Surveillance EARS : l'Europe des nations

Vincent Jarlier
Yves Péan

RICAI mardi 18 décembre 2018

Surveillance de la résistance en Europe (European Union/European Economic Area) (EU/EEA)

- Principaux commensaux et saprophytes : EARSS (commission européenne DG Santé) 1999 → Ears-net (ECDC) 2010
- Gonocoque : ECDC 2009 → European Gonococ. Antimicrob. Surv. Progr. (Euro-GASP, ECDC) 2016
- *M.tuberculosis :* EURO-TB 1996 → ECDC/WHO 2008

EARSS – Ears-net : inclusion des espèces

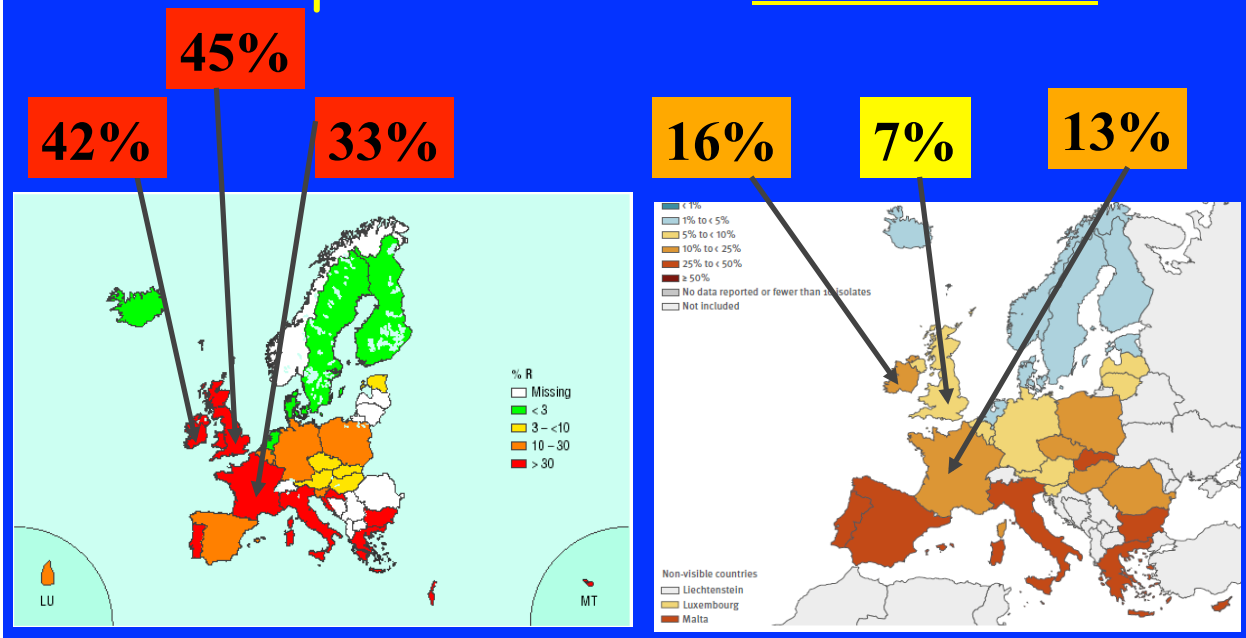
- *S.aureus, S. pneumoniae : 1999*
- *E.coli, Enterococci : 2001*
- *K.pneumoniae, P.aeruginosa : 2005*
- *Acinetobacter 2014*

Recommandations françaises pour contrôler la diffusion des bactéries résistantes (SARM, EBLSE

AP-HP 1993

National 1999

% MRSA in *S.aureus* in bacteremias Europe - EARS-net 2001-2017



2001 2017

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Evolution of MRSA % in *S.aureus* in Europe Bacteraemias, EARS-net 2001-2017

Country	N° *S.aureus*/Y	2001	2011	2017	2001-17
UK	2000-3000	45	14	7	- 85%
France	4000- 5000	33	20	13	- 61%
Belgium	1000-1300	23	17	9	- 61%
Germany	1000-1900	17	16	9	- 47%
Italy	1200-1500	41	38	34	- 17%
Spain	1400-1900	23	23	25	#
Greece	350-750	39	39	38	#
Poland	200-1000	15	24	15	#
Romania	100-500	46	50	44	#
Czek rep	1500-1800	6	15	13	x 2
Hungary	1000-1700	5	26	24	x 5
Portugal	1000-3000	32	55	39	+ 22%

