



The Italian scenario: shadows and lights

Maria Luisa Moro

- The epidemiological scenario
- Activities to contrast antimicrobial resistance
- Variability: a huge problem

ale



- ✓ > 61 millions inhab
- ✓ 20 regions
- ✓ 110 provinces
- ✓ 8092 municipalities

Area



National Health Service (1978)

- ✓ 2° best for efficiency and access to care (WHO 2000)
- ✓ 20 Regional Health Authorities
- ✓ 141 Local Health Authorities
- ✓ 82 Hospital trusts
- ✓ 1540 hospitals (publics+private)
- ✓ 5858 residential facilities for the elderly (3409 guest disabled)



DIMENSION OF THE PROBLEM



Background: the antimicrobial R challenge in Italy

2013 EARS-net (bacteremias)	Italy % non susceptible	European category (6-highest AMR to 1-lowest AMR)	Trend 2006-13
3 rd generation ceph-R Klebsiella	55.1	6 th	↑
Carbapenem-R Klebsiella	34.3	5th	↑
3 rd generation ceph-R E.coli	26.2	5 th	↑ *
FQ R E.coli	42.2	5 th	↑ *
Carbapenem-R Pseudomonas	27.2	5 th	↑ *
Carbapenem-R Acinetobacter	79.5	6 th	n.r.
MRSA	35.8	5 th	=
Macrolide NS S. pneumoniae	24.6	4 th	=
Vanco-R Enterococcus faecium	4.4	2 th	=



In hospital, the prevalence of antibiotic use and antimicrobial resistance is among the highest in Europe

Figure 54. Composite index: percentage of isolates non-susceptible to antimicrobials, by country (n=5725 isolates)

Non-susceptible isolates (%)

- <5
- 5 to <20
- 20 to <35
- 35 to <50
- ≥50
- Data excluded
- Not included

Non-visible countries

- Liechtenstein
- Luxembourg
- Malta

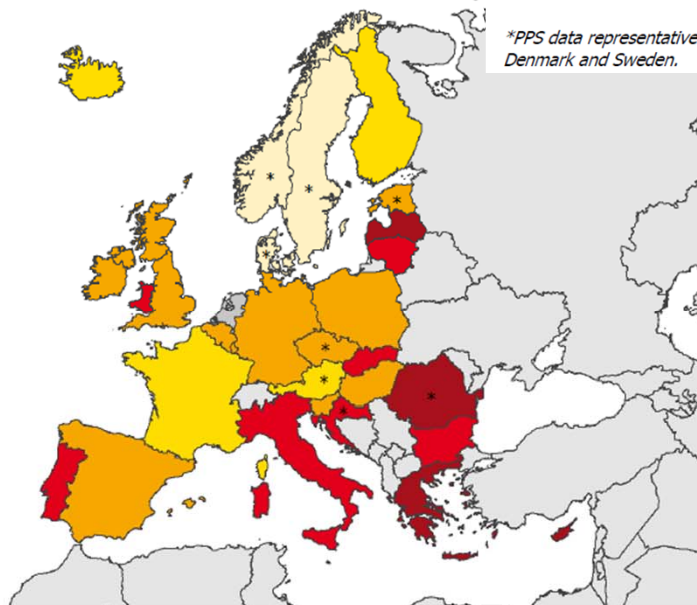


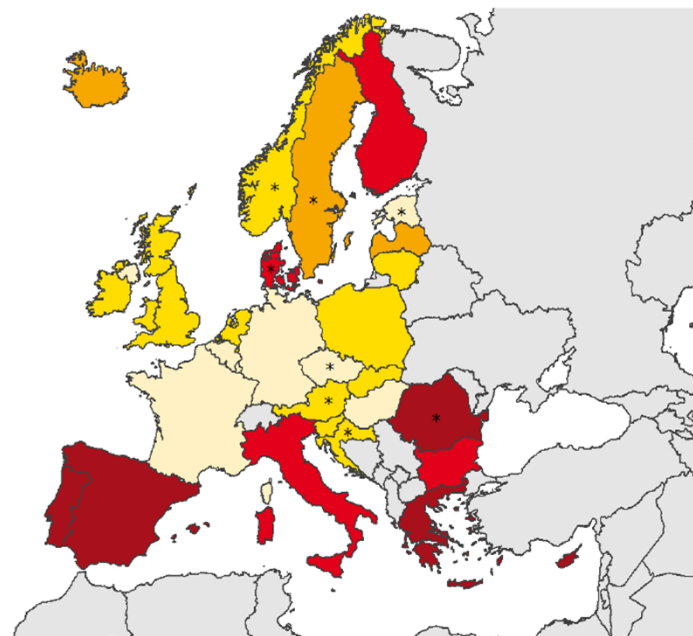
Figure 65. Prevalence of antimicrobial use (percentage of patients receiving antimicrobials) in acute care hospitals, ECDC PPS 2011–2012

Patients on antimicrobials (%)

- <30
- 30 to <35
- 35 to <40
- 40 to <45
- ≥45
- Not included

Non-visible countries

- Liechtenstein
- Luxembourg
- Malta



*PPS data representativeness was poor in Austria, Croatia, Czech Republic, Estonia, Norway and Romania and very poor in Denmark and Sweden.

ECDC. PPS in acute care hospitals, 2013

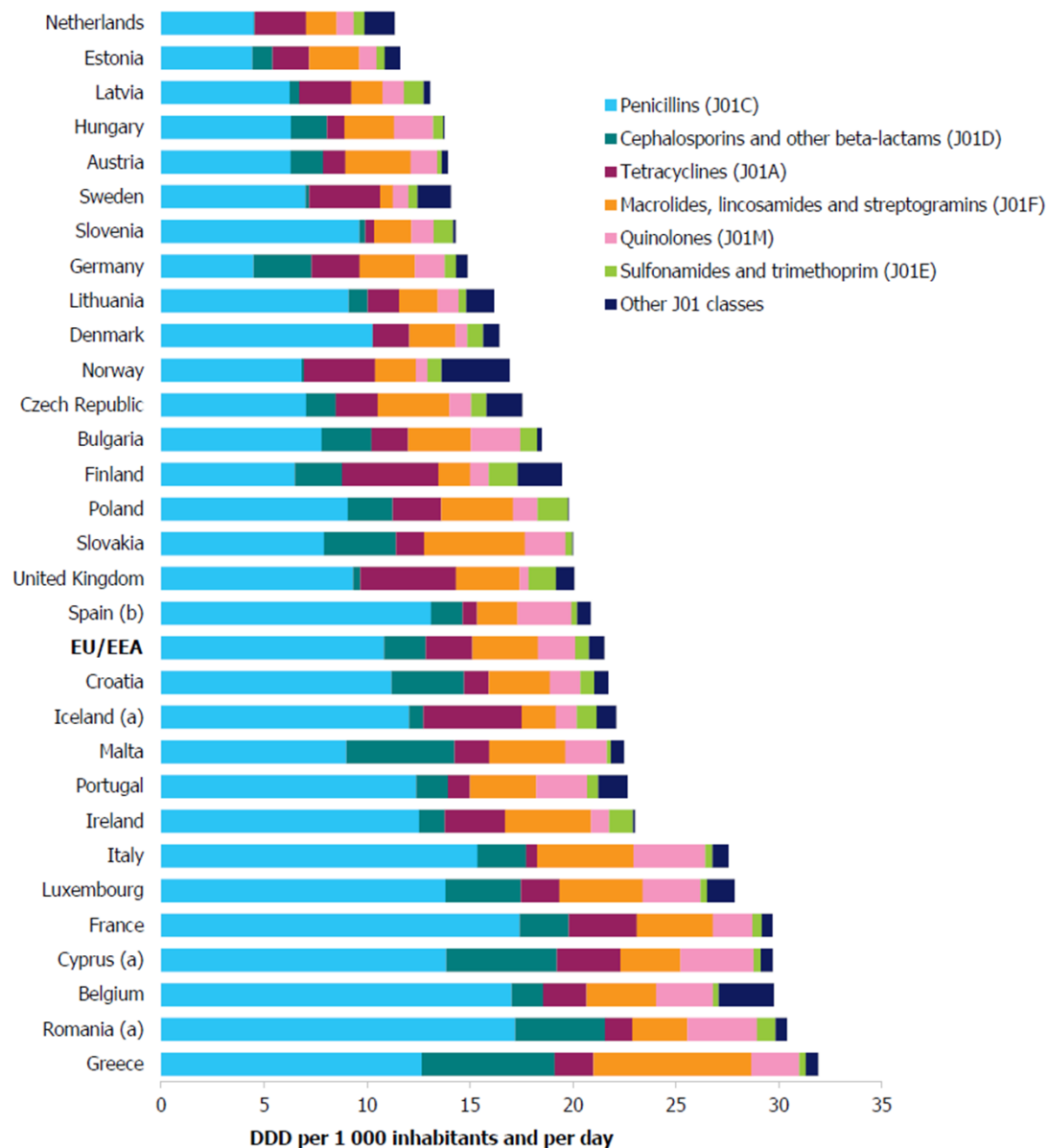
First-level antimicrobial resistance markers in PPS: MRSA, VRE, Enterobacteriaceae non-susceptible to third-generation cephalosporins, Pseudomonas aeruginosa and Acinetobacter baumannii non-susceptible to carbapenems. Data from the Netherlands were excluded for reasons explained above.



