Impatto sanitario ed economico dell'antibiotico resistenza in Italia: soluzioni OMS

Alessandro Cassini and Benedetta Allegranzi
per la WHO IPC Global Unit

World Health Organization

Antibiotico-resistenza in laboratorio

AMR non è una malattia, è un insuccesso terapeutico

- L'antibiotico-resistenza è
  - Multifattoriale (mutazione, geni acquisiti)
  - Multisettoriale (one health, one world)

- Che varia a seconda del
  - Ospite
  - Organismo
  - Antibiotico
  - Tipo di infezione

Fonte: tradotto da Melissa Brower, US CDC

Un grande numero di combinazioni!

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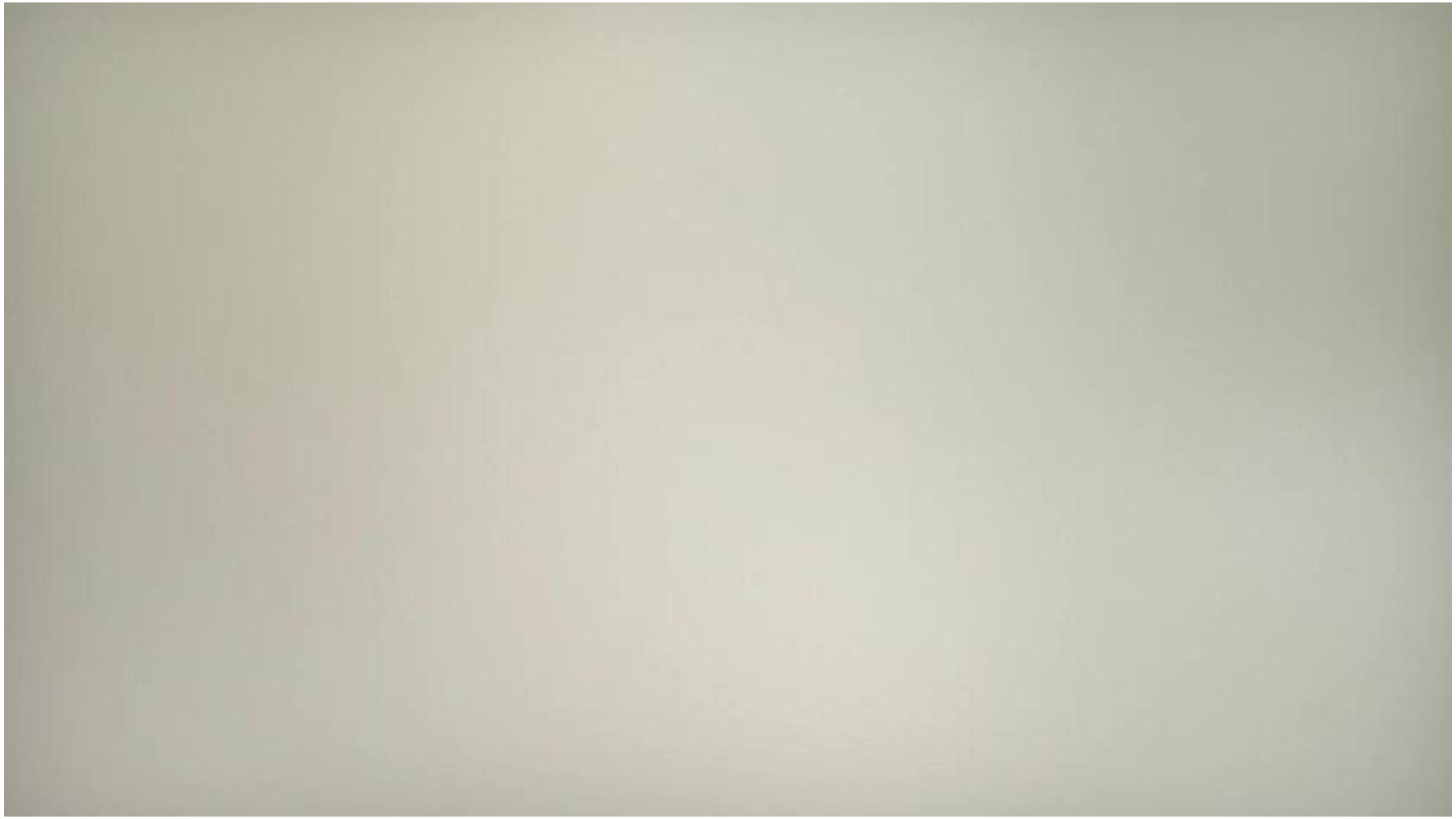
Come si diffonde l’antibiotic-resistenza



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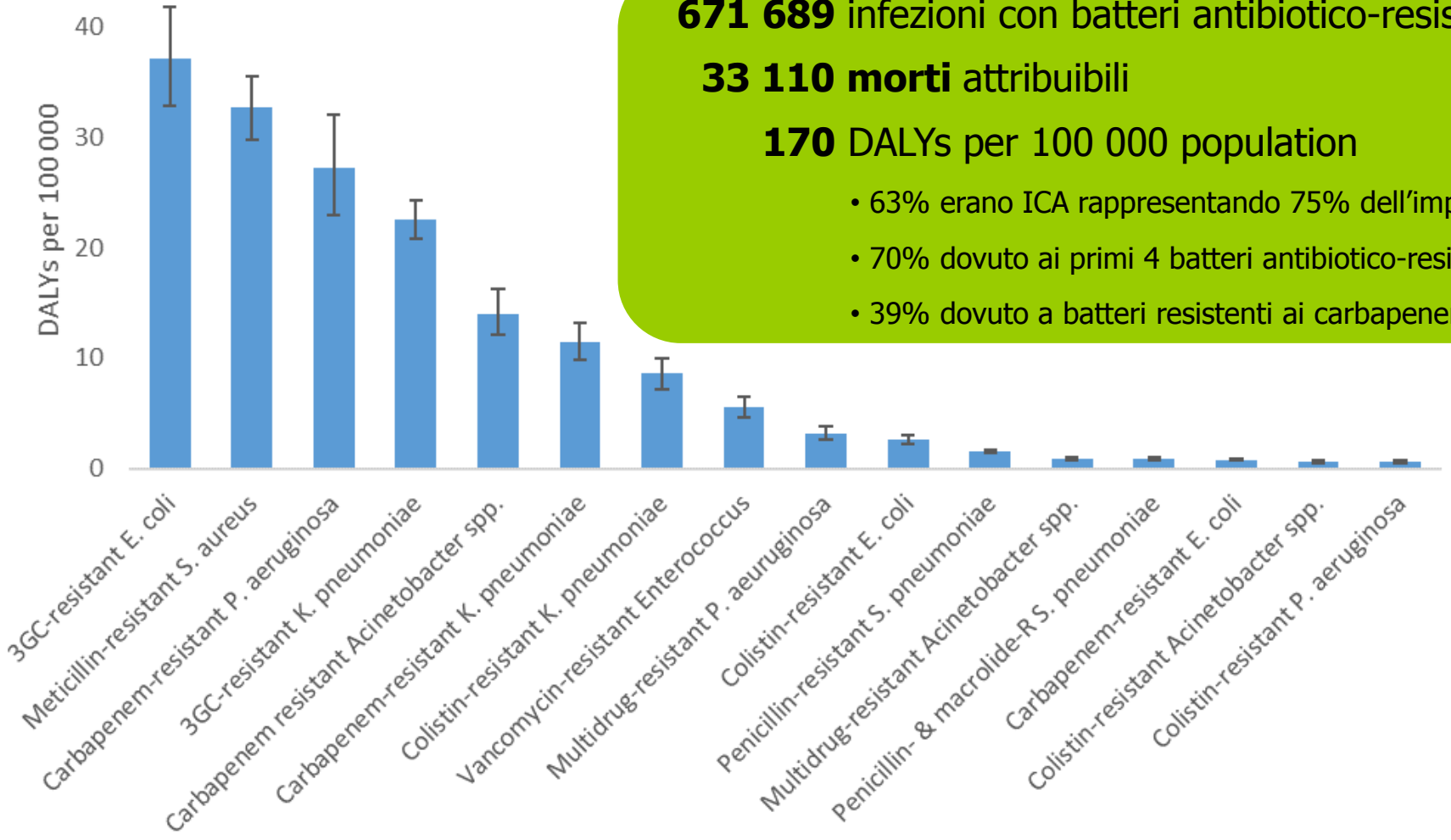
Impatto delle infezioni con batteri antibiotico-resistenti, UE/SEE, 2015



671 689 infezioni con batteri antibiotico-resistenti

33 110 morti attribuibili

170 DALYs per 100 000 population

- 63% erano ICA rappresentando 75% dell'impatto totale in DALYs
- 70% dovuto ai primi 4 batteri antibiotico-resistenti
- 39% dovuto a batteri resistenti ai carbapenemi e/o colistina

Cassini A., et al. (2019). The Lancet Infectious Diseases 19(1): 56-66.

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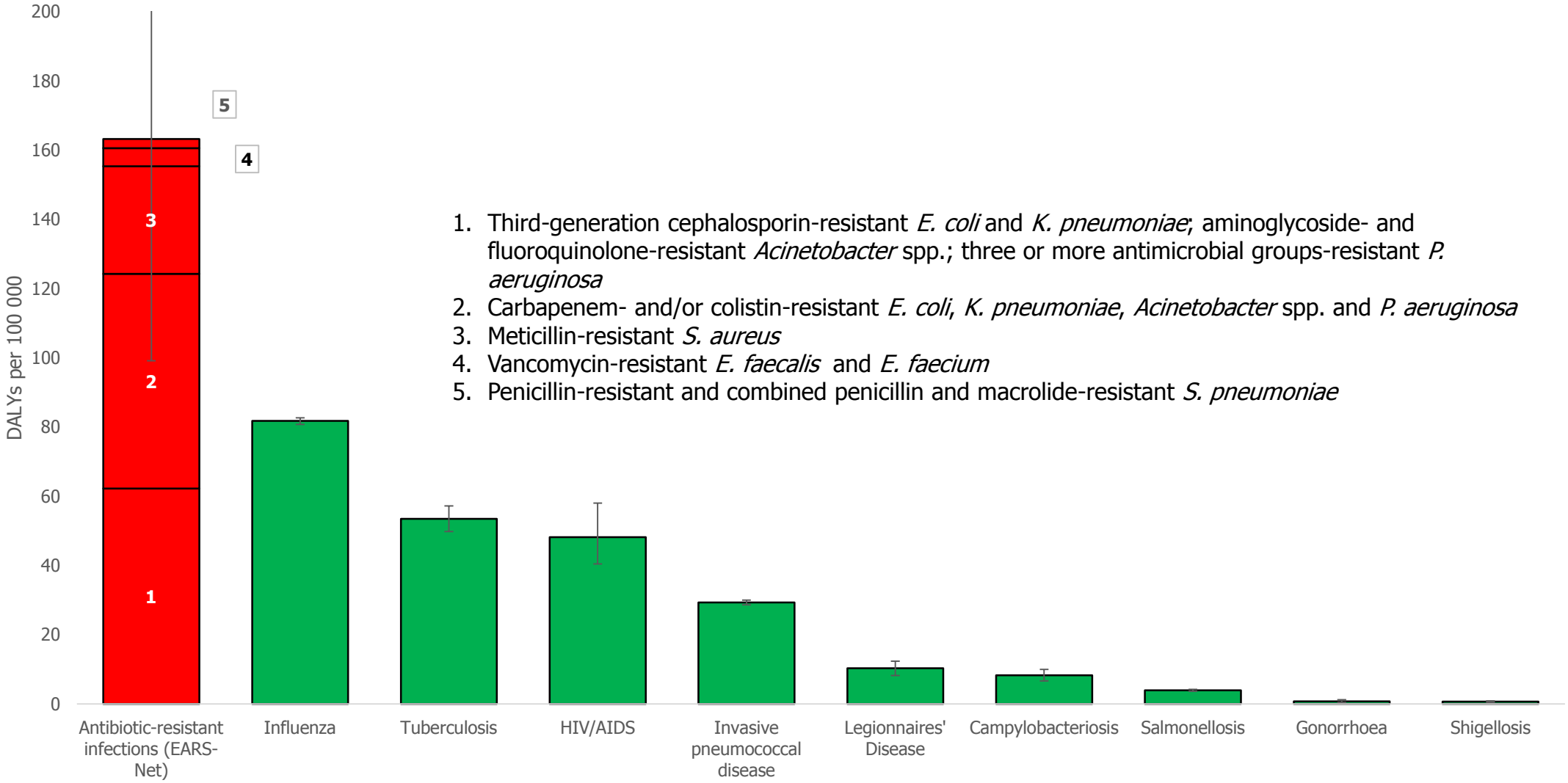
L'impatto è paragonabile a quello cumulativo dell'influenza, tubercolosi e HIV/AIDS



