
Health-Care Associated Infections: Prevention & Control Program

Pr Christian Brun-Buisson
Chair, Advisory Board for the French National IC Program (MoH)
CHU Henri Mondor, Créteil, Fr
INSERM U 657
Christian.brun-buisson@hmn.aphp.fr

Background : Organization and
Structures dedicated to infection control
& evaluation tools (*France*)

Infection Control Structures Operating in France : the 3 levels

■ *Local (hospital) level*

- Local Committee: ICCs (1988-1999)
- Infection control teams (ICT, 1999)

■ *Regional & inter-regional*

- Interregional coordinating centres for infection control (CCLINs, 1992)
- Regional subsidiary structures (2005)

■ *National level*

- Coordinating unit – NI Bureau, Ministry of Health
- Advisory Board for the National Program (2004)
- National Expert Committee (1992 CTINILS -> 2004 HCSP)
- National Institute for Public Health Surveillance (InVS, 1998), coordinating the EWRS (mandatory notification of sentinel events, 2001) and
- National prevalence studies & RAISIN surveillance networks (1999-03), a partnership between InVS and the CCLINs

The current organization of structures dedicated to Prevention & Control of HCAI in France



The 5 Interregional Coordinating centers



- Promotion & implementation of the national program
- Expert assistance to ICC and IC teams & documentation
- Organisation of national surveys and surveillance networks
- Follow-up and investigation of mandatory notifications

Surveillance: Sentinel events & Surveillance Networks

French national NI surveillance system:

1. National network of networks (RAISIN, 2001): targeted surveillance programs for *benchmarking and follow-up of the national program*, coordinated by the French national Institute for Public Health Surveillance (InVS), and the 5 Inter regional Coordinating Centers (C-CLINs)
2. National Prevalence surveys (c. every 5 years)
3. Alerts and sentinel events: early warning system (mandatory notification, decree 26/07/2001)

<http://www.invs.sante.fr/raisin/>

- **National network of networks** (RAISIN, 2001), jointly coordinated by the National Institute for Public Health Surveillance (InVS), and the 5 Inter regional Coordinating Centers (C-CLINs)

- 5 targeted surveillance programs (standardised methods):
 - *Surgical site infections (2002);*
 - *Multidrug-resistant bacteria (MRSA, ESBL; 2002);*
 - *Antibiotic use (2008)*
 - *ICU-acquired infections (2003).*
 - *Blood and body fluid exposures of personnel (2002);*
 - *Nosocomial bacteremia (2002);*

- *Additional 'labelled' networks (Pediatrics, Hemodialysis, ..)*

Defining Priorities: The (“first”) national NI control program

2005 – 2008

Re: « **French National Program for Prevention of Healthcare-Associated Infections and Antimicrobial Resistance, 1992–2008** »

Jean Carlet, Pascal Astagneau, Christian Brun-Buisson, Bruno Coignard, Valérie Salomon, Béatrice Tran & al.

ICHE 2009; 30: 737-45.

Key considerations & incentives: the evolving environment of infection prevention & control

- **Adapting/strengthening** the national structures and organisation:
 - ❑ evolving structures and institutions (National agencies: patients' safety, networks: RAISIN,...),
 - ❑ emerging inter-disciplinary activities (risk management, quality insurance programs...)
- **Integrating new priorities:**
 - ❑ Diagnosis and management of NI,
 - ❑ Increasing role of infection control teams (ICT),
 - ❑ Nursing homes / Rehabilitation / LTC / Ambulatory care
- Perceived need for **process/performance indicators** and **public disclosure** : Public health law / qualitative & quantitative indicators
 - ❑ **Public reporting:** information & patients' rights – risk perception / media

Objectives & Evaluation measures

Directive MoH (DGS/DHOS n°599, Dec. 13, 2004)

http://www.sante.gouv.fr/htm/actu/infect_nosoco181104/prog.pdf

PROGRAMME NATIONAL DE LUTTE CONTRE LES INFECTIONS NOSOCOMIALES 2005 – 2008



Un dispositif spécifique en place au niveau local, régional national

- **A National Program** for control of nosocomial infections in all health-care facilities, 2005-2008.
 - **5 key priorities**
 - **A coordinated action plan transposed at the 3 operating levels**
- **Setting goals and indicators for public reporting:**
 - **12 objectives as 2008 targets** for all HCF
 - **5 Indicators (all HCFs) for piloting and public reporting** at the national level:
 - **To monitor the progresses** of infection control activities in HCF and provide an **incentive** for institutions and governing bodies **to improve IC & quality of care in all hospitals, and to inform the public**

The 12 goals targeted for 2008

1. 100% HCF have an **operating ICT**
2. 100% HCF have increased their **IC activity score (ICALIN)** between 2005 / 2008 and none remain in the lower class
3. 75% HCF have **doubled their use of AHR** and
4. 100% have **reached the minimal personalized target consumption**
5. 75% HCF perform **audits** of preventive practices
6. The **prevalence of MRSA** has decreased by 25% in at least 75% HCF
7. 100% HCF have organised the mandatory reporting of **sentinel events**
8. All HCF performing surgery have organised a **surveillance program for SSI**.
9. 100% HCF have an **anti-infective drug committee**.
10. 100 % HCF have elaborated protocols for good **antimicrobial prescribing and monitor antibiotic consumption**
11. 100% HCF present their **IC program** in their **information leaflet**.
12. All HCF **provide the complete set of relevant indicators**

To implement a panel of indicators in all hospitals to promote and follow-up infection control activities and better inform the public

■ *Local level*

- ❑ Implement a mandatory panel of indicators, including **processes and performance** indicators.
- ❑ Includes **5 indicators for ALL HCFs**:
 1. Combined **organisation & infection control activities** (ICALIN).
 2. Annual volume of **alcohol-based HR used** p.1000 patient-days (ICSHA)
 3. Surveillance of **surgical site infections** per subspecialty (SURVISO)
 4. **Antibiotic policy and surveillance** of consumption (ICATB)
 5. Control of AMRB: **incidence of MRSA** p.1000 patient-days. (ISARM)

■ *Regional / national level*

- ❑ Follow-up the implementation in each HCF of the panel of indicators, and help resolve organisational problems.

Evaluation of the 2005-2008 program and indicator measures

- Based on :
 - **Process measures:** Individual and aggregated data from the mandatory annual report issued by each healthcare facility (HCF) (no. # 2800)
 - Annual reports from the Advisory Board for the National Program
- Outcomes at the national level:
 - Trends recorded in INVS-RAISIN national surveillance networks
 - Prevalence data
 - Other sources (EARSS, ..)
- Assessing quality of data :
 - Checking data from the mandatory annual report on a random sample of 10% HCFs
 - At the district level by the regional health agencies (MoH subsidiaries)

Rationale for Public reporting

- Motivating HCF management and ICT to improve the quality of care and develop a prevention program
- Evaluating results from the national program
- Responding to patients' wishes & rights to be more and better informed

Public Reporting: Media coverage & caveats



2005: The « black list »:
HCFs not performing SSI
surveillance

Chirurgie :
les 107 établissements
qui ne surveillent pas
leurs infections



An evolving presentation (and perception?):
The « safest hospitals » (2008)



1. Adapting Infection Control Structures and Organisation

- Strengthen infection control structures and bodies at all levels (local, regional/interregional & national):
 - *Objective 2008: 100% HCFs have an operating Infection Control Team*
 - *Objective 2008: the composite score assessing infection control organisation and activities (ICALIN), has improved in 100% HCF and none remain in class E (indicator n°1);*

Indicator n°1: Composite indicator of IC

Organisation, Resources and Activities (ICALIN)



MINISTÈRE DE LA SANTÉ
ET DES SPORTS

- First published in 2005, based on the 2004 annual report from each hospital (ICT + management)
- A 100 points score including 3 components:
 - Organization (33 pts)
 - Resources (33 pts)
 - Actions (34 pts)
- A **rating system** : class A to E (F non-respondents)
 - Percentiles of distribution (NHS method)
 - Reference base for building the score and determining classes: yr 2003 data
 - Stratified by (13) hospital categories
- **Classes (A – E) : 10 - 30 - 70 - 90 % of the maximum score**

<http://www.icalin.sante.gouv.fr/index.php>

The overall index of IC activities, ICALIN:

3 - Activities

Actions								
N1	N2	N3	Items	N1	N2	N3	Pts	
A	A1 Protocols		A11 – 6 priority recommendations * 2	34	17		12	
			A12 – 10 other recommenations * 0,5				5	
	A2 Surveillance		A21 – Notification & Prevention of BBFE			12		3
			A22 – Control Program for AMRB				4	
			A23 – At least 1 surveillance program				3	
			A24 – Surveillance from laboratoy data				1	
			A2e – Internal reporting of surveillance data				1	
	A3 Evaluation		A31 – Auditing of preventive practices for ≥ 1 local recommendation			15		2
			A32 – Measuring antibiotic use				2	
			A33 – including at least 1 audit				1	

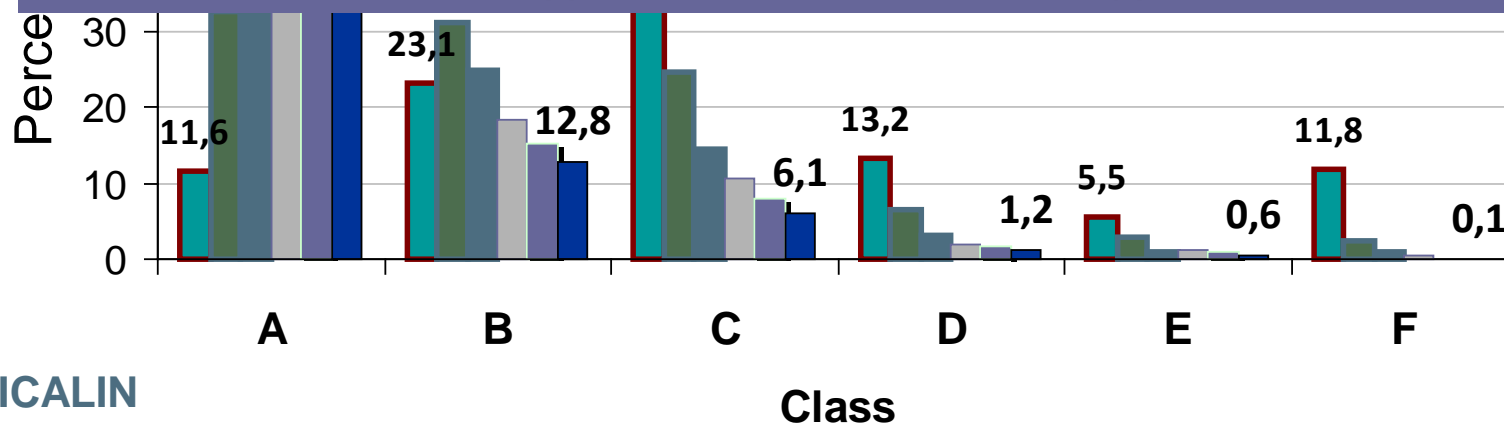
Global indicator of IC Organisation & Activities (ICALIN)

2004 - 2009, released Dec. 2010, ~ 2,800 healthcare facilities



2008 target: 100% HCF have improved their overall process score, and none remains in the lowest class E

2009: > 90% HCFs in A-B strata & <1% in strata E



ICALIN

Class

Composite indicator for infection control organisation, resources and activities (max. score 100), stratified by HCF categories

2. Promote improved organisation of care and practices having an impact on infectious risks

- Prioritize **adherence to preventive practices** having a strong impact on the infectious risk associated with **invasive procedures** and on the **prevalence of antibiotic resistance**
 - *2008 target : All HCF have reached class A/B of their individual target for minimal consumption of alcohol-based HR products (indicator n°2)*
 - *2008 target: The MRSA rate has decreased by 25% in at least 75% of HCF (indicator n°5)*
- Develop evaluation of preventive practices by physicians and other personnel (e.g., via audit programs)
 - *2008 target: Auditing practices is performed in at least 75% of HCF*
 - **National audit program (MoH directive) launched in 2005**

Indicator n° 2: Consumption of Alcohol-based hand rubbing products

- First released in **2006** (2005 data), expressed as the **actual consumption** (numerator) relative to a **(minimum) target objective** (denominator)
- Numerator = number of litres of alcohol-based products purchased annually by the HCF
- Denominator = “personalized objective” (minimum target to be achieved by the HCF) :
 - ❑ Minimum no. derived from a literature review
 - ❑ Total patient-days for each subspecialty x minimal number of hand-rubs per day for each type of activity (medical/ surgical/ ICU/ LTC..., x 0,003 L (ie, one hand-rub))

Indicator n°2: ICSHA

Volume (L) of AHR products used per year

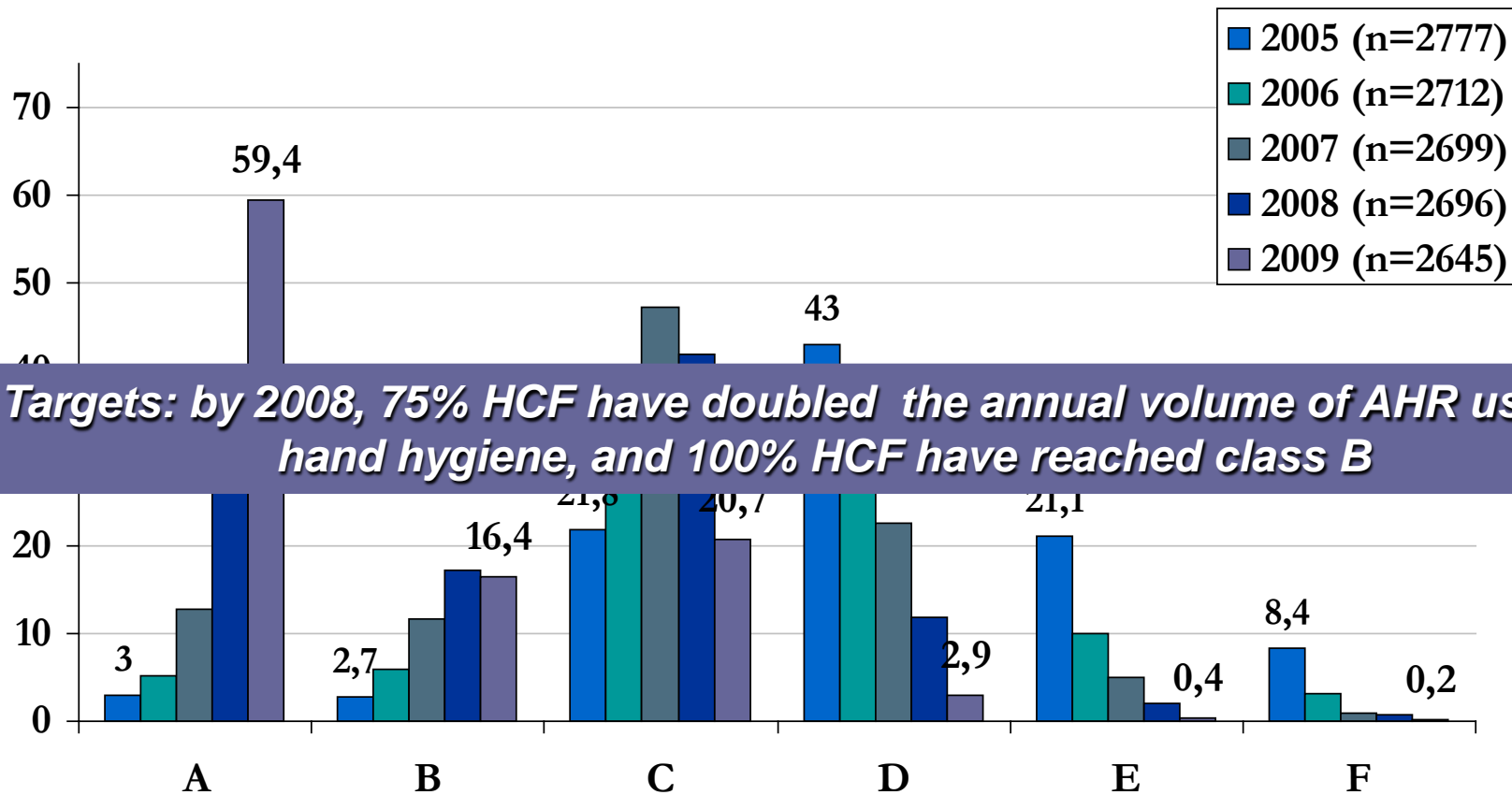
Individual HCF-specific minimum target, according to activities

