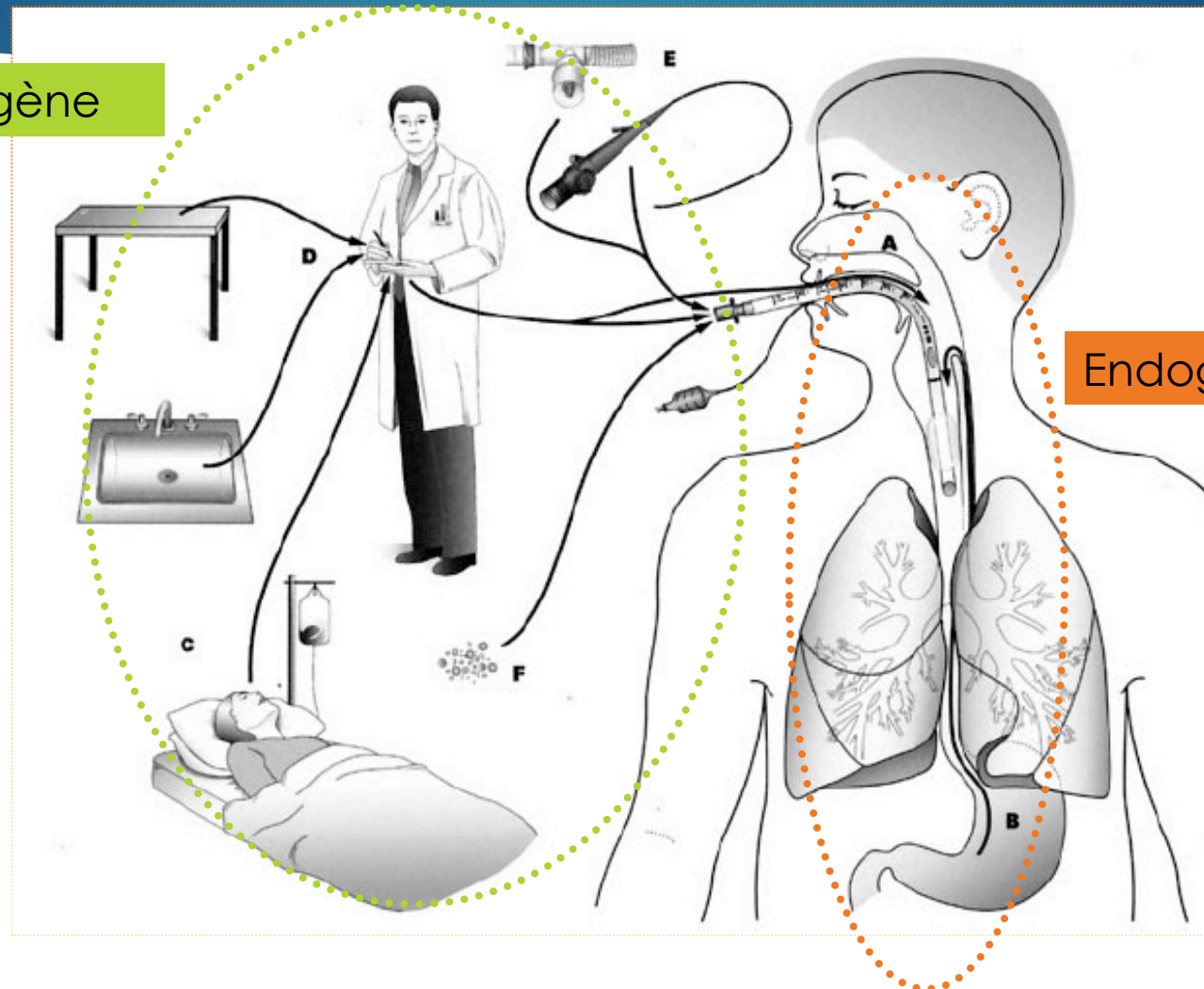
OR **1.32** [95%CI, 1.10-1.60]; P = 0.003