1. Third-generation cephalosporin-resistant *E. coli* and *K. pneumoniae*; aminoglycoside- and fluoroquinolone-resistant *Acinetobacter* spp.; three or more antimicrobial groups-resistant *P. aeruginosa*
2. Carbapenem- and/or colistin-resistant *E. coli*, *K. pneumoniae*, *Acinetobacter* spp. and *P. aeruginosa*
3. Meticillin-resistant *S. aureus*
4. Vancomycin-resistant *E. faecalis* and *E. faecium*
5. Penicillin-resistant and combined penicillin and macrolide-resistant *S. pneumoniae*

Adattato da: Cassini A., et al. (2019). The Lancet Infectious Diseases 19(1): 56-66.
Cassini A, et al. Eurosurveillance 2018;23(16):pii=17-00454

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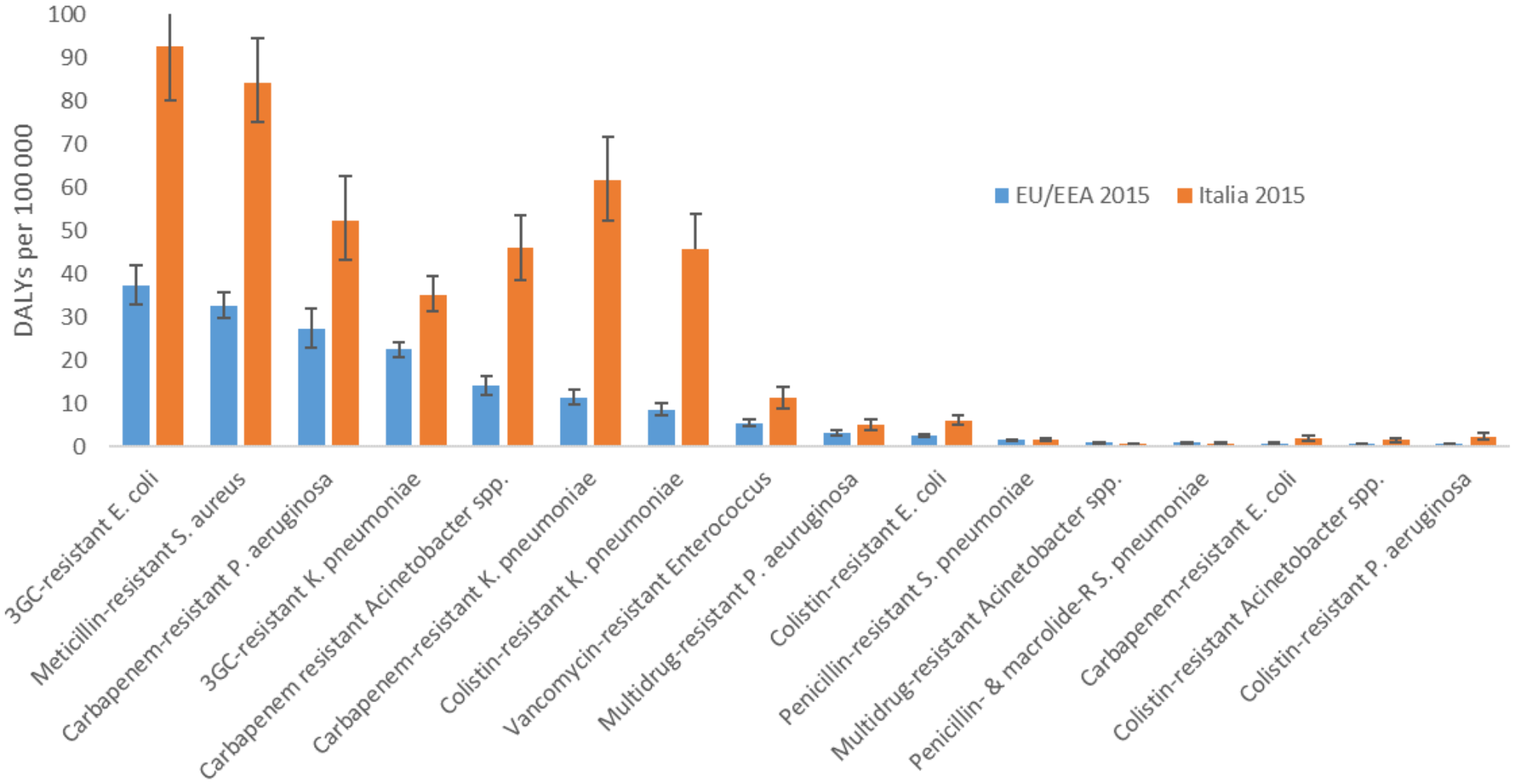
Paragone impatto UE/SEE e Italia



Cassini A., et al. (2019). The Lancet Infectious Diseases 19(1): 56-66.

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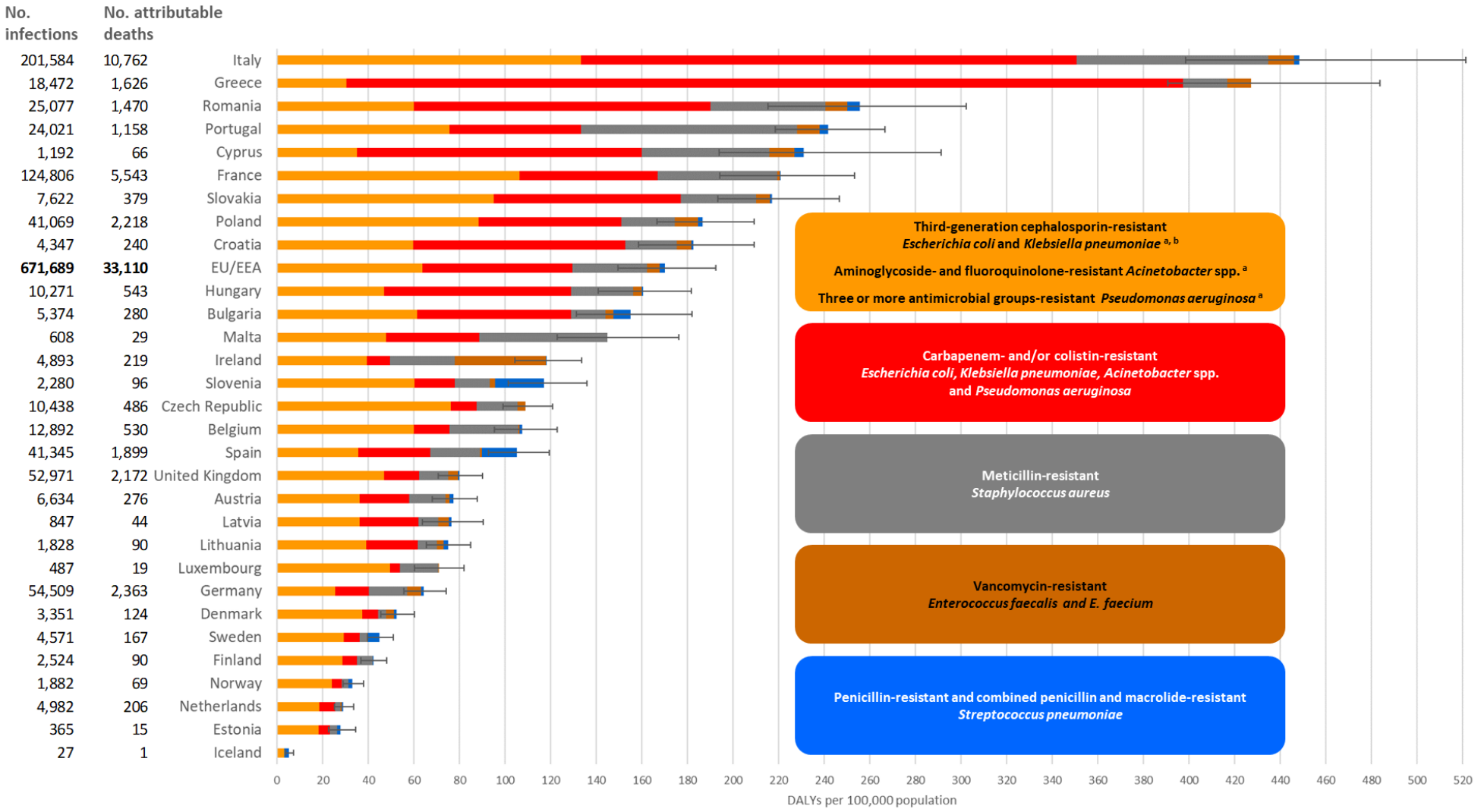
Impatto delle infezioni con batteri antibiotico-resistenti, per paese, 2015, standardizzato per gruppo d'età



Cassini A., et al. (2019). The Lancet Infectious Diseases 19(1): 56-66.

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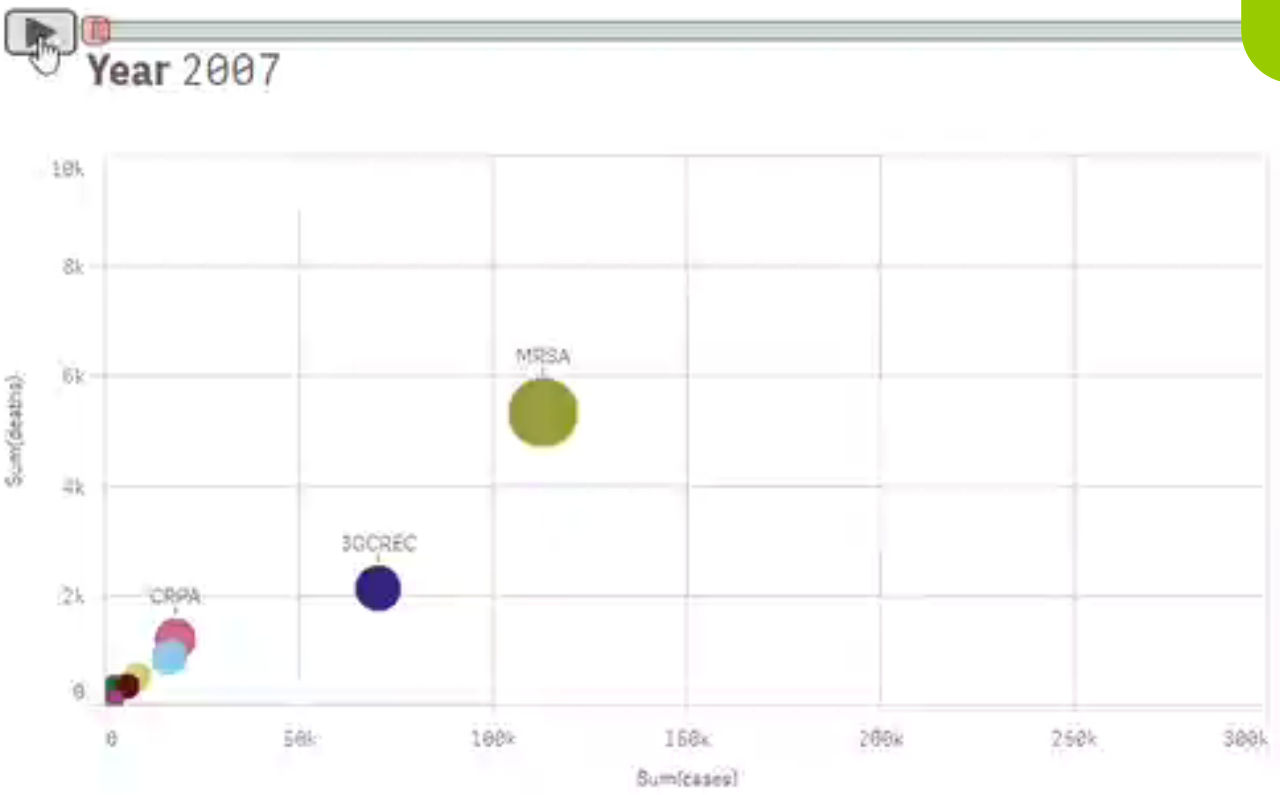
Aumento dei decessi attribuibili ad AMR – 2007-2015 paesi UE