*Computing the **individualised target** : minimal no. of HR per patient-day for each of 10 subspecialties*

- ❑ Medicine : 7
 - ❑ Surgery : 9
 - ❑ Obstetrics : 8
 - ❑ Intensive Care : 48
 - ❑ Hemodialysis : 6 HR / session
 - ❑ ED : 2 HR / visit
 - Rehabilitation : 5
 - LT care : 4
 - Ambulatory/Home-care : 2
 - Psychiatry : 2
- The target objective for a given HCF is the sum of all targets for each subspecialty in the HCF, according to the annual no. of patient-days.
 - **Classes IT : 10 - 30 - 70 - 90 % of the individualised target value**

Trends in National Indicators

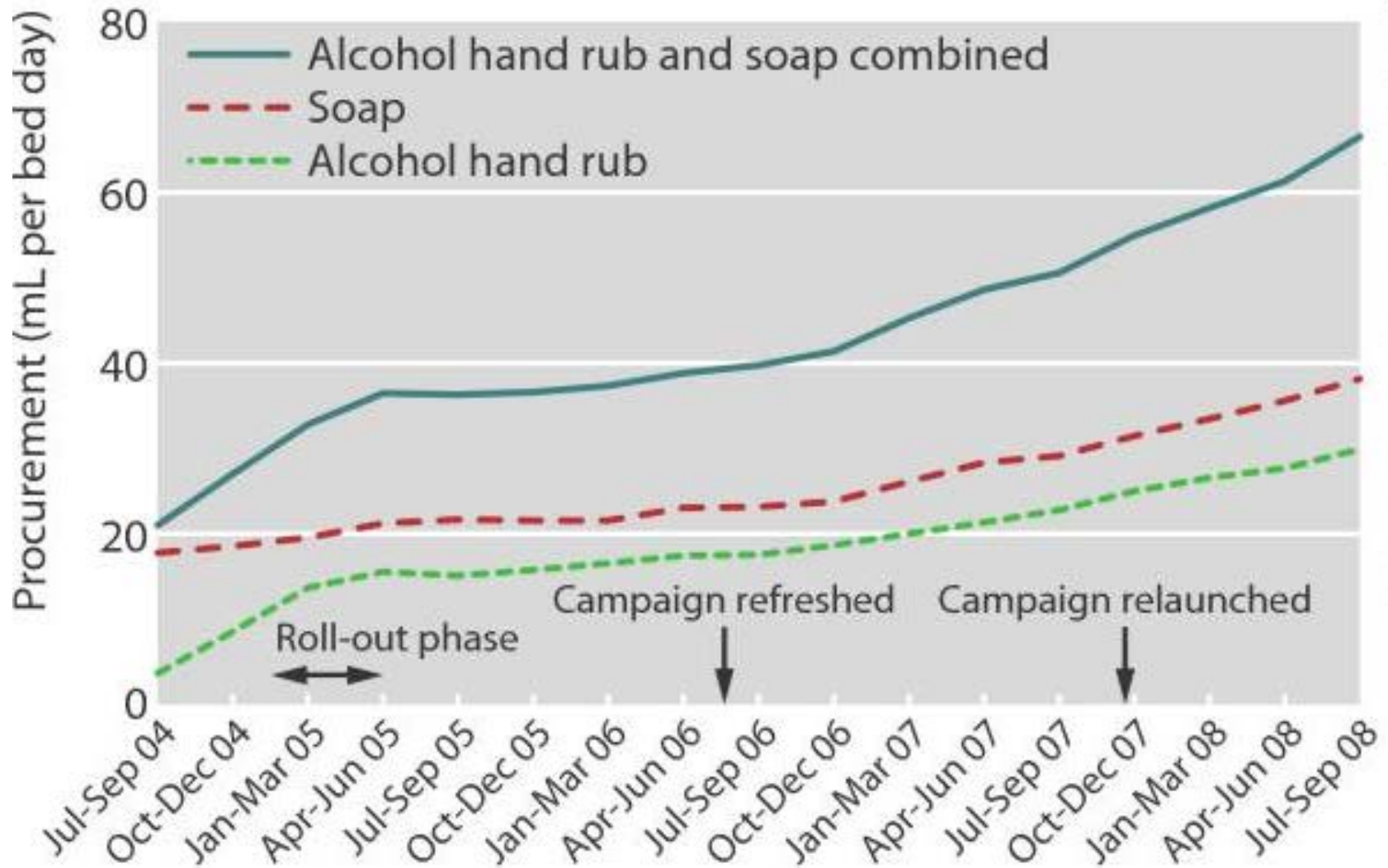
ICSHA: Per cent of the individualized target consumption



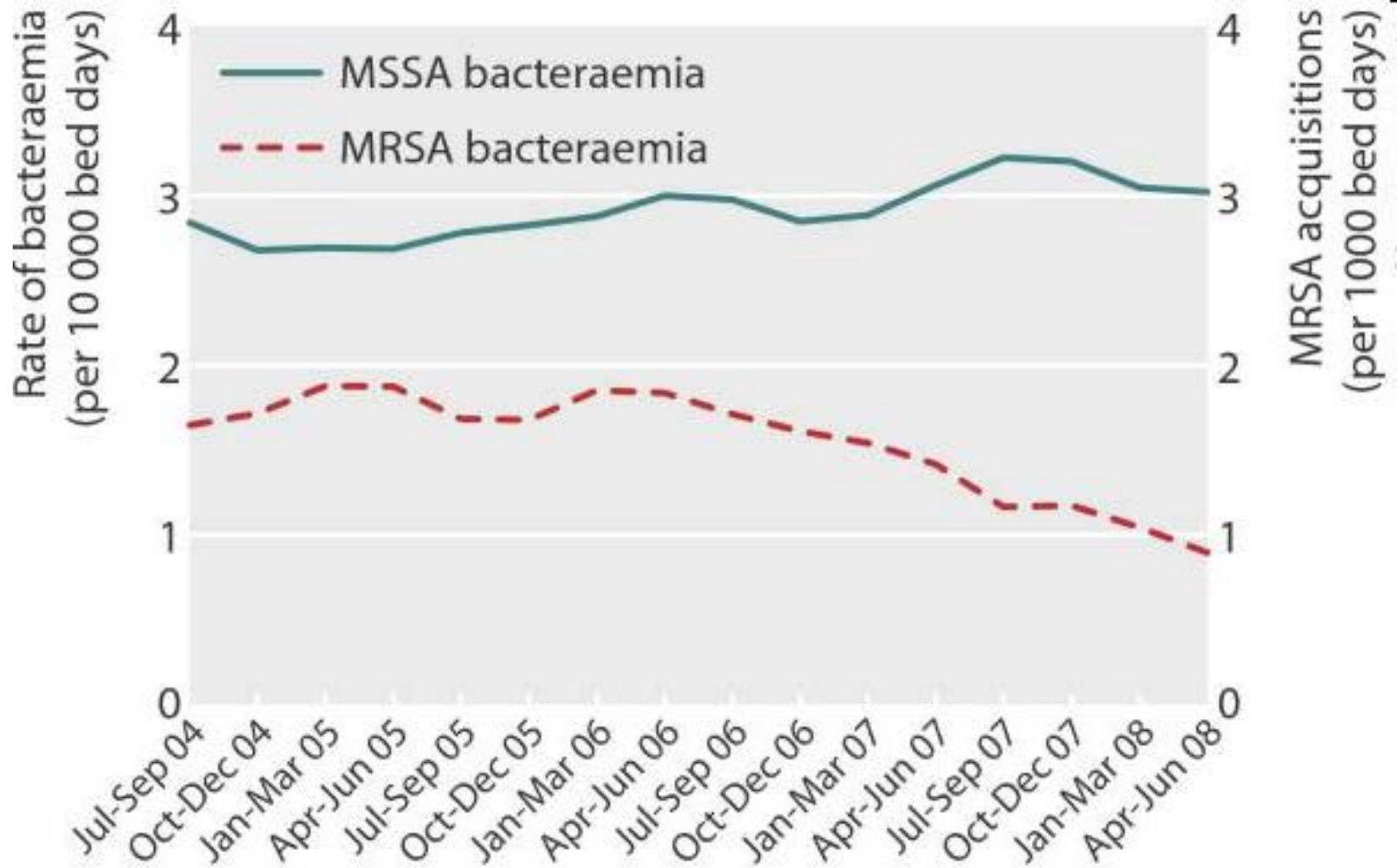
Targets: by 2008, 75% HCF have doubled the annual volume of AHR used for hand hygiene, and 100% HCF have reached class B

2009: 75% HCF have doubled their AHR consumption between 2005 & 2009; 75% HCFs have reached class A/B.

Improving Hand Hygiene



Hand Hygiene vs. MRSA



2. Promote improved organisation of care and practices having an impact on infectious risks (2)

- Improve the quality of care delivered to **infected patients**
 - *2008 target: An antibiotic drugs committee and a physician for antibiotic counselling is available in 100% of HCF. (Indicator n°4)*
 - *2008 target: Protocols for appropriate use of antibiotics are available in all hospitals, and antibiotic consumption is monitored (indicator n°4).*

Indicator n°4. Antibiotic Stewardship and Use (ICATB): Building the score

- First released early 2008 (2006 data)
- From a simple antibiotic consumption measure:
 - ❑ public release of consumption (no ranking),
 - ❑ and a targeted objective of decreasing overall national consumption (by 10% within 3 years)
- To a composite process indicator:
 - ❑ Score and performance ranking,
 - ❑ Using the 3 categorised groups of items (Organisation, Resources, Activities) similarly to ICALIN,
 - ❑ Scoring on 20 points (4-8-8)
 - ❑ Consumption recorded, but not scored.

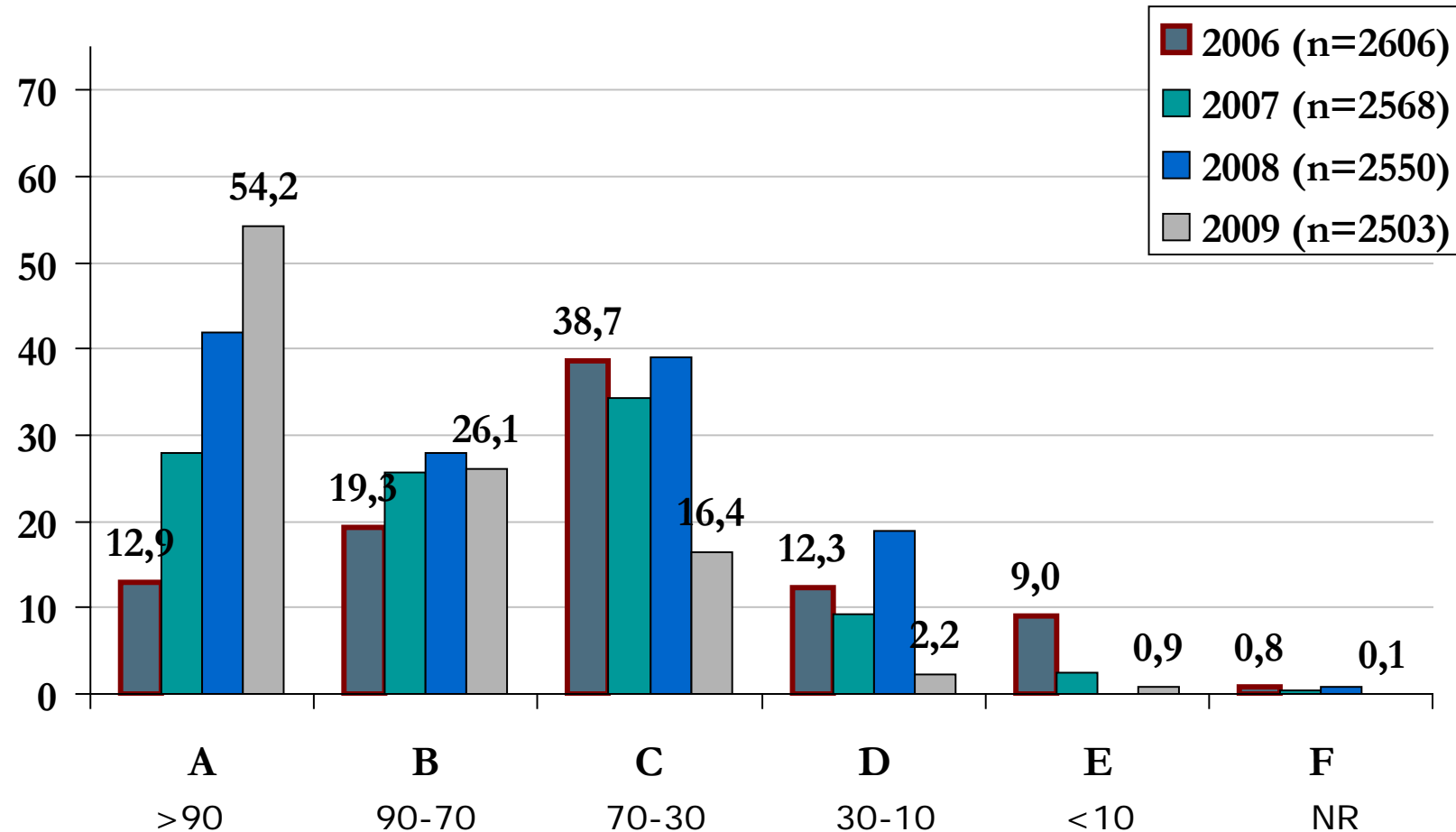
Indicator n°4: Antibiotic Policy and Use (ICATB)

Building the 3-level score

L1	L2	L3	Items	L1	L2	L3	Items	
O	1- Antibiotic drugs committee		1 - AB drug committee, no. of meetings	20	4	4	4	
R	R1- Antibiotic counselling		2 - Availability of a IDP for counselling		8	3	4	4
	R2- Information system		3a - Computerized connexion				1	
			3b - Computerized prescription				2	
	R3 - Training		4 - Education of new prescribers				1	1
A	A1 - Prevention	5-Protocols	5 - Protocols for antibiotic prophylaxis & use		8	1	2	2
		6- Therapeutics	6a - Antibiotic formulary				0,25	
	6b - List of controlled drugs		0,5					
	6c - Controlled stop orders		0,25					
	A2 -Surveillance	7	7 - Monitoring antibiotic use				2.5	2,5
	A3 - evaluation	8	8- Auditing antibiotic prescribing and use	2.5			2,5	

Indicator n° 4: Antibiotic policy and use

ICATB: Composite score of Organisation, Resources, and Activities related to antibiotic policy and stewardship (max. 20)