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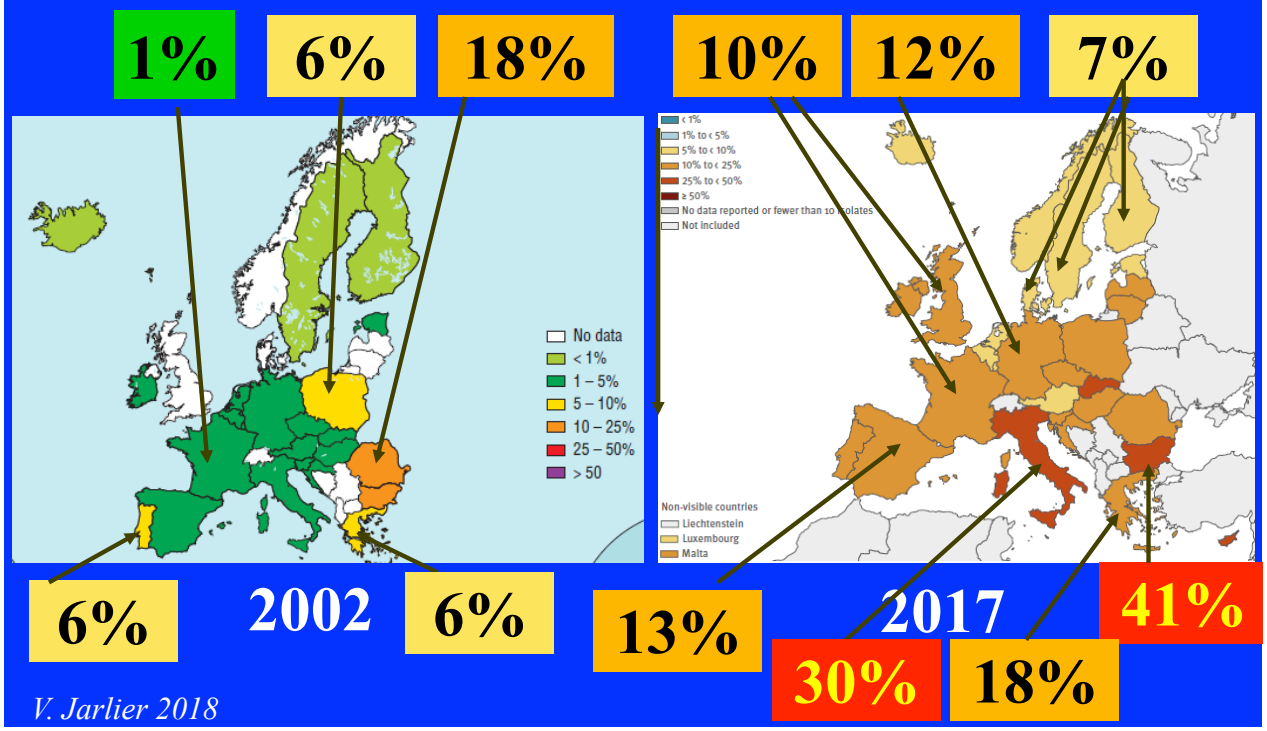
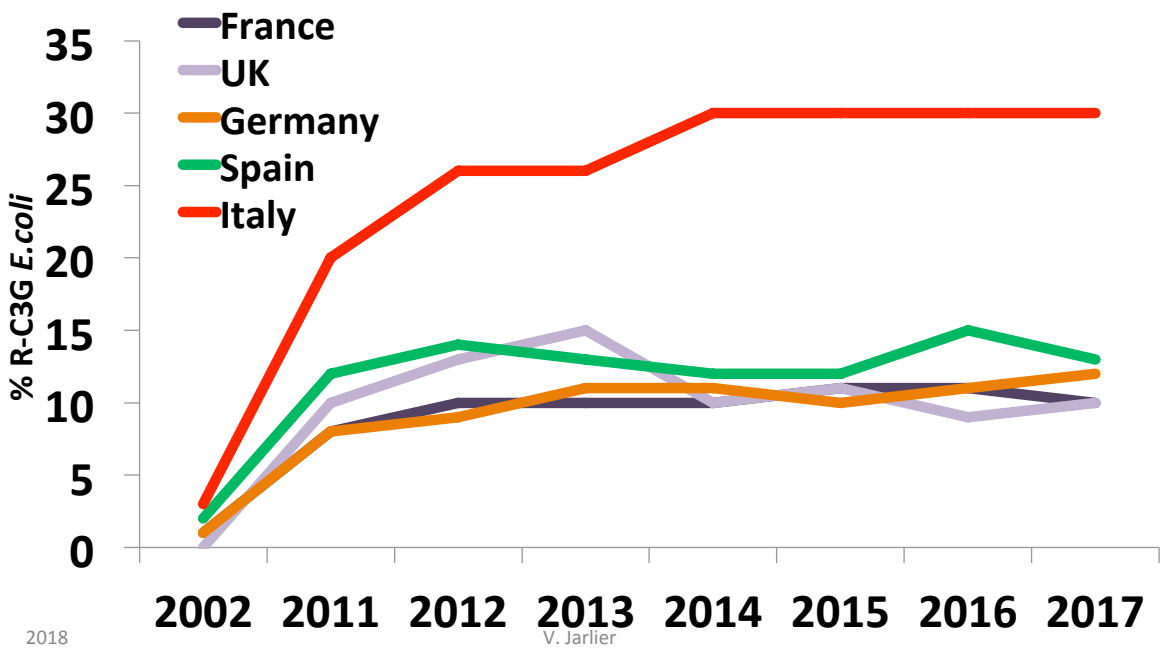
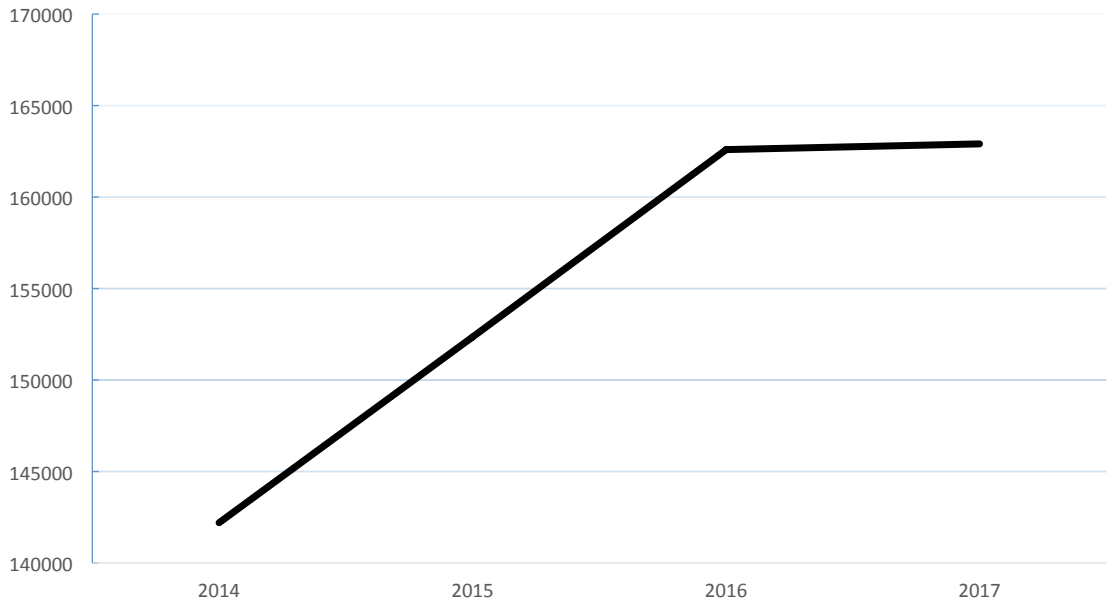
% resistance to 3rd gen. cephalosporins in *E.coli* in bacteremias Europe - EARS-net 2002-2017