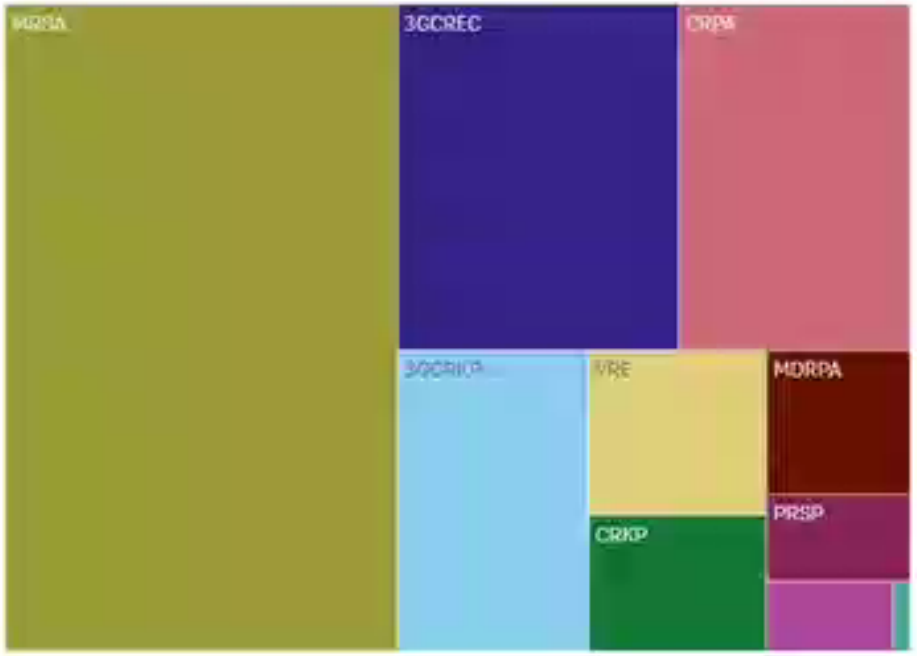
2007 to 2015:

Number of deaths more than doubled

Number of deaths due to:

- **carbapenem-resistant *K. pneumoniae* increased six-fold**
- **third-generation cephalosporin-resistant *E. coli* increased four-fold**





Adattato da Cassini A., et al. (2019). The Lancet Infectious Diseases 19(1): 56-66.

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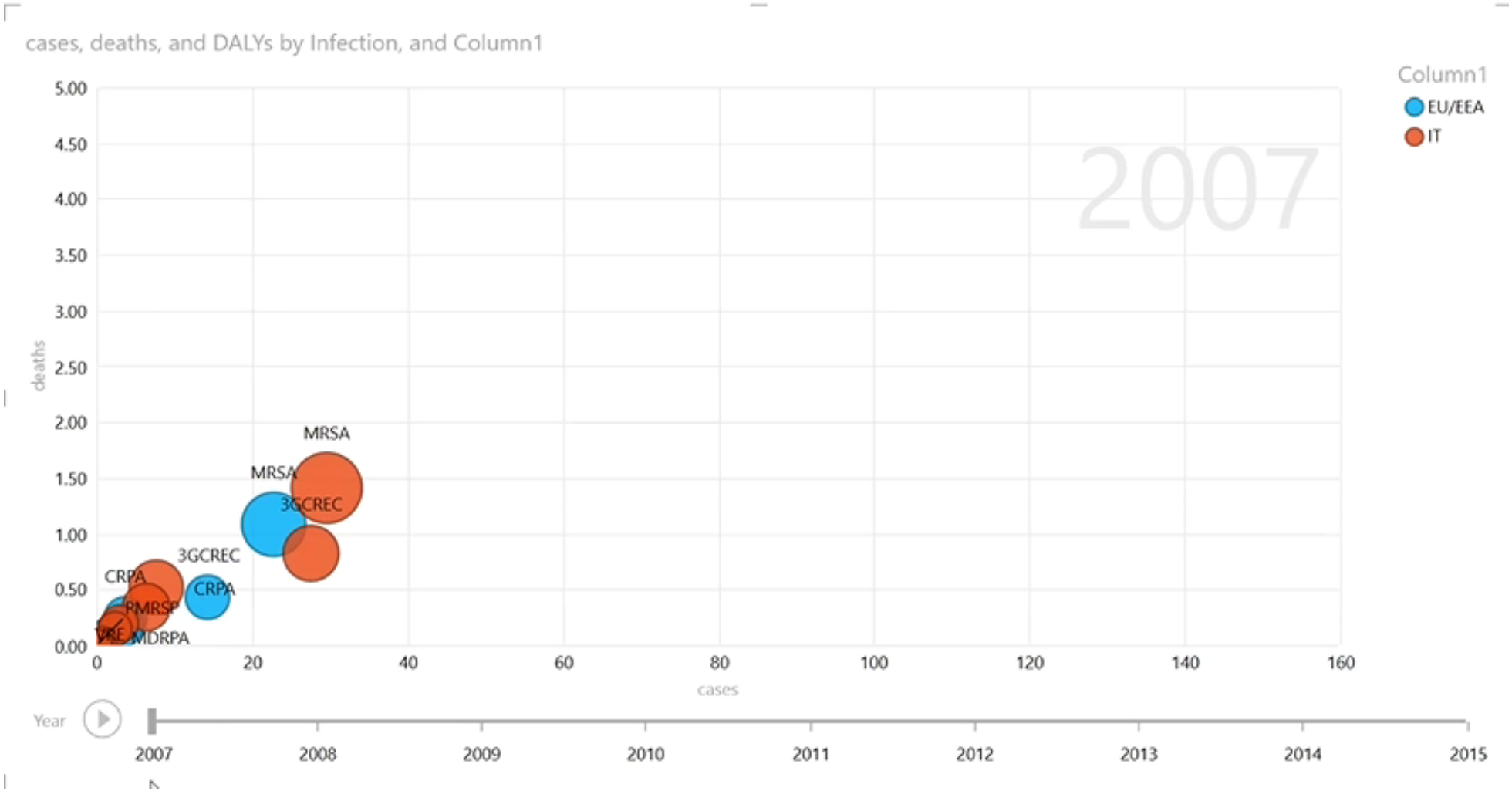
Impatto delle infezioni con batteri antibiotico-resistenti, UE/SEE e Italia, 2007-2015



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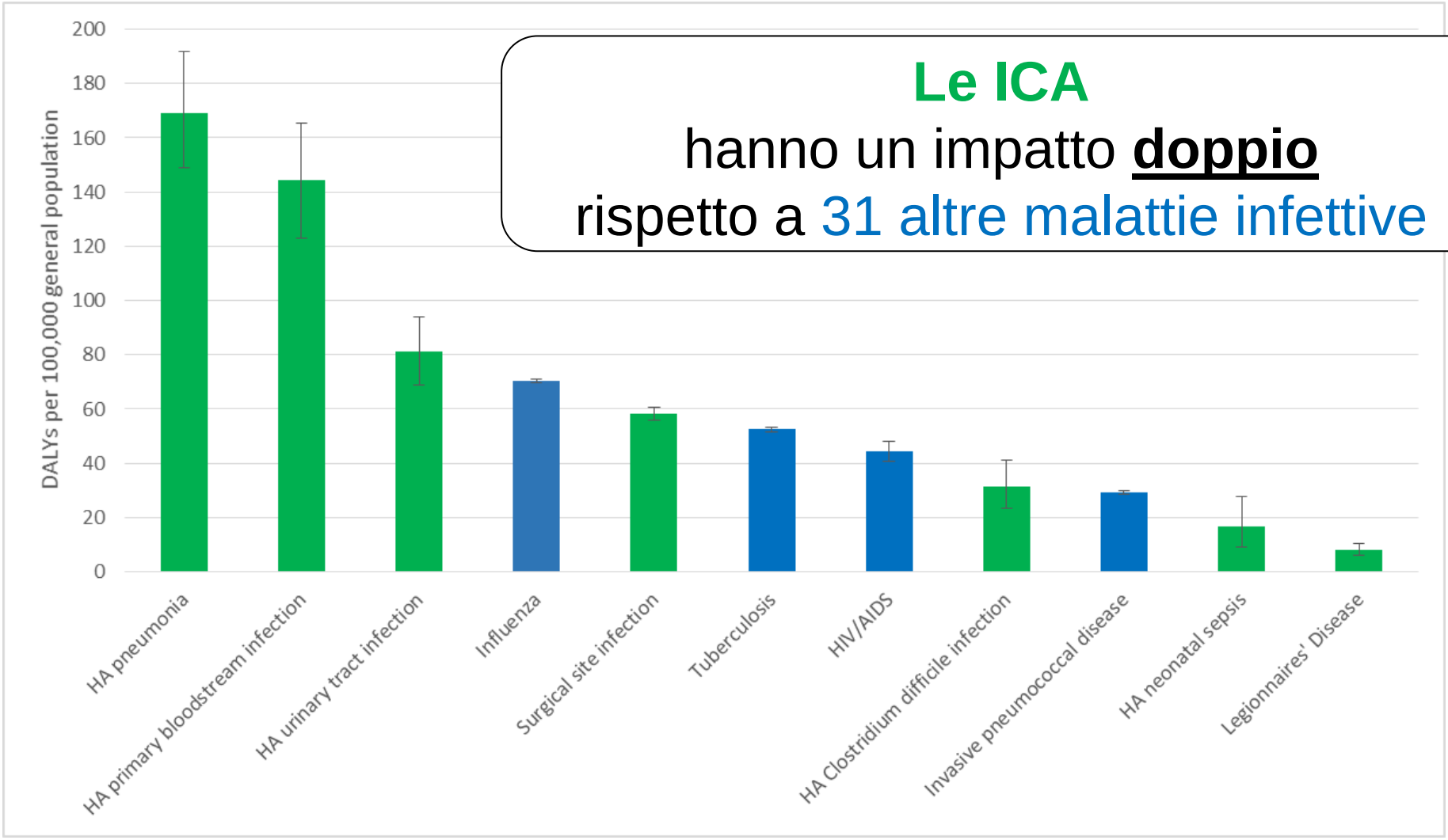
Paragonando l'impatto delle ICA e quello di altre infezioni



Le ICA
hanno un impatto **doppio**
rispetto a 31 altre malattie infettive

Adattato da: Cassini A, et al. PLoS Med 2016;13(10):e1002150
Cassini A, et al. Eurosurveillance 2018;23(16):pii=17-00454