ATB-Raisin: Antimicrobial Use Surveillance



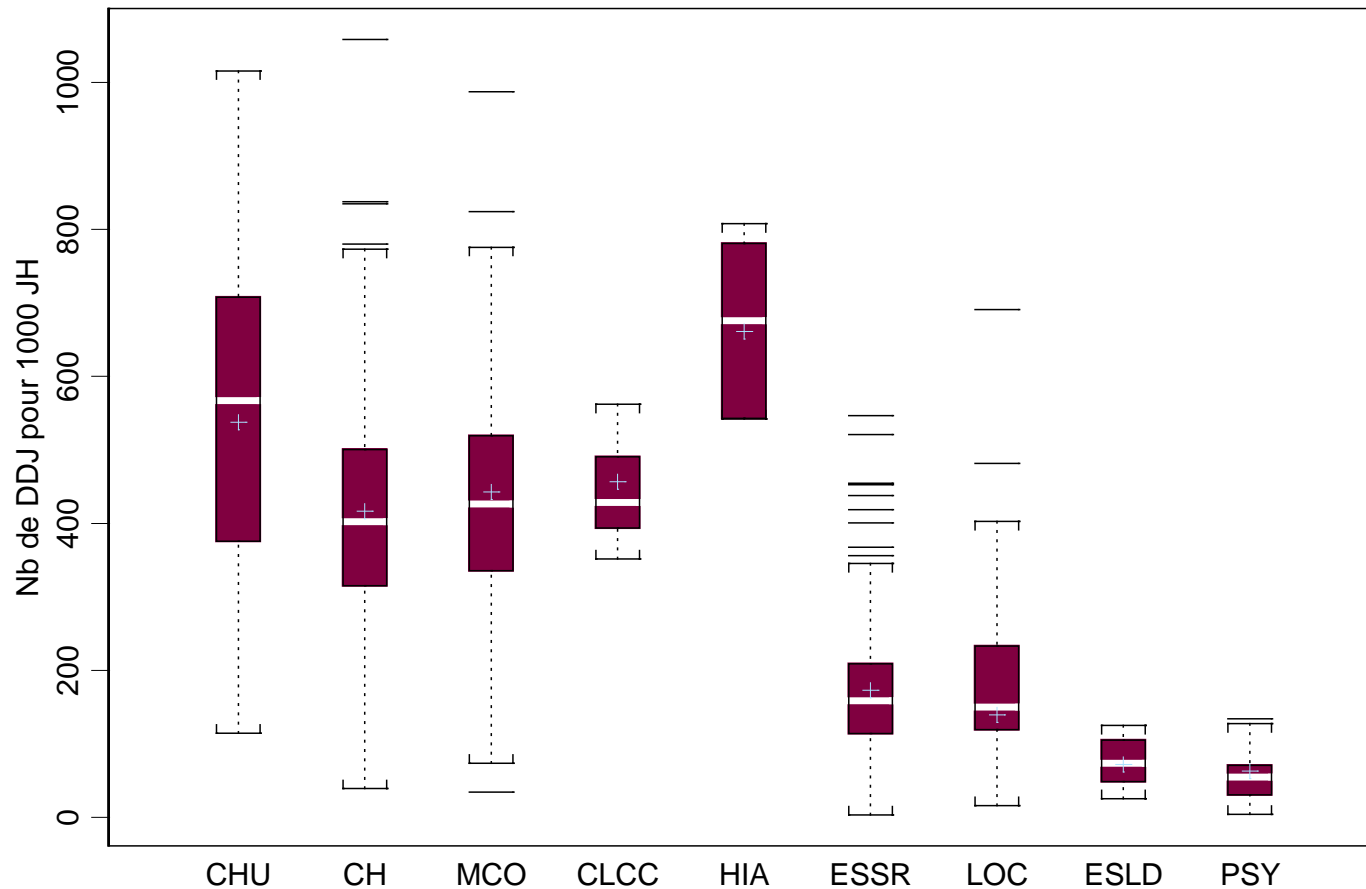
- Regional and national indicators: following trends
 - Antimicrobial selection pressure
 - By antimicrobial families or compounds
 - Trends: assessing antimicrobial stewardship policies
 - Correlations with trends in (MDR) bacteria (*C. difficile*, ESBL, VRE)

- One surveillance protocol for all healthcare facilities

- A base for assessing the quality of antimicrobial prescriptions
 - *En 2012, 100% des établissements de santé concernés ont inscrit la réévaluation de l'antibiothérapie entre la 24ème heure et la 72ème heure dans la politique de bon usage des antibiotiques et évaluent son application dans le dossier patient*

ATB-Raisin: Antimicrobial Use Surveillance

Distribution of systemic antibiotic use in 2009,
by hospital category (DDD/1000 pt-d)



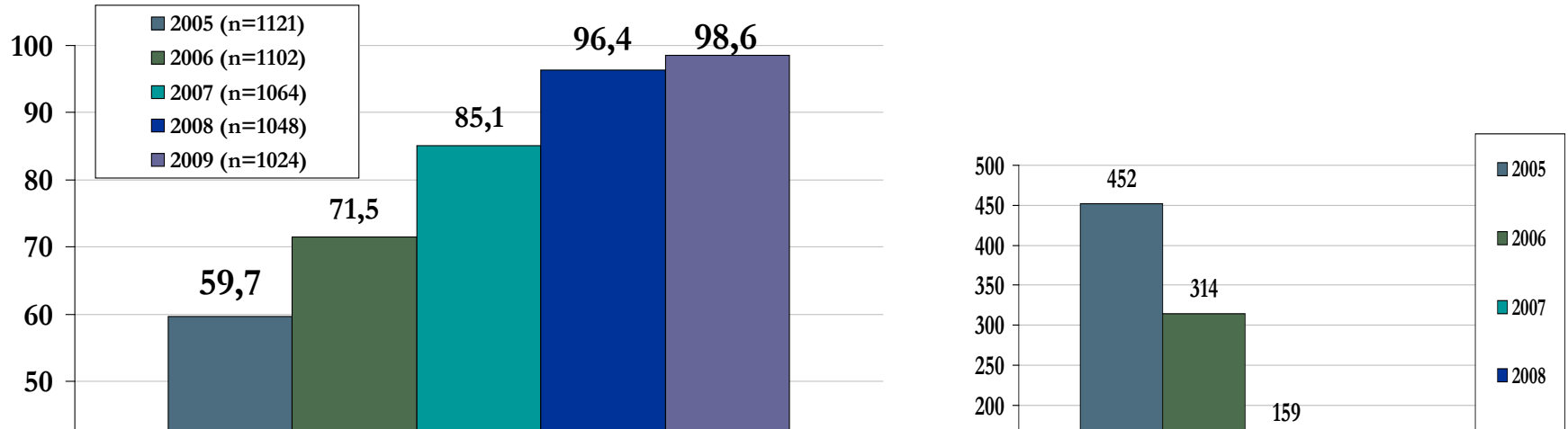
3. Optimise the collection and use of surveillance data

- Improve the **quality and adequacy of data collection for surveillance** of NI
 - *Objective 2008 : 100% of HCF performing surgery have organized a targeted SSI surveillance (**indicator n°3**).*

- **Optimise the use of various sources of information**, to improve and broaden our ability to prevent and control emerging infectious risks
 - *Objective 2008 : 100% of HCF have organised a procedure for notifying alerts of sentinel events, and one person is identified as in charge of the procedure (law, art. R.6111-12 to -17).*

Indicator n° 3: SSI Surveillance

SURVISO: Nb of surgical subspecialties performing SSI surveillance



2008 target: 100% HCFs performing surgery have organised the follow-up of at least one procedure for each subspecialty; no HCF remains in lowest category of the indicator in 2008.

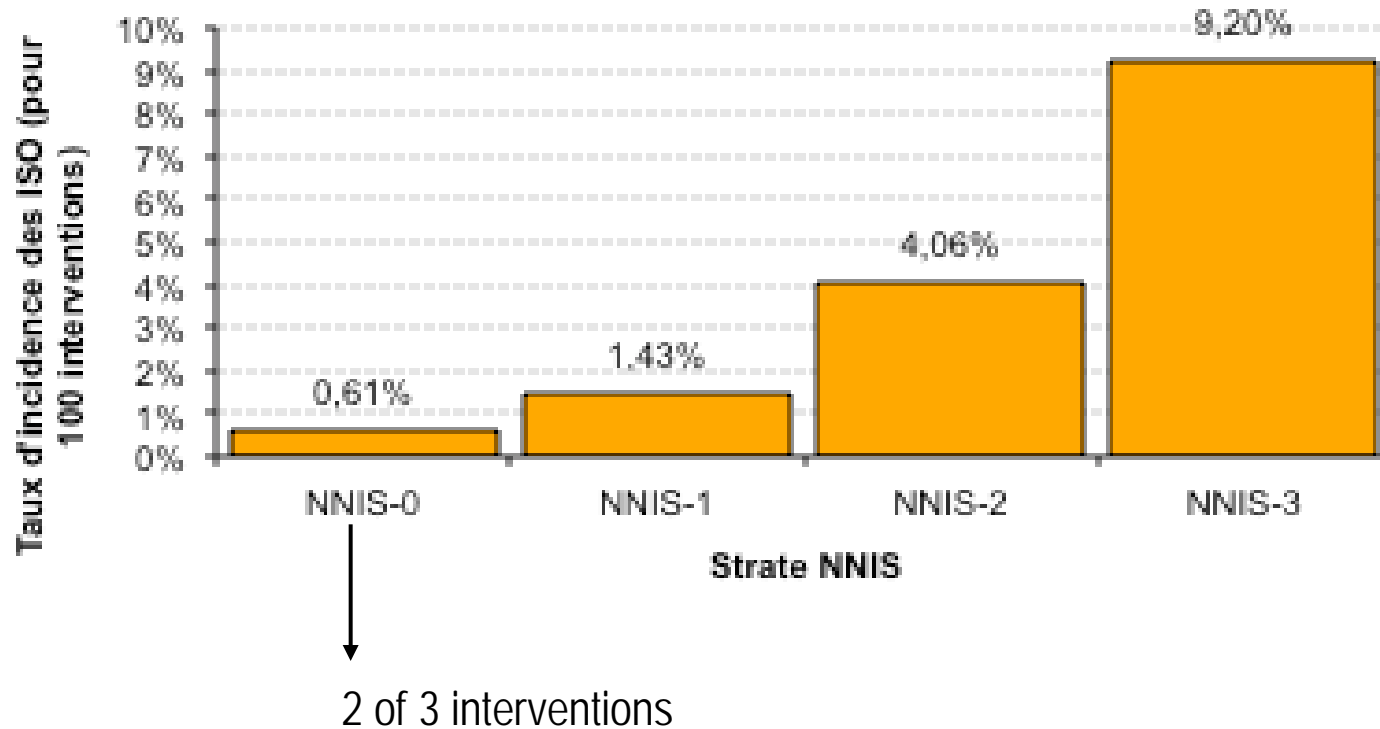


HCF performing surgery and no SSI surveillance were « penalized » in 2007 (3rd year).

ISO-Raisin: Surgical Site Infection Surveillance



Crude incidence rate, 2010 : 0,96% (49% deep SSI)

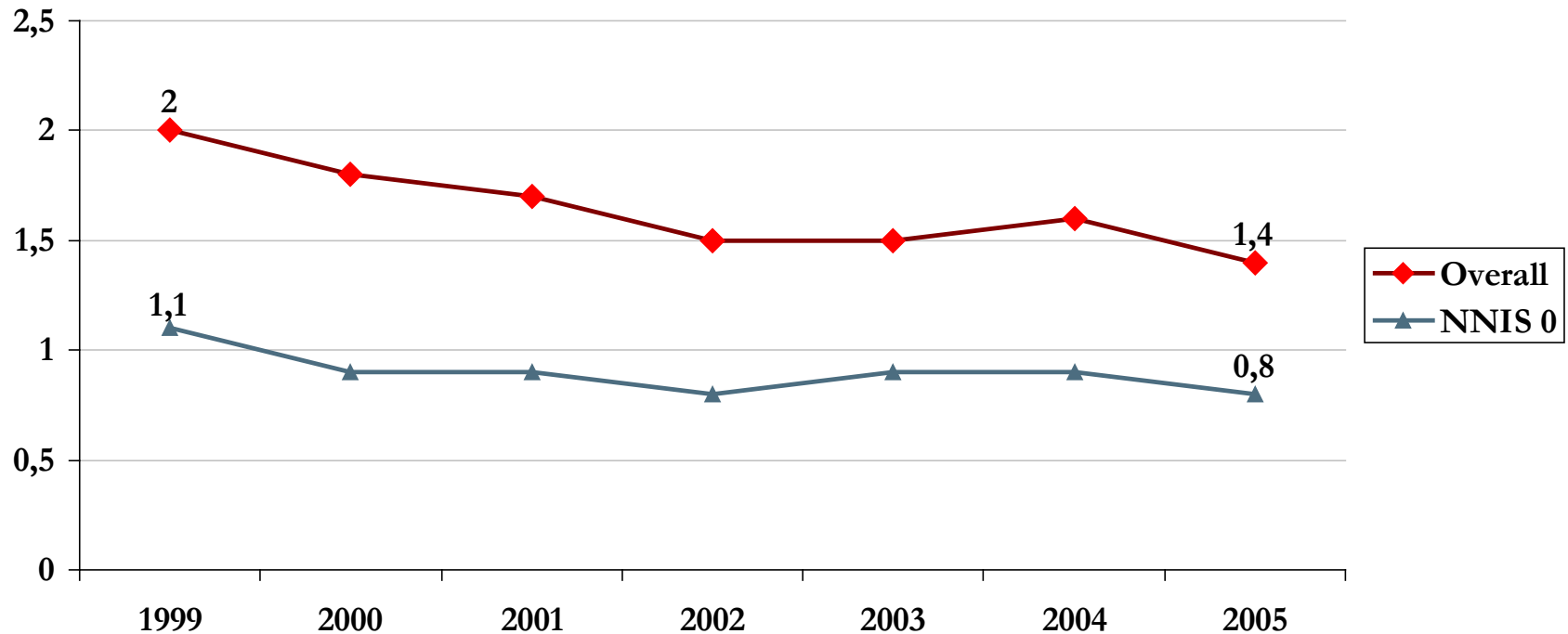


ISO-Raisin: Trends in Surgical Site Infection Rates (1)



Trends 1999 – 2005, France

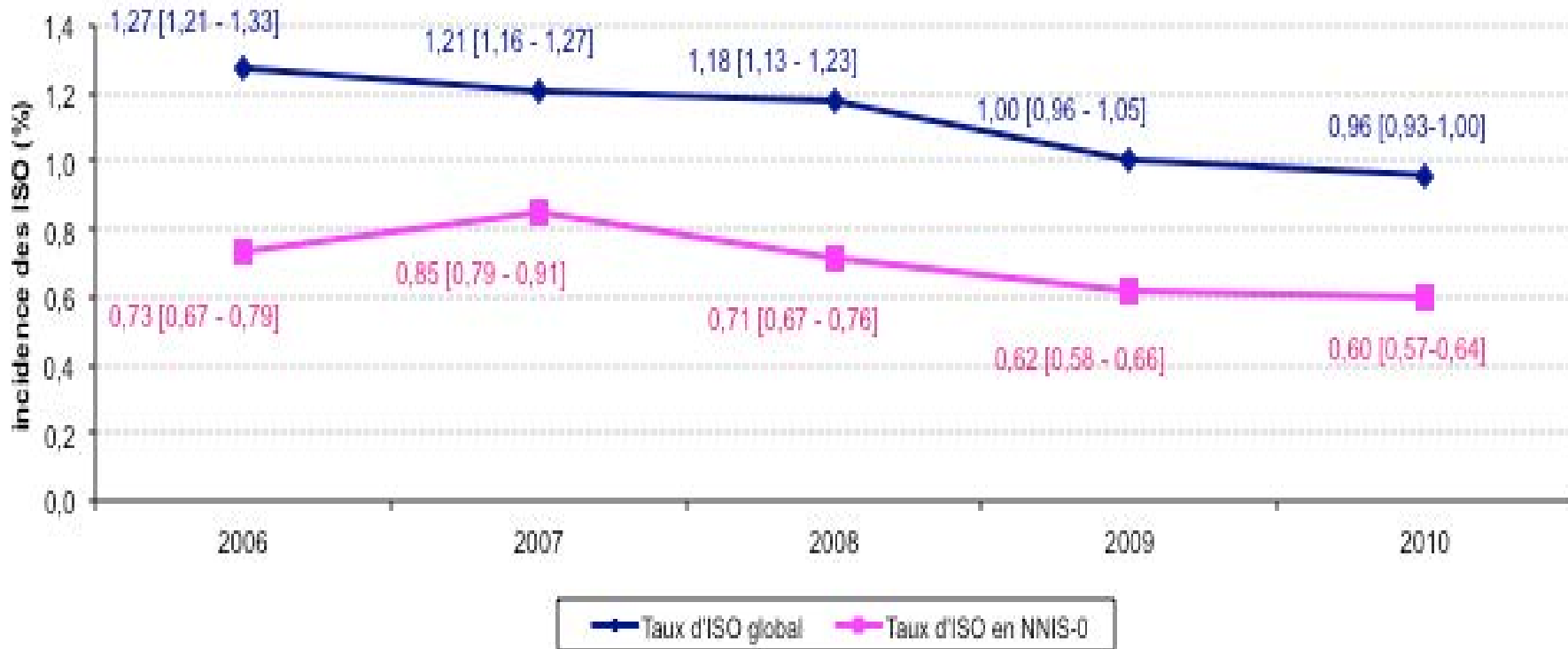
Annual overall and risk-adjusted surgical site infection incidence rate for main surgical procedures, from the RAISIN database