Rationnel

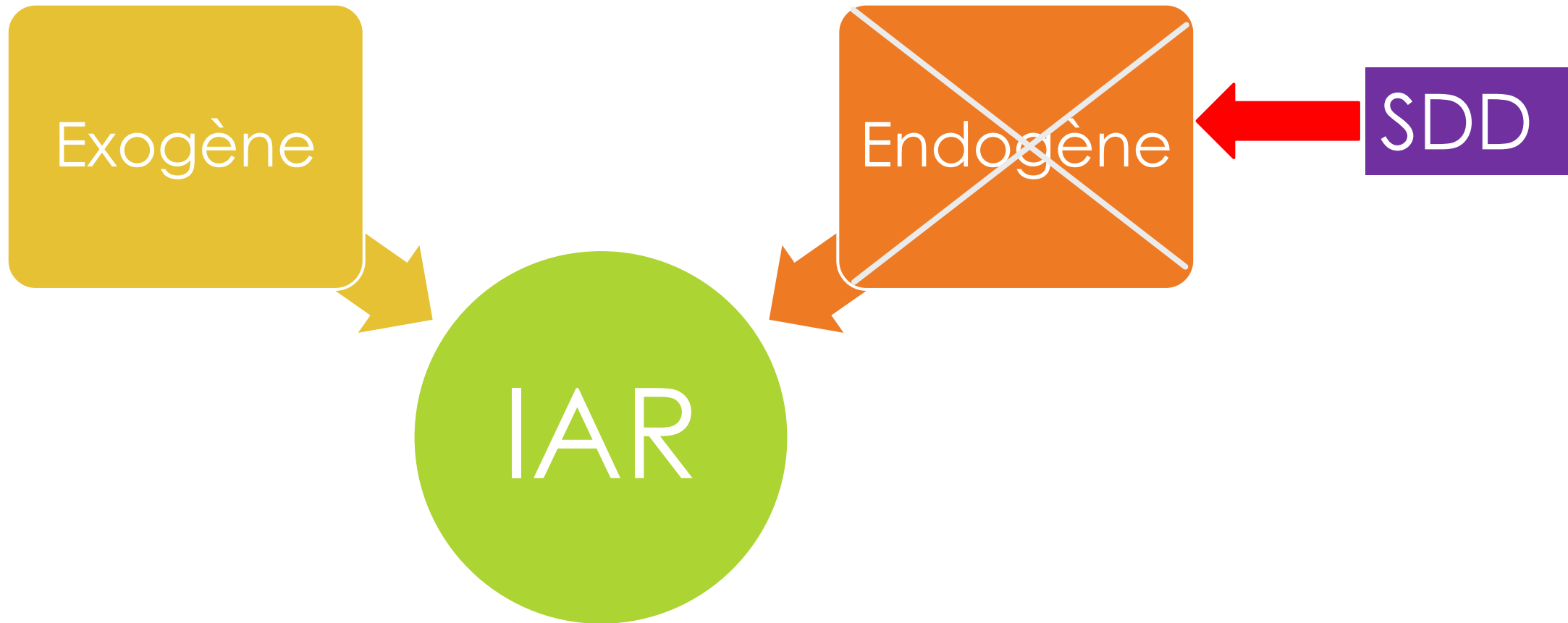
Safdar N, Respir Care 2005

Exogène

Endogène



Rationnel



Définition

Wittekamp B, ICM 2020

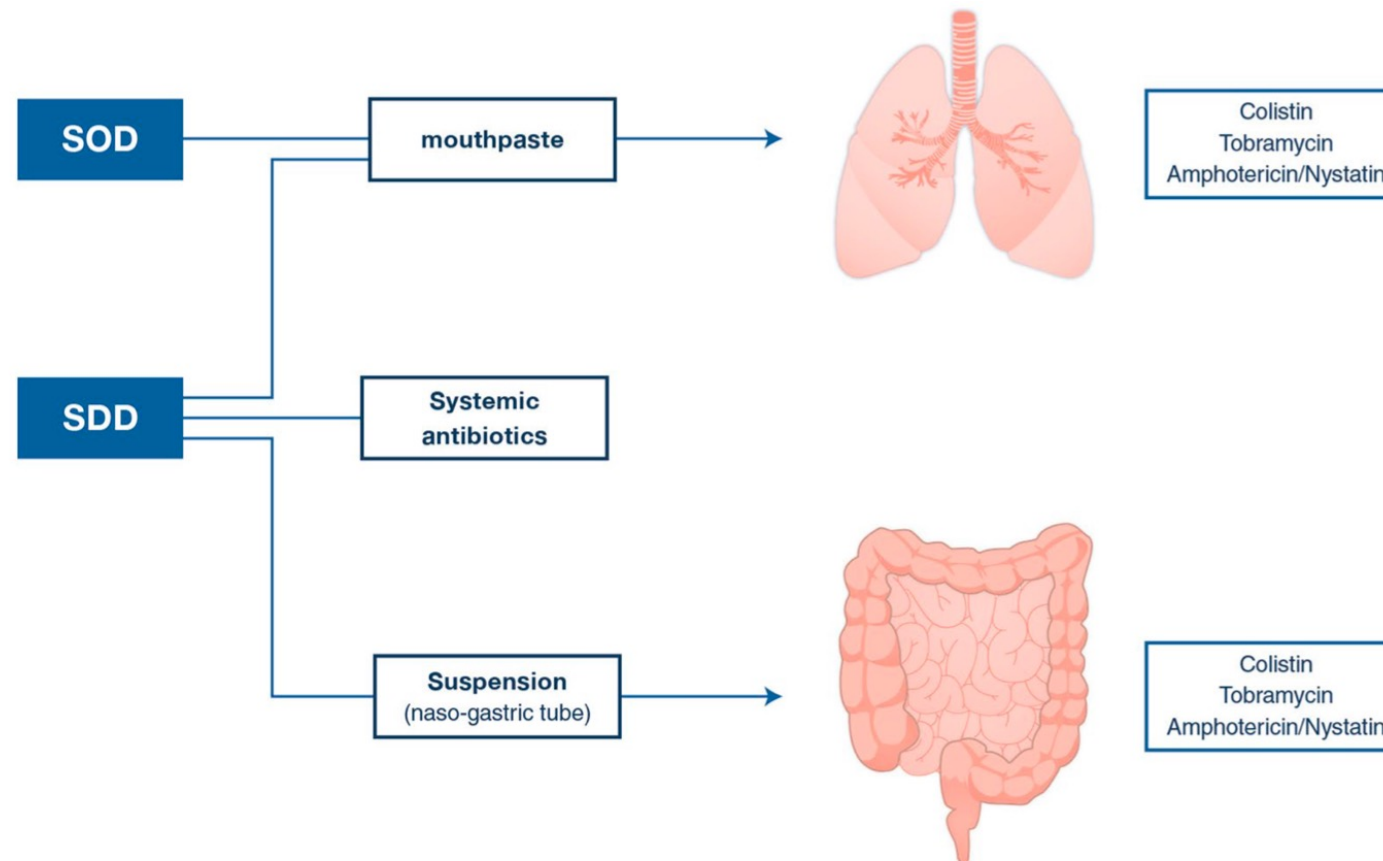


Fig. 1 Components of SDD and SOD. *SDD* selective digestive tract decontamination, *SOD* selective oropharyngeal decontamination

[Intervention Review]

Topical antibiotic prophylaxis to reduce respiratory tract infections and mortality in adults receiving mechanical ventilation

Minozzi S, 2021

- ▶ **41 études, 11,004 patients**
- ▶ durée VM 2-6 j
- ▶ durée de séjour en Réa 11-33 j
- ▶ immunodépression 0-22%
- ▶ >40% possible risque de biais de sélection
- ▶ 5 études à risque élevé de biais de détection des infections respiratoires basses (IRB)

[Intervention Review]

Topical antibiotic prophylaxis to reduce respiratory tract infections and mortality in adults receiving mechanical ventilation

Minozzi S, 2021

ATB systémique et locale

- ▶ Réduit la **mortalité** vs placebo ou pas de traitement **RR 0.84, 95% CI 0.73 - 0.96** (18 études, 5290 patients, certitude de l'évidence: **haute**)
- ▶ Réduit probablement les **infections respiratoires basses** (IRB) **RR 0.43, 95% CI 0.35 to 0.53** (17 études, 2951 patients, certitude de l'évidence: **modérée**)

[Intervention Review]

Topical antibiotic prophylaxis to reduce respiratory tract infections and mortality in adults receiving mechanical ventilation

Minozzi S, 2021

Majorité des études aux Pays-Bas ou des réanimations à faible incidence de BMR

- ▶ Réduit probablement la **mortalité** vs placebo ou pas de traitement (**RR 0,96, 95% CI 0,87-1.05**, 22 études, 4213 patients; certitude de l'évidence: **modérée**)
- ▶ Pourrait réduire les IRB (**RR 0.57, 95% CI 0.44-0.74**; 19 études; 2698 patients; certitude de l'évidence: **faible**)

Decontamination Strategies and Bloodstream Infections With Antibiotic-Resistant Microorganisms in Ventilated Patients

L'utilisation de soins de bouche CHX, SOD, ou SDD associée à une réduction des bactériémie à BGN MR?