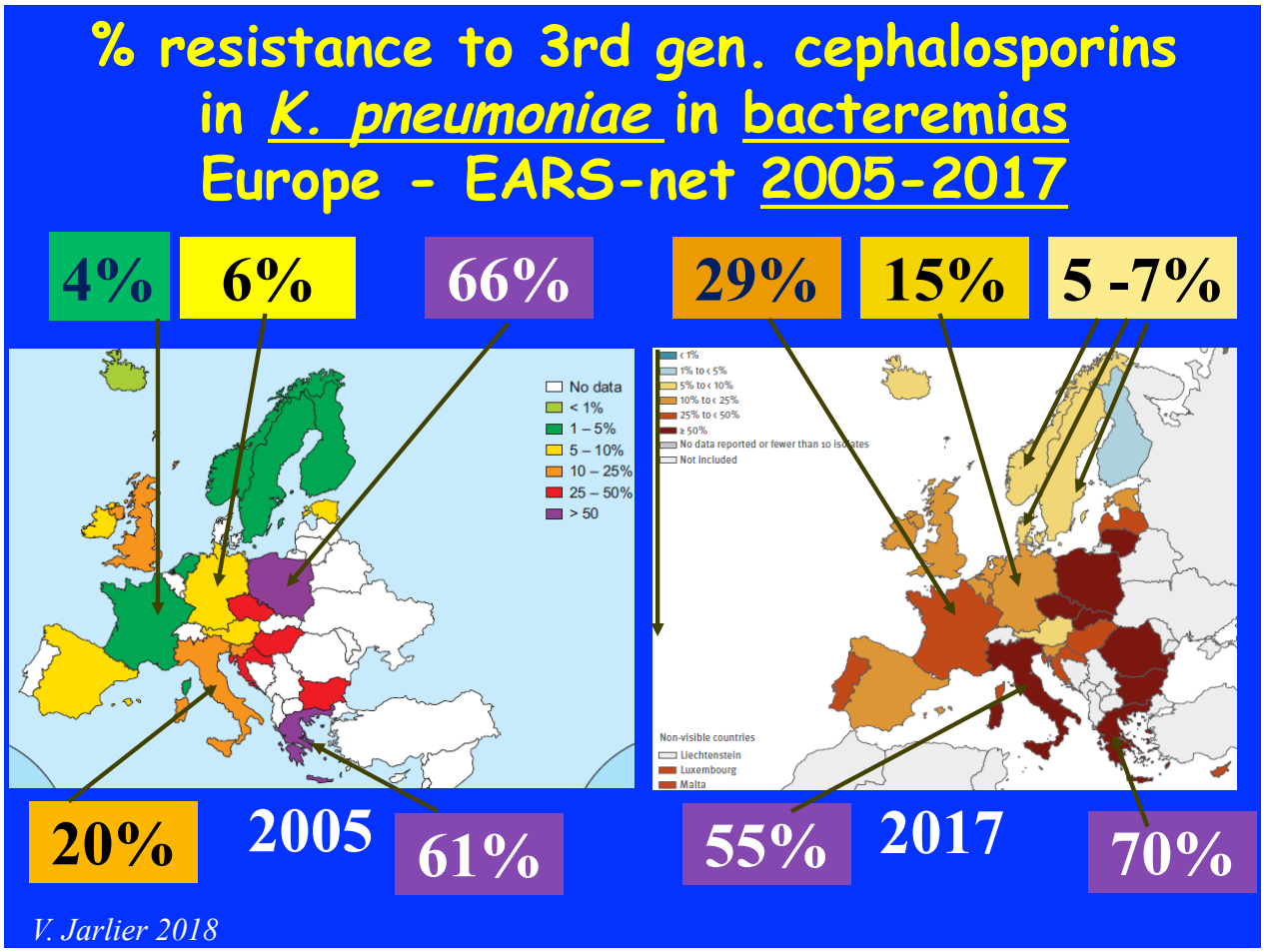


% R-C3G chez *E.coli* EARSS-Ears-net 2002 2017

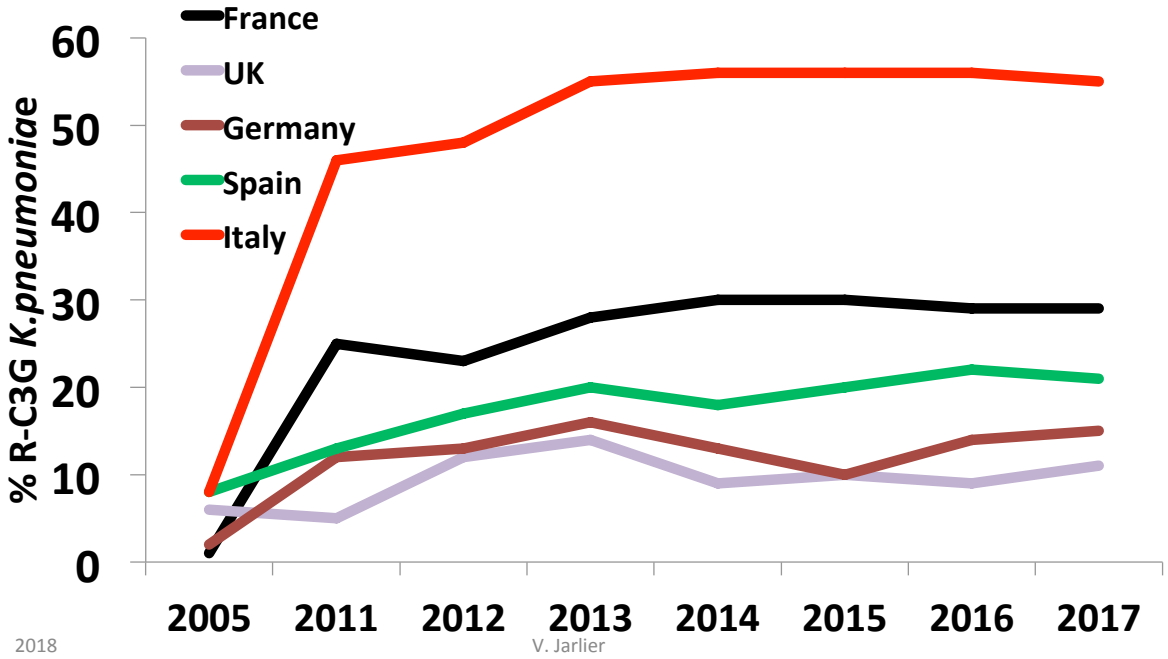


NB total de bactériémie à *E.coli* EARSS-Ears-net 2014 2017





% R-C3G chez *K.pneumoniae* EARSS-Ears-net 2005 2017



EARSS-France évolution du % de résistance et du rang en Europe

- SARM 2001 → 2017

  33% → 15%

  20ème /26* → 16ème /30 **+ 4 places**

- **E.coli** R C3G 2002 → 2017

  1% → 11%

  7ème /25* → 6ème /30 **≈ stabilité**

- **K.pneumoniae** R C3G 2005 → 2017

  4% → 29%

  5ème /24* → 16ème /30 **- 11 places**

** Manquent : Lituanie Lettonie Norvège…*

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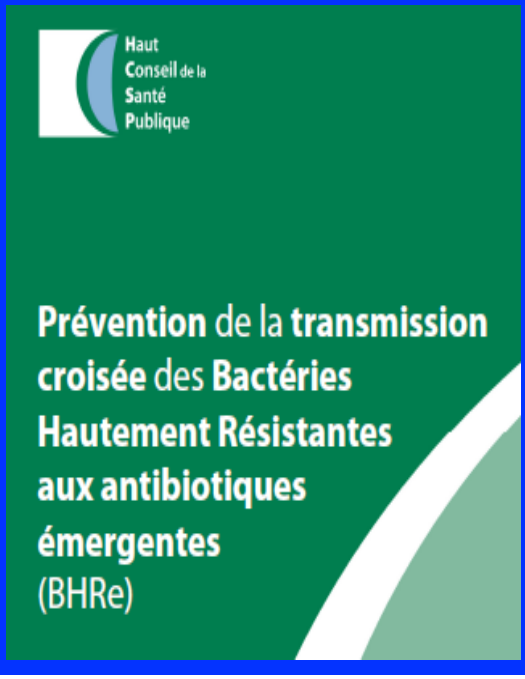
Why MRSA measures (isolation procedures) are not sufficient for controlling ESBL