**In the community,
the prevalence of
antibiotic use is
among the
highest in Europe**




Figure 3.1. Consumption of antibacterials for systemic use (ATC group J01) at ATC group level 3 in the community, EU/EEA countries, 2012, expressed as DDD per 1 000 inhabitants and per day





In the community, the trend of antibiotic use is stable (not significant slight decrease)

Country	2008	2009	2010	2011	2012		Trends in antimicrobial consumption, 2008–2012	Average annual change 2008–2012	Statistical significance
Italy	28.5	28.7	27.3	28.2	27.6			-0.22	n.s.

**European Centre for Disease Prevention and Control.
Surveillance of antimicrobial consumption in Europe
2012. Stockholm: ECDC; 2014.**

European Surveillance of Antimicrobial Consumption (ESAC): quality appraisal of antibiotic use in Europe

Niels Adriaenssens^{1,2*†}, Samuel Coenen^{1,2†}, Ann Versporten¹, Arno Muller¹, Vanessa Vankerckhoven¹
and Herman Goossens¹ on behalf of the ESAC Project Group

J Antimicrob Chemother 2011; **66** Suppl 6: vi71–vi77

Ratio broad
spectrum/narrow
spectrum 99.28



And the quality of
prescribing is
among the worst
in Europe

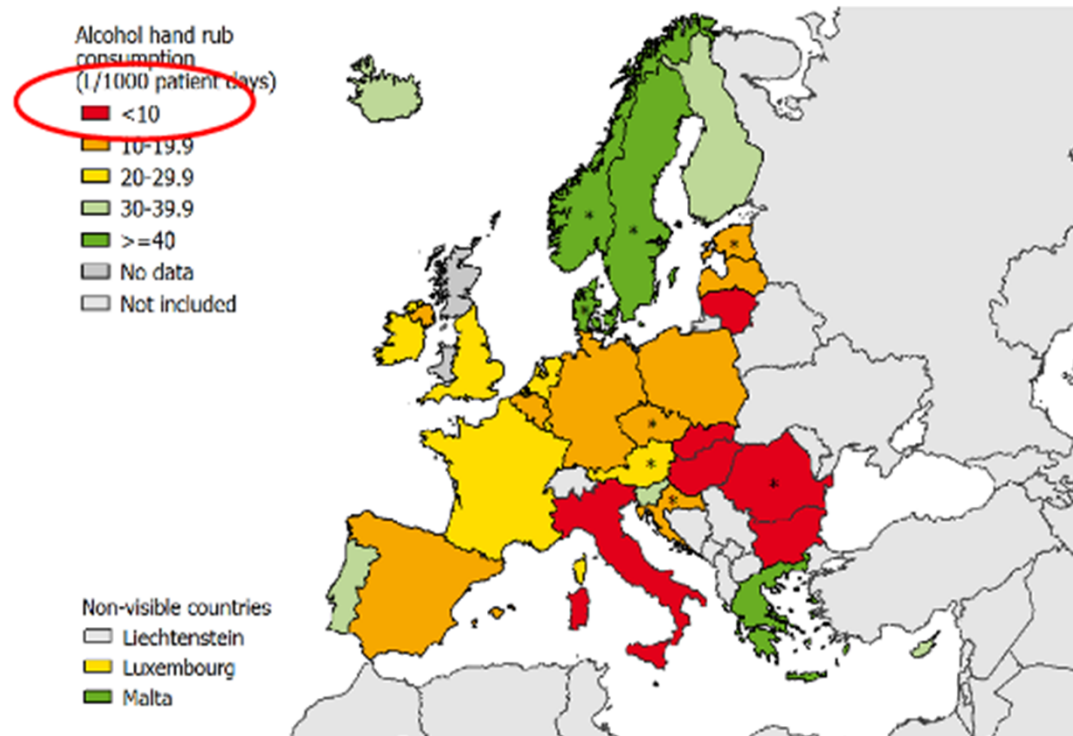
Country	[J01_DID]	[J01C_DID]	[J01D_DID]	[J01F_DID]	[J01M_DID]	[J01CE_%]	[J01CR_%]	[J01DD+DE_%]	[J01MA_%]	[J01_B/N]	[J01_SV]	[J01M_SV]
Italy	28.66	15.18	2.78	5.33	3.61	0.01%	34.26%	7.18%	12.05%	99.28	27.34%	20.05%
Cyprus	34.44	16.01	6.45	3.98	4.13	0.34%	29.30%	1.68%	11.98%	26.93	-	-
Luxembourg	28.19	13.47	4.33	3.87	2.81	0.33%	29.93%	0.04%	9.96%	33.84	41.88%	25.28%
Belgium	27.52	15.13	1.82	2.96	2.61	0.36%	32.31%	0.00%	9.48%	43.49	33.64%	18.22%
France	29.58	16.08	2.92	4.15	2.00	0.50%	21.95%	6.41%	6.53%	42.76	-	-
Spain	19.68	12.31	1.56	1.90	2.42	0.46%	38.68%	2.76%	12.04%	56.89	25.74%	17.29%
Malta	21.59	9.08	5.50	3.89	1.66	0.13%	36.41%	0.84%	7.67%	149.49	-	-
Greece	38.64	12.89	8.68	11.54	2.63	1.88%	13.68%	0.76%	6.80%	31.68	32.55%	3.25%
Slovakia	23.78	9.56	4.12	6.09	2.03	7.75%	22.68%	2.26%	8.55%	7.39	35.08%	10.28%
Portugal	22.94	12.00	1.96	3.83	3.04	0.07%	39.24%	1.65%	13.25%	23.24	27.52%	7.35%
Hungary	15.98	7.06	1.98	3.00	1.79	4.20%	28.82%	2.41%	11.03%	12.95	57.41%	25.10%
Poland	23.59	10.68	2.89	3.88	1.25	0.63%	20.90%	0.00%	5.28%	36.28	-	-
Austria	15.93	7.09	1.80	3.93	1.33	6.23%	28.24%	4.95%	8.32%	7.39	37.46%	16.84%
Germany	14.90	4.27	2.39	2.51	1.48	5.72%	2.00%	3.42%	9.93%	3.98	46.06%	31.52%
Croatia	21.21	9.69	3.70	3.24	1.33	4.99%	23.87%	3.85%	6.27%	4.58	21.13%	-4.12%
Israel	22.42	11.82	3.96	1.90	1.44	0.36%	20.65%	0.07%	6.43%	9.58	15.43%	-6.94%
Bulgaria	18.59	8.40	2.30	3.20	1.97	1.95%	14.37%	0.90%	10.60%	6.18	-	-
Romania	10.19	4.31	2.47	1.84	1.26	1.56%	23.59%	0.97%	12.32%	6.10	-	-
Russian Fed.	12.20	4.23	0.47	1.72	2.01	0.49%	7.80%	1.97%	15.74%	7.36	18.47%	8.63%
Latvia	10.48	4.80	0.43	0.87	0.85	1.48%	12.49%	0.46%	7.74%	6.23	33.43%	19.51%
Ireland	20.76	10.66	1.33	3.79	0.94	4.09%	26.52%	0.49%	4.52%	5.44	18.91%	4.13%
Slovenia	14.42	9.51	0.42	2.33	1.08	13.51%	28.24%	0.77%	7.45%	3.47	26.00%	9.85%
Estonia	11.07	4.37	0.83	2.09	0.79	2.17%	10.83%	0.01%	7.11%	7.86	31.20%	4.39%
Czech Rep.	18.44	7.73	1.55	3.66	1.27	11.16%	21.07%	0.42%	6.90%	4.06	19.06%	9.13%
Lithuania	19.72	10.08	1.27	1.93	1.23	4.67%	8.69%	0.44%	5.73%	2.54	21.07%	4.50%
Iceland	19.35	10.41	0.30	1.15	0.55	12.14%	18.33%	0.00%	2.86%	1.67	13.46%	5.38%
Netherlands	11.39	4.48	0.04	1.46	0.89	3.42%	15.97%	0.07%	7.66%	6.42	18.04%	2.50%
Denmark	15.97	10.00	0.03	2.25	0.52	32.21%	2.57%	0.04%	3.26%	0.36	17.90%	6.60%
Finland	17.96	6.14	2.33	1.46	0.87	8.05%	6.85%	0.00%	4.87%	0.71	12.32%	6.62%
UK	17.27	8.03	0.58	2.51	0.48	4.28%	6.41%	0.02%	2.80%	0.84	17.14%	7.64%
Sweden	13.95	6.98	0.24	0.63	0.79	27.76%	1.70%	0.18%	5.65%	0.17	11.73%	1.17%
Norway	15.23	6.59	0.13	1.68	0.51	23.94%	0.02%	0.03%	3.34%	0.19	-	-





The consumption of alcohol-based products for hand hygiene is 10 L/1000 days of stay (the lowest category in Europe) against a European average of 18.7 L/1000

Figure 15. Median alcohol hand rub consumption (litres per 1000 patient-days), ECDC PPS 2011–2012



*PPS data representativeness was poor in Austria, Croatia, Czech Republic, Estonia, Norway and Romania and very poor in Denmark and Sweden.