Wittekamp B, JAMA 2018

POPULATION



5561 Men 3104 Women

Adult patients who were not pregnant, with expected duration of invasive mechanical ventilation of ≥ 24 hours

Median age: **64.1** years
(range, 18-98)

LOCATIONS

13
ICUs in Europe



INTERVENTION

8665 Patients randomized

2251

Standard of care

Daily CHX
body washing
and hand hygiene

2108

CHX 2% mouthwash

4 times daily

2224

SOD

Mouthpaste
with colistin,
tobramycin,
and nystatin
4 times daily

2082

SDD

Mouthpaste and
gastrointestinal
suspension
with colistin,
tobramycin,
and nystatin
4 times daily

Decontamination Strategies and Bloodstream Infections With Antibiotic-Resistant Microorganisms in Ventilated Patients

Wittekamp B, JAMA 2018

FINDINGS

Standard of care

2.1% bloodstream infection

31.9% 28-day mortality

CHX mouthwash

1.8% bloodstream infection

32.9% 28-day mortality

Limites

Pas d'ATB systémique

SOD, SDD arrêtées après extubation

Adjusted hazard ratios (95% CIs) vs **standard of care**
for bloodstream infection
with multidrug-resistant gram-negative bacteria

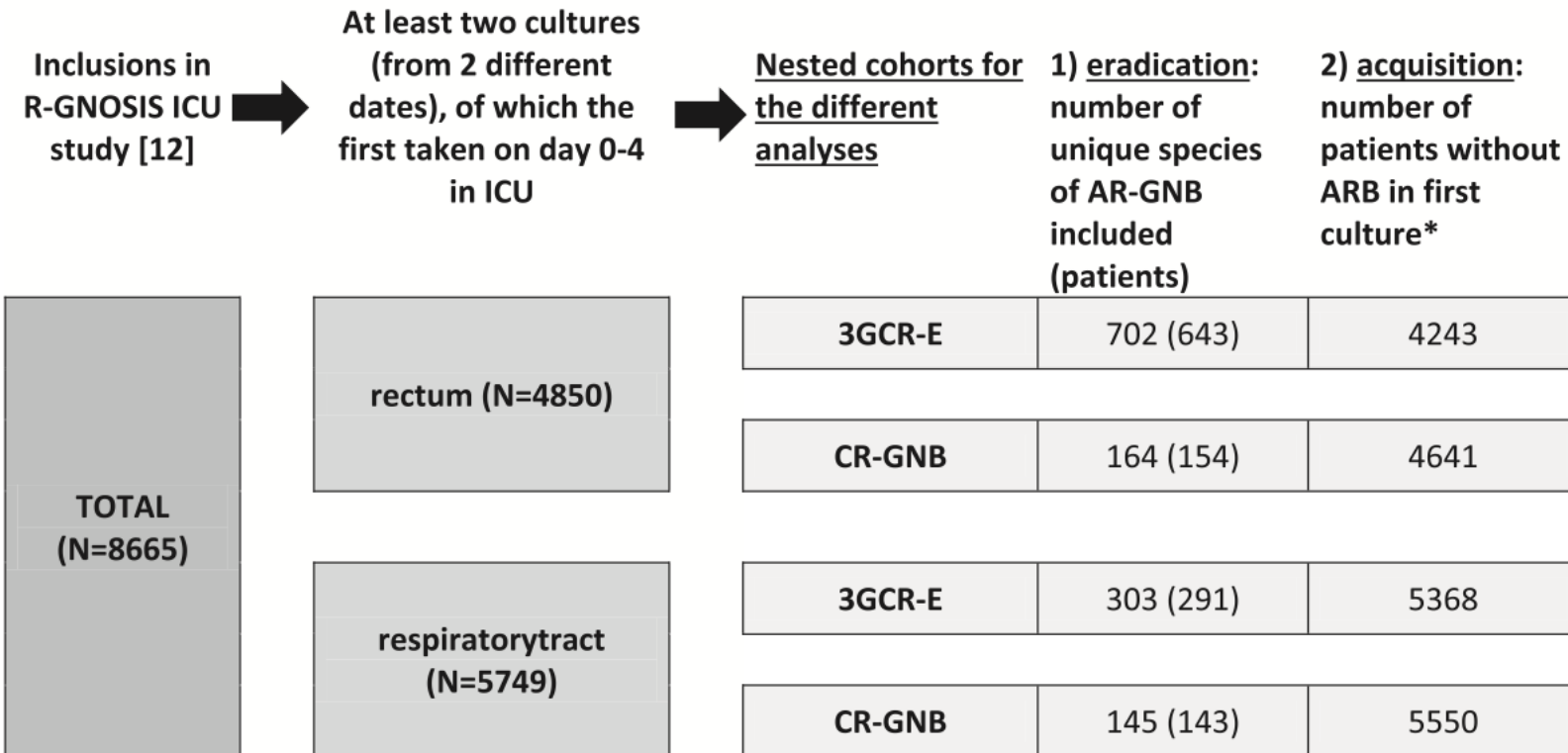
1.13 (0.68-1.88) for **CHX**

0.89 (0.55-1.45) for **SOD**

0.70 (0.43-1.14) for **SDD**

The effects of topical antibiotics on eradication and acquisition of third-generation cephalosporin and carbapenem-resistant Gram-negative bacteria in ICU patients; a *post hoc* analysis from a multicentre cluster-randomized trial

Plantinga NL, CMI 2020



The effects of topical antibiotics on eradication and acquisition of third-generation cephalosporin and carbapenem-resistant Gram-negative bacteria in ICU patients; a *post hoc* analysis from a multicentre cluster-randomized trial