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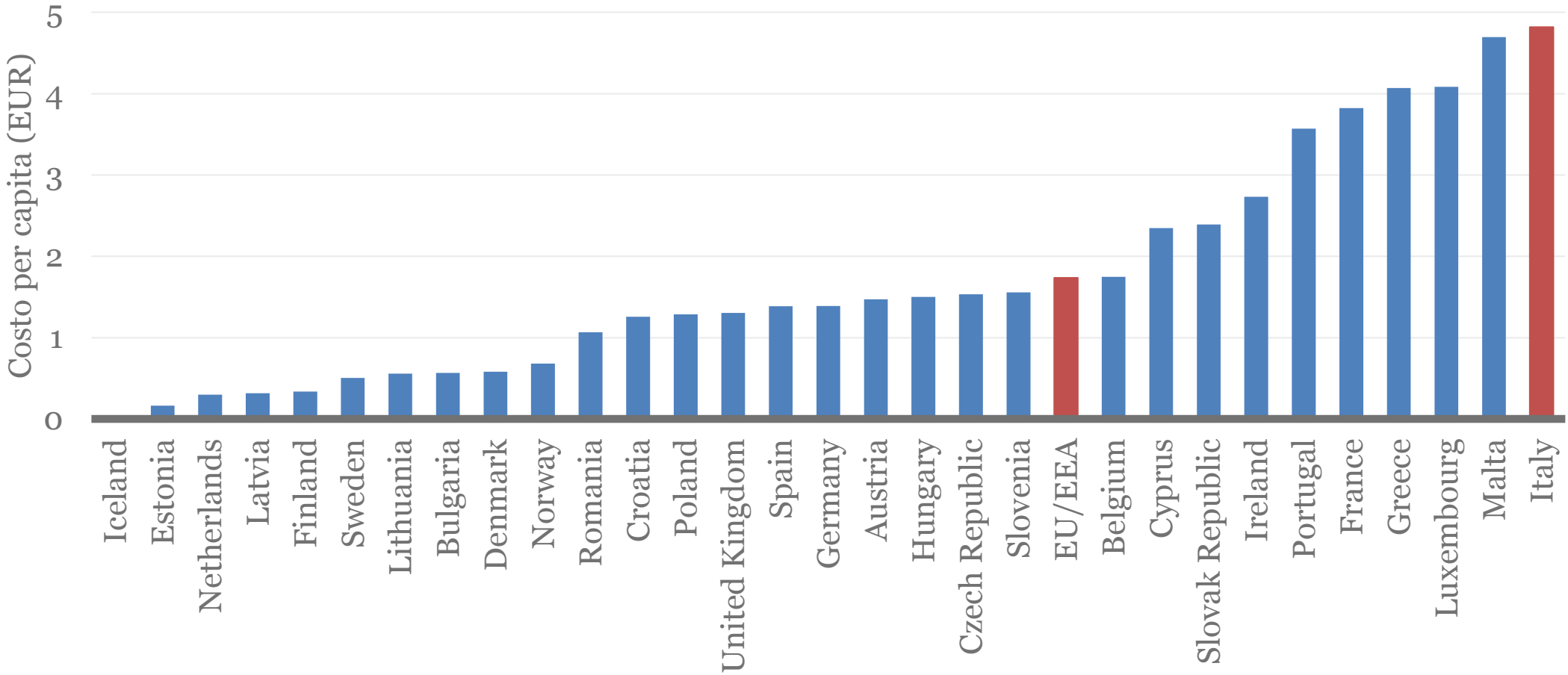
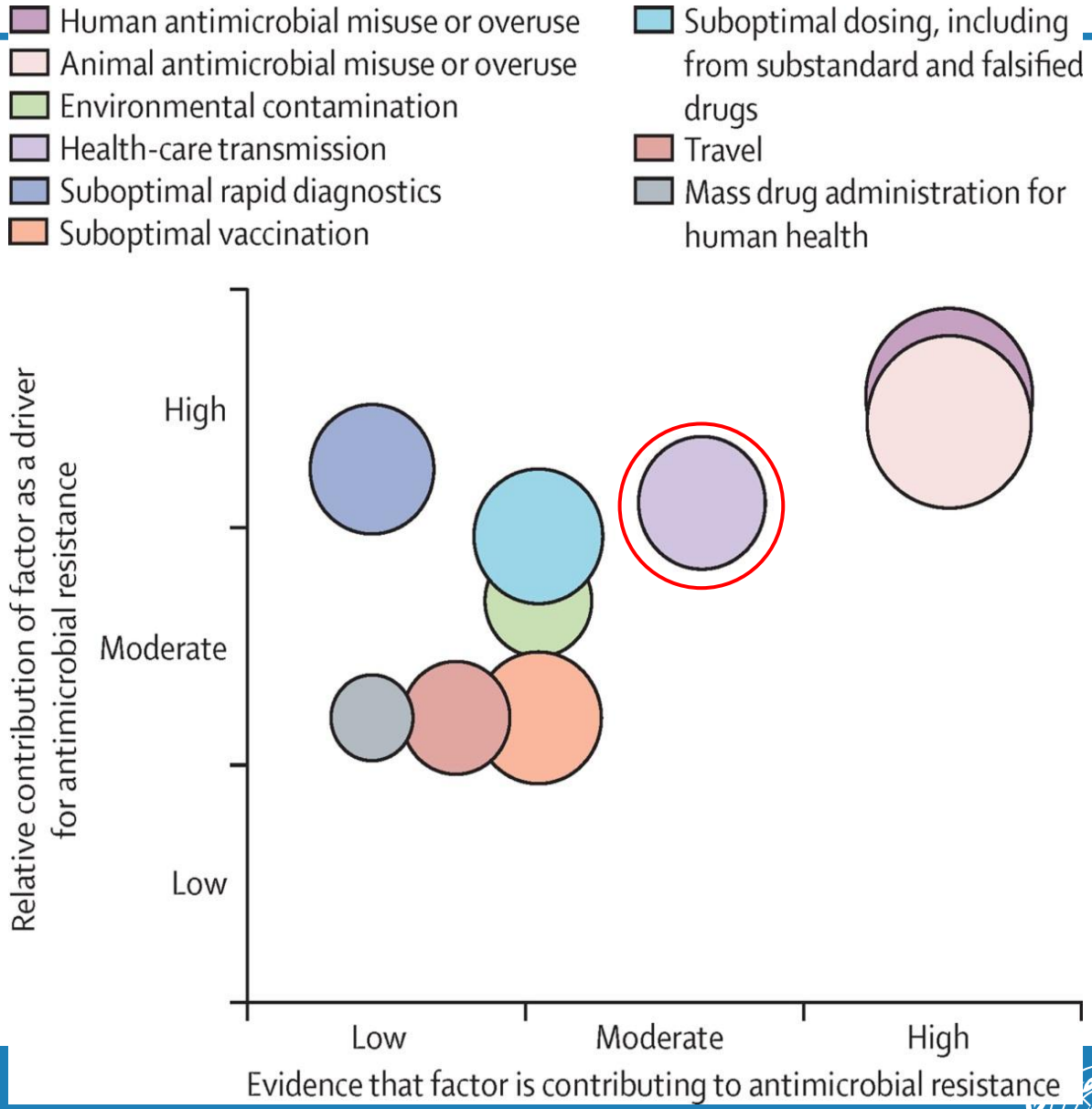
L’antibiotico resistenza costa 1.1 miliardi di Euro/anno ai sistemi sanitari europei con altissimi costi in Italia



Source: OECD. Stemming the Superbug Tide: just a few dollars more. 2018. oe.cd/amr-2018

Ringraziamenti a Michele Cecchini, Responsabile Salute Pubblica, OCSE

Fattori che contribuiscono all'AMR



Alison H Holmes, Lancet 2016; 387: 176–87

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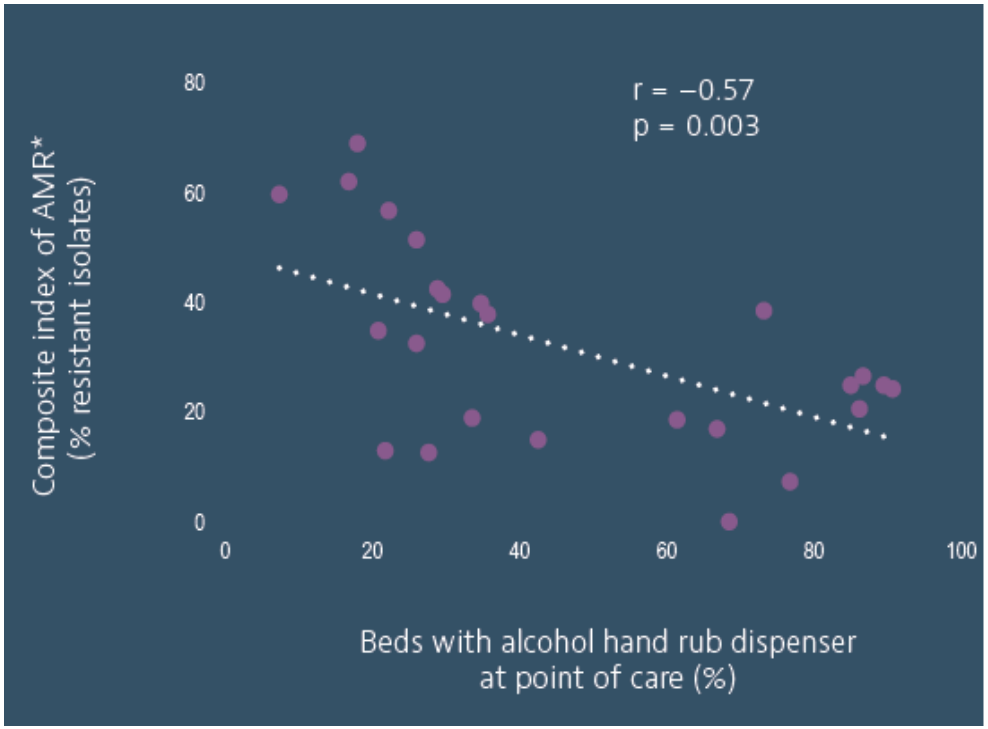
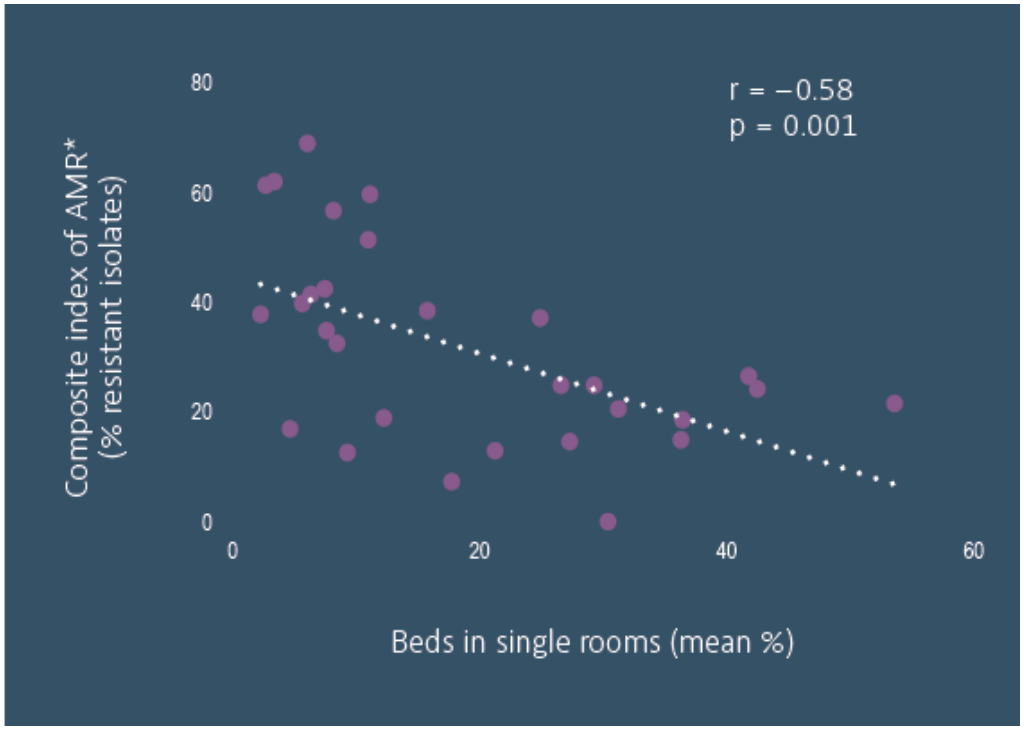
Correlazioni tra prevenzione e controllo delle ICA e AMR





Source: OECD & ECDC (2019): Antimicrobial Resistance, Tackling the Burden
in the European Union. Briefing note for EU/EEA countries.