ISO-Raisin: Trends in Surgical Site Infection rates (2)



Trends 2006 – 2010 : -24% (-18% NNIS-0)



3. Optimise the collection and use of surveillance data

- Improve the **quality and adequacy of data collection for surveillance of NI**
 - *Objective 2008 : 100% of HCF performing surgery have organized a targeted SSI surveillance (indicator n°3).*
- **Optimise the use of various sources of information**, to improve and broaden our ability to prevent and control emerging infectious risks
 - *Objective 2008 : 100% of HCF have organised a procedure for **notifying alerts of sentinel events**, and one person is identified as in charge of the procedure (law, art. R.6111-12 to -17).*

The overall « aggregate » score

A simple summary indicator, directed
to the public and consumers

Priority 4: Improve transfer of knowledge and information on health-care associated risk

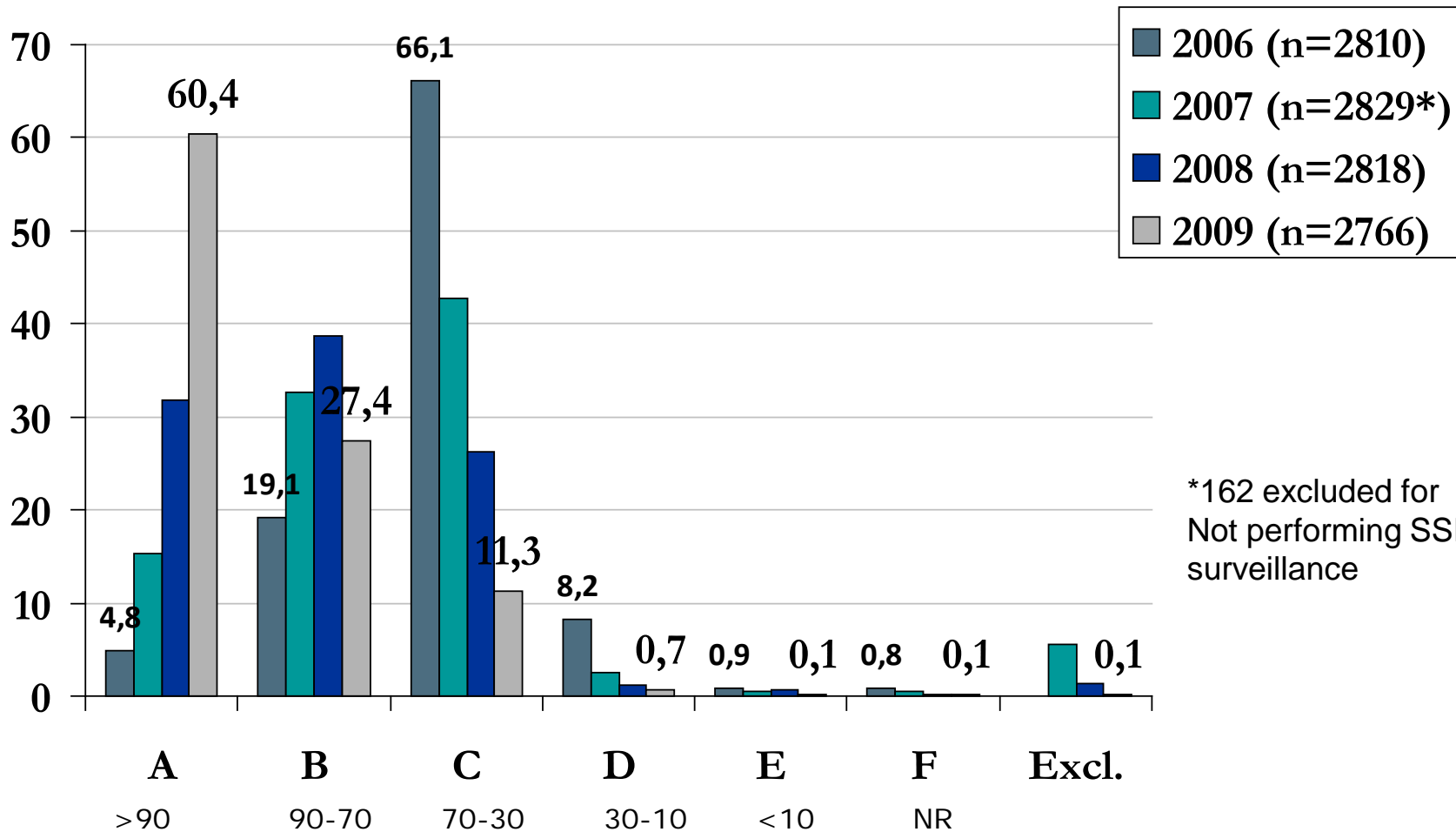
- Towards a better information of the public
 - *2008 target: 100% of HCF describe their infection control program in an information leaflet.*
- Sharing the information with patients and the public
 - *2008 target: the panel of all relevant indicators is made publicly available in 100 % HCFs*

<http://www.icalin.sante.gouv.fr/index.php>

Adapting the aggregate score to each hospital category

	ICALIN	ICSHA	ICATB	SURVISO
Univ-Reg hospitals	+	+	+	+
Pub Hosp <300 beds	+	+	+	+
Pub Hosp >300 beds	+	+	+	+
Psychiatry	+	+	+	
Community hospitals	+	+	+	
Priv MCO <100 beds	+	+	+	+
Priv MCO >100 beds	+	+	+	+
Rehab-LTCF	+	+	+	+
CCancer Centers	+	+	+	+
Hemodialysis	+	+		
MECSS	+			
Ambulatory care	+			+

The Aggregate Score for Public Reporting



*162 excluded for
Not performing SSI
surveillance

Disseminating the information:
Displaying the indicators on the
MoH website

<http://www.icalin.sante.gouv.fr/>

The combined indicator



Tableau de bord des Infections Nosocomiales Résultats 2008



Recherche d'établissements

Pour obtenir de l'aide, cliquer sur l'icône . Vous pouvez saisir une partie d'un mot ou d'une phrase dans les champs du moteur de recherche, celui-ci affichera les résultats contenant votre saisie.

Nom de l'établissement:

Nom de la commune:

Département:

ou Région:

Catégorie de l'établissement:

Résultat de la recherche

1 établissement

[Score agrégé](#) | [ICALIN](#) | [ICSHA](#) | [SURVISO](#) | [ICATB](#) | [SARM](#)

Chu A.Chenevier-H.Mondor (Ap-Hp)

51 Av De Lattre De Tassigny-
94010 Creteil Cedex

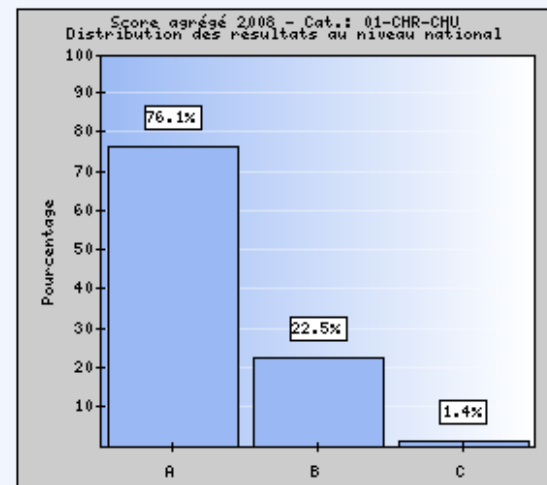
N° finesse: 940100027
Catégorie: 01-CHR-CHU

Les années suivies d'une *, les déclarations ont été validées par l'administration.

Score agrégé

Score agrégé du Tableau de bord des Infections Nosocomiales

	2006	2007	2008
Score agrégé	96.40	98.60	98.60
Classe	A	A	A



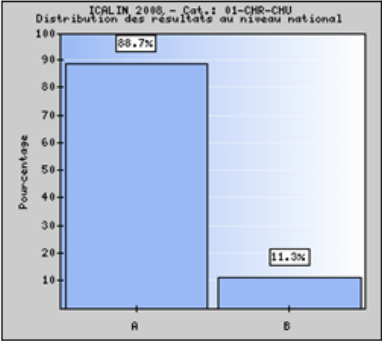
The 5 individual indicators

Plus de compléments... My Library New Issues

ICALIN

Indice Composite des Activités de Lutte contre les Infections Nosocomiales

	2006	2007	2008
Score	96.00	99.00	99.00
Classe	B	A	A




ICALIN 2008 - Cat.1 01-CHR-CHU
Distribution des résultats au niveau national

Percentage

88.7%
11.3%

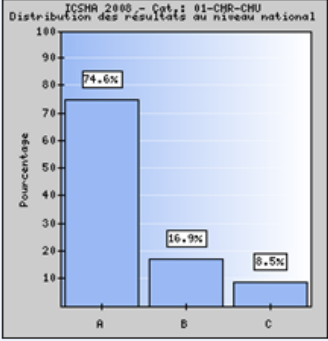
A B

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ICSHA

Indicateur de Consommation de Produits Hydro Alcooliques

	2006	2007	2008
% réalisé	115.20 %	104.70 %	145.50 %
Classe	A	A	A
Conso. déclarée (en litres)	10860.40	9817.15	13647.40
Objectif personnalisé (en litres)	9427.70	9379.70	9379.10




ICSHA 2008 - Cat.1 01-CHR-CHU
Distribution des résultats au niveau national

Percentage

74.6%
16.9%
8.5%

A B C



Internet | Mode protégé

Plus de compléments... My Library New Issues

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SURVISO

Enquête d'incidence des infections du site opératoire

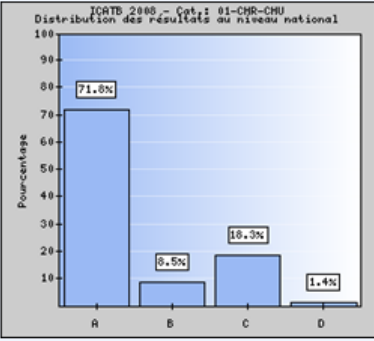
	2006	2007	2008
Réalisation de l'enquête	oui	oui	oui
Nombre de services participants	7	6	6
Nombre total de services chirurgicaux	7	6	6

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ICATB

Indice Composite de bon usage des Antibiotiques

	2006	2007	2008
Score	18.00	19.00	19.00
Classe	A	A	A




ICATB 2008 - Cat.1 01-CHR-CHU
Distribution des résultats au niveau national

Percentage

71.8%
8.5%
18.3%
1.4%

A B C D

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Indice SARM

Indice SARM (calculé sur 3 ans) pour 1 000 journées d'hospitalisation

	2004-2006	2005-2007	2006-2008
Taux	-	0,7	0,58

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Internet | Mode protégé

Overview of HCF Ratings for the 1st generation of indicators (2005-2009)

Indicator	% HCF A or B (2010)
ICALIN (organisation & activities)	92,7 %
ICSHA 2 (HH & AHR)	72,2 %
SURVISO (SSI)	70,5 %
ICATB (Antibiotic use)	87,1%
MRSA*	38,6%
Agregate score (ICALIN, ICSHA, SURVISO, ICATB)	89,7%

The new 2009-2013 Plan

http://www.sante.gouv.fr/IMG/pdf/plan_strategique_national_2009-2013_de_prevention_des_infections_associees_aux_soins.pdf

<http://www.sante.gouv.fr/programme-national-de-prevention-des-infections-nosocomiales-2009-2013.html>

Trends & Perspectives

- Challenges for the 2009-2013 program:
 - Refining the hierarchy of priorities
 - Update regulations and adapt organisation and structures (IC teams, regional-based programs)
 - From NI to HCAI: Facing the challenge of HCAI in LTCFs & nursing homes,
 - Broaden the model to global patient safety and fostering a safety culture,
 - Keep the momentum for process improvement
 - Transparency and public disclosure: go further in public reporting of results with improving the first generation and more performance indicators
 - ...
- Focusing more on activities and results rather than structures and organisation

The 2009-2013 National Program : Priorities & Quantitative Objectives at the national level (results)

- **Priority 1: Reduce rates of device-associated infections**
 1. *The incidence of CVC-related bacteremias in ICUs should be reduced by 25% (ref REA-RAISIN 2008)*
 2. *The incidence of SSI per 100 low-risk procedures (scheduled surgery) should decrease by 25% (ref ISO-RAISIN 2008)*
 3. *The incidence of needle/sharp injuries per 100 admissions should decrease by 25%, overall and in each hospital category*

- **Priority 2: Control the dissemination of MDRB and of emerging new resistance markers at risk of epidemics**
 4. *The incidence of MRSA per 1000 HD should decrease by 25%, including the rate of MRSA BSI (ref BMR-RAISIN 2008)*
 5. *The proportion of GRE among E. faecium remains at <1% at the national level.*

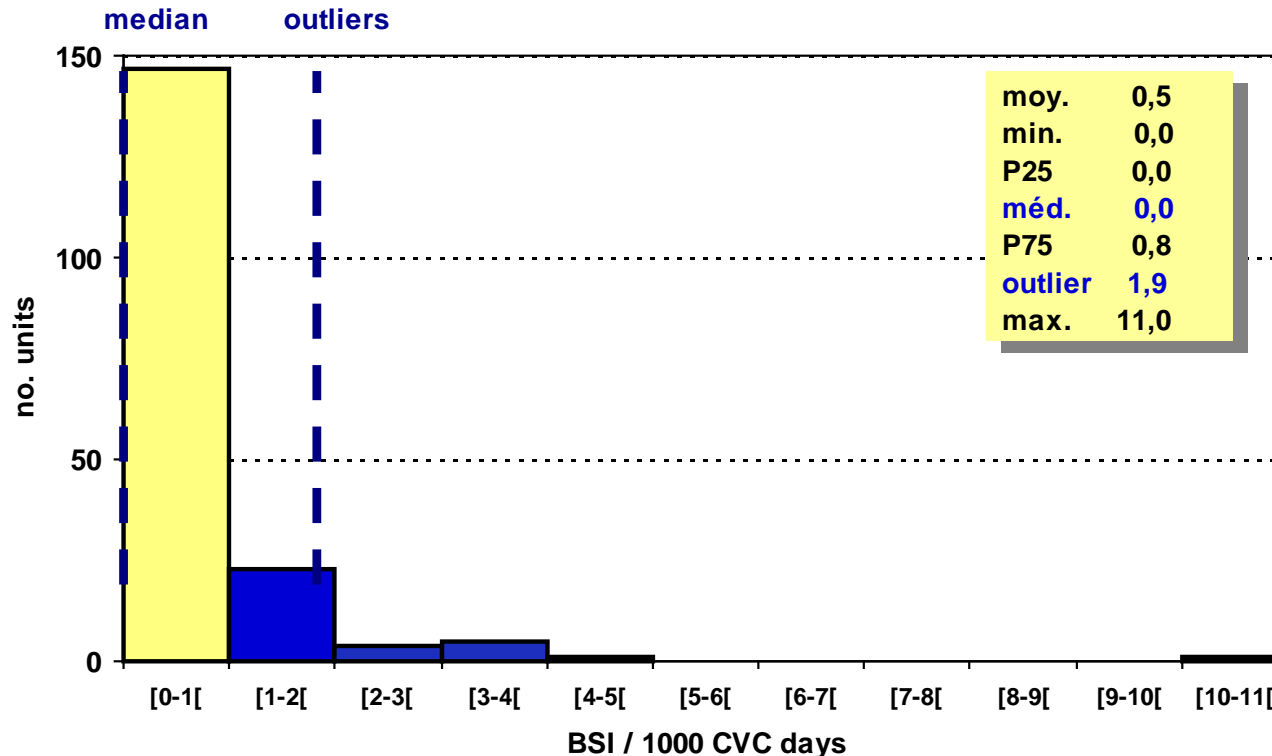
REA-Raisin: Surveillance of ICU-Acquired Infections (1)