Definitely, we got a problem

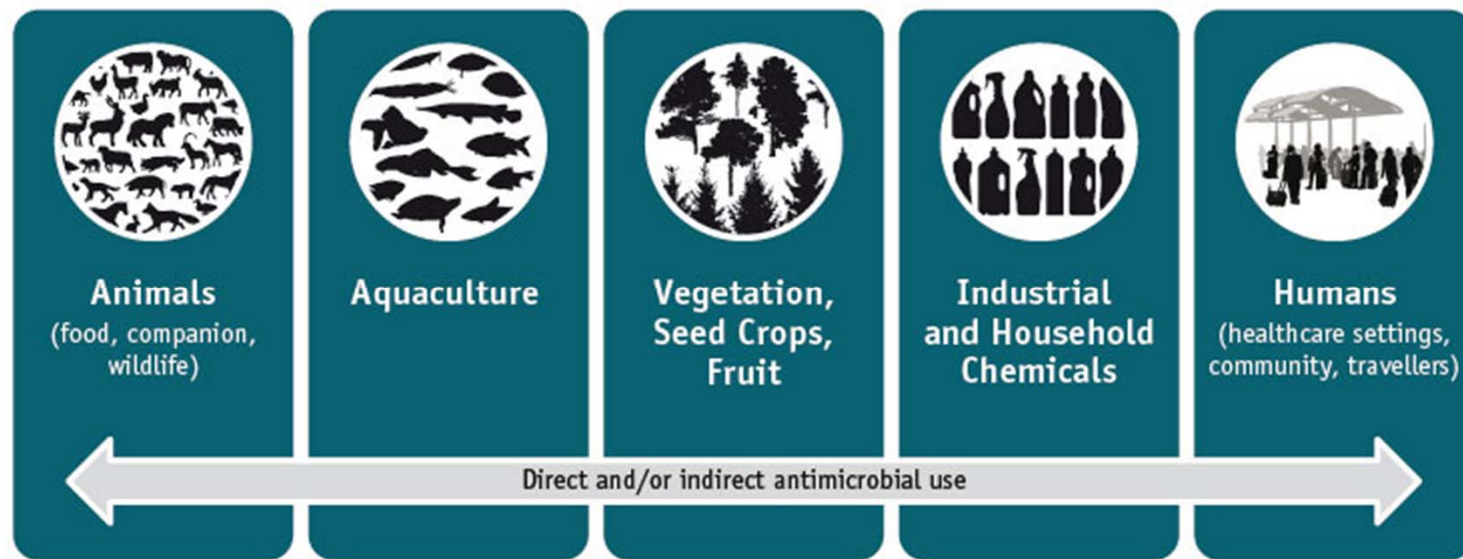




NATIONAL/REGIONAL ACTIVITIES TO CONTRAST ANTIMICROBIAL RESISTANCE: THE LIGHTS



Antimicrobial Resistance—A Shared Responsibility



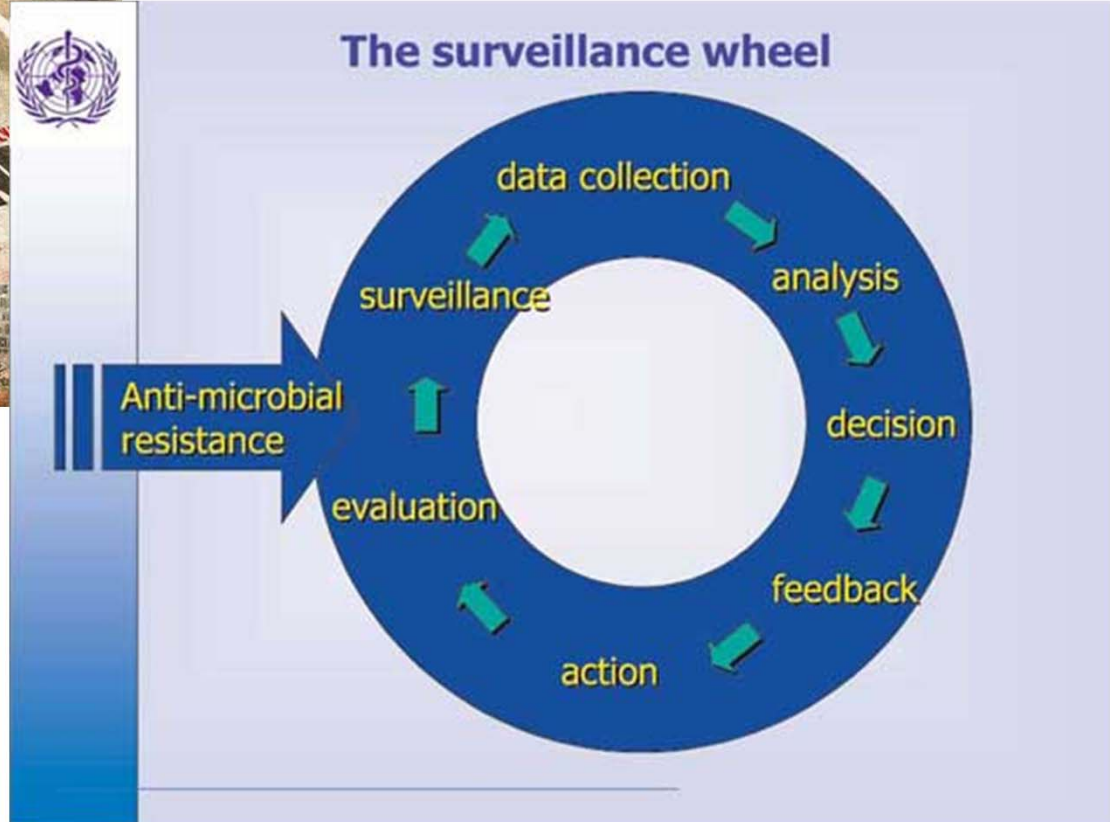
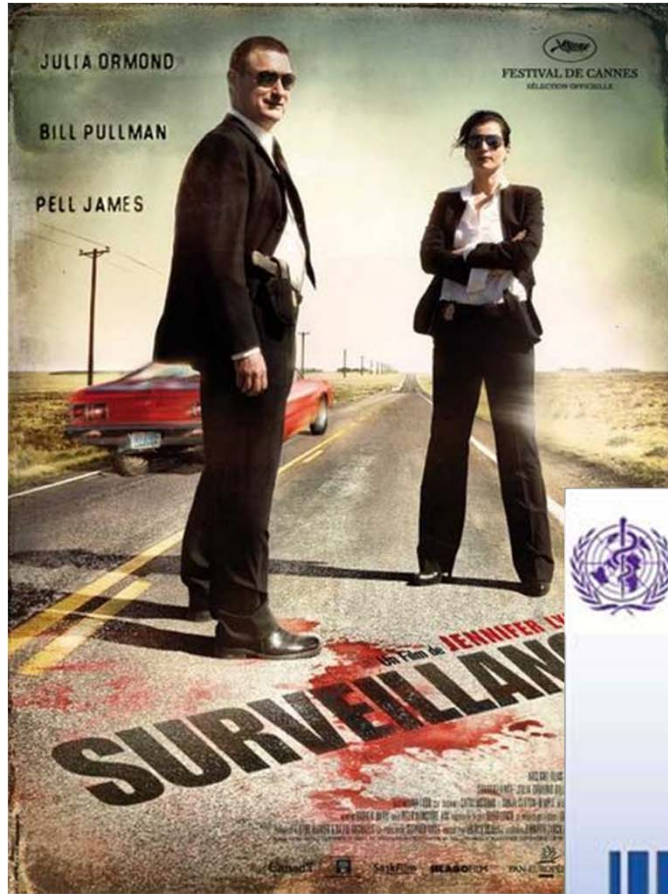
**Inter-
sectoral
coordination**

Surveillance

**Promote
awareness**

**Antibiotic
stewardship**

**Infection
Control**



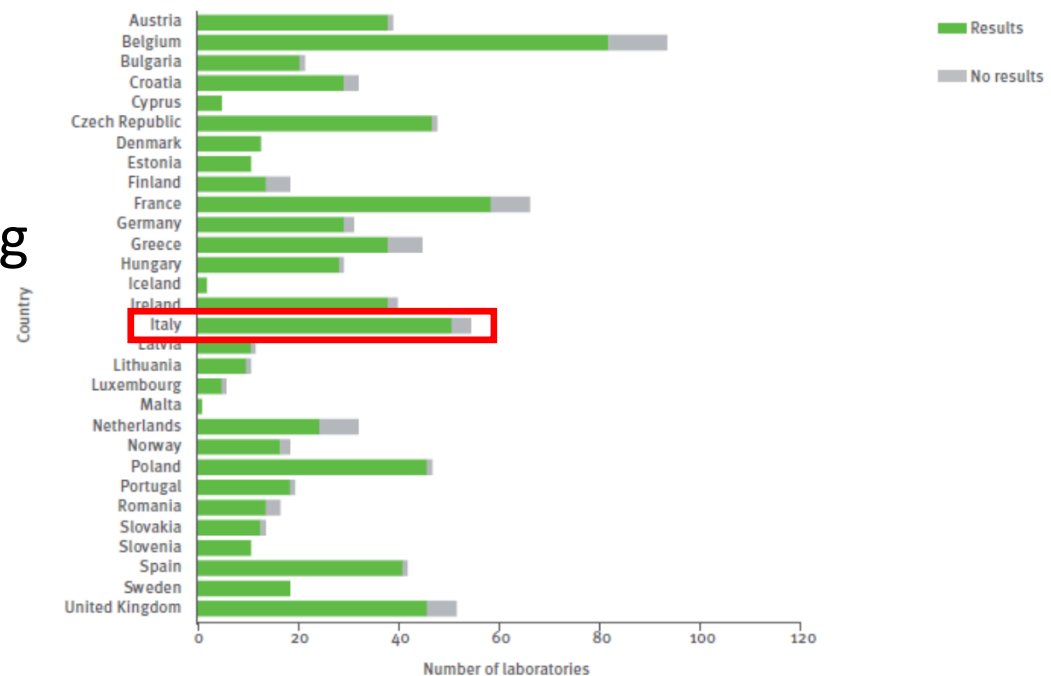


Surveillance of antimicrobial resistance

AR-ISS (National Surveillance System – National Health Institute)