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Politiche per contrastare l'antibiotico resistenza

Ambiente ospedaliero

Promuovere l'igiene delle mani
Presso il personale operante nei servizi sanitari

Migliore igiene dell'ambiente
Per minimizzare la trasmissione delle infezioni ambientali e da presidi medico chirugici

Programmi di stewardship
Per promuove un uso prudente degli antibiotic e porre fine a decenni di prescrizione inappropriata

Comunità

Prescrizione ritardata
Per diminuire il consumo di antibiotici nel caso di infezioni virali

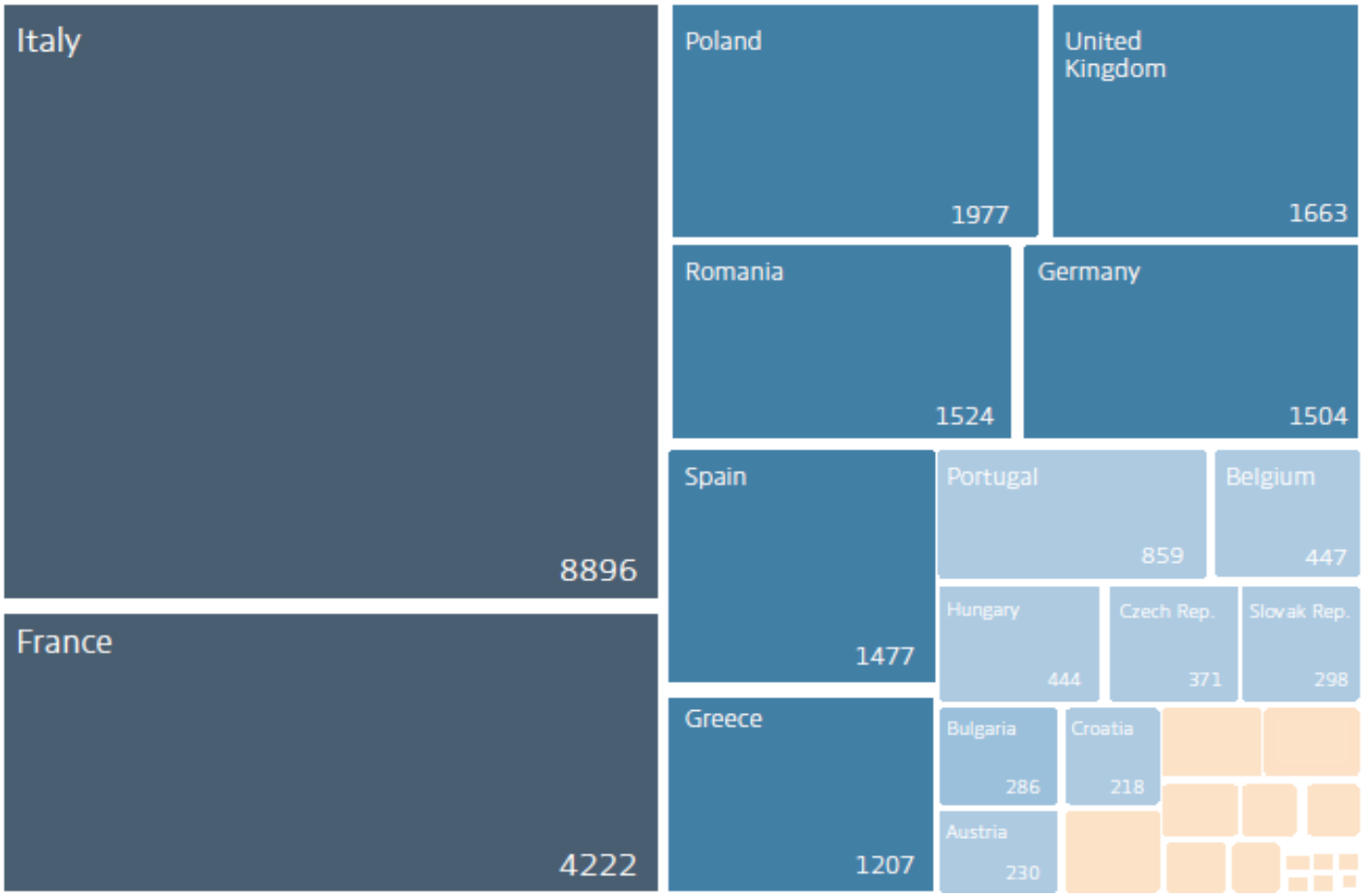
Campaigne informative
Per diffondere la consapevolezza dei rischi associati alla inappropriatezza prescrittiva

Uso dei test diagnostici rapidi
Per aiutare i medici di famiglia a determinare se un'infezione necessiti di un trattamento antibiotico o meno

Pacchetto di interventi

Source: OECD. Stemming the Superbug Tide: just a few dollars more. 2018. oe.cd/amr-2018
Ringraziamenti a Michele Cecchini, Responsabile Salute Pubblica, OCSE

Il ‘pacchetto’ di interventi potrebbe evitare la morte di quasi 9000 persone/anno in Italia e 27000 in Europa

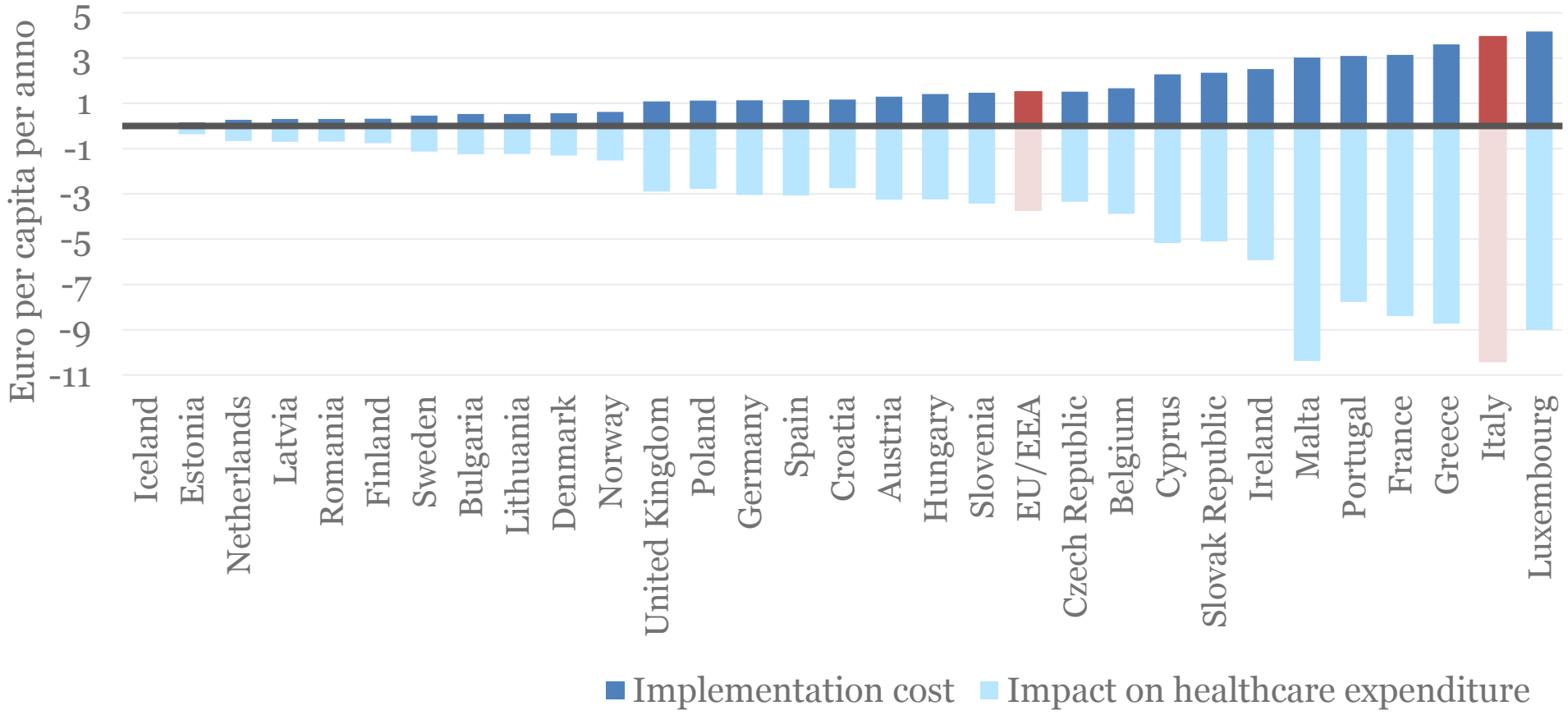


Note: The countries shown in orange are, by descending order: **The Netherland** (193), **Ireland** (170) **Sweden** (149), **Denmark** (102), **Lithuania** (79), **Slovenia** (77), **Finland** (74), **Cyprus** (63), **Norway** (54)**, Latvia** (33), **Malta** (25), **Luxembourg** (15), **Estonia** (14) and **Iceland** (1).

Source: OECD. Stemming the Superbug Tide: just a few dollars more. 2018. oe.cd/amr-2018
Ringraziamenti a Michele Cecchini, Responsabile Salute Pubblica, OCSE

…e far risparmiare circa 1.4 miliardi di Euro per anno al budget dei sistemi sanitari Europei di cui 600 ml in Italia

Valutazione economica del 'pacchetto' di interventi:
un investimento di pochi Euro produce significativi risparmi nella spesa sanitaria



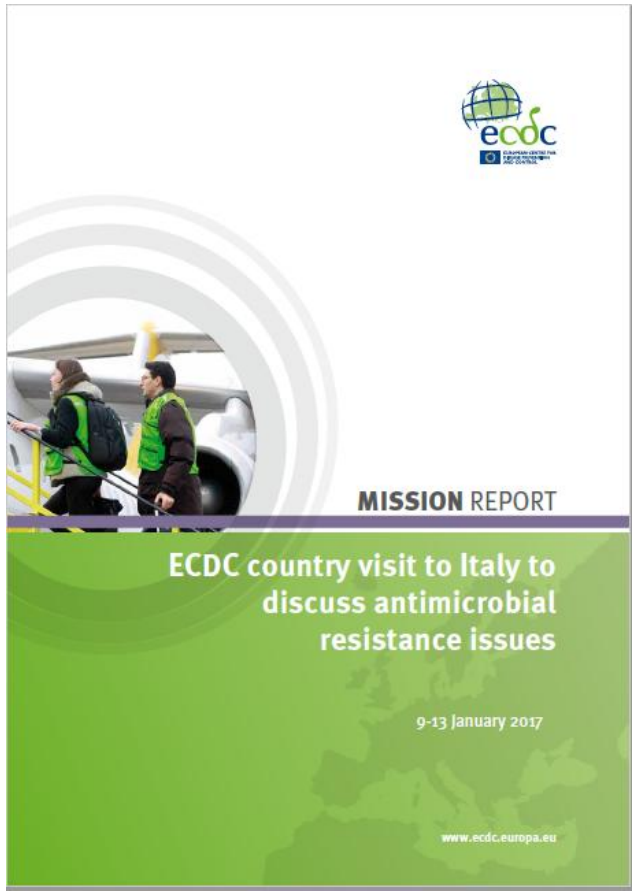
Nota: * includendo l'effetto sulle infezioni non resistenti

Source: OECD. Stemming the Superbug Tide: just a few dollars more. 2018. oe.cd/amr-2018

Ringraziamenti a Michele Cecchini, Responsabile Salute Pubblica, OCSE

Conclusioni della visita ECDC in Italia nel 2017

- Poca percezione dell'attuale situazione dell'antibiotico-resistenza da parte della maggior parte degli interessati e una tendenza di molti di essi a evitare di prendere in carico il problema;
- Mancanza di sostegno istituzionale a livello nazionale, regionale e locale;
- Mancanza di leadership professionale ad ogni livello;
- Mancanza di responsabilità ad ogni livello;
- Mancanza di coordinamento delle attività tra e all'interno di tutti i livelli.