Plantinga NL, CMI 2020

- ▶ SDD associée avec plus d'éradication et moins d'acquisition de C3GR-E et CR- GNB dans le rectum que SC
 - csHR 1.76 (95% CI 1.31-2.36) éradication C3GR-E
 - csHR 3.17 (95% CI 1.60-6.29) éradication CR-GNB
 - csHR 0.51 (0.40-0.64) acquisition C3GR-E
 - csHR 0.56 (0.40-0.78) acquisition CR-GNB

The effects of topical antibiotics on eradication and acquisition of third-generation cephalosporin and carbapenem-resistant Gram-negative bacteria in ICU patients; a *post hoc* analysis from a multicentre cluster-randomized trial

Plantinga NL, CMI 2020

- ▶ SDD et SOD associée avec moins d'acquisition de C3GR-E et CR- GNB (respiratoire)
 - SDD: csHR 0.38 (0.28-0.50) acquisition C3GR-E
 - SOD: csHR 0.55 (0.42-0.71) acquisition C3GR-E

 - SDD: csHR 0.46 (0.33-0.64) acquisition CR-GNB
 - SOD: csHR 0.60 (0.44-0.81) acquisition CR-GNB

Effect of selective decontamination on antimicrobial resistance in intensive care units: a systematic review and meta-analysis

Lancet ID 2013

Nick Daneman, Syed Sarwar, Robert A Fowler, Brian H Cuthbertson, on behalf of the SuDDICU Canadian Study Group

- ▶ 64 études, 47 RC, 35 data sur l'ATB résistance
- ▶ Impact sur la prévalence de colonisation ou d'infection à des bactéries résistantes

SARM

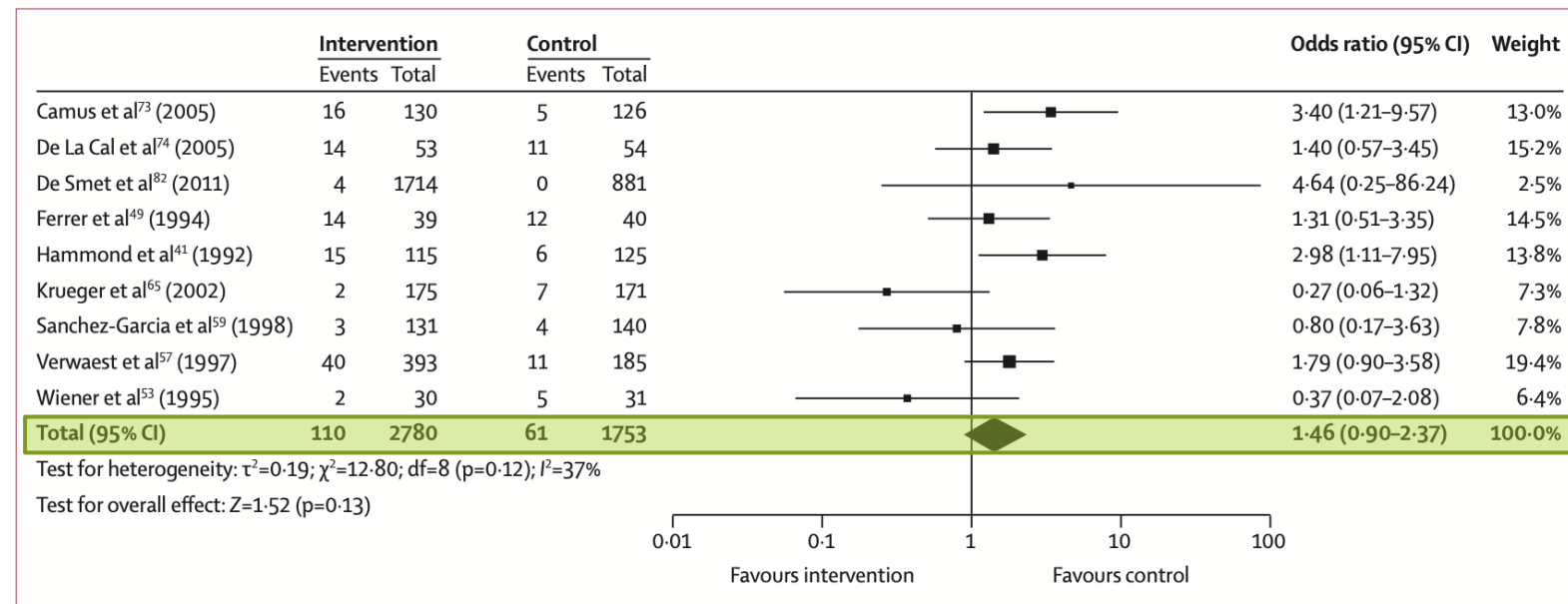


Figure 2: Prevalence of MRSA infection or colonization in patients in intensive care