	MRSA (chromosomal)	**ESBL (plasmidic)**
Human reservoir	**nose , throat** (abscesses)	**Digestive tract** (urines)
Bacterial load	**~10^8**	10^8 / gram of feces **~10^{10} /day**
Spreadable	**+**	**+++**
Measure for control	**Isolation procedures**	**Reinforced measures Sanitation**

Et les bactéries hautement résistantes émergentes (BHRe) ?

Recommandations françaises pour contrôler la diffusion des bactéries hautement résistantes émergentes (BHRe)

- 2006
- 2010
- 2013



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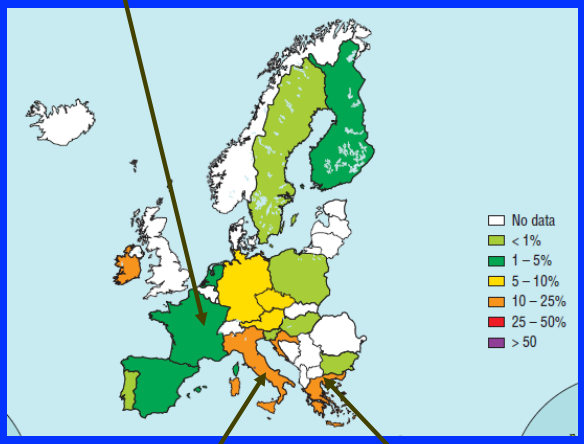
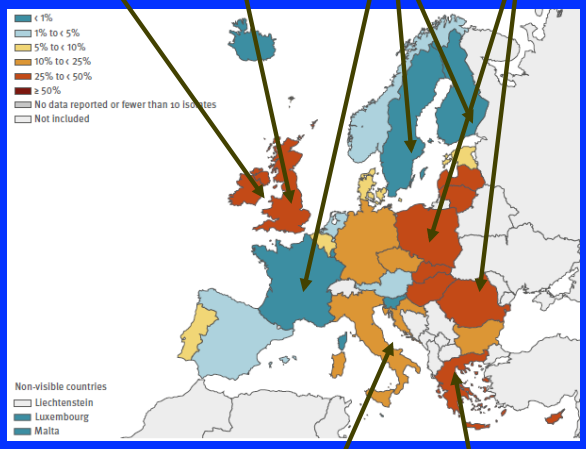
% VRE in *E.faecium* in bacteremias Europe – EARS-net 2002-2017

2% (5% in 2004)

38% 26% < 1% 34%





2002

21% 19%

2017

15% 31%

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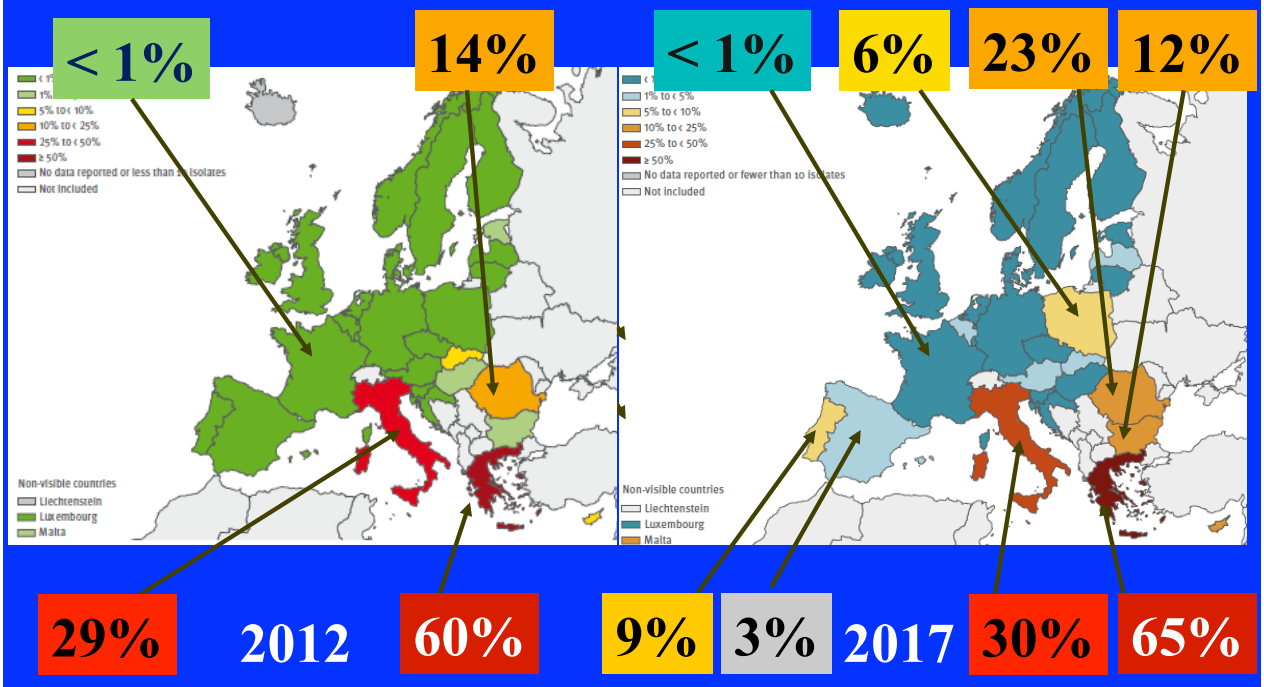
% CRE in *Klebsiella pneumoniae* in bacteremias Europe – EARS-net 2012-2017



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% resistance to carbapenems in *K.pneumoniae* vs. R to 3CG in *E.coli* Bacteremias - EARS-net data 2017

Lowest *E.coli* R. rates countries			
	% 3GC-R *E.coli*		% Carb-R *K.pneumoniae*
Iceland	6		0
Netherland	6		0
Finland	7		0.3
Sweden	7		0.1
Denmark	7		0
Norway	6		0