- Coverage: from 52 laboratories reporting *S.aureus* to 42 reporting *P. aeruginosa* in 2013
- External quality assessment

Figure A1. Number of participating laboratories returning EQA reports 2013, per country





Surveillance of antimicrobial resistance

Regional surveillance systems

- **Coverage:** all (or mostly all) hospital laboratories
- No centralized external quality assessment





Data availability for action: Emilia-Romagna region



**Antimicrobial
resistance**
Data available on-
line: interactive data
analysis



Surveillance of healthcare associated infections



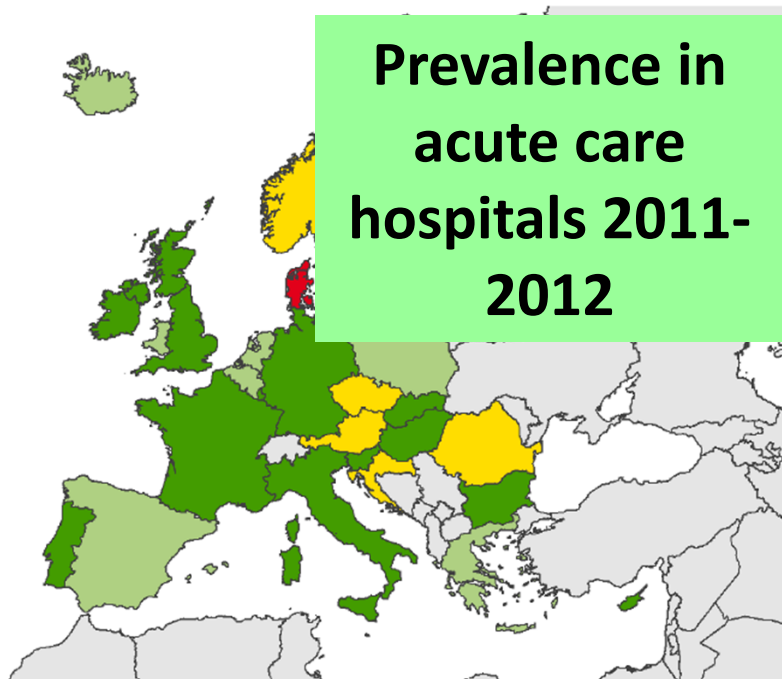
Surveillance of infections in Intensive Care Units (since 2009)

Surveillance of infections in surgery (since 2007)

Figure 9. Sample representativeness in the ECDC PPS by country, 2011–2012

- Very poor
- Poor
- Good
- Optimal
- Not included

- Non-visible countries
- Liechtenstein
 - Luxembourg
 - Malta



Prevalence in acute care hospitals 2011-2012

Prevalence in residential facilities, 2013

1181 facilities in Europe 235 of which in Italy (first country for participation)



SURVEILLANCE AND OUTBREAK REPORTS

The Italian national surgical site infection surveillance programme and its positive impact, 2009 to 2011

M Marchi^{1,2}, A Pan (apan@regione.emilia-romagna.it)^{1,2,3}, C Gagliotti¹, F Morsillo¹, M Parenti¹, D Resi^{1,4}, M L Moro¹, the Sorveglianza Nazionale Infezioni in Chirurgia (SNICH) Study Group⁵

¹ Area Rischio Infettivo, ² Agenzia Sanitaria e Sociale Regionale dell'Emilia-Romagna, ³ Infectious Diseases, ⁴ Health and Social

Operations performed in hospitals with at least two years of surveillance showed a 29% lower risk of SSI.

Longer intervention duration, American Society of Anesthesiologists' (ASA) score of at least three, and pre-surgery hospital stay of at least two days were associated with increased risk of SSI, while videoscopic procedures had reduced SSI rates.

Implementation of a national surveillance programme was helpful in reducing SSI rates and should be prioritised in all healthcare systems.

Increase the public awareness



National information campaigns on prudent antibiotic use – Italian Medicine Agency

2008



"Antibiotics yes, but with caution"

2009



"Antibiotics? Use them cautiously"

2010



"Antibiotics. Defend your defense. Use them cautiously "

2012



"Antibiotics? Only when necessary" - Web campaign

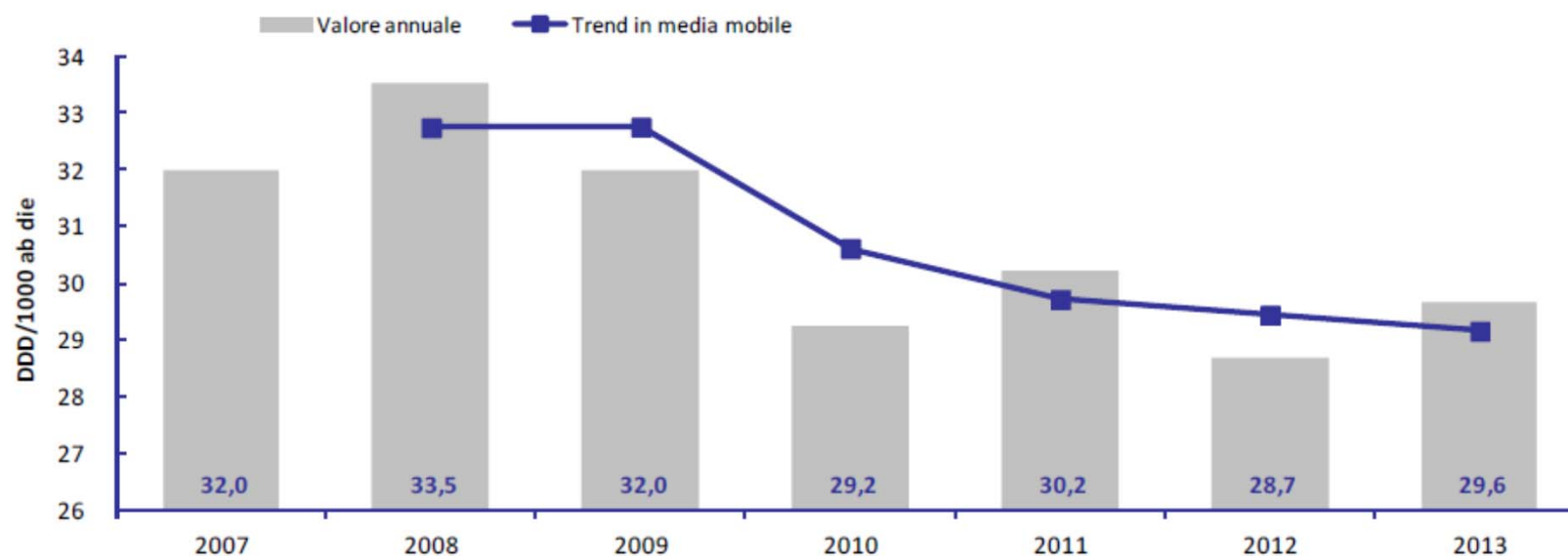
2014



"With no rule antibiotics do not work"



Trend of systemic antibiotics use (DDD/1000)





Regional information campaigns

BMJ



BMJ 2013;347:f5391 doi: 10.1136/bmj.f5391 (Published 12 September 2013)

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RESEARCH

- ✓ GPs/paediatricians active role (designing the campaign & using brochures/posters in their surgeries)
- ✓ advertisements on local media
- ✓ newsletter on local antibiotic resistance (targeted at doctors and pharmacists)

Feasibility and effectiveness of a low cost campaign on antibiotic prescribing in Italy: community level, controlled, non-randomised trial

OPEN ACCESS

Giulio Formoso *epidemiologist*, Barbara Paltrinieri *scientific journalist*, Anna Maria Marata *clinical pharmacologist*, Carlo Gagliotti *epidemiologist*, Angelo Pan *infectiologist*, Maria Luisa Moro *head of infective risk area*, Oreste Capelli *pneumologist*, Nicola Magrini *head of drug evaluation area*, for the LOCAAL Study Group

Emilia-Romagna Regional Agency for Health and Social Care, Viale Aldo Moro 21, 40127 Bologna, Italy

Table 1| Change in antibiotic* consumption and expenditure in intervention and control areas and in rest of Italy, November 2011 to March 2012, compared with same period of previous year

Geographical area	Defined daily doses per 1000 inhabitants/day			€ per 1000 inhabitants/day		
	Nov 2011–Mar 2012	Nov 2010–Mar 2011	% difference	Nov 2011–Mar 2012	Nov 2010–Mar 2011	% difference
Intervention provinces	20.0	22.7	–11.9	24.3	32.5	–25.1
Control provinces	21.0	22.7	–7.4	25.6	33.4	–21.8
Rest of Italy	26.1	27.0	–3.2	40.2	48.2	–16.7

€1.00 (£0.85; \$1.32).

*Penicillins, cephalosporins, monobactams, macrolides, lincosamides, quinolones, and glycopeptides. See text for codes of Anatomical Therapeutic Chemical Classification System.