- 2010 Data
 - 181 wards
 - 2 030 ICU beds (37% of all adult ICU beds in France)
 - 25 685 patients hospitalised > 2 days

Invasive device	% patients exposed	Duration Exposure, mean (med.) days	Exposition ratio (%)
ET Intubation	64.5	10.9 (6)	60.8
Central VC	63.3	12.2 (8)	66.0
Urinary cath.	87.0	11.3 (7)	84.2

REA-Raisin: Surveillance of ICU-Acquired Infections (2)

- Incidence of CVC-related BSI (0 in 120 /181 ICUs (66%))



REA-Raisin: Surveillance of ICU-Acquired Infections (3)



■ Catheter-related BSI incidence, 2008 to 2010

- P75: 1,23 → 1,40 → 0,77 for 1000 CVC days
- i.e., **– 37.4 % in 3 years**

- *En 2012, le taux d'incidence* des bactériémies associées aux cathéters veineux centraux (CVC) en réanimation pour 1000 jours d'exposition aux CVC a diminué d'un quart ; [données de référence : REA RAISIN 2008]*

The « bundle » approach



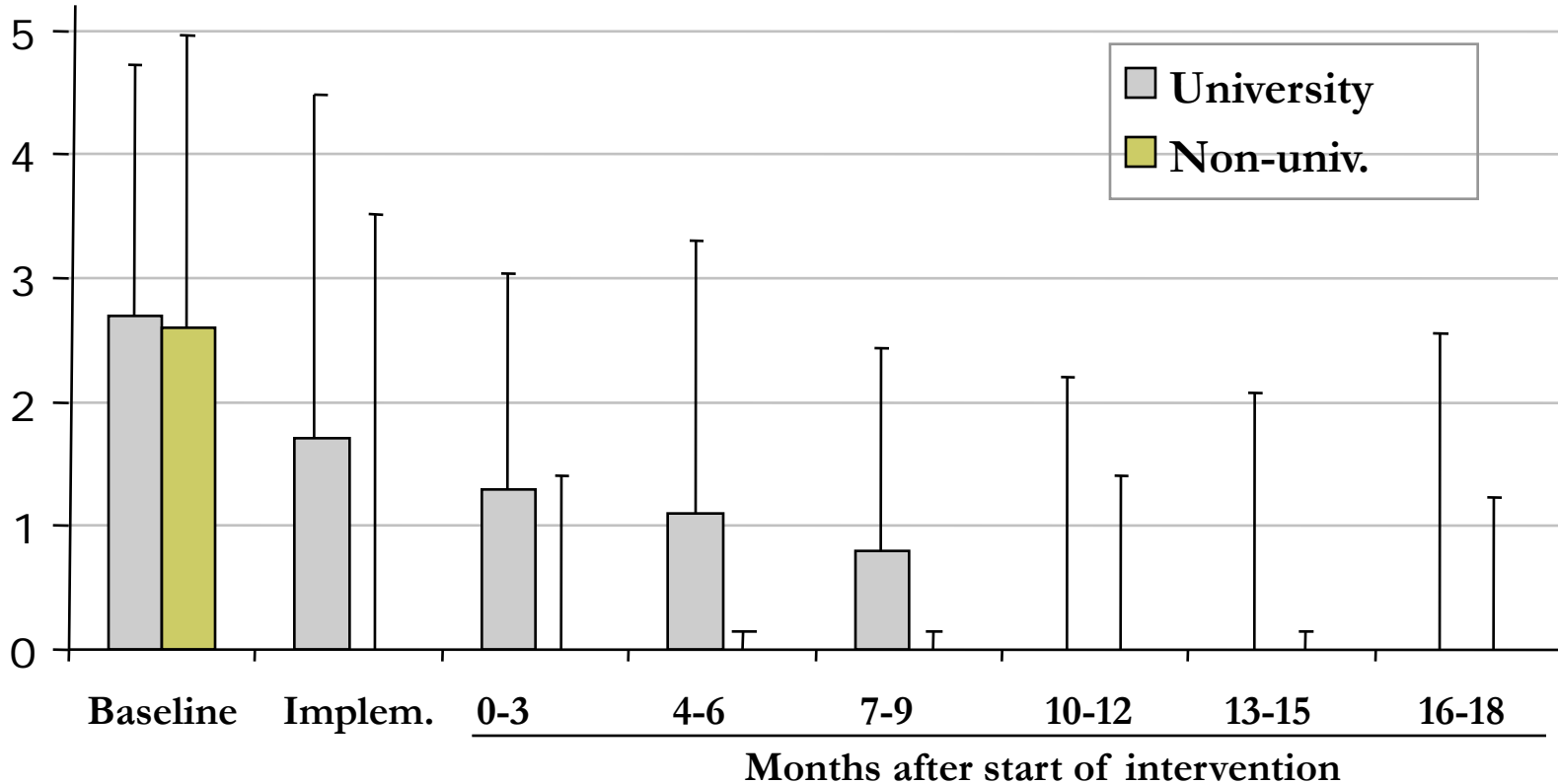
An Intervention to Decrease Catheter-Related Bloodstream Infections in the ICU

Peter Pronovost, M.D., Ph.D., Dale Needham, M.D., Ph.D., Sean Berenholtz, M.D., David Sinopoli, M.P.H., M.B.A., Haitao Chu, M.D., Ph.D., Sara Cosgrove, M.D., Bryan Sexton, Ph.D., Robert Hyzy, M.D., Robert Welsh, M.D., Gary Roth, M.D., Joseph Bander, M.D., John Kepros, M.D., and Christine Goeschel, R.N., M.P.A.

- 103 ICUs (Michigan)
- 375,757 catheter-days.
- Intervention focused on 5 evidence-based interventions (CDC)
 - Having substantial impact on infection rates
 - And the least barriers to implementation.
- Including :
 - Hand hygiene,
 - Maximal barrier precaution at insertion,
 - Skin disinfection with chlorhexidine,
 - Avoiding the femoral site
 - Catheter removal asap.
- Local team leaders (physician + nurse) in each unit

Controlling Catheter-related Infections

BSI / 1000 Cath-days, median



Median	2.7	0
(mean)	(7.7)	(1.4)

PROPIN 2009-2013: Quantitative Objectives (2): MDRB

MAITRISER LA DIFFUSION DES BACTERIES MULTI-RESISTANTES ET L'EMERGENCE DE PHENOMENES INFECTIEUX A POTENTIEL EPIDEMIQUE

Objectifs quantifiés de résultats

- *En 2012, le taux d'incidence* des SARM isolés de prélèvements cliniques pour 1 000 journées d'hospitalisation a diminué d'un quart, y compris pour les bactériémies à SARM [données de référence : BMR RAISIN 2008]*
- *En 2012, la proportion de souches d'Enterococcus faecium résistants aux glycopeptides reste inférieure à 1% au niveau national [référence : réseau EARSS-France]*

* * la valeur cible utilisée est le troisième interquartile de la distribution des taux (P75, qui reflète la valeur maximale de 75% de l'ensemble des taux observés dans le réseau), dont on attend qu'elle tende vers le taux médian (valeur maximale observée pour 50% des taux) observés avant la période du programme 2009-2012.

National Programme 2009-13: Processes & activities objectives at the HCF level

- *By 2013, 100% of HCF routinely use **checklist** as an incentive to compliceance to preventive measures during insertion and care of :*
 - *CVC in ICUs*
 - *peripheraly-inserted iv catheters and urinary catheters*
 - *And in the **operatiing room***

- *By 2013, 100% HCFs use **root cause analysis** methods for assessing **serious infectious events***

- *By 2012, 100% HCFs have implemented routine auditing practices of HCW for prevention of the infection risk*

- *By 2013, 95% HCFs have implemented **SSI surveillance** through integration into their **information system**.*

National Programme 2009-13: Processes & activities objectives at the HCF level

- ***By 2013, All HCFs have reached 70% of the target objective for consumption of AHR products***
- ***By 2013, All HCFs have established a programme for control of MDRB, tailored to their activity***
- ***By 2013, All HCFs have implemented the routine reassessment of antibiotic therapy at 24-72h as part of their antibiotic stewardship program and assess the adherence to this process***
- ***By 2013, All HCFs have an established and operational procedure for in-house and externalised alerts***
- ***By 2013, All HCFs have established an operational plan for rapid response in case of emerging disease posing a high epidemic risk.***

National Programme 2009-13: Processes & activities objectives at the HCF level

- *By 2013, All HCFs have an operational procedure, in conjunction with the occupational medicine services, for **surveillance and management of BBFE** in personnels.*
- *By 2013, All HCFs have organised and implemented, in conjunction with the occupational medicine services, the monitoring of HCW vaccination status against, influenza, measles, and HBV*
- *By 2013, All HCFs have an **adequately staffed infection control team**, according to national specifications*
- *By 2013, All references and affiliated centers participating to the management of **complicated bone-joint infections** have evaluated the **satisfaction of patients** treated at their institution*

Mandatory annual report by HCFs

- http://www.sante.gouv.fr/IMG/pdf/circulaire_134_270312_12_134to.pdf
- http://www.sante.gouv.fr/IMG/pdf/Instruction_et_annexes_101_010312.pdf

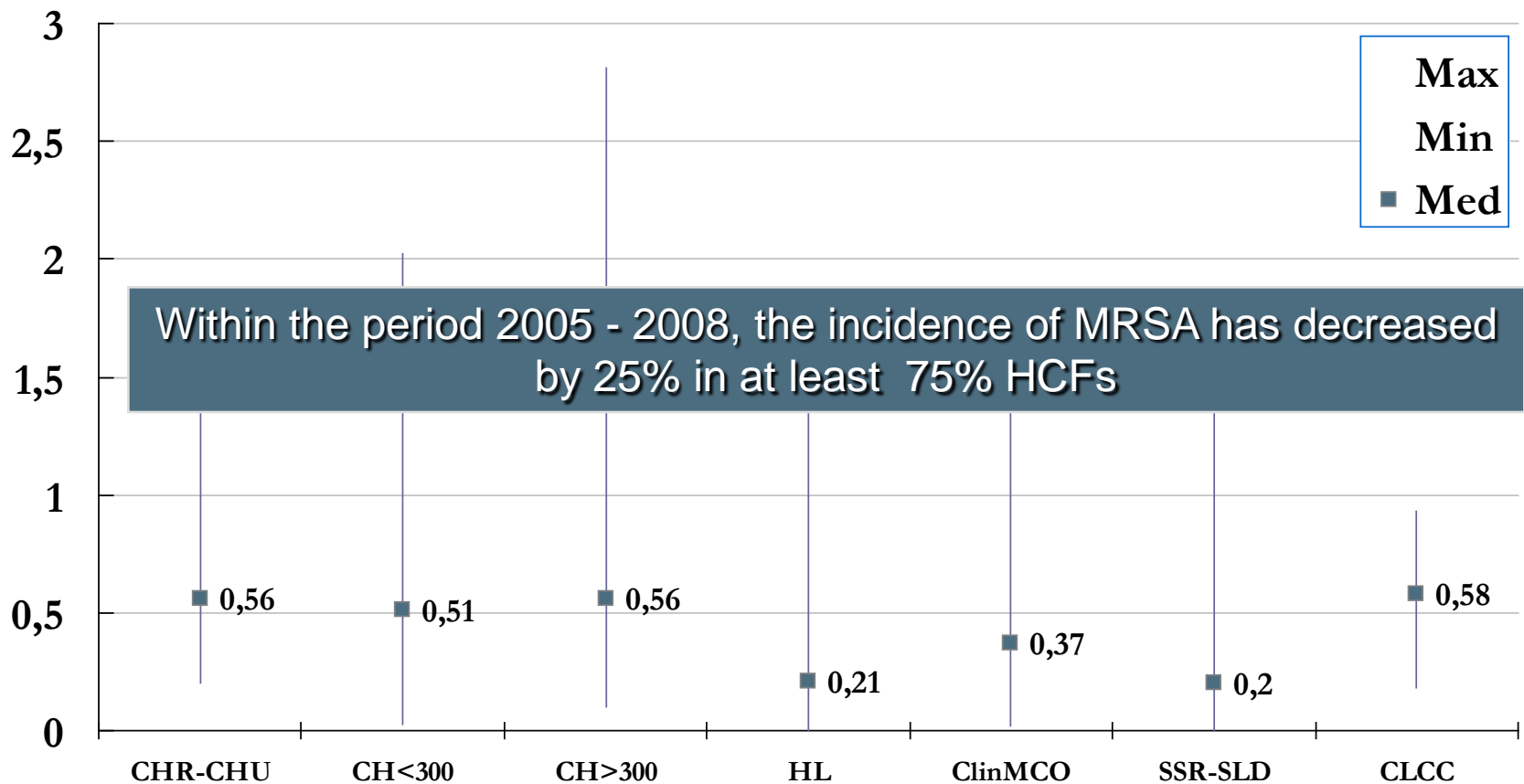
- Second generation of indicators:
 - ICALIN2
 - ICALISO
 - ICABMR

National Indicator N°5: MRSA Incidence

- A much controversial indicator
- First released in 2008
- Reflecting both input and output of MRSA cases (imported/acquired)
- Difficult to adapt to all categories of HCF (sample size)
- Sensitive to case-mix
- Reported as the 3-yr average incidence (p.1000 pt-days) of MRSA cases (clinical samples)
- Grouped per hospital category
- Evolving to trends over time for a given HCF (targeted 25% reduction)

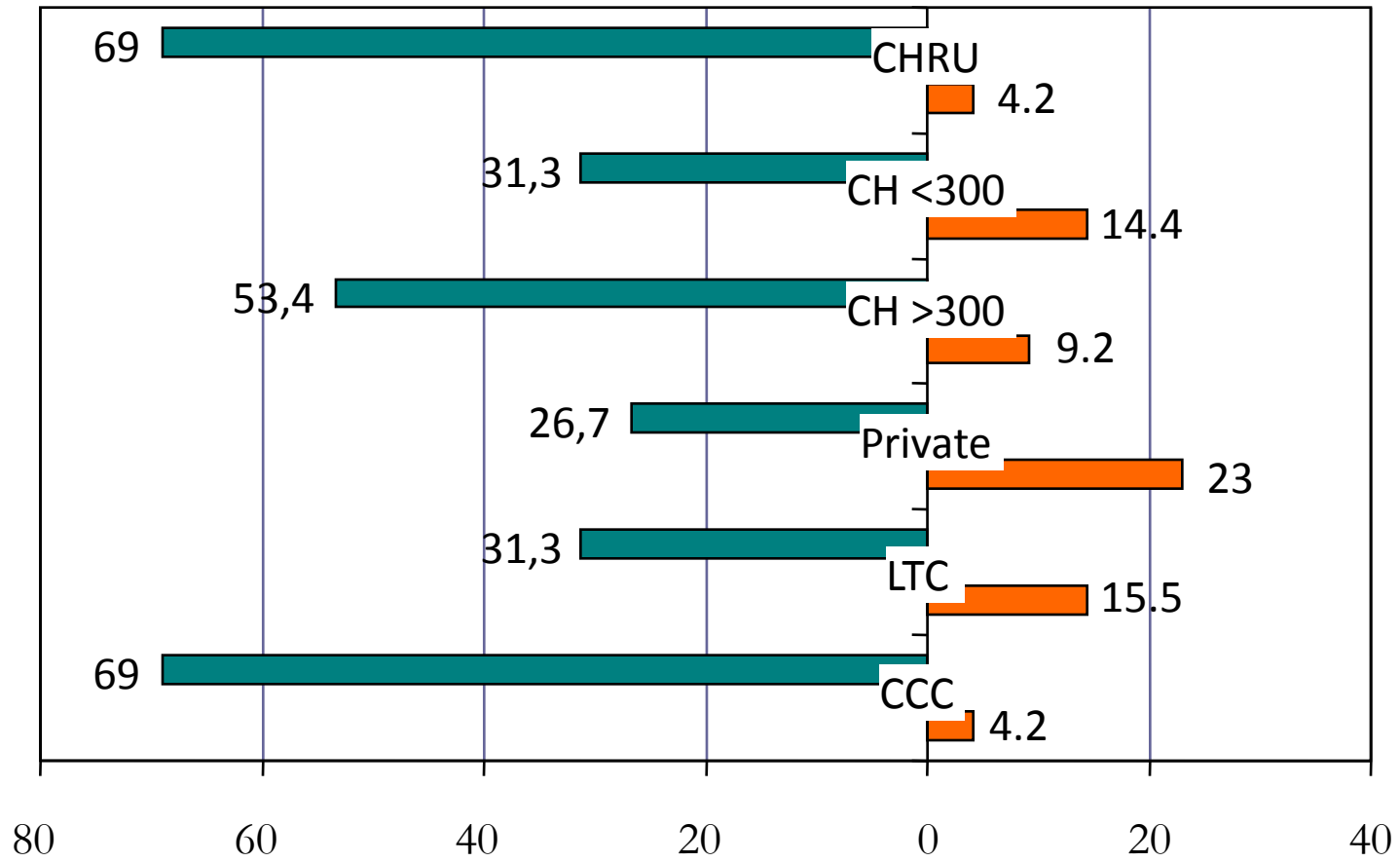
National Indicator N°5: MRSA Incidence 2005-2007 (1023 HCFs)