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La risposta: PNCAR

PROGRAMMA	TARGET	PRINCIPALI OBIETTIVI	
		A BREVE TERMINE (2017-2018)	A LUNGO TERMINE (2019-2020)
SORVEGLIANZA AMR	Umano	Sistema nazionale di sorveglianza dell'AMR con la partecipazione di tutte le Regioni	Consolidare le sorveglianze "dedicate" (es. CPE), valutare la sorveglianza per nuovi cloni emergenti e tendere verso un modello di sorveglianza esaustivo e non più sentinella
	Veterinario	Rafforzare la *performance* del sistema di sorveglianza e monitoraggio dell'AMR	Sorvegliare nuovi cloni antibiotico-resistenti
SORVEGLIANZA DELLE INFEZIONI CORRELATE ALL'ASSISTENZA (ICA)	Umano	Sviluppare un piano nazionale di sorveglianza delle ICA	Applicare il piano nazionale di sorveglianza delle ICA in tutte le Regioni
SORVEGLIANZA DEL CONSUMO DEGLI ANTIBIOTICI	Umano	Ottimizzare il monitoraggio del consumo degli antibiotici prescritti a livello nazionale	Promuovere lo sviluppo di sistemi regionali per il monitoraggio dell'appropriatezza prescrittiva
	Veterinario	Rendere la prescrizione veterinaria elettronica obbligatoria su tutto il territorio nazionale. Promuovere lo sviluppo di modelli di classificazione delle aziende sulla base della valutazione del rischio di sviluppo di AMR e consumo di antibiotici (miglioramento dei controlli ufficiali)	Misurare i dati di prescrizione e di consumo degli antibiotici e non soltanto quelli di vendita
RESIDUI DI ANTIBIOTICI	Veterinario	Aggiornamento annuale del piano di monitoraggio dei residui in animali e alimenti di origine animale, con rivalutazione periodica delle ricerche	Aggiornamento annuale del piano di monitoraggio dei residui in animali e alimenti di origine animale, con rivalutazione periodica delle ricerche
PREVENZIONE DELLE INFEZIONI CORRELATE ALL'ASSISTENZA (ICA)	Umano	Armonizzare le strategie per la prevenzione e il controllo delle ICA, integrandole con quelle per l'uso appropriato di antibiotici	Migliorare e adeguare costantemente alle evidenze scientifiche le misure di prevenzione e controllo delle ICA
PREVENZIONE DELLE MALATTIE INFETTIVE E DELLE ZOONOSI	Veterinario	Sviluppare programmi di buone pratiche nella corretta gestione degli allevamenti e strategie di prevenzione della malattie infettive	Ridurre il rischio infettivo nelle aziende zootecniche
USO CORRETTO E PRUDENTE DEGLI ANTIBIOTICI	Umano	Armonizzare le strategie sull'uso appropriato di antibiotici, integrandole con quelle di controllo delle ICA. Rendere specifici e sostenibili i programmi di *antimicrobial stewardship*. Migliorare conoscenze e consapevolezza negli operatori sanitari e nei cittadini	Migliorare e aggiornare costantemente le indicazioni nazionali sull'uso appropriato di antibiotici. Promuovere interventi utili a ridurre il fenomeno dell'utilizzo di antibiotici "avanzati" a domicilio
	Veterinario	Predisporre Linee guida per l'uso prudente di antibiotici in animali produttori di alimenti e animali da compagnia	Rafforzare la cooperazione con Industria farmaceutica, Associazioni e Organizzazioni sull'uso prudente
COMUNICAZIONE	Umano e Veterinario	Promuovere programmi di comunicazione per aumentare la consapevolezza del fenomeno AMR e le buone pratiche di uso degli antibiotici	Coinvolgere nelle iniziative tutti gli operatori sanitari, le società scientifiche, le associazioni: dai cittadini agli operatori sanitari
FORMAZIONE		Promuovere la formazione degli operatori sanitari nei diversi ambiti, secondo il principio *One Health*	Educare e promuovere lo scambio di buone pratiche di formazione sull'uso corretto e prudente degli antibiotici
RICERCA E SVILUPPO		Identificare il tema AMR e delle ICA come area prioritaria nell'ambito della ricerca	Promuovere il trasferimento dei risultati della ricerca

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Prevenire le ICA è possibile

>30% Reduction	Effective IPC programmes lead to more than a 30% reduction in HAI rates
25-57% Reduction	Surveillance contributes to a 25-57% reduction in HAIs
50% Reduction	Improving hand hygiene practices may reduce pathogen transmission in health care by 50%
13-50% Reduction	Strong IPC plans, implemented across the USA between 2008 and 2014, reduced central line-associated bloodstream infections by 50%, surgical site infections (SSIs) by 17% and MRSA bacteraemia by 13%
56% Reduction	MRSA declined by 56% over a four-year period in England in line with a national target
44% Reduction	A safety culture and prevention programme reduced SSI risk in African hospitals by 44%
80% Compliance	Between 2010 and 2015 Australia achieved and sustained 80% hand hygiene compliance in hospitals nationwide

http://www.who.int/infection-prevention/en/

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WHO IPC Global Unit Functions

Leadership, connecting, coordinating

One WHO team, Global IPC Network, HQ IPC Hub, POPS, Sepsis Coordination Group

Guidelines & implementation strategies

7 guidelines, > 100 tools, scientific papers

Campaigns & advocacy

Save Lives: Clean Your Hands Campaign, Injection Safety national campaigns, WAAW

Capacity building

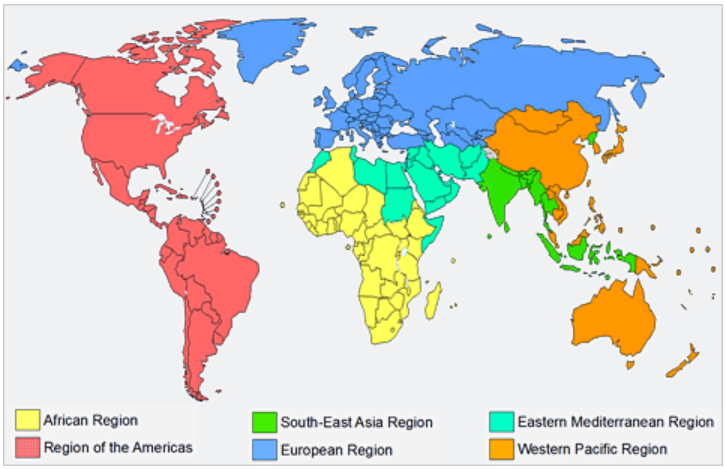
Country Support Framework, direct support to 11 countries, regional capacity

Measuring & learning

IPC & HH indicators across national & facility tools, global surveys, national assessments

HEALTH CARE WITHOUT AVOIDABLE INFECTIONS

1. Leadership, connecting, coordinating



HQ IPC HUB

HQ Sepsis Coordination Group

Global IPC Network

Private Organizations for Patient Safety
Hand Hygiene

Private Organizations for Patient Safety
Injection Safety

Global infection prevention and control priorities 2018–22: a call for action www.thelancet.com/lancetgh Vol 5 December 2017

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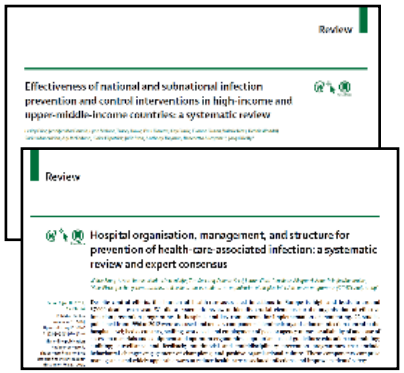
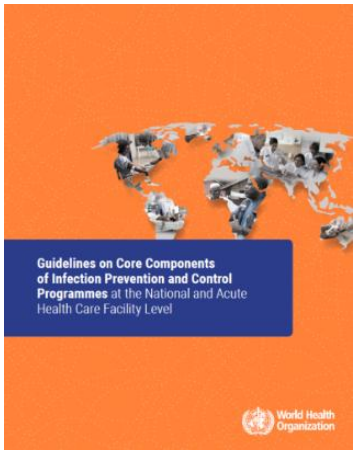
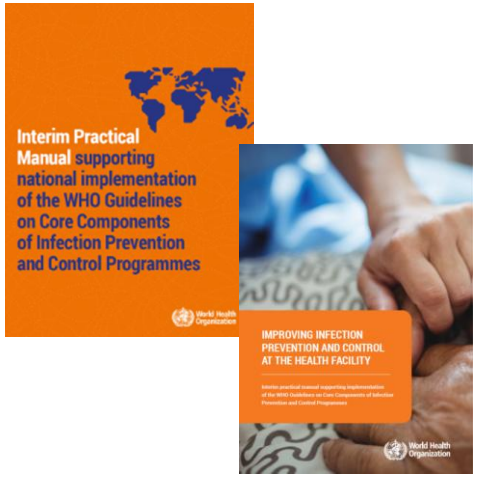
2. Guidelines & implementation

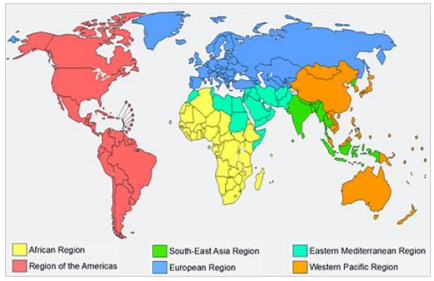
2015-2018: 6 guidelines, about 60 implementation tools, 10 scientific papers

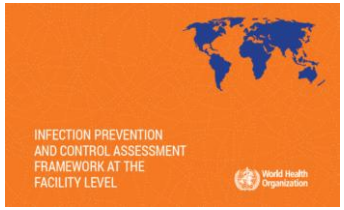






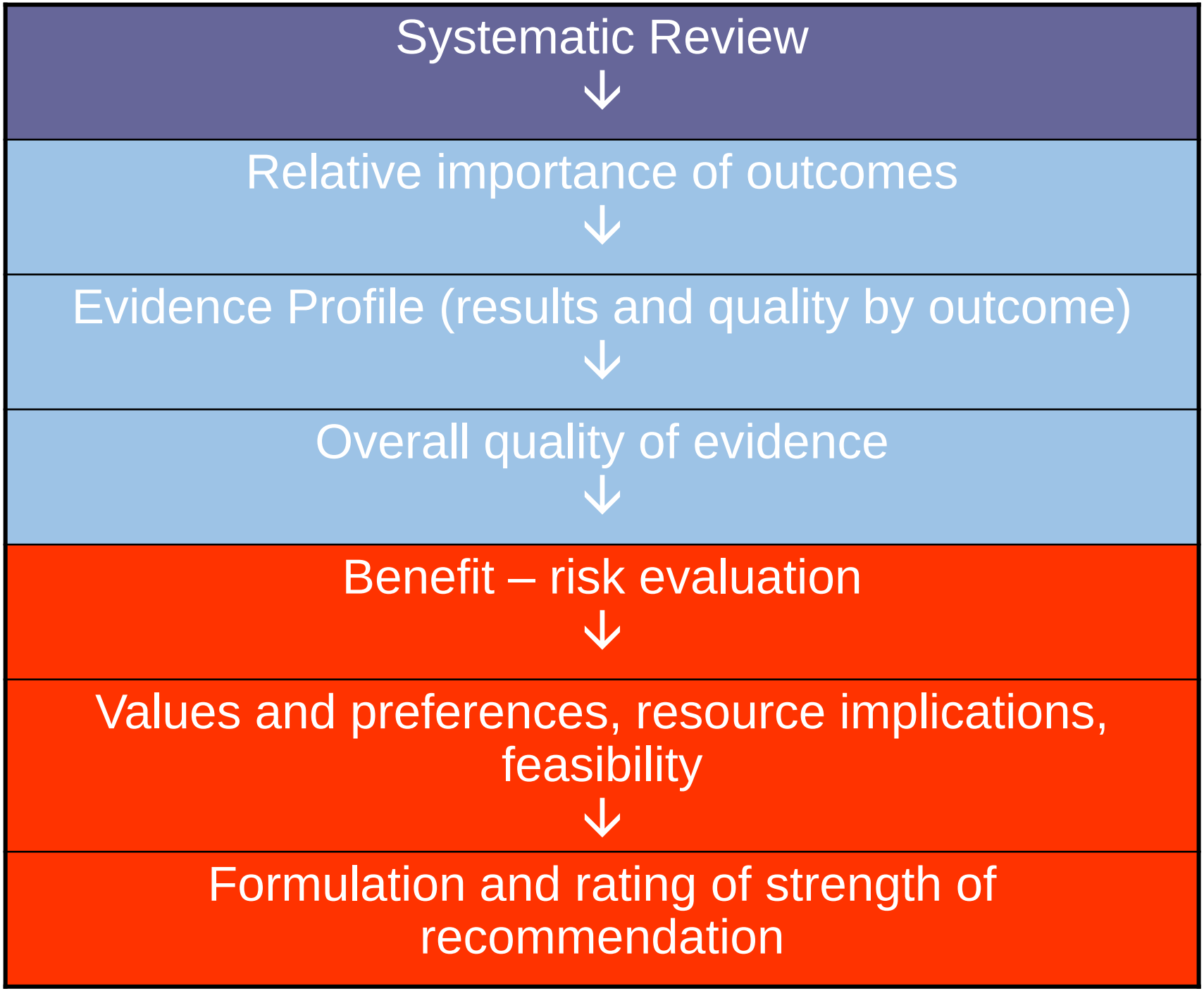
Evidence & consensus → **Guidelines** → **Implementation strategies & tools** ↔ **Testing & research**