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Entérocoque Vanco R

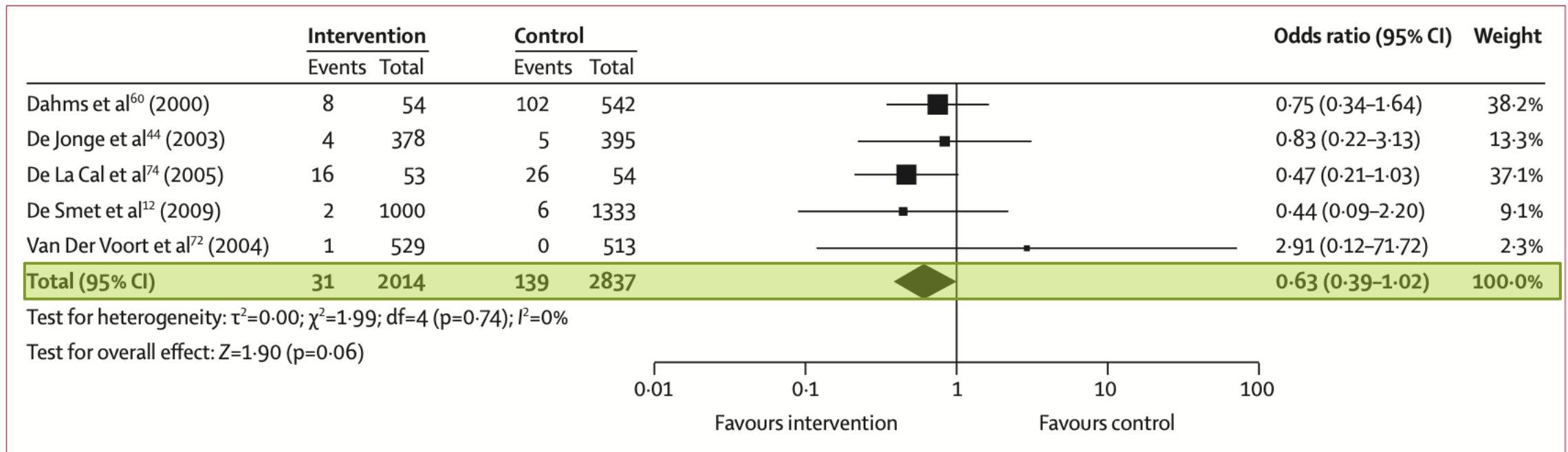


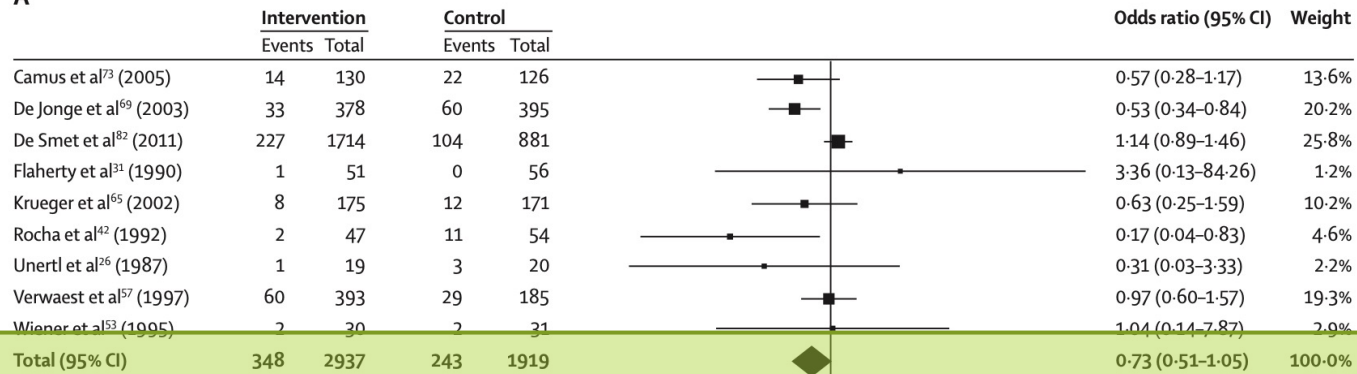
Figure 3: Prevalence of VRE infection or colonisation in patients in intensive care

Effect of selective decontamination on antimicrobial resistance in intensive care units: a systematic review and meta-analysis

Nick Daneman, Syed Sarwar, Robert A Fowler, Brian H Cuthbertson, on behalf of the SuDDICU Canadian Study Group

Lancet ID 2013

A

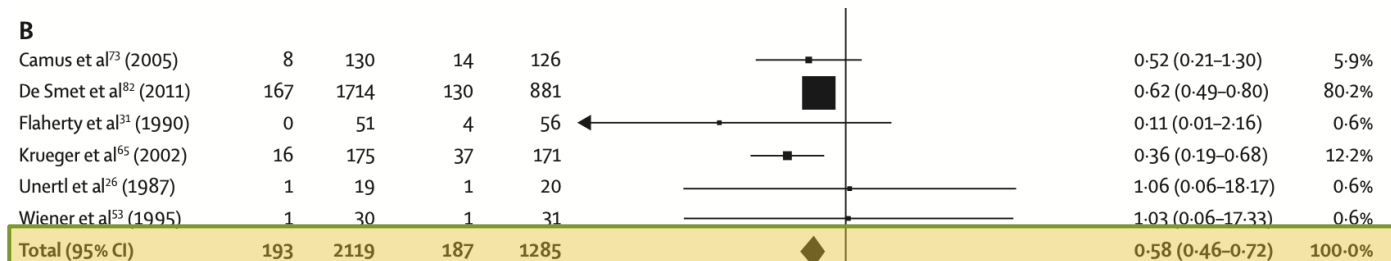


Test for heterogeneity: $\tau^2=0.12$; $\chi^2=16.51$; $df=8$ ($p=0.04$); $I^2=52\%$

Test for overall effect: $Z=1.68$ ($p=0.09$)

BGN Aminoides R

B



Test for heterogeneity: $\tau^2=0.00$; $\chi^2=4.00$; $df=5$ ($p=0.55$); $I^2=0\%$

Test for overall effect: $Z=4.92$ ($p<0.00001$)

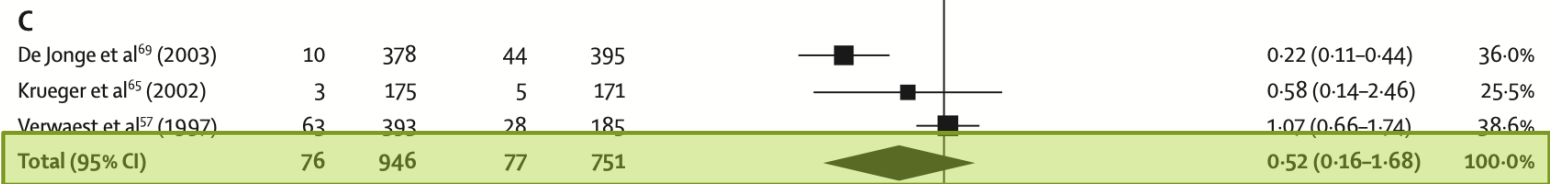
BGN Polymixine R

Effect of selective decontamination on antimicrobial resistance in intensive care units: a systematic review and meta-analysis