Highest *E.coli* R. rates countries		
	% 3GC-R *E.coli*	% Carb-R *K.pneumoniae*
Greece	18	65
Roman.	19	23
Cyprus	31	16
Slovenia	31	*4*
Italy	30	30
Bulgaria	4 1	12

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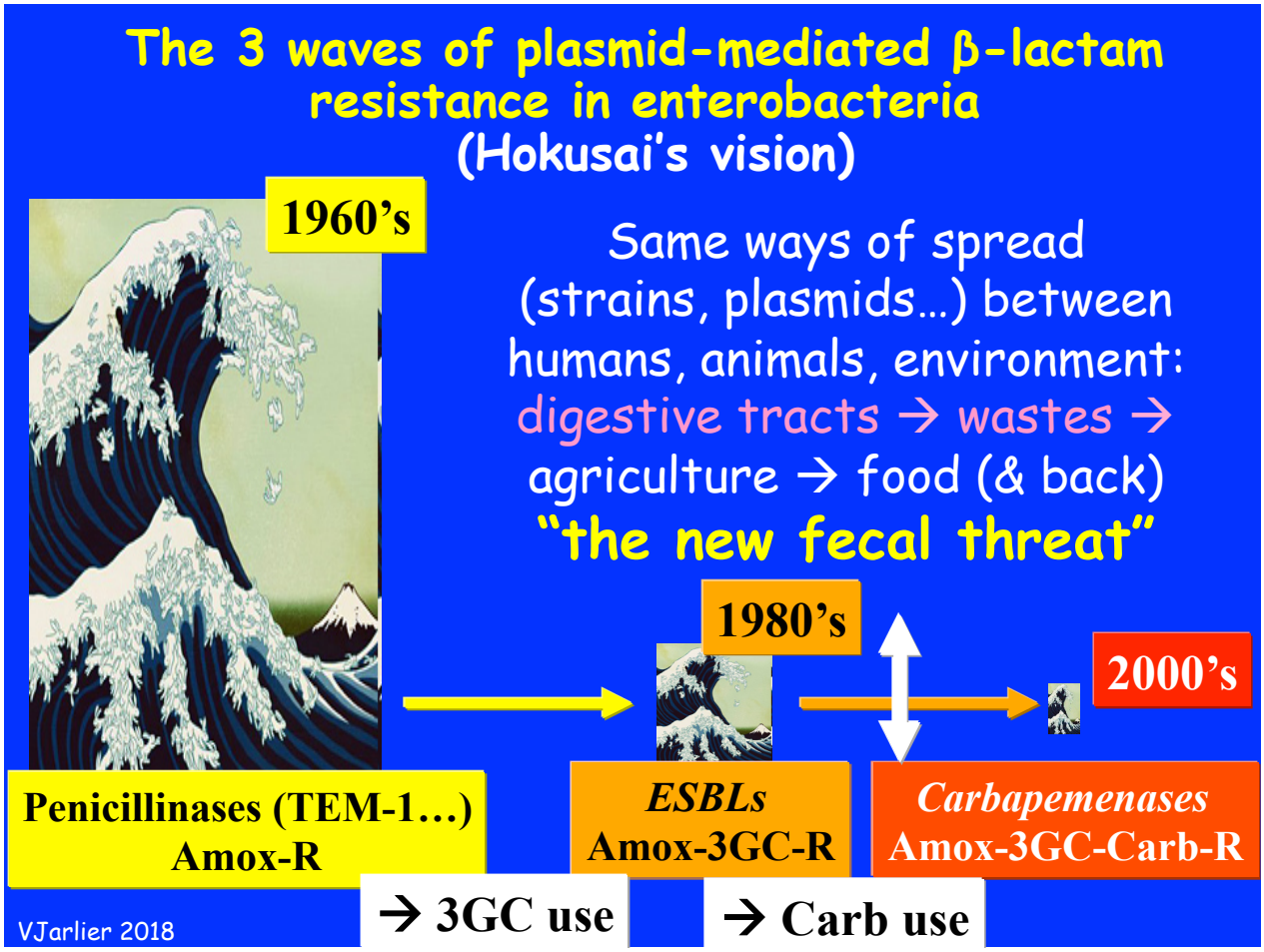
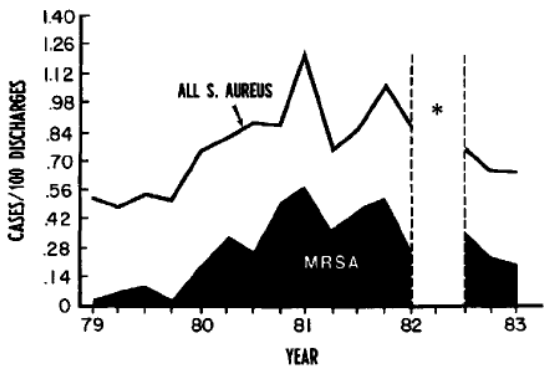


La résistance "crée" t-elle des cas ?

JOHN M. BOYCE, REBECCA L. WHITE,
EMILY Y. SPRUILL
Department of Infection Control, University of Mississippi Medical Center, Jackson, Mississippi