Dissemination → **Measuring impact**

WHO's process for developing Guidelines



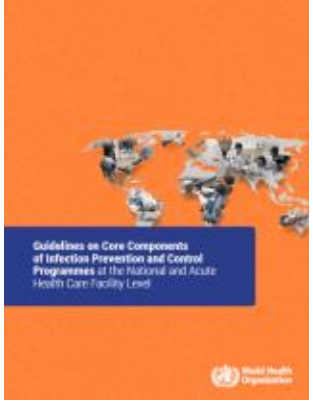
GRADE DECISION MAKING

GDG

WHO IPC global guidelines

http://www.who.int/infection-prevention/en/

Core components of infection prevention and control programmes at the national and acute health care facility level



Core Component 1
IPC Programme

Core Component 2
IPC Guidelines

Core Component 3
IPC Training/Education

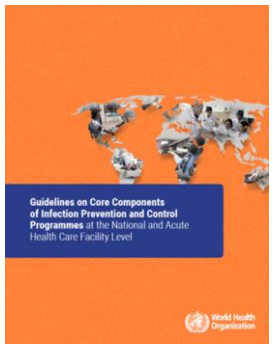
Core Component 4
HAI Surveillance

Core Component 5
Multimodal Strategies

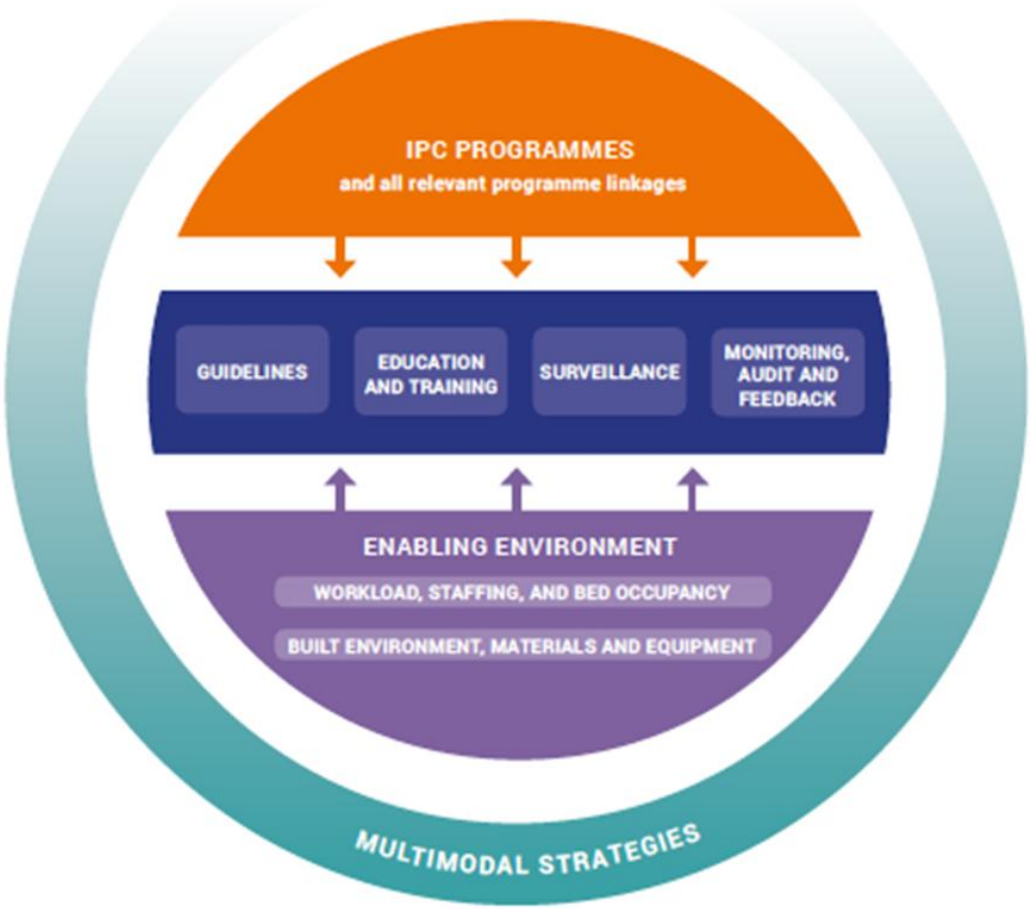
Core Component 6
Monitoring, audit & feedback

Core Component 7
Workload, staffing & bed occupancy

Core Component 8
Built environment, materials & equipment for IPC



WHO core components for effective IPC programmes



- **8 Core components**
  - *8 Facility level*
  - *6 National level*
- 11 evidence*-based recommendations
- 3 good practice statements

* Evidence from LMICs:
- 7 high-quality studies
- 22 lower quality

R= recommendation; GPS: good practice statement

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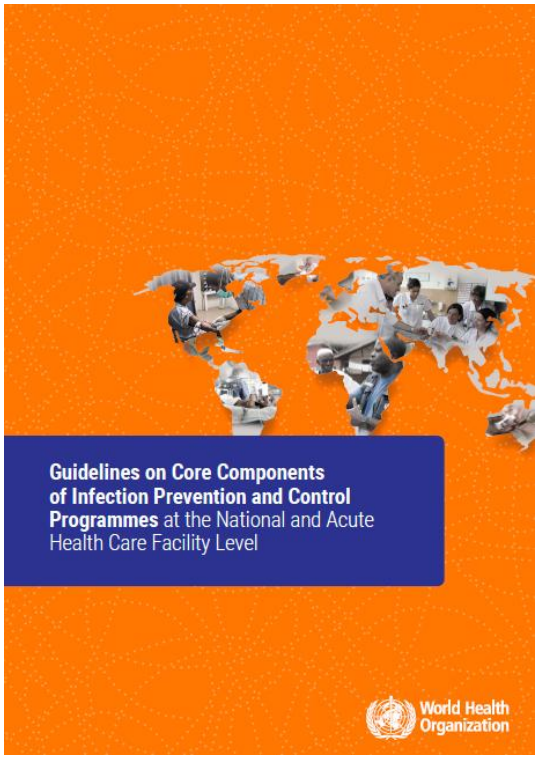
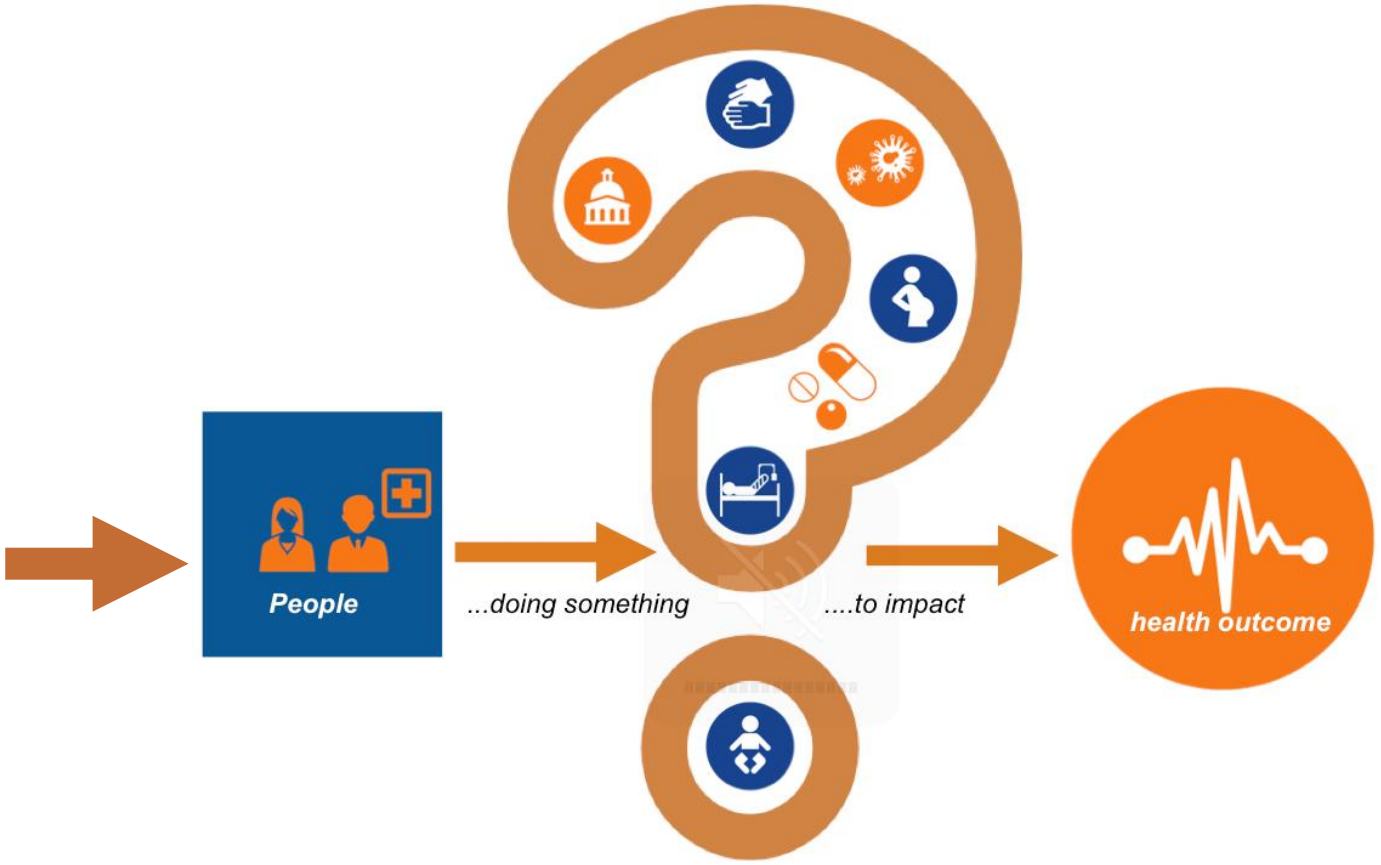
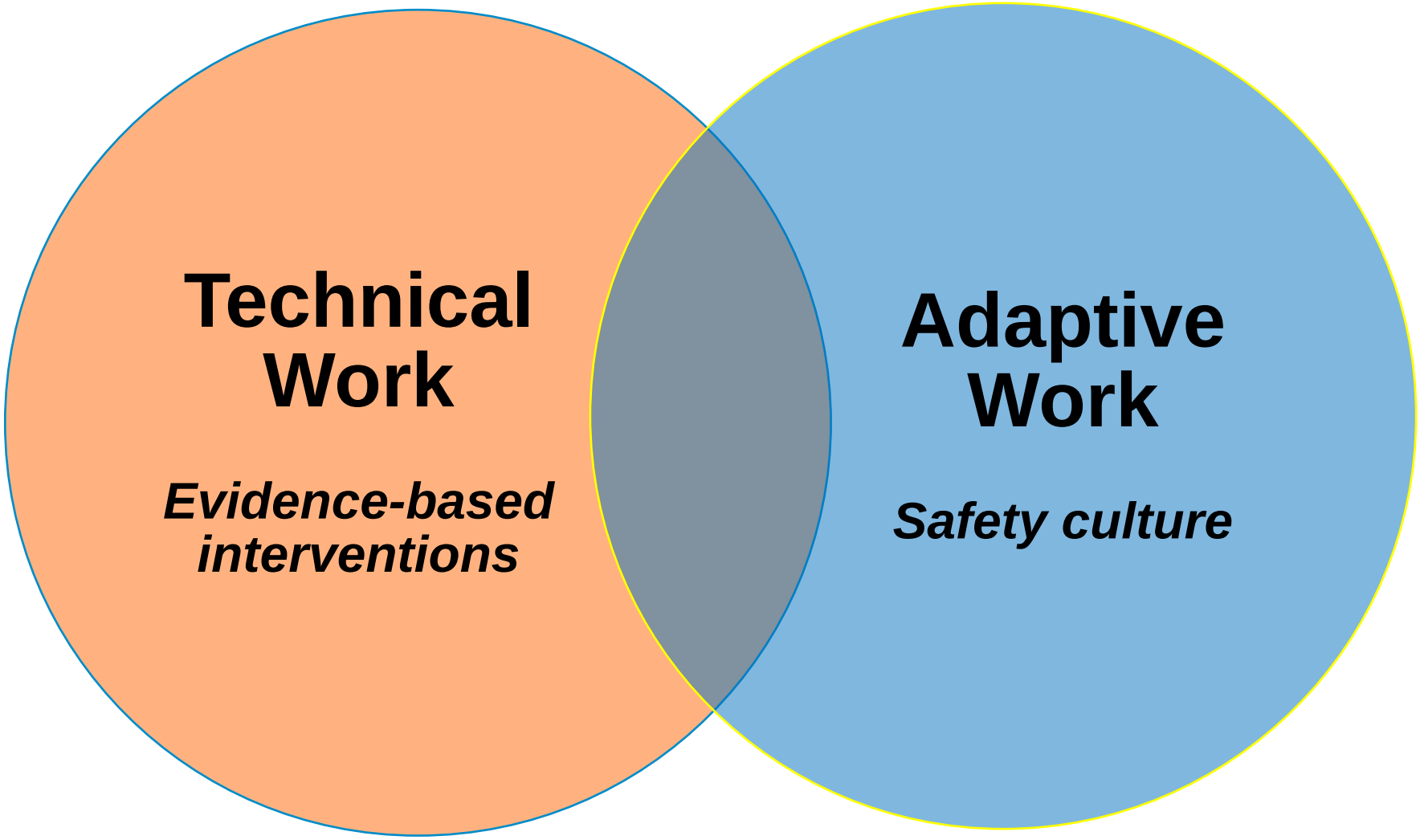
Translating guidelines to action