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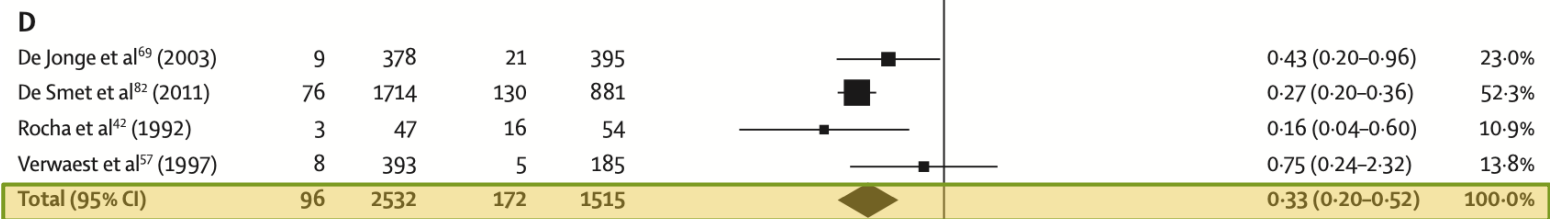
BGN FQ R



Test for heterogeneity: $\tau^2=0.88$; $\chi^2=13.66$; $df=2$ ($p=0.001$); $I^2=85\%$

Test for overall effect: $Z=1.10$ ($p=0.27$)

BGN C3G R



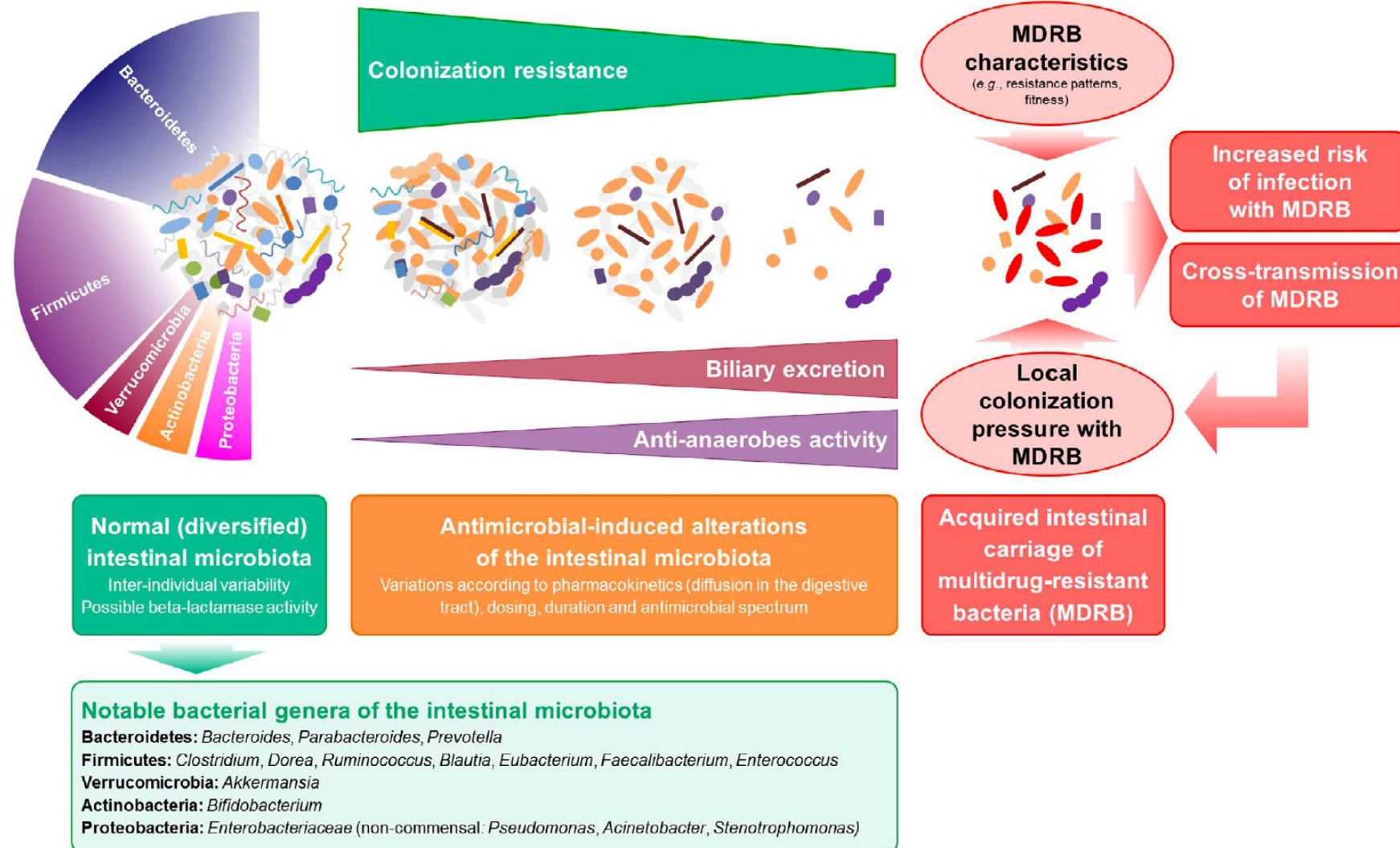
Test for heterogeneity: $\tau^2=0.09$; $\chi^2=4.72$; $df=3$ ($p=0.19$); $I^2=36\%$