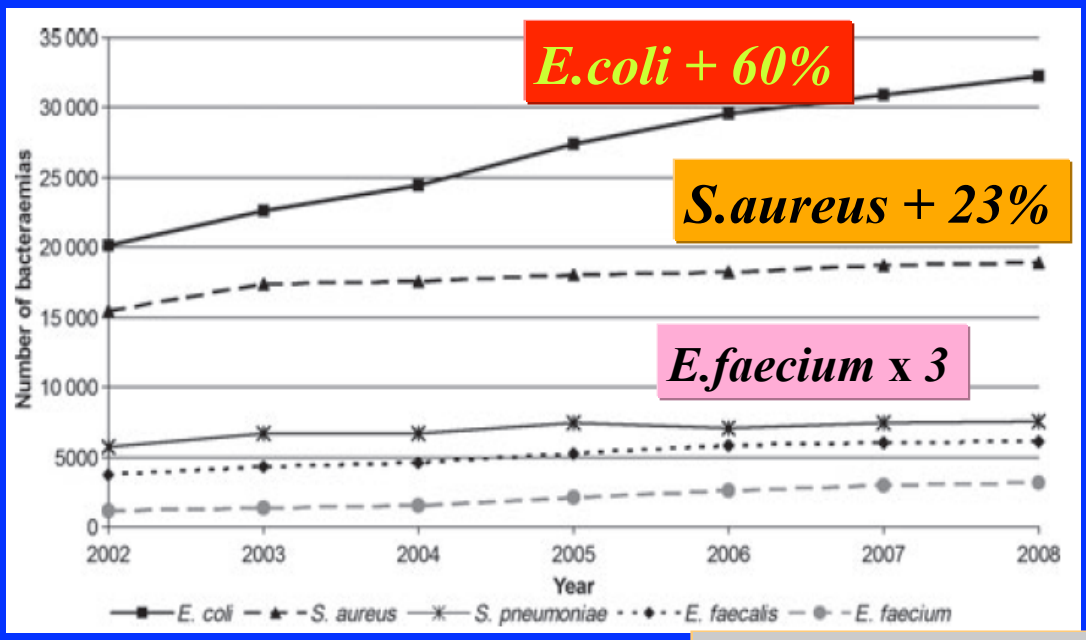


Legend. Incidence of nosocomial *Staphylococcus aureus* infections at the University of Mississippi Medical Center, January 1979–March 1983. Standard criteria for defining nosocomial infections and for identifying *S aureus* were used throughout the study period, and no changes were made in surveillance techniques. Hospital-wide prevalence surveys to identify patients with *S aureus* were not conducted. The asterisk indicates the period not surveyed. MRSA = methicillin-resistant *S aureus*.

THE JOURNAL OF INFECTIOUS DISEASES • VOL. 148, NO. 4 • OCTOBER 1983

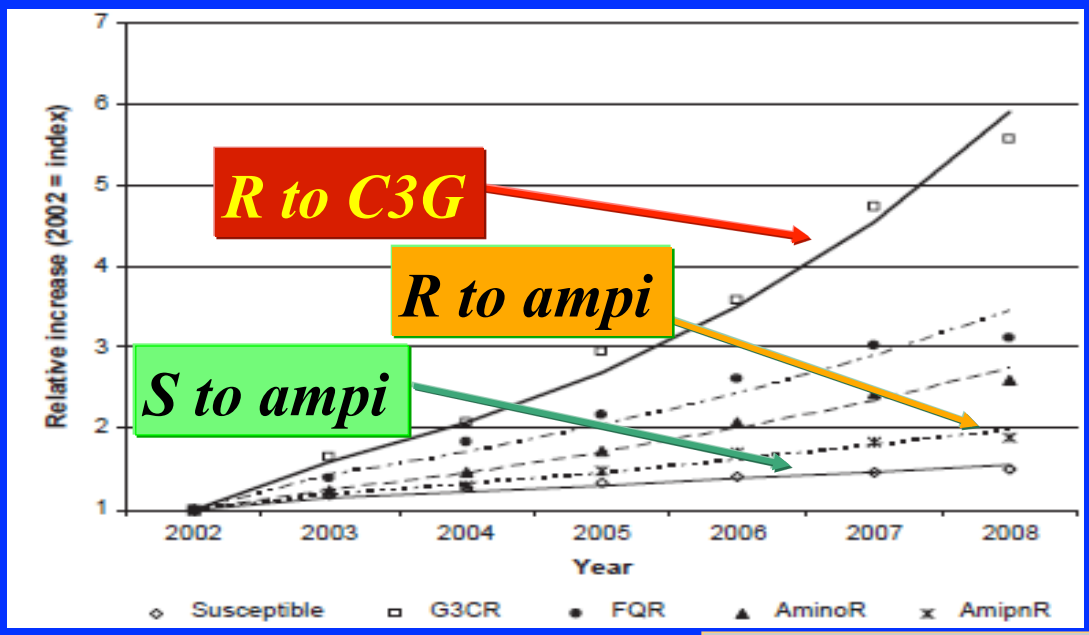
Boyce JID 1983

Trends in bacteremias in Europe (labs **constently** reporting 2002-08)



Kraker, Jarlier CMI 2012

Trends (relative increase)
of *E.coli* bacteraemias by pattern of resistance
in Europe (labs consistently reporting 2002-08)



Kraker, Jarlier CMI 2012

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Lien entre
résistance naturelle
et résistance acquise ?

Résistance naturelle chez les BGN

	Amino-penicil	Carb/Ureido-penicil	1GC 2GC	3GC	Nalidixic acid	Trimetop Tetracycl
E.coli						
K.pne	R	R				
P.aeru	R		R	(CTX)	R	R
Acinet	R		R	(CTX)	R	R