Emilia-Romagna 2014 information campaign

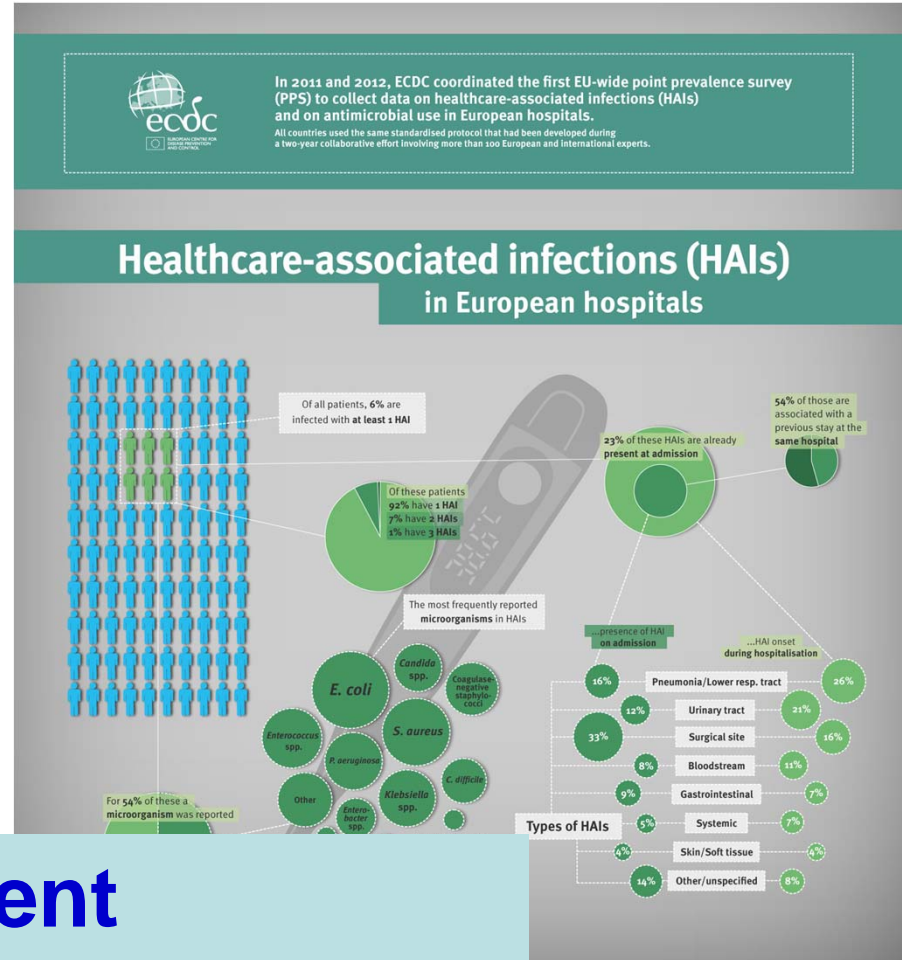
- ✓ Brochures/posters in GPs/paediatricians surgeries
- ✓ videos on videoterminals of waiting rooms (hospitals, clinics, outpatients)
- ✓ web posting
- ✓ videoterminals in railway stations
- ✓ **posters on hand hygiene in nursery and primary schools**

Campagna "Antibiotici. E' un peccato usarli male: efficaci se necessari, dannosi se ne abusi"





Measure to prevent healthcare associated infections



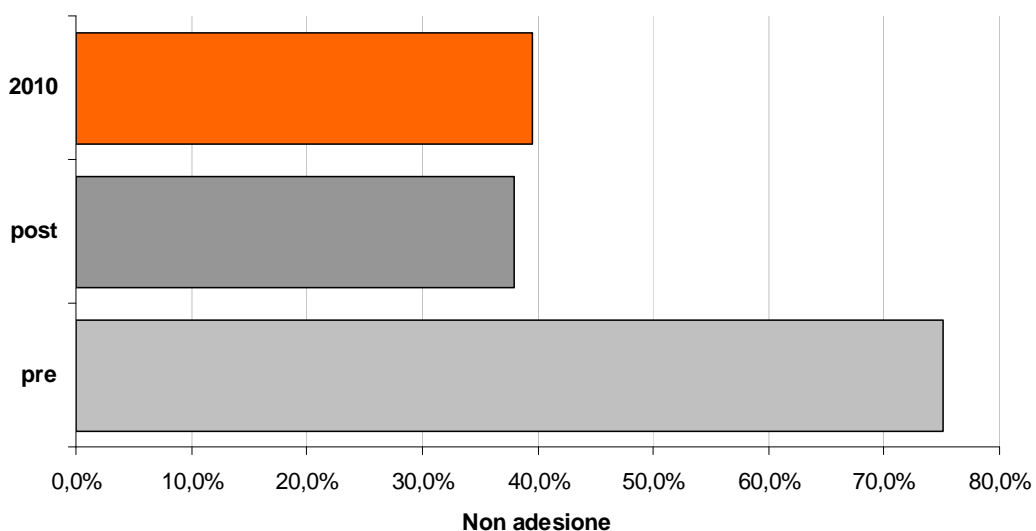


National Hand Hygiene Campaign 2007-2008

Participating wards

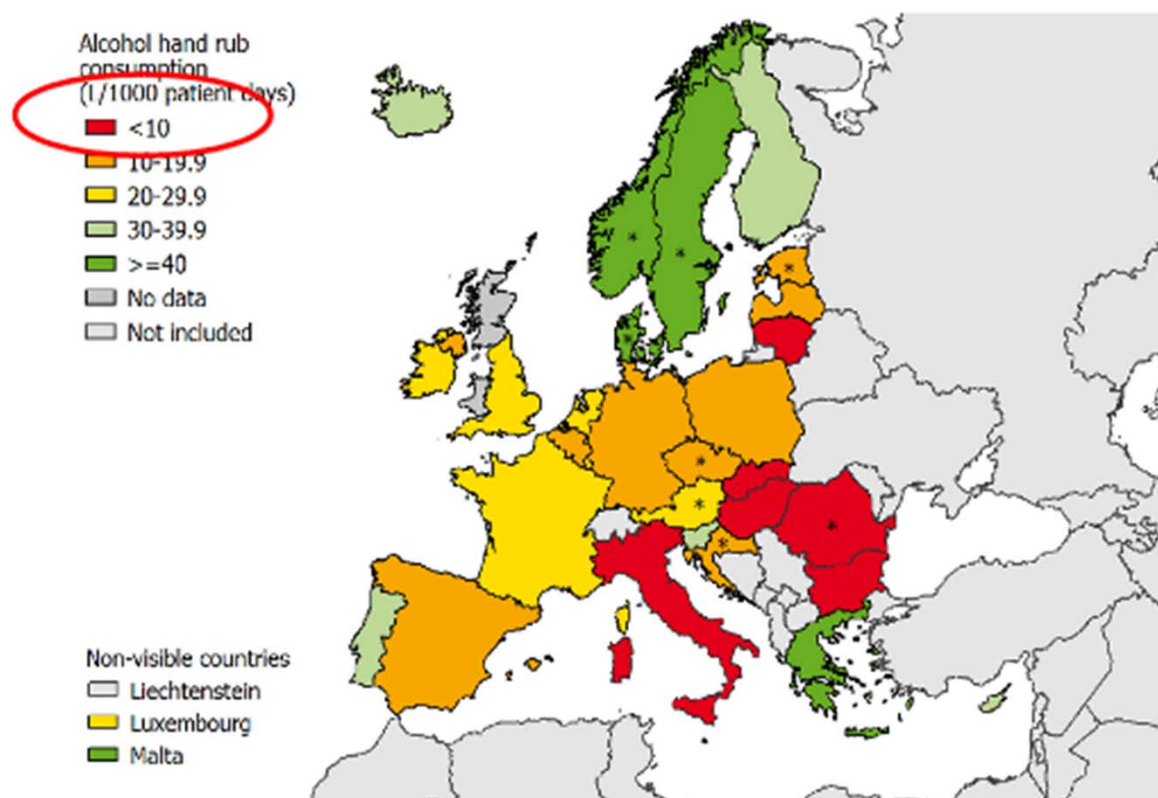


Momento 1, non adesione (%)



A significant impact in participating wards, but other regions/hospitals/wards have been affected?

Figure 15. Median alcohol hand rub consumption (litres per 1000 patient-days), ECDC PPS 2011–2012



**PPS data representativeness was poor in Austria, Croatia, Czech Republic, Estonia, Norway and Romania and very poor in Denmark and Sweden.*



Promoting compliance requires sustained efforts: the Emilia-Romagna experience

National campaign
(10 Health Trusts, 17 wards, of which 11 ICUs)

Hand hygiene compliance follow up
(5 Health Trusts, 11 wards of which 7 ICUs)

Regional indicators
Hand rub alcohol products
WHO Framework
(All the 17 Health Trusts)

2007/2008

2010

2010-2014



World Health Organization Patient Safety SAVE LIVES Clean Your Hands

Scheda di osservazione

Attrezzatura sanitaria: Numero:

Struttura: Data: Osservatore:

Departmento: Osservatore (se diverso): Pagina N°:

Servizio/Realtà: Durata sessione:

CRS:

Regione:

Profilo	Indicatore	Attrezzatura	Struttura	Departmento	Servizio/Realtà	CRS	Regione
1	Profilo 1	Indicatore 1	Attrezzatura 1	Struttura 1	Departmento 1	Servizio/Realtà 1	CRS 1
2	Profilo 2	Indicatore 2	Attrezzatura 2	Struttura 2	Departmento 2	Servizio/Realtà 2	CRS 2
3	Profilo 3	Indicatore 3	Attrezzatura 3	Struttura 3	Departmento 3	Servizio/Realtà 3	CRS 3
4	Profilo 4	Indicatore 4	Attrezzatura 4	Struttura 4	Departmento 4	Servizio/Realtà 4	CRS 4
5	Profilo 5	Indicatore 5	Attrezzatura 5	Struttura 5	Departmento 5	Servizio/Realtà 5	CRS 5
6	Profilo 6	Indicatore 6	Attrezzatura 6	Struttura 6	Departmento 6	Servizio/Realtà 6	CRS 6
7	Profilo 7	Indicatore 7	Attrezzatura 7	Struttura 7	Departmento 7	Servizio/Realtà 7	CRS 7
8	Profilo 8	Indicatore 8	Attrezzatura 8	Struttura 8	Departmento 8	Servizio/Realtà 8	CRS 8

World Health Organization Patient Safety SAVE LIVES Clean Your Hands

Hand Hygiene Self-Assessment Framework 2010

Introduction and user instructions

The **Hand Hygiene Self-Assessment Framework** is a systematic tool which is used to assess the current state of hand hygiene practices and to identify areas for improvement. It is designed to be used by healthcare professionals and managers to assess the current state of hand hygiene practices and to identify areas for improvement. The framework is designed to be used by healthcare professionals and managers to assess the current state of hand hygiene practices and to identify areas for improvement.