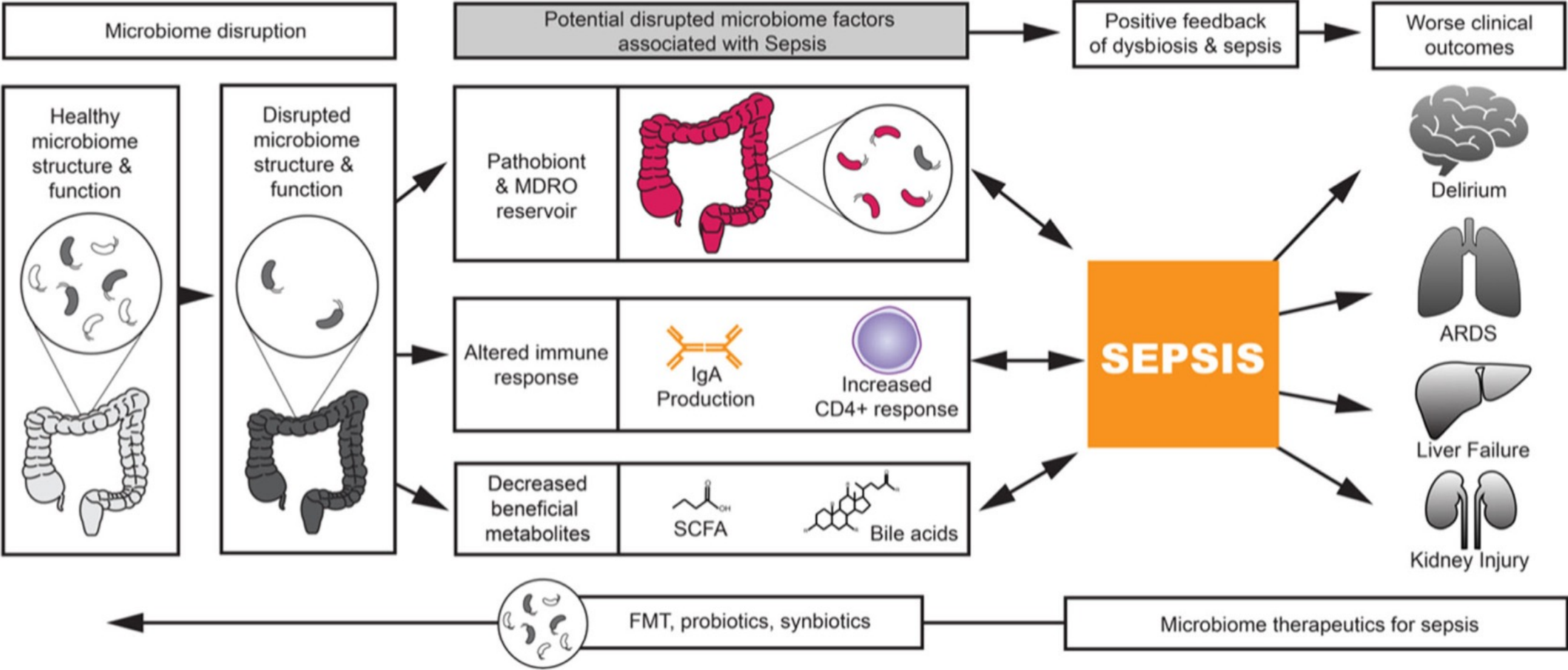
Test for overall effect: $Z=4.64$ ($p<0.00001$)

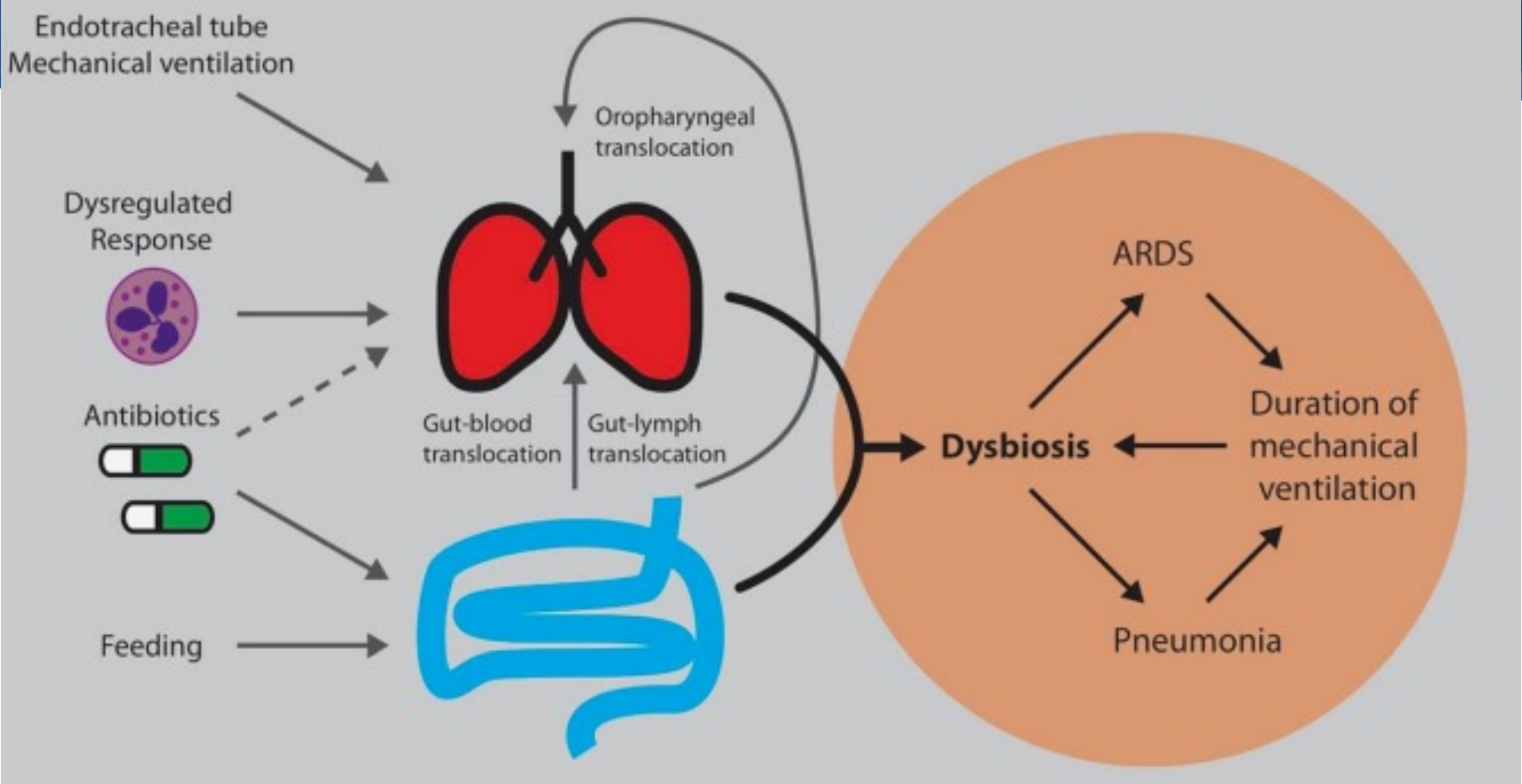
0.01 0.1 1 10 100
Favours intervention Favours control

Impact des ATB sur microbiome

Woerther PL, IJAA 2018







Ventilator-associated pneumonia in critically-ill patients with COVID-19 in a setting of selective decontamination of the digestive tract

Van der Meer SB, Crit Care 2021

- ▶ 22/212 (10%) patients avec une PAVM (vs 40-58% dans la littérature)