Median of 3-yr Incidence of MRSA clinical isolates, p./1000 pt-days



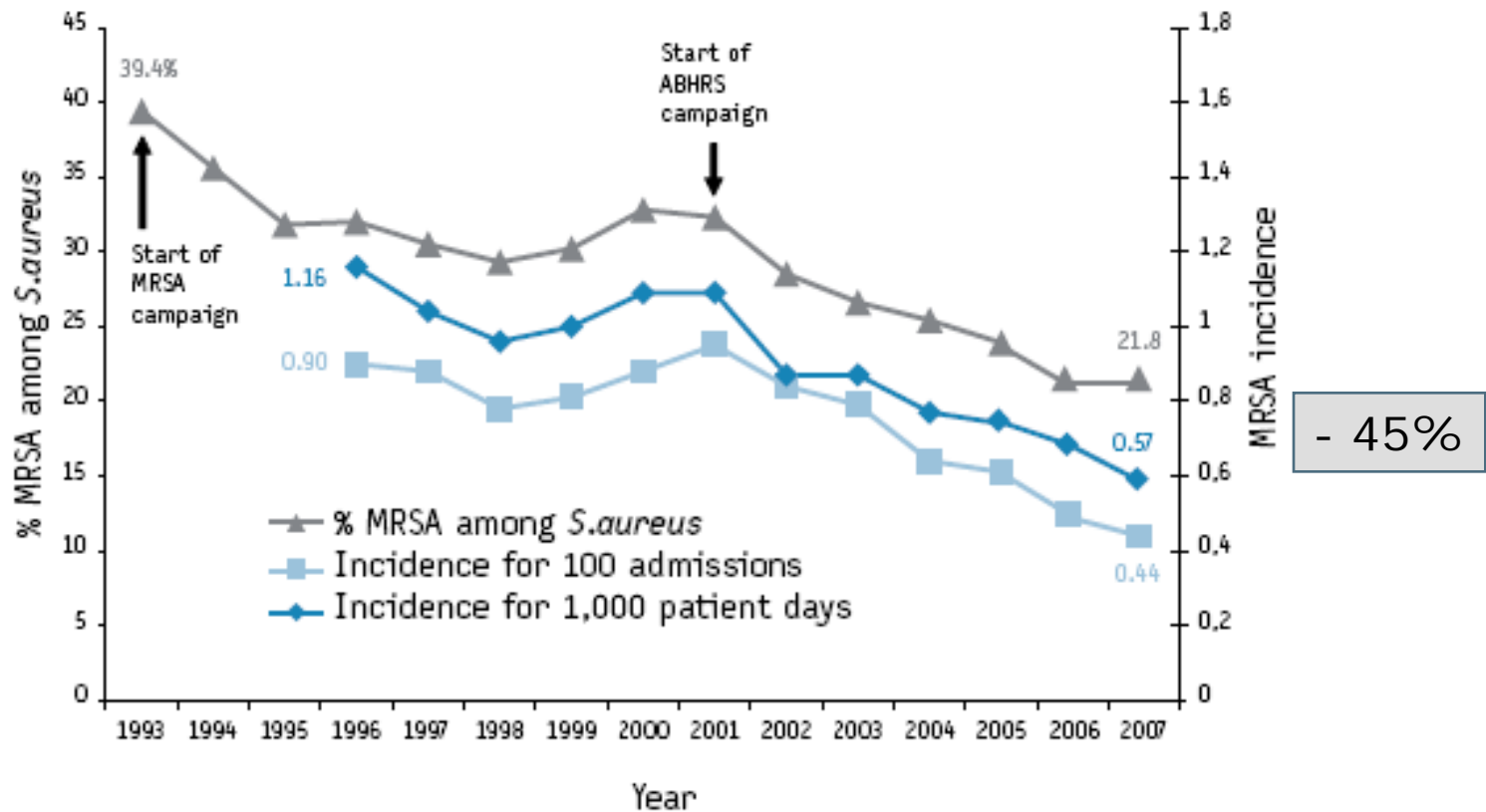
Distribution of HCF according to changes in MRSA rates, 2005-2010

Per cent facilities with increasing/declining MRSA rates

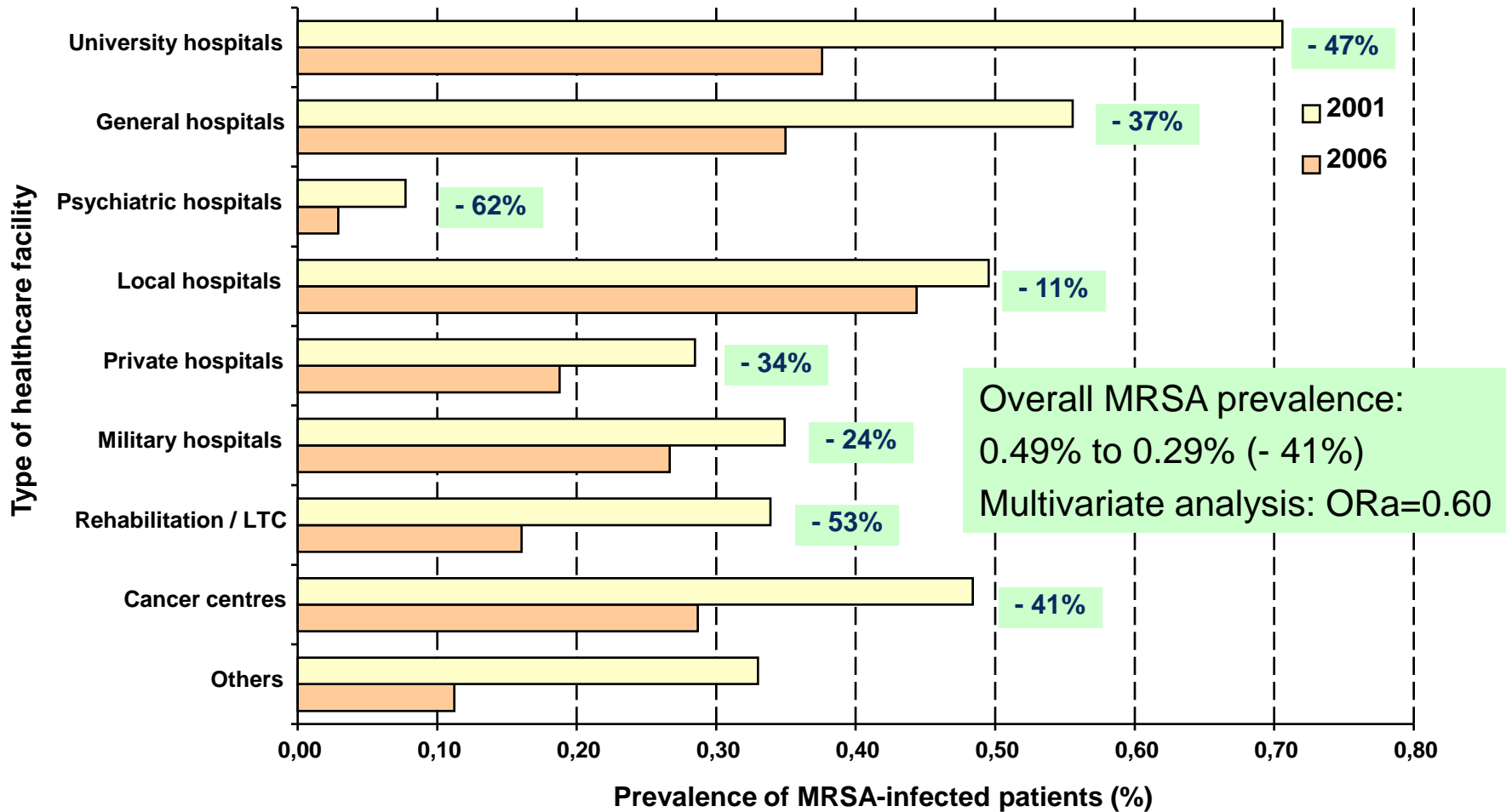


Trends in MRSA, Paris University Hospitals Group (AP-HP)

MRSA proportion among *S. aureus*, and MRSA incidence, 39 teaching hospitals of the Paris area, 1993 to 2007

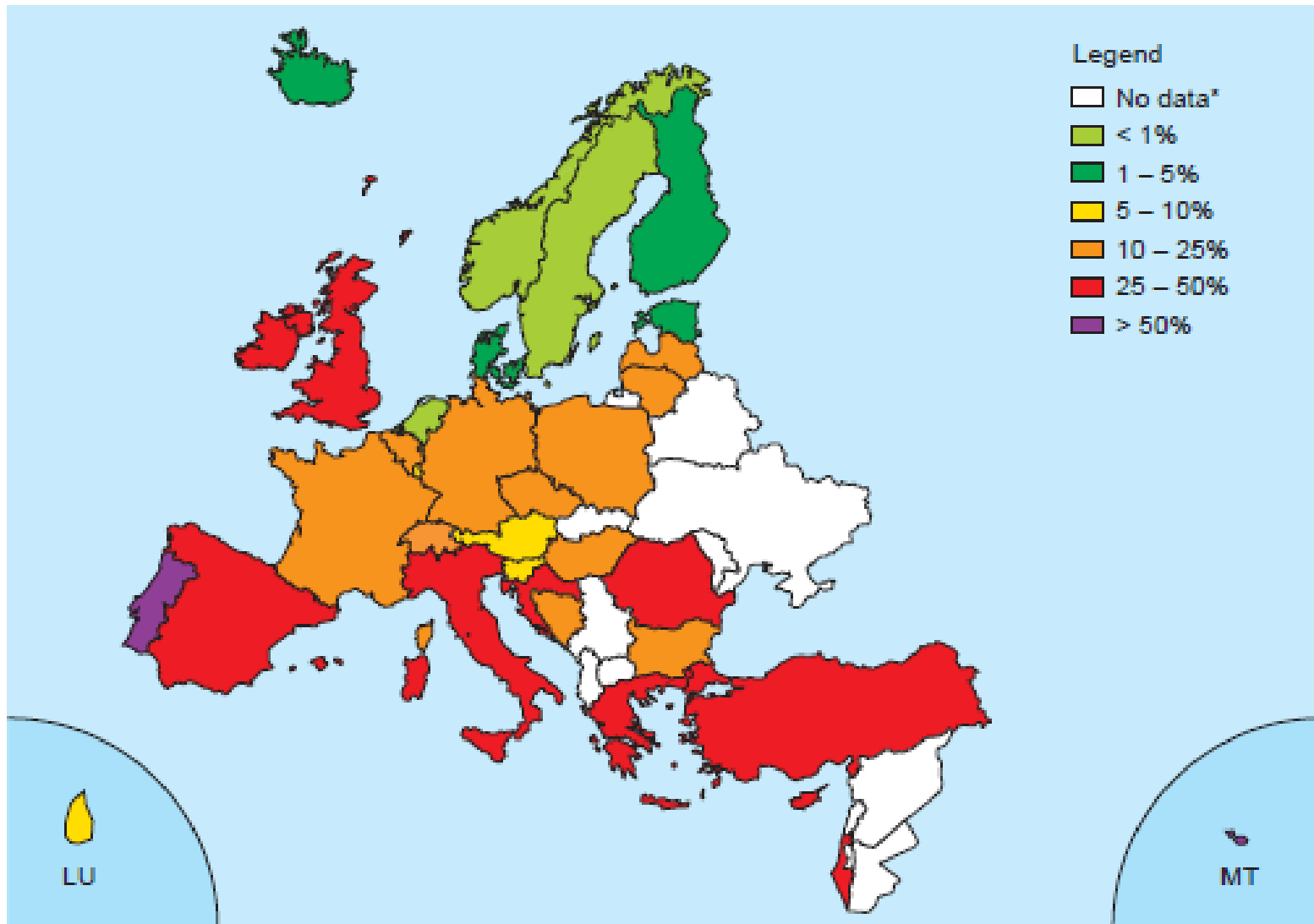


MRSA Trends: Prevalence of MRSA-infected Patients, France, 2001 - 2006



Prevalences compared in 1 351 healthcare facilities participating in both surveys.

EARSS 2008: MRSA invasive isolates



EARSS Annual Report 2008 - <http://www.earss.rivm.nl>.

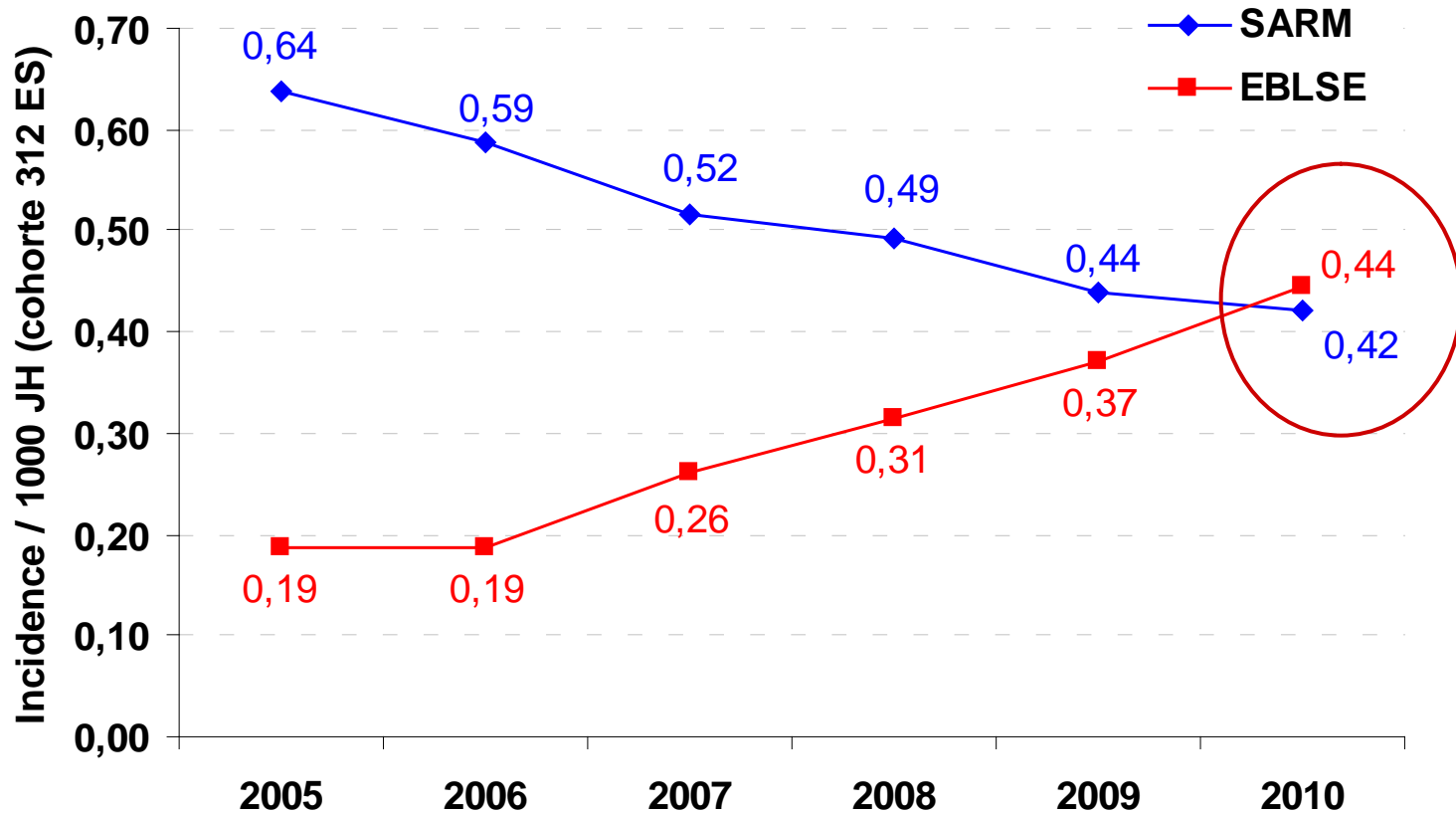
BMR-Raisin: MDR Bacteria Surveillance

(1)