What is the purpose?

The purpose of the framework is to assess the current state of hand hygiene practices and to identify areas for improvement. It is designed to be used by healthcare professionals and managers to assess the current state of hand hygiene practices and to identify areas for improvement.

Who should use the Hand Hygiene Self-Assessment Framework?

The framework should be used by healthcare professionals and managers to assess the current state of hand hygiene practices and to identify areas for improvement. It is designed to be used by healthcare professionals and managers to assess the current state of hand hygiene practices and to identify areas for improvement.

How is it structured?

The framework is structured into several sections, including an introduction, a list of indicators, and a series of questions designed to assess the current state of hand hygiene practices. It is designed to be used by healthcare professionals and managers to assess the current state of hand hygiene practices and to identify areas for improvement.



Promoting compliance requires sustained efforts: the Emilia-Romagna experience

**Awareness
intervention, training**

2014

Information program:
crosswords, rebus,
questions to think about

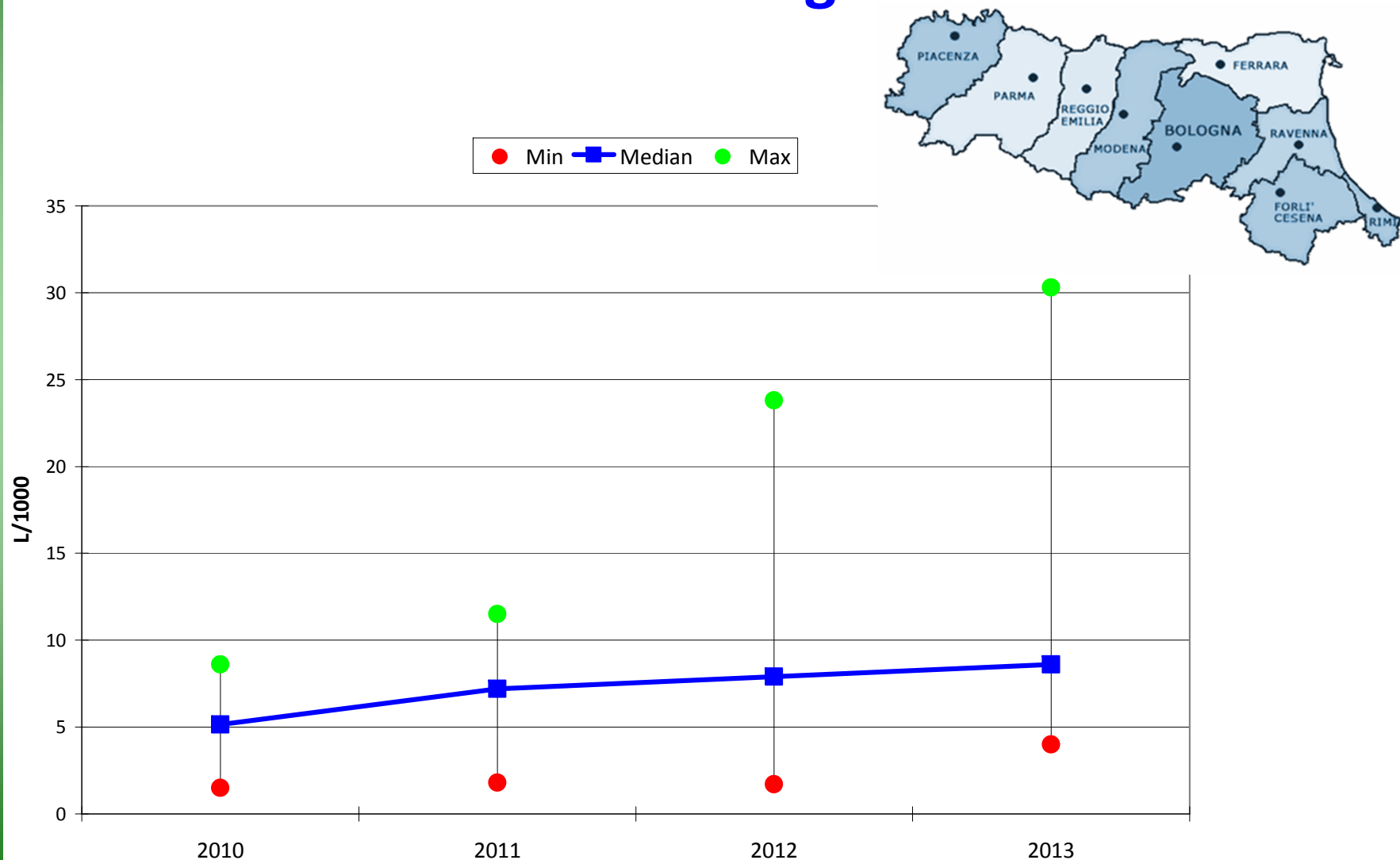


Videos:
cocoa to
make visible
the invisible



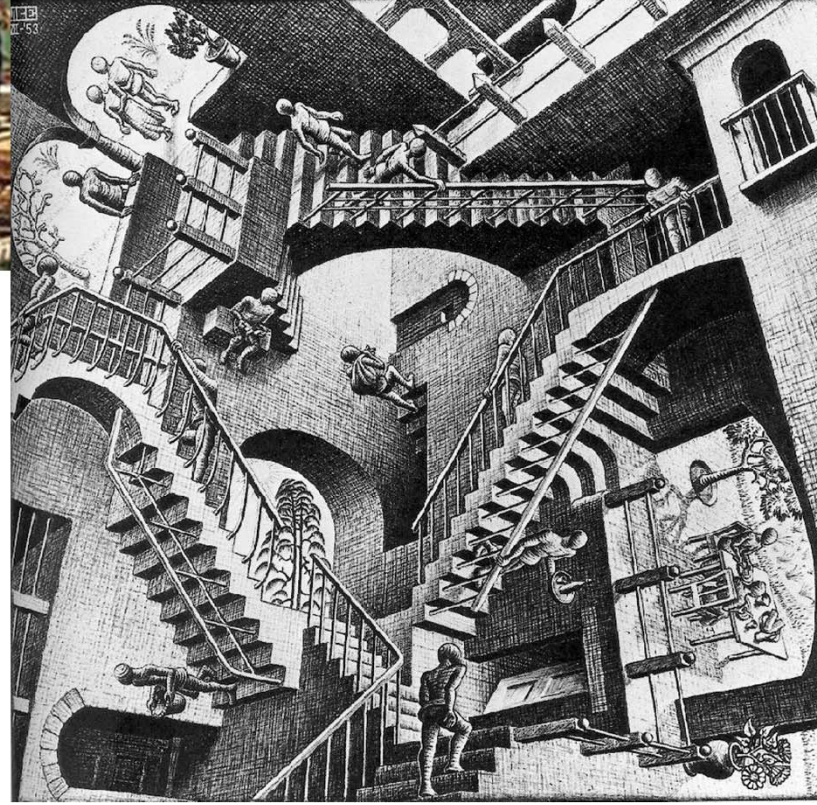
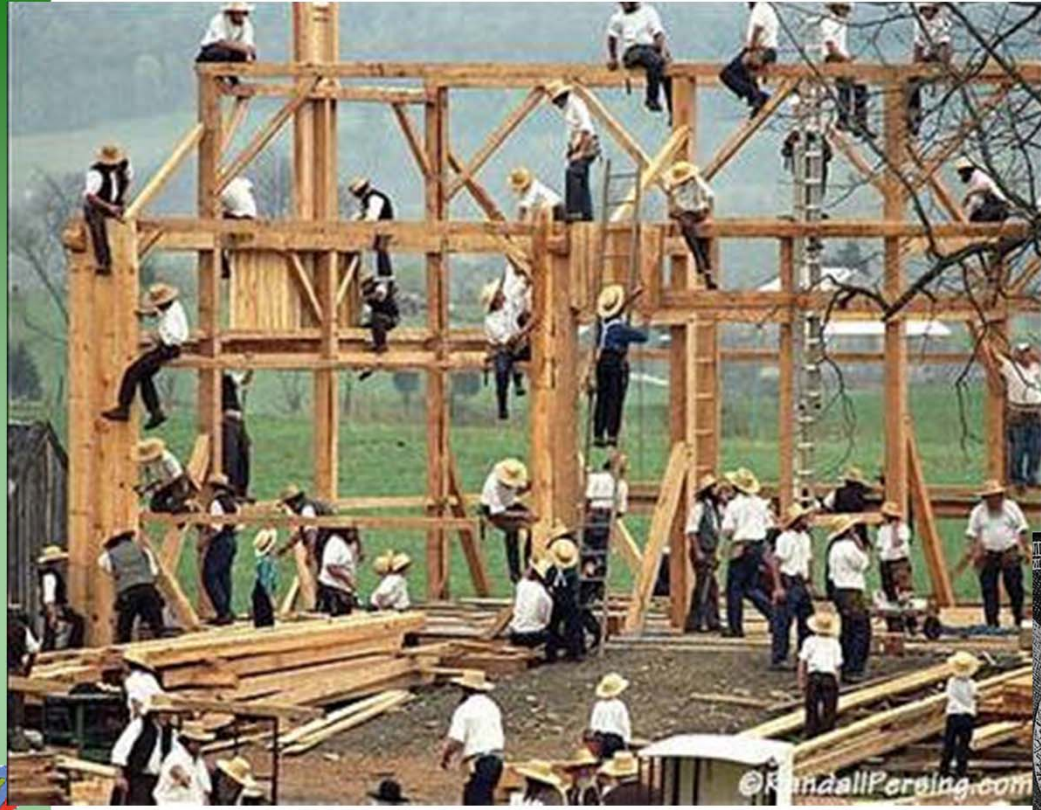