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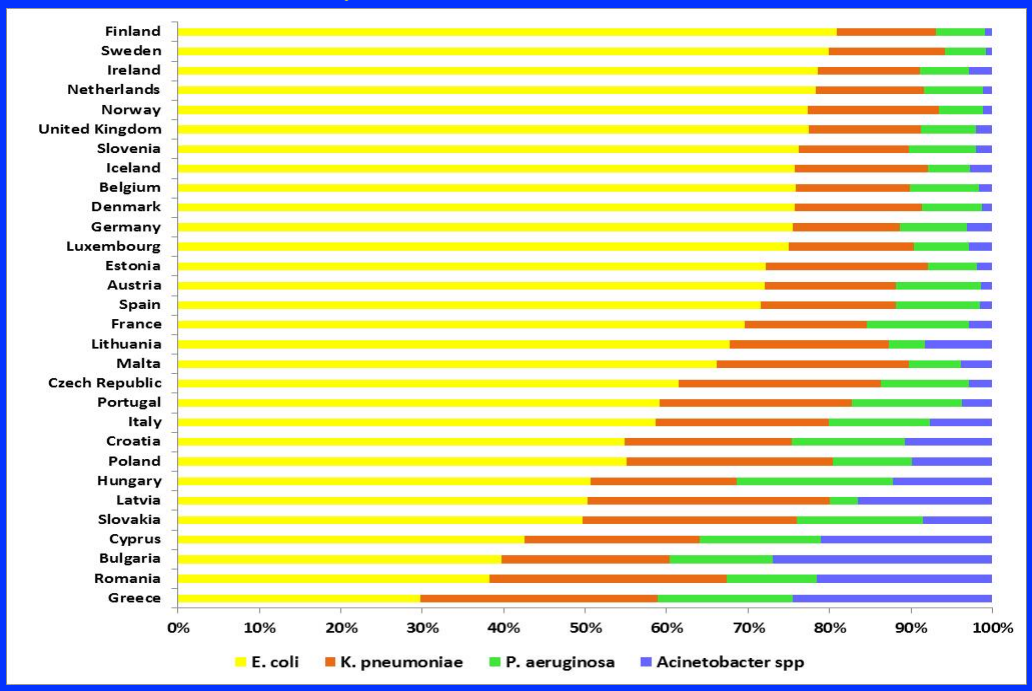
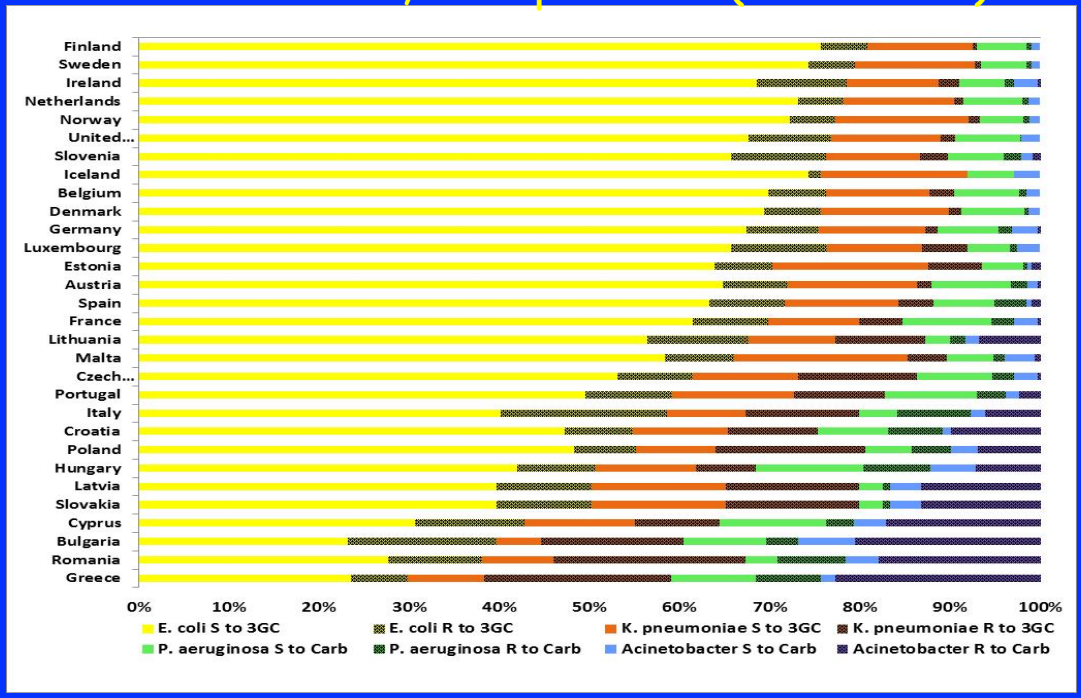
Distribution (%) des 4 espèces majeures de bacilles à Gram négatif dans les bactériémies, Europe 2015 (EARS-net)



Jarlier et al 2018 soumis à Eurosurveillance

VJarlier 2018

Distribution (%) of the 4 mains Gram- bacilli species and resistance to broad spectrum B-lactams Bactaeremias, Europe 2015 (EARS-net)

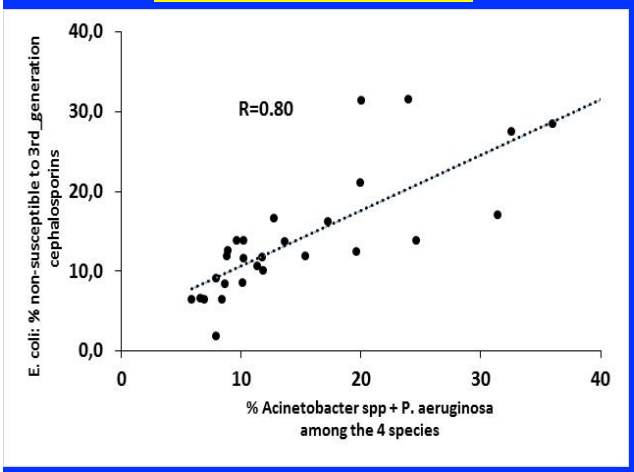


Jarlier et al 2018 submitted

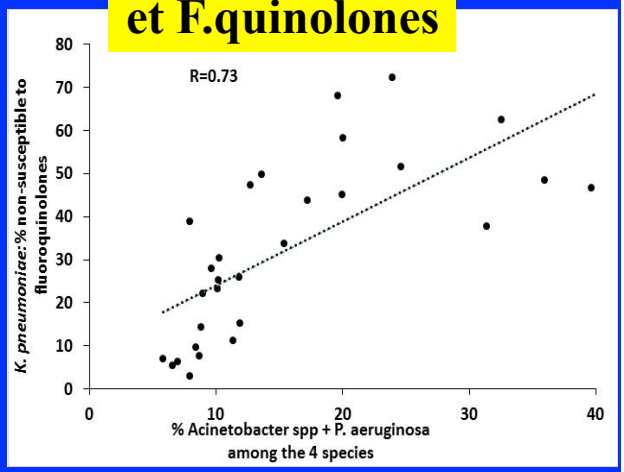
VJarlier 2018

Relation entre la proportion de *P.aeruginosa* + *Acinetobacter* et la résistances acquise chez *E.coli* et *K.pneumoniae* Bactériémies, Europe 2015 (EARS-net)

***E. coli* et C3G**



***K. pneumoniae* et F.quinolones**



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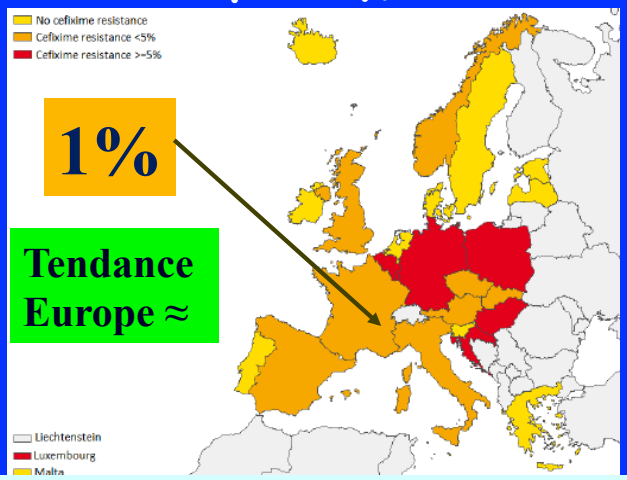
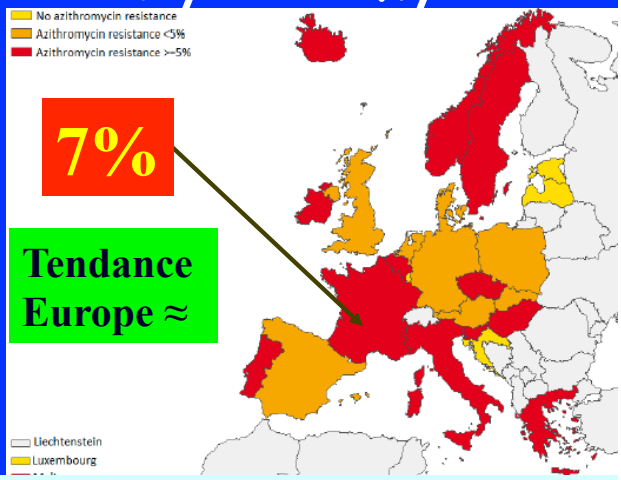
… et quelques autres bactéries