MRSA Incidence p. 1000 patient-days, 2010

Region	2008	2009	2010	Trend (%)
Nord (wo. APHP)	0,54	0,51	0,49	-9,3
Nord (APHP)	0,51	0,44	0,41	-19,6
Est	0,43	0,38	0,41	-4,7
Ouest	0,33	0,31	0,30	-9,1
Sud-Est	0,42	0,38	0,42	0,0
Sud-Ouest	0,51	0,48	0,46	-9,8
Total	0,45	0,41	0,41	-8,9
Healthcare facilities, n	930	929	933	

BMR-Raisin: MDR Bacteria Surveillance (3)



2005 – 2010 Trends in 312 Healthcare Facilities participating continuously

EARS-Net: MDR Bacteria Surveillance in Europe

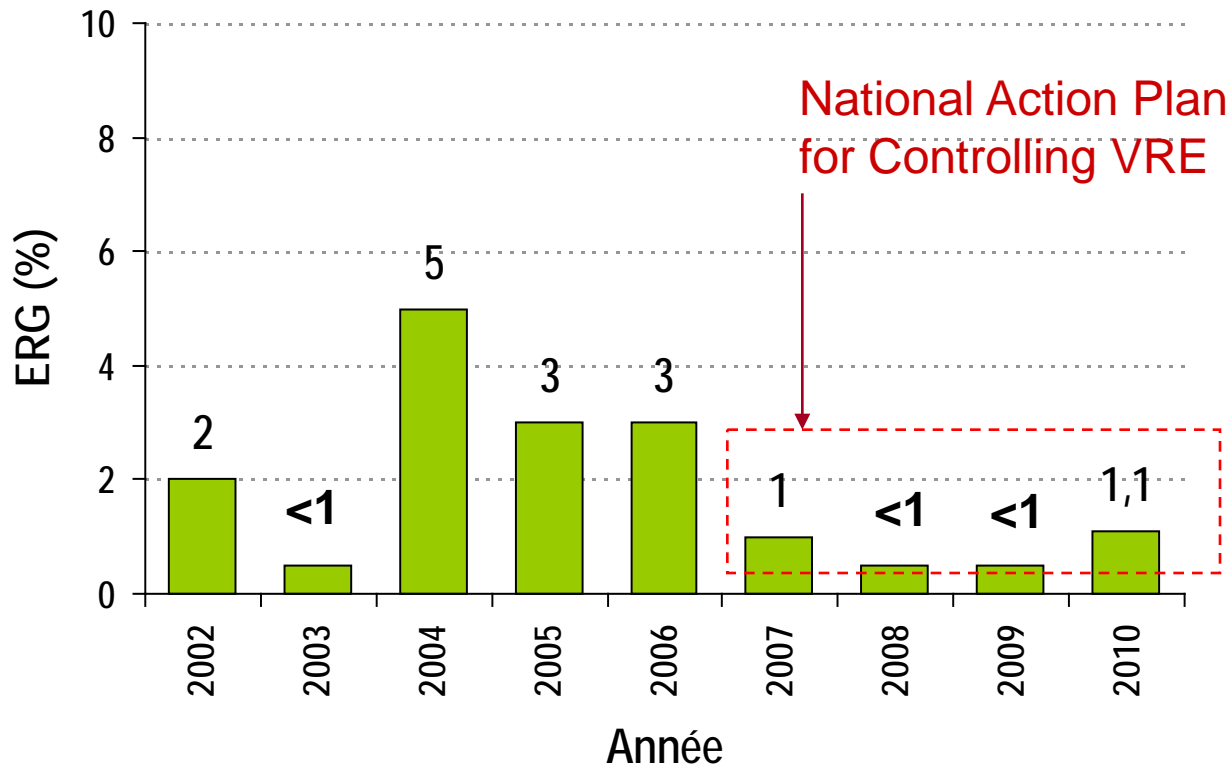


Country	Year	Antibiotic Group	S	I	R	Total N	%S	%I	%R
France (123)	2002	Vancomycin	121	0	2	123	98.37 %	0.00 %	1.63 %
France (123)	2003	Vancomycin	123	0	0	123	100.00 %	0.00 %	0.00 %
France (161)	2004	Vancomycin	151	2	8	161	93.79 %	1.24 %	4.97 %
France (194)	2005	Vancomycin	189	0	5	194	97.42 %	0.00 %	2.58 %
France (221)	2006	Vancomycin	214	0	7	221	96.83 %	0.00 %	3.17 %
France (322)	2007	Vancomycin	318	0	4	322	98.76 %	0.00 %	1.24 %
France (353)	2008	Vancomycin	350	1	2	353	99.15 %	0.28 %	0.57 %
France (591)	2009	Vancomycin	586	0	5	591	99.15 %	0.00 %	0.85 %

E. faecium

- **En 2012**, la proportion de souches d'*Enterococcus faecium* résistants aux glycopeptides reste inférieure à 1% au niveau national [référence : réseau EARSS-France]

Enterococcus faecium : Vancomycin-Resistant isolates, France, 2002 – 2010



Source : ECDC / EARS-Net 2010

<http://www.infectiologie.org.tn>

Early Warning & Response System (EWARS): Tracking Emerging Threats

Tracking the Emergence of Carbapenemase-producing *Enterobacteriaceae* in France

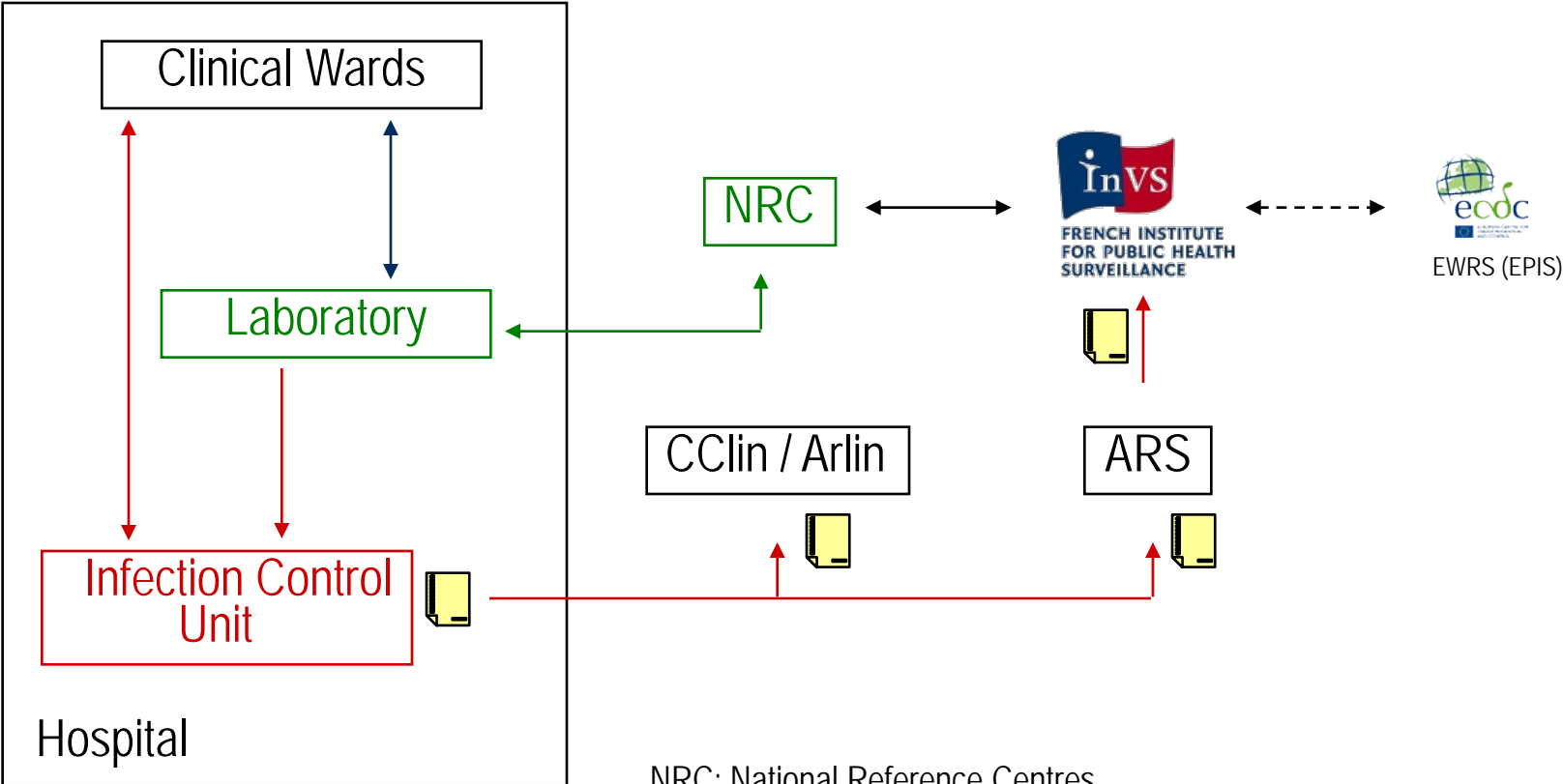
National HAI Early Warning and Response System, France

(Signalement des infections nosocomiales)


National, HAI/AMR Early Warning and Response System, France (1)

- Law regulation (26/07/2001)
- Mandatory notification of some HAI : *emerging, severe, epidemic*
 - **Rare or severe** infection, based on the characteristics of the pathogen, its resistance phenotype, or the infection site
 - Associated with a contaminated product or device / specific practices / environment
 - Death associated with a HAI
 - Otherwise notifiable infectious diseases acquired in the hospital
- Objectives : assistance to healthcare facilities in investigation and control, detection, feedback of experience

Information Flow (1)



NRC: National Reference Centres
 ARS: Regional Health Authorities
 Cclin / Arlin: Regional Infection Control Coordinating Centres

 Notification Form



Context

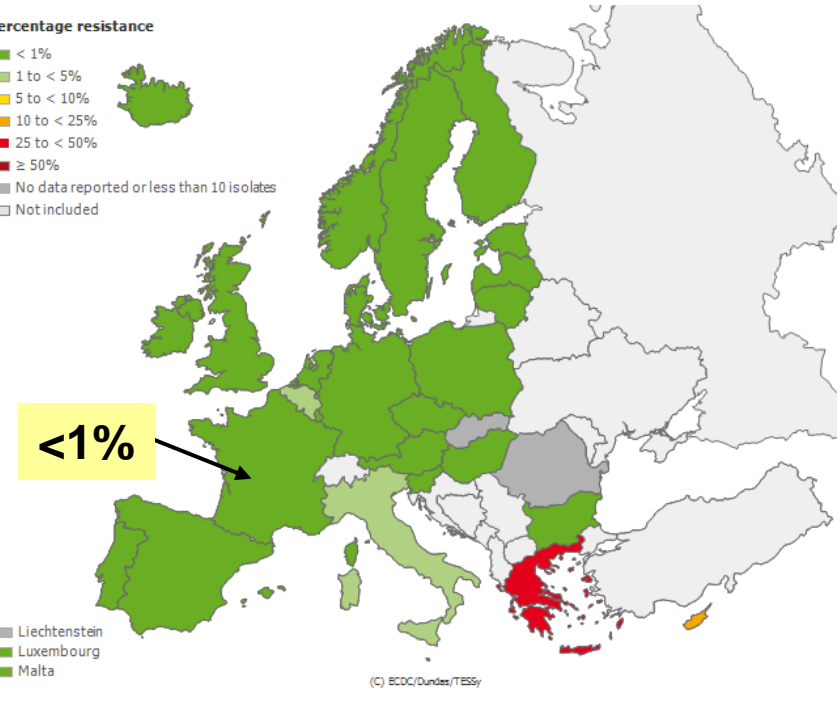
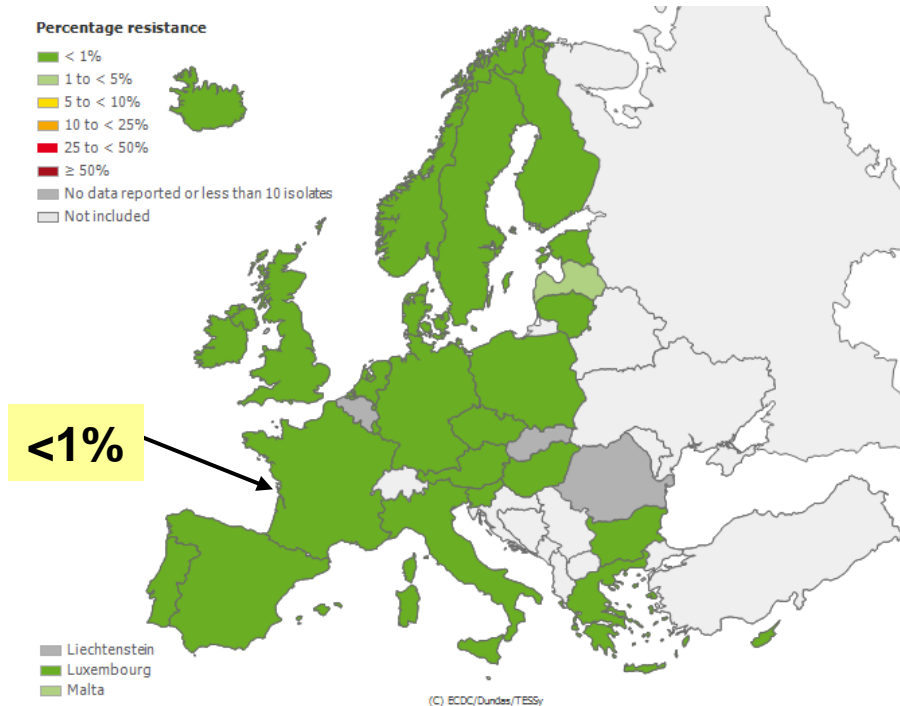
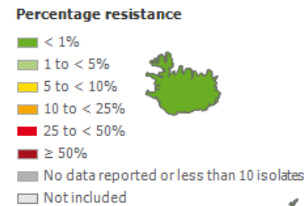
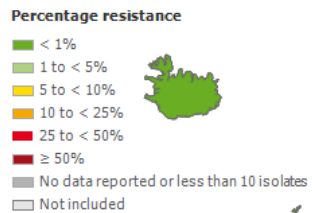
- *Enterobacteriaceae*
 - Increasingly resistant to antibiotics
 - Carbapenems: last-line therapy against strains producing extended-spectrum beta-lactamases.
- Carbapenemase-producing *Enterobacteriaceae* (CPE)
 - Resistance to carbapenems
 - Various types
 - Increasingly reported worldwide
 - Last step towards a therapeutic dead end