Promoting compliance requires sustained efforts: the Emilia-Romagna



Area Rischio infettivo

Agencia sanitaria e sociale regionale





THE SHADOWS



Italy is “diverse”



In 2001 the “Costitutional reform of the V Title”

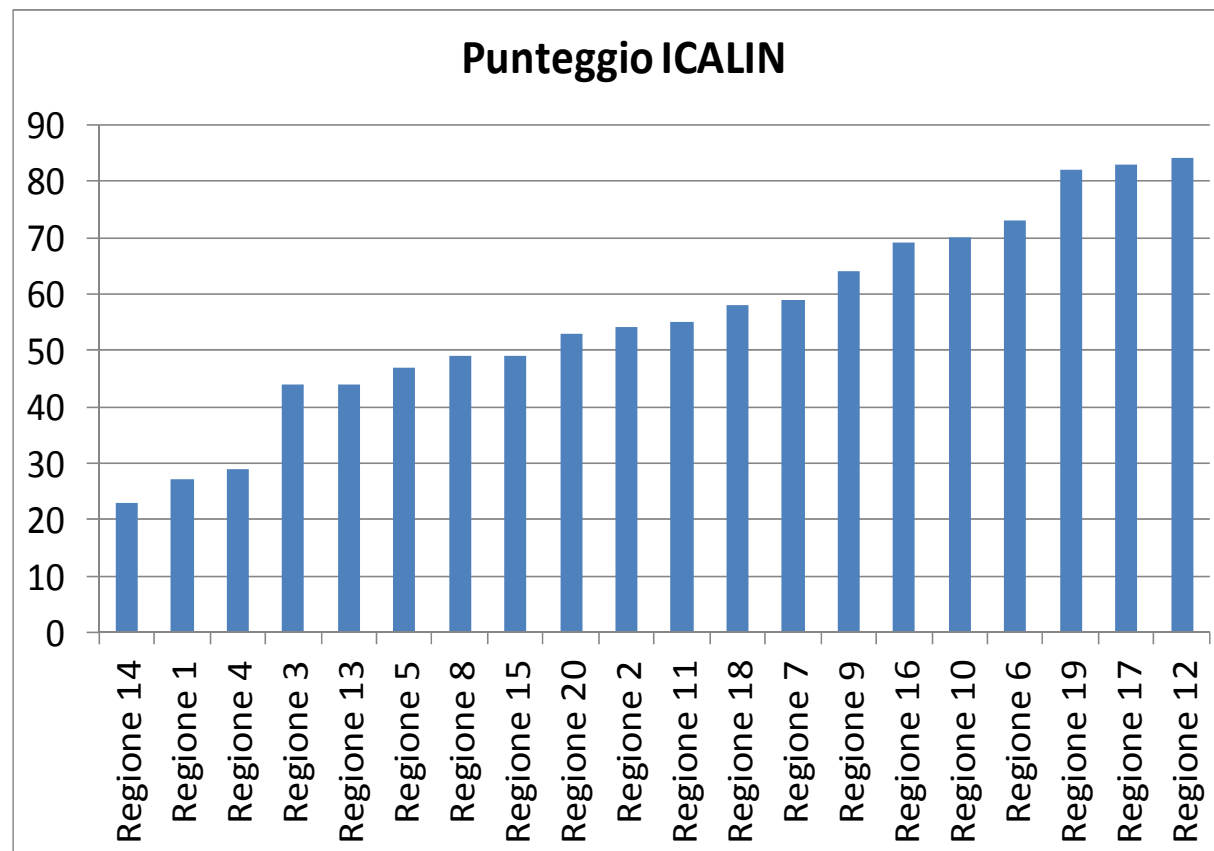
Responsability for health is shared between regions and the state

Variability

North-South trend



- ✓ Significant differences in the intensity of healthcare associated infection control programs



National survey, 2007



- ✓ In the participation to the national HAIs surveillance systems



Sorveglianza delle infezioni del sito chirurgico in Italia

Interventi ortopedici anno 2012

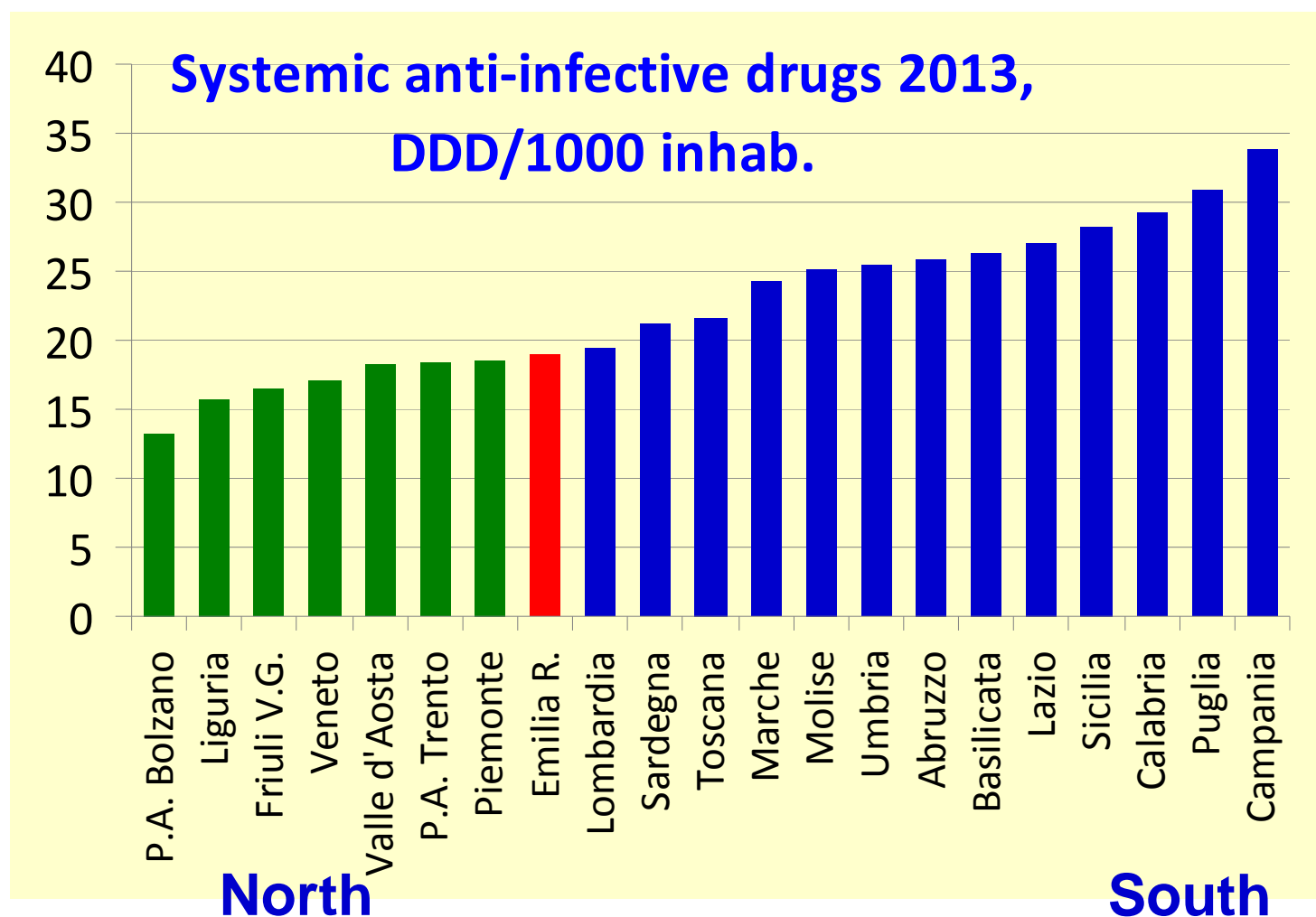
Interventi non ortopedici anno 2013

Figura 1. Distribuzione territoriale degli ospedali partecipanti alla sorveglianza (interventi ortopedici 2012)





- ✓ In the consumption of antiinfective drugs (including antibiotics)