Résistance chez le gonocoque EURO-GASP (ECDC) 2016

céfixime | azythromycine





~100 souches / pays ; Europe : 2256 (1366 en 2009)

Ciprofloxacine : France 37%
Europe : 47% (extrêmes 20-70%), tendance ↘

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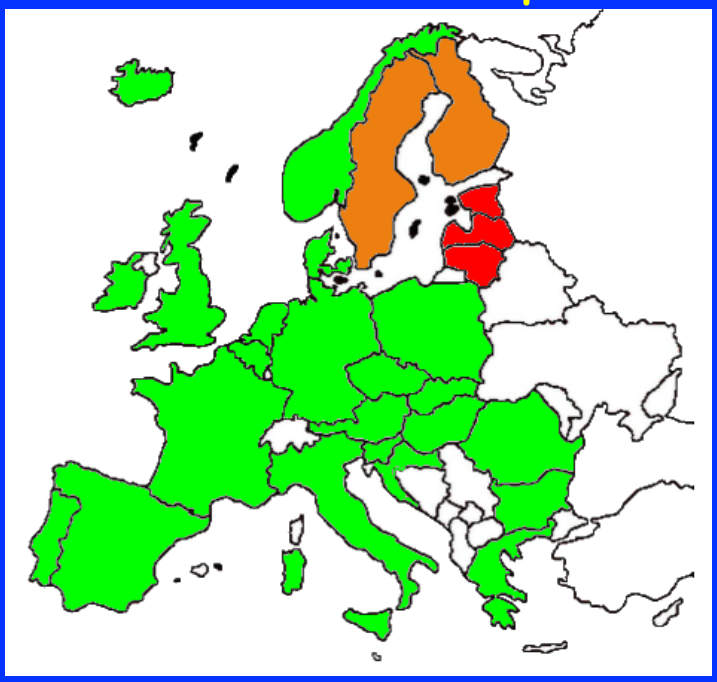
% MDR chez *M.tuberculosis* (nouveaux cas) ECDC / OMS Europe



- <3 %
- 3-5%
- 5-15%

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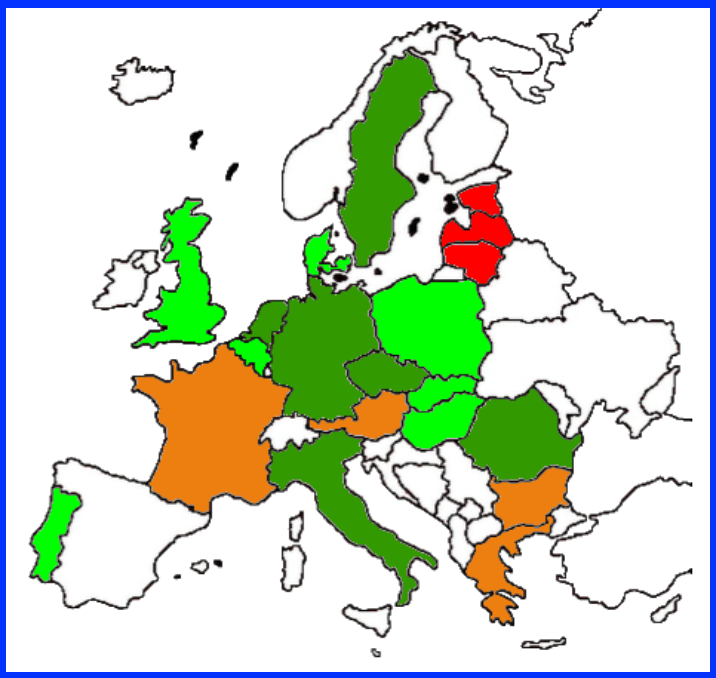
% MDR chez *M.tuberculosis* (antécédents de traitement) ECDC / OMS Europe



- 3-10%
- 10-15%
- 15-20%
- 20-50%

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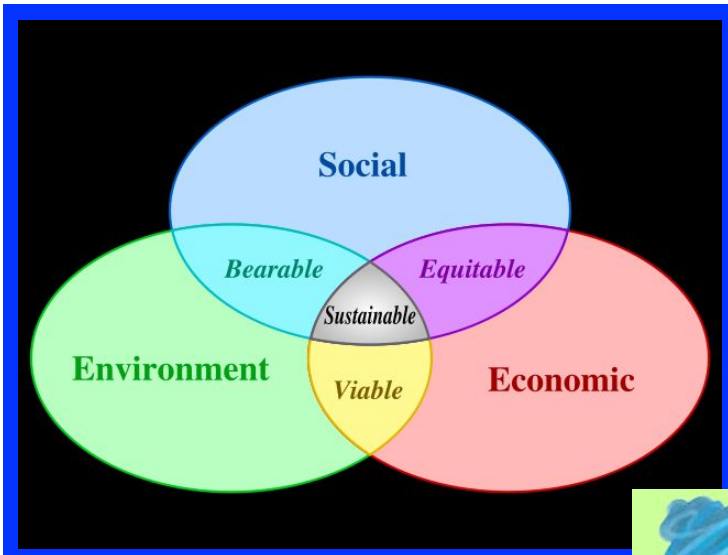

Développement durable

- Eau
- Forêts
- Réchauffement
- Antibiotiques

% resistance to 3rd gen. cephalosporins in *E.coli* in bacteremias Europe - EARS-net 2011-2017

	France	UK	Germany	Spain	Italy
2002	1	6 (2005)	1	2	3
2011	8	10	8	12	20
2012	10	13	9	14	26
2013	10	15	11	13	26
2014	10	10	11	12	30
2015	11	11	10	12	30
2016	11	9	11	15	30
2017	10	10	12	13	30

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% resistance to 3rd gen. cephalosporins in *K.pneumoniae* in bacteremias Europe - EARS-net 2005-2017

	France	UK	Germany	Spain	Italy
2005	1	6	2	8	8
2011	25	5	12	13	46
2012	23	12	13	17	48
2013	28	14	16	20	55
2014	30	9	13	18	56
2015	30	10	10	20	56
2016	29	9	14	22	56
2017	29	11	15	21	55

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