E. coli and *K. pneumoniae* : proportion of carbapenem resistant isolates from patients with invasive infections, 2009



Carbapenem resistant *E. Coli* isolates, 2009

Carbapenem resistant *K. pneumoniae* isolates, 2009

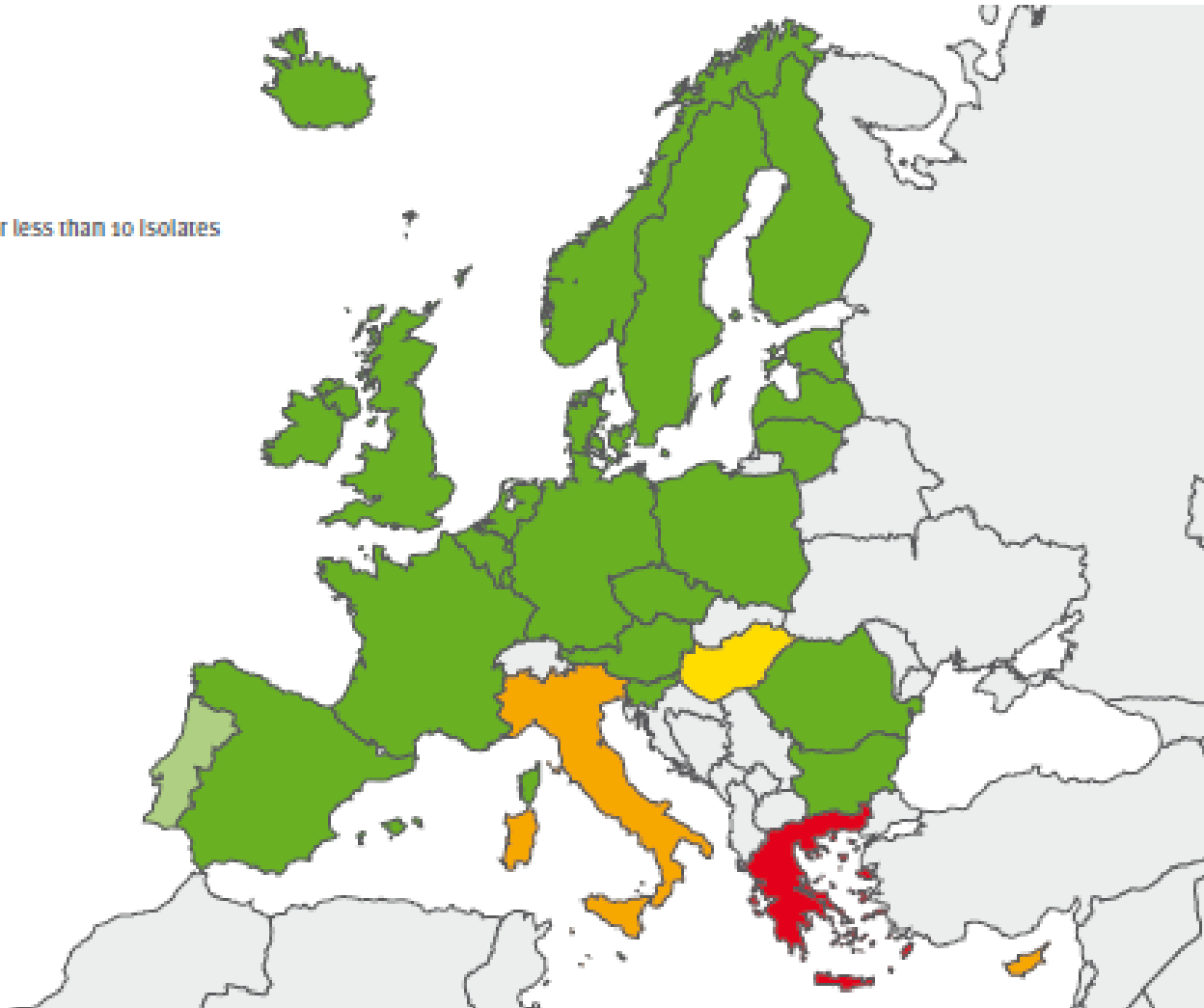
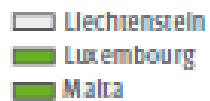


Carbapenem-resistant *K.pneumoniae*, 2010

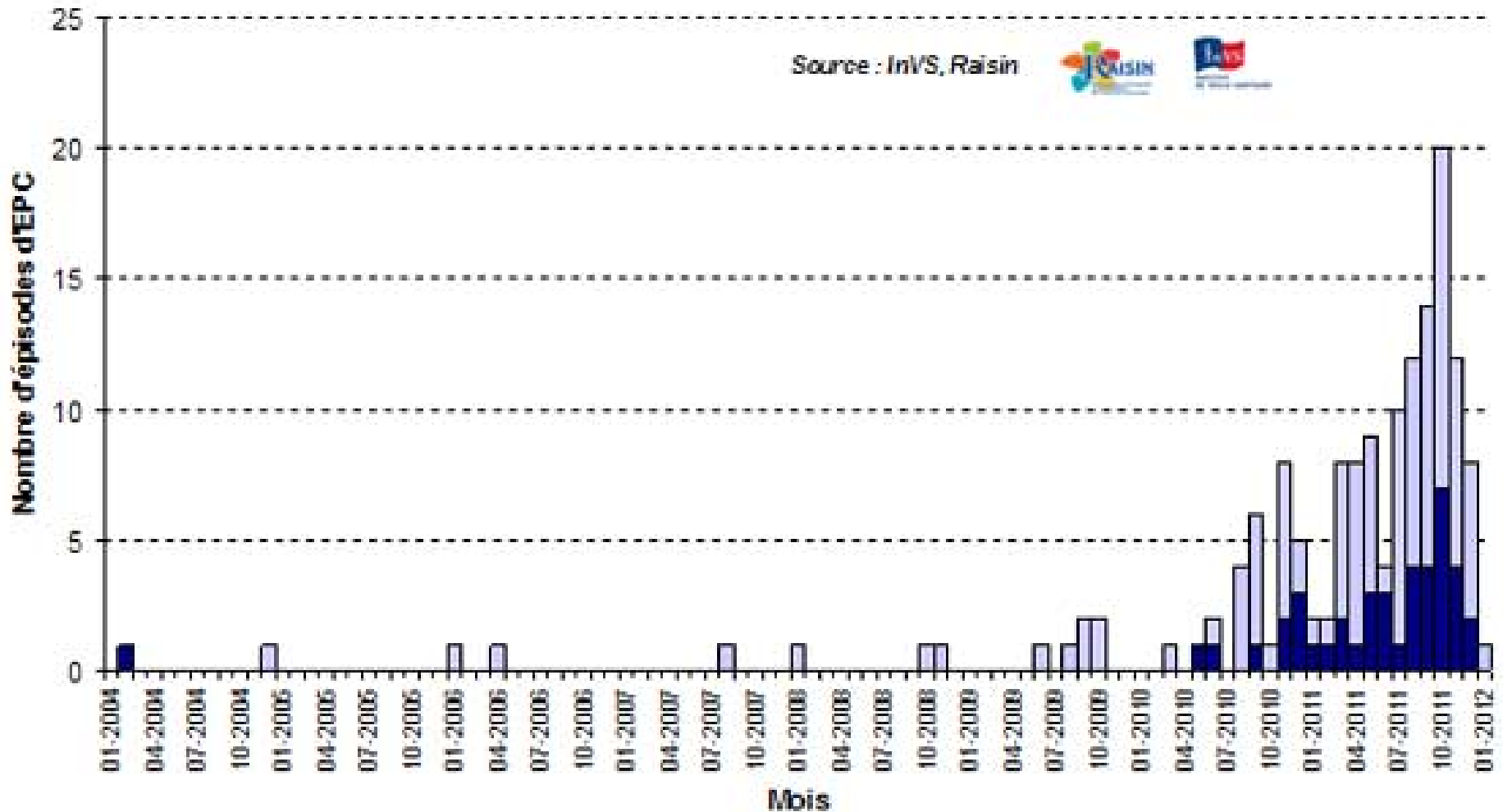
Figure 5.25: *Klebsiella pneumoniae*: proportion of invasive isolates resistant to carbapenems in 2010



Non-visible countries



Notifications EPC to the NIPH (InVS), by January 2012



Bacterial species involved in reported CPE episodes (N=104)

Bacterial species	Number of episodes	
	N	%
<i>Klebsiella pneumoniae</i>	67	59
<i>Escherichia coli</i>	25	22
<i>Enterobacter cloacae</i>	14	12
<i>Enterobacter aerogenes</i>	3	3
<i>Citrobacter freundii</i>	3	3
<i>Proteus mirabilis</i>	1	<1
<i>Serratia marcescens</i>	1	<1
<i>Providencia stuartii</i>	1	<1
Total	115*	100

* 2 or 3 enterobacteriaceae with the same carbapenemase involved in 9 episodes

Epidemiological characteristics of CPE episodes (N=104)

- 249 cases identified
 - Infected: 68 (29%) - 238 cases described
 - Colonised: 170 (71%)
- 1 to 44 cases by episode
- Secondary cases: 22 episodes (21%)
For these episodes:
 - Mean number of cases: 8 cases
 - Median number of cases: 3 cases
- 2 episodes with co-index cases
- Deaths: 51
 - Crude lethality rate (all infected / colonised cases): 20%

Episodes associated with cross-border transfer within the past year (N=76)

- 73% of all episodes

Context	Number of episodes	(%)
Direct transfer from a foreign hospital	50	(66%)
Hospitalisation in a foreign hospital	13	(17%)
Resident in France, travel abroad without reported hospitalisation	7	(9%)
Resident abroad without reported hospitalisation	6	(8%)
Total	76	(100%)

Carbapenemase type, by country where index cases had been hospitalised or stayed abroad (N=76)

Country	KPC	OXA-48	VIM	NDM-1	Total
Greece	16 ²⁰⁰⁷		4 ²⁰⁰⁴		19*
Morocco	2 ²⁰¹¹	15 ²⁰¹⁰			17
India	2 ²⁰¹¹			9 ²⁰¹⁰	9*
Italy	3 ²⁰¹⁰		2 ²⁰⁰⁸		5
Algeria	1 ²⁰¹⁰	2 ²⁰¹⁰	1 ²⁰⁰⁸		4
Egypt	1 ²⁰¹¹	2 ²⁰⁰⁹	1 ²⁰¹⁰		4
Turkey		4 ²⁰¹⁰			4
Tunisia		3 ²⁰¹¹			3
Senegal		3 ²⁰¹¹			3
Koweit		2 ²⁰¹¹			2
Israël	1 ²⁰¹¹	1 ²⁰¹¹			2
Iraq				1 ²⁰¹⁰	1
USA	1 ²⁰⁰⁶				1
Spain		1 ²⁰¹¹			1
Serbia				1 ²⁰¹¹	1

Carbapenemase type, by country where index cases had been hospitalised or stayed abroad (N=76)

Country	KPC	OXA-48	VIM	NDM-1	Total
Greece	16 2007		4 2004		19*
Morocco	2 2011	15 2010			17
India	2 2011			9 2010	9*
Italy	3 2010		2 2008		5
Algeria	1 2010	2 2010	1 2008		4
Egypt	1 2011	2 2009	1 2010		4
Turkey		4 2010			4
Tunisia		3 2011			3
Senegal		3 2011			3
Koweit		2 2011			2
Israël	1 2011	1 2011			2
Iraq				1 2010	1
USA	1 2006				1
Spain		1 2011			1
Serbia				1 2011	1

Carbapenemase type, by country where index cases had been hospitalised or stayed abroad (N=76)

Country	KPC	OXA-48	VIM	NDM-1	Total
Greece	16 ²⁰⁰⁷		4 ²⁰⁰⁴		19*
Morocco	2 ²⁰¹¹	15 ²⁰¹⁰			17
India	2 ²⁰¹¹			9 ²⁰¹⁰	9*
Italy	3 ²⁰¹⁰		2 ²⁰⁰⁸		5
Algeria	1 ²⁰¹⁰	2 ²⁰¹⁰	1 ²⁰⁰⁸		4
Egypt	1 ²⁰¹¹	2 ²⁰⁰⁹	1 ²⁰¹⁰		4
Turkey		4 ²⁰¹⁰			4
Tunisia		3 ²⁰¹¹			3
Senegal		3 ²⁰¹¹			3
Koweit		2 ²⁰¹¹			2
Israël	1 ²⁰¹¹	1 ²⁰¹¹			2
Iraq				1 ²⁰¹⁰	1
USA	1 ²⁰⁰⁶				1
Spain		1 ²⁰¹¹			1
Serbia				1 ²⁰¹¹	1

Episodes without cross-border transfer and carbapenemases involved (N=28)

KPC	OXA-48	VIM	NDM-1	IMI	IMP	Total
1 2010	21 2010	2 2004	3 2010	1 2011	1 2004	28 ^a

^a two different carbapenemases involved for one episode

- 27% of all episodes without known cross-border transfer
 - 75% involved OXA-48.
 - occurred in 4 regions, 12 French départements
- Suggesting the emergence of indigenous circulation of OXA-48 CPE in France

Recommendations for patients repatriated or with a history of hospitalization abroad

- Patients repatriated or with a history of hospitalization abroad
 - Implementation of contact precautions for this patients
 - Screening of patients
 - Immediate notification to regional Health authorities and CClin
 - Laboratory confirmation of the carbapenemase
- CPE Confirmed case
 - Reinforcement of contact and standard precautions
 - Contact tracing, cohorting of patients into three distinct sectors (one for cases, one for contact patients and one for new-admitted CPE – free patients)

- Haut Conseil de la Santé Publique. Maîtrise de la diffusion des bactéries multirésistantes aux antibiotiques importées en France par des patients rapatriés ou ayant des antécédents d'hospitalisation à l'étranger.

Novembre 2010. http://www.hcsp.fr/docspdf/avisrapports/hcspr20101116_bmrimport.pdf

- *Circulaire (6 decembre 2010).*

<http://www.infectiologie.org.tn>

Conclusion

- CPE episodes are an emerging problem in France
- significantly increased number during the past 3 years
- Most episodes are related with cross-border transfer
 - Awareness of the risk of spreading MDRB via cross-border transfer of patients
 - Rapid identification of CPE by screening potential carriers among patients transferred from hospitals of countries with high CPE prevalence
 - Implementing preemptive isolation & adequate control measures
 - Reinforcing appropriate control measures in areas where CPE are endemic
- Emergence of an indigenous circulation of OXA-48
 - Sustained vigilance needed when carbapenem resistance is suspected in *Enterobacteriaceae* isolated from **any** patient

Acknowledgments

To the many contributors to the achievements of the French national Infection control program, whether individuals and organizations, among which:

- The Infection Control bureau of the Quality & Safety division at the MoH
 - *Drs V. Salomon, L. May-Michelangeli, V. Drouvot*
- The Inter-regional IC Coordinating Centers (CCLINs) and RAISIN networks
 - *Drs P. Astagneau, J Fabry, B. Lejeune, C. Rabaud, P. Parneix, A. Savey, V Jarlier, A Carbonne, P.Jarno, D. Talon, C. Dumarttin*
- The Infectious Diseases division at the National Institute for Public Health Surveillance (InVS)
 - *Drs JC Desenclos & B. Coignard*
- The Patients' Safety Commission at the Council for Public Health (HCSP)
 - *Drs J. Carlet, G. Beaucaire & B. Grandbastien*
- Members of the Advisory Board for the National Infection Control Program
- Steering committee for NI Indicators
 - *Drs P. Parneix, JC Lucet & B. Grandbastien*
- Consumers' associations
 - *AM Ceretti, C Rambaud*

- And to the thousands IC teams contributing to improving infection control and patients' safety within HCFs

Conclusions

- Facing the problem of HCA infection in France:
 - ❑ A 30 years history of development,
 - ❑ A finely tuned multilevel integrated organization,
 - ❑ A strong implication of IC professionals,
- A national public health challenge addressed:
 - ❑ A genuine political concern and support,
 - ❑ An important role of consumers' claims,
 - ❑ A comprehensive legislation.

Conclusions (2)

- The role of publicly available indicators
 - ✓ A strong incentive for HCFs,
 - ✓ A “booster” effect, inciting ICTs to reach highest marks
 - ✓ A field taken as exemplary for the development of patients’ safety actions in France

- Consumers and Public
 - Well taken up by the press
 - Not much yet by patients:
 - Interpretation not straightforward
 - Other considerations may predominate
 - Research on behavioural changes needed