	No VAP n = 190 (90%)	VAP ^a n = 22 (10%)	p value
Age	63 (56–70)	65 (54–23)	.75
Gender (female)	57 (30%)	4 (18%)	.32
BMI > 30	78 (41%)	7 (32%)	.49
Diabetes mellitus	54 (28%)	4 (18%)	.45
Hypertension			
Chronic kidney disease			
Chronic lung disease			
Immune compromise			
SOFA-score			
Time to VAP (days)	na	12 (7–17)	
Use of SDD	189 (99.5%)	22 (100%)	1.00
Corticosteroids	118 (62%)	15 (68%)	.65
ECMO	12 (6%)	3 (14%)	.19
CRRT	24 (13%)	2 (9%)	1.00
Proning during MV	107 (56%)	19 (86%)	.006
Length of MV (days)	13 (8–21)	26 (15–33)	<0.0001
Length of ICU stay (days)	15 (9–22)	25 (21–35)	<0.0001
ICU mortality	57 (30%)	9 (41%)	.33

Pas de groupe contrôle
Pas de confirmation microbiologique
Monocentrique rétrospective

Selective digestive decontamination to reduce the high rate of ventilator-associated pneumonia in critical COVID-19

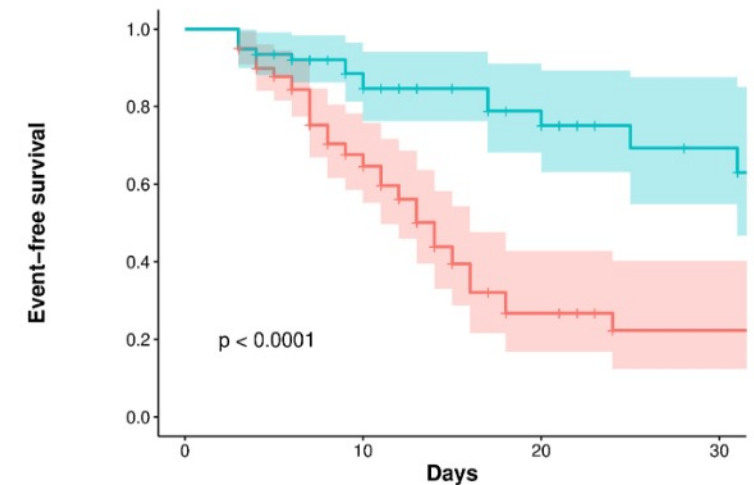
Luque-Paz D, ACCPM 2022

- ▶ 178 patients COVID-19 (77 SDD)
- ▶ Bicentrique rétrospective

VAP 9.4 vs. 23.5 per 1000 ventilator days, P < 0.001

Multivariate analysis of predictive factors of ventilator-acquired pneumonia.

Ventilator-acquired pneumonia	Patients with VAP (n = 66)	Patients w/o VAP (n = 112)	P-value	Adjusted HR (95% CI)	P-value
Age, ^a median [IQR]	67 [59–72]	67 [58–75]	0.71	1.01 (0.99–1.04)	0.41
Male gender, ^a n (%)	58 (88)	76 (68)	0.01	2.70 (1.27–5.74)	0.01
SAPS-2 score at admission, median [IQR]	40 [33–49]	38 [30–48]	0.82		
ECMO support, ^a n (%)	18 (27)	9 (8)	< 0.001	2.3 (1.24–4.10)	0.008
Inter-hospital transferred patients, n (%)	12 (18)	24 (21)	0.52		
SDD use, ^a n (%)	16 (24)	61 (54)	< 0.001	0.36 (0.20–0.63)	< 0.001



LETTER

Absence of candidemia in critically ill patients with COVID-19 receiving selective digestive decontamination



Jochem B. Buil^{1,2,3*}, Jeroen A. Schouten^{2,3,4}, Joost Wauters⁵, Hans van de Hoeven⁴ and Paul E. Verweij^{1,2,3} on behalf of CAC-SDD study group

Aucune candidémie (30 mois)

Comparaison cohort COVID sans SDD : 8/569 (1,4%) (95% CI 0.19–2.7%; $p = 0.0207$)

Table 1 Characteristics of the COVID-19 cohort

Number of patients	378
Age, mean (range)	61 (16–93)
Apache II score, mean (range)	17.0 (1–38)
Mean duration of ICU stay per patient (days)	18.8 (1–89)
Number of patients with ICU stay of < 5 days	62 (16%)
Number of patients receiving SDD	352 (93%)
Number of patients with diabetes	79 (21%)
Number of patients with central vascular catheter	310 (82%)
Number of patients on mechanical ventilation	309 (82%)
Number of patients with renal replacement therapy	45 (12%)
Number of patients receiving IL6- inhibitors	188 (50%)
Number of patients receiving dexamethasone	274 (72%)
Number of blood culture sets (aerobic/anaerobic), mean per patient during ICU stay	6.5 (0–31)
Number of patients with <i>Candida</i> colonization	199 (53%)
Median time to <i>Candida</i> decolonization (days)	7 (1–53)

Selective Decontamination of the Digestive Tract in Intensive Care Unit Patients (SuDDICU)

ClinicalTrials.gov Identifier: NCT02389036

[Recruitment Status](#) ⓘ : Recruiting

[First Posted](#) ⓘ : March 17, 2015

[Last Update Posted](#) ⓘ : April 19, 2022

See [Contacts and Locations](#)

- ▶ Cluster, cross-over, RCT in mechanically ventilated critically ill patients
- ▶ 12,000–15,000 patients in Canada, the UK, and Australia
- ▶ Patients not already receiving an intravenous therapeutic antibiotic : 4-day course of intravenous cephalosporins
- ▶ Evaluation of SDD effects on antibiotic resistance patterns
- ▶ Cost- effectiveness analyses, microbiome/meta genetic analysis

Conclusions

- ▶ SDD associée à une réduction de la mortalité et de l'incidence des IRB dans des réanimation avec une incidence faible d'antibio-résistance
- ▶ La réduction de la mortalité et des IAR plus importante avec la SDD vs SOD
- ▶ L'impact de la SDD sur la mortalité et de l'incidence des IRB dans des réanimation avec une incidence élevée d'antibio-résistance reste à déterminer
- ▶ SDD et SOD : pas d'impact significatif sur la résistance
- ▶ L'impact de la SDD sur le microbiome digestif et pulmonaire est à évaluer