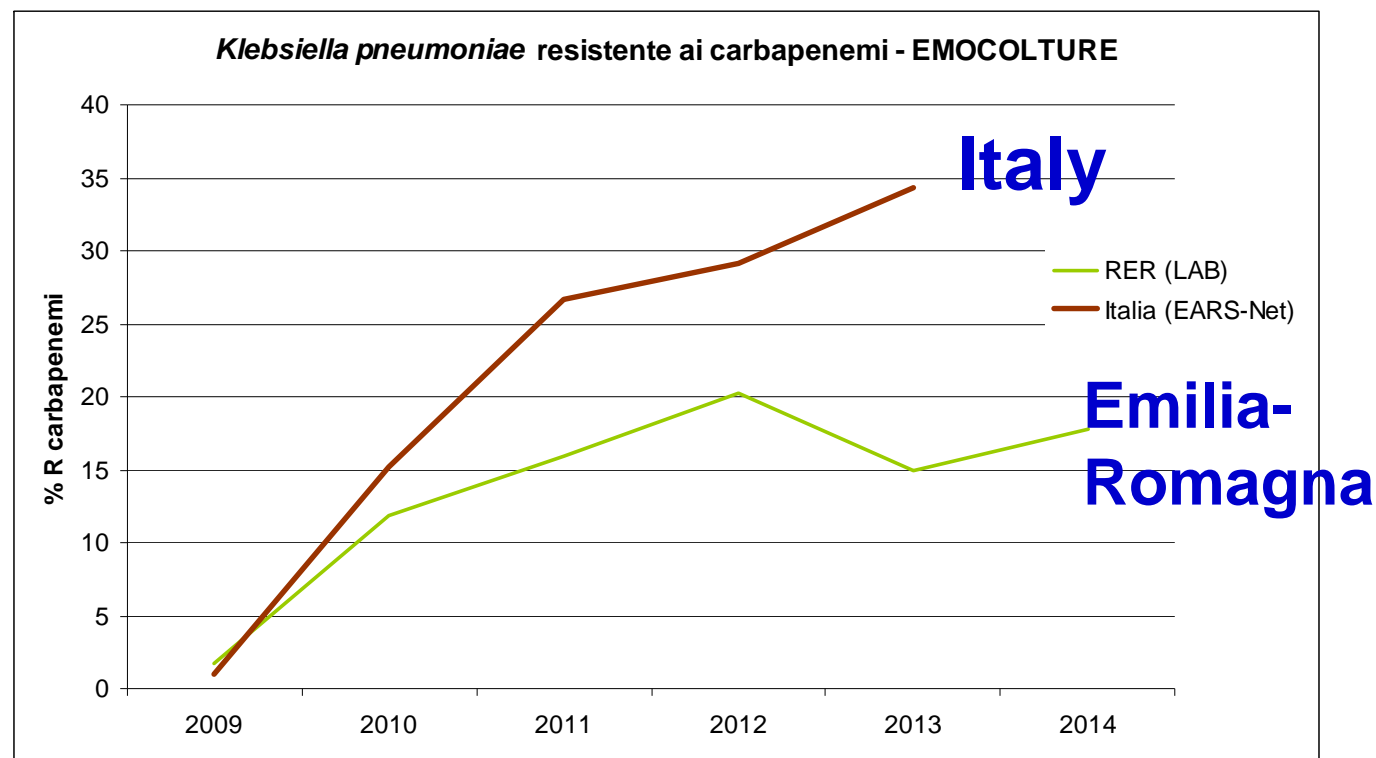




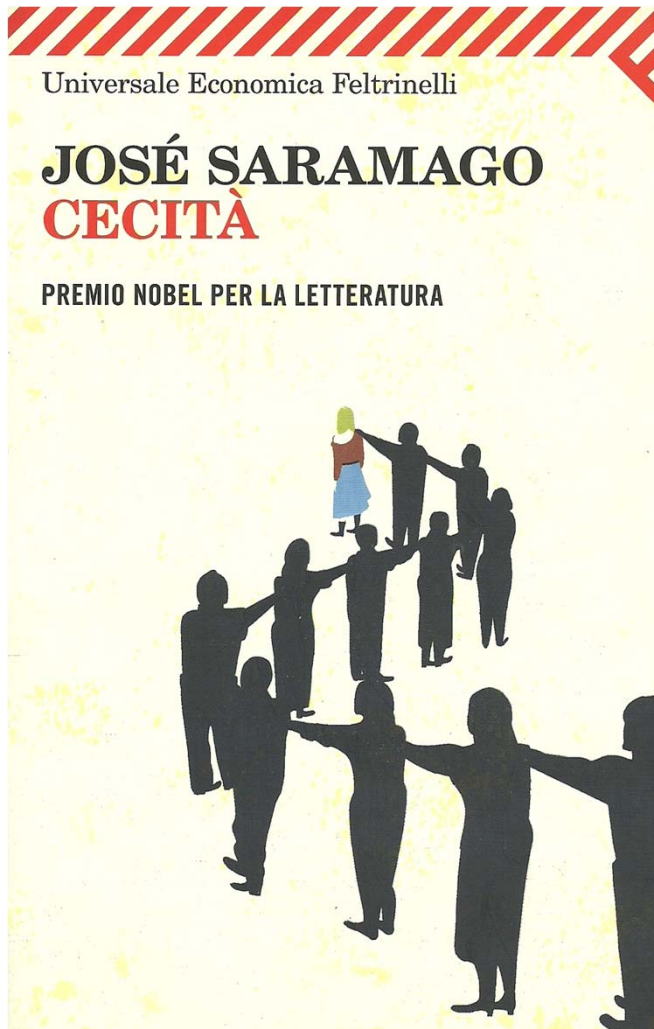
✓ In the capability of halting the diffusion of new multidrug-resistant bugs. The example of KPC

Control of carbapenemase-producing *Klebsiella pneumoniae*: a region-wide intervention

C Gagliotti (cgagliotti@regione.emilia-romagna.it)¹, V Cappelli¹, E Carretto², M Marchi¹, A Pan¹, P Ragni³, M Sarti⁴, R Suzzi⁵, G A Tura⁶, M L Moro¹, on behalf of the Emilia-Romagna Group for CPE Control⁷



To conclude



**We cannot be blind
longer**

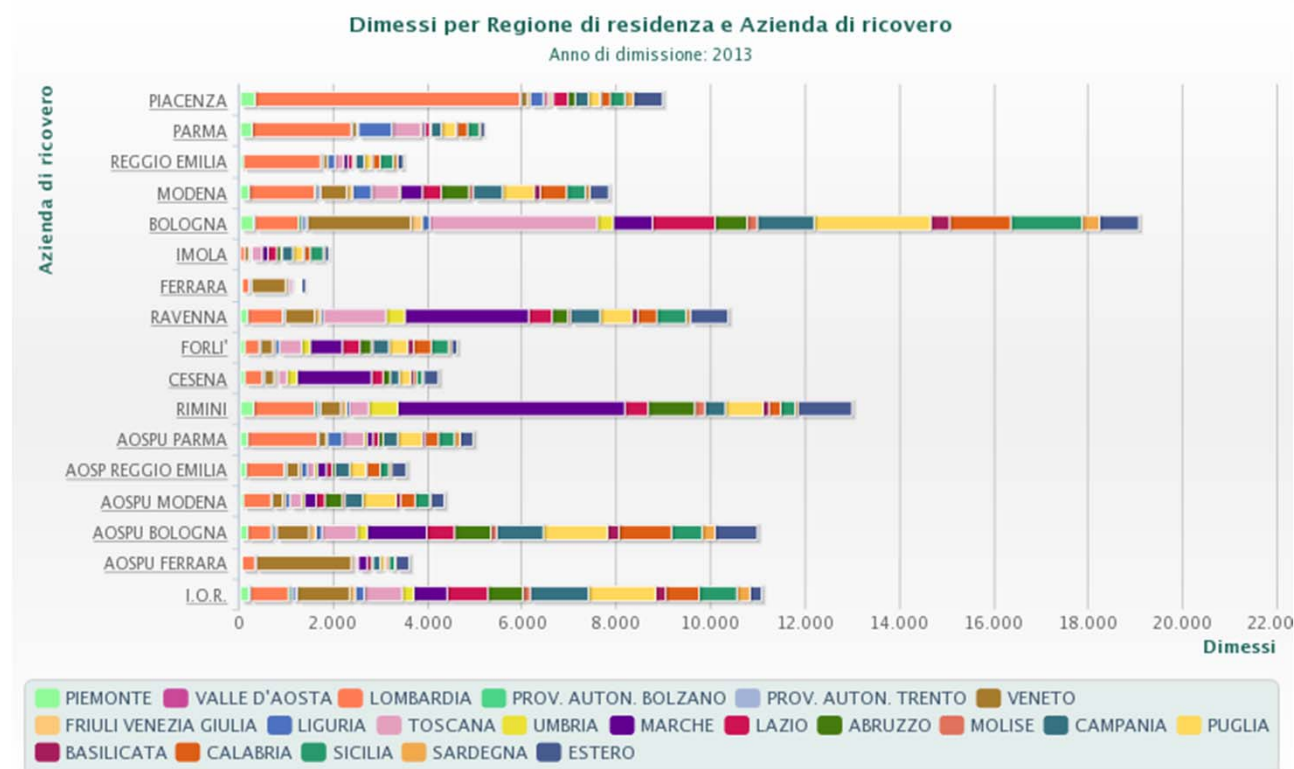
- ✓ Antimicrobial resistance: everyone is responsible
- ✓ Microorganisms have no borders



Dispersal of antibiotic-resistant high-risk clones by hospital networks: changing the patient direction can make all the difference

T. Donker^{a,b,*}, J. Wallinga^b, H. Grundmann^{a,b}

The structure of the patient referral network has a profound effect on the epidemic behaviour of high-risk clones.





2014-2018 National Prevention Program Objectives (Antimicrobial resistance and HAIs)

- ✓ Improved surveillance of CPE
- ✓ Improved surveillance of HAIs
- ✓ Monitoring antibiotic usage
- ✓ Information campaigns on prudent antibiotic use



Coordination, cooperation

among national agencies,
national and regional health
ministries

Definition of an ad hoc national plan

- ✓ Make clear antibiotic resistance is a **top priority**
- ✓ Identification of **priorities**
- ✓ Identification of **standards and indicators** to be achieved in defined periods of time

Partnership (patients-healthcare workers)

Information, training, partnership, network



Thank you