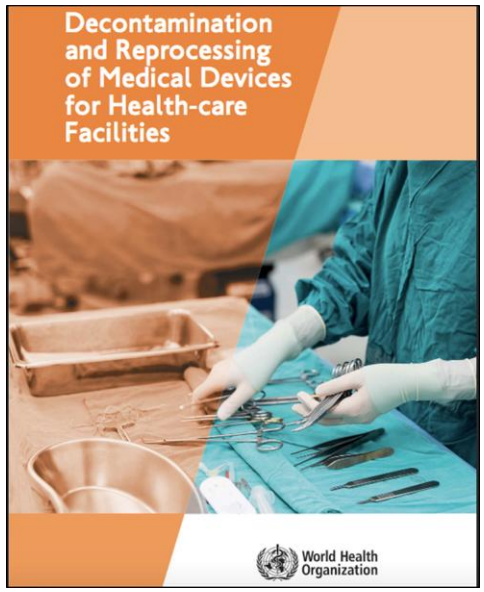


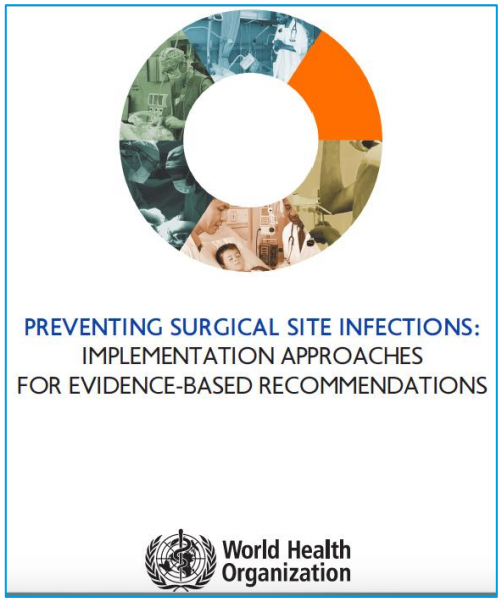


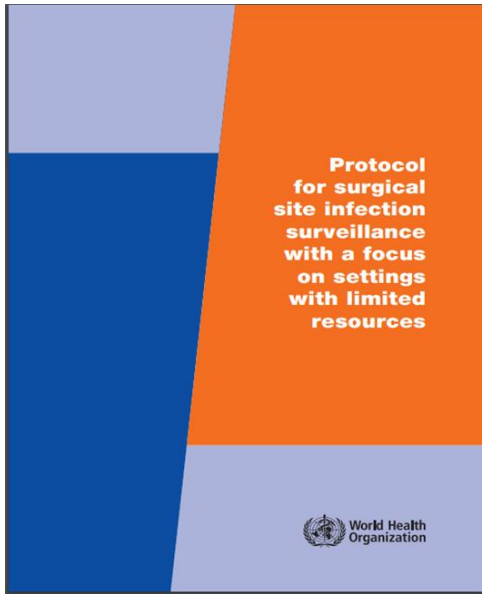

Technical Work
Evidence-based interventions
Adaptive Work
Safety culture

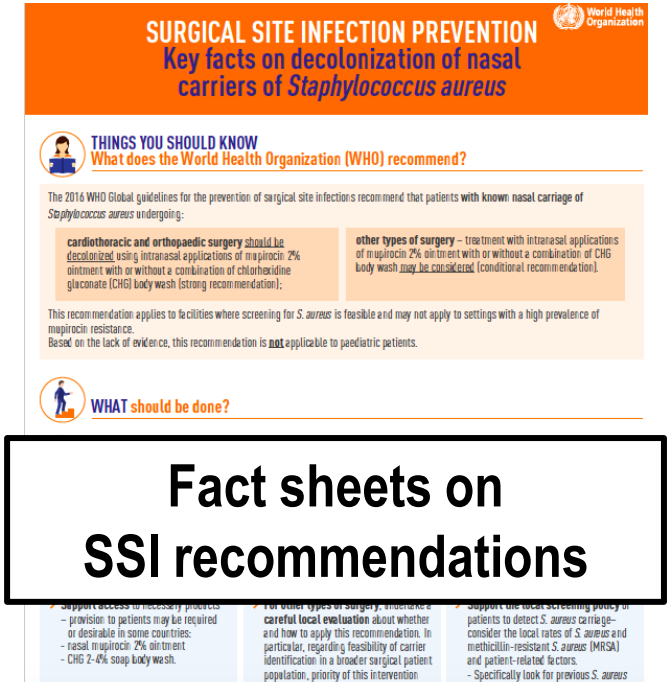
Recently launched WHO SSI Prevention Implementation Package

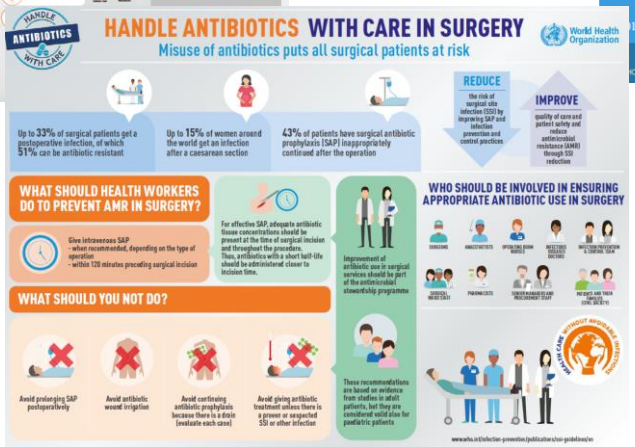
World Health Organization

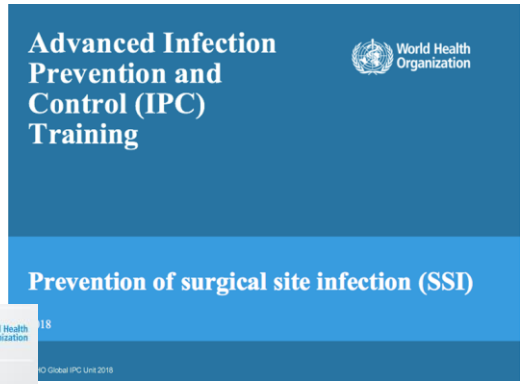










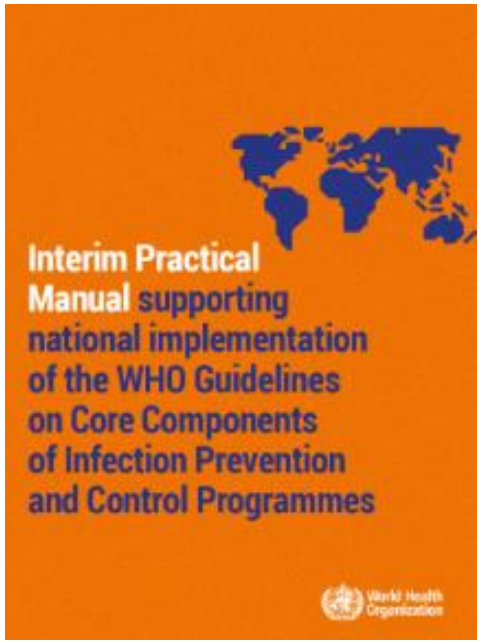


Fact sheets on SSI recommendations

http://www.who.int/infection-prevention/tools/surgical/en/

Implementation resources for the WHO IPC Core Components Guidelines

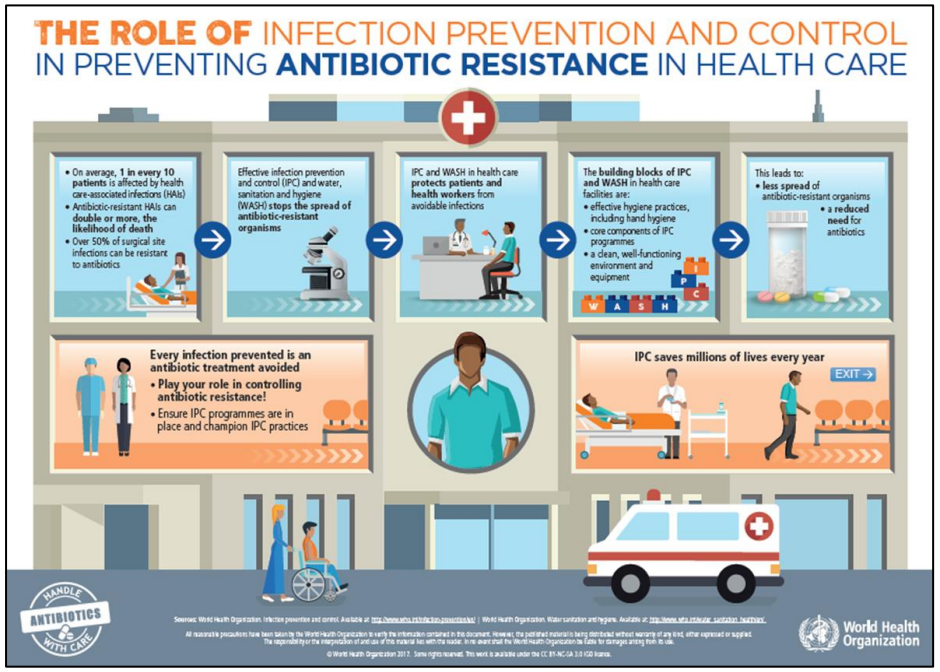
World Health Organization



http://www.who.int/infection-prevention/tools/core-components/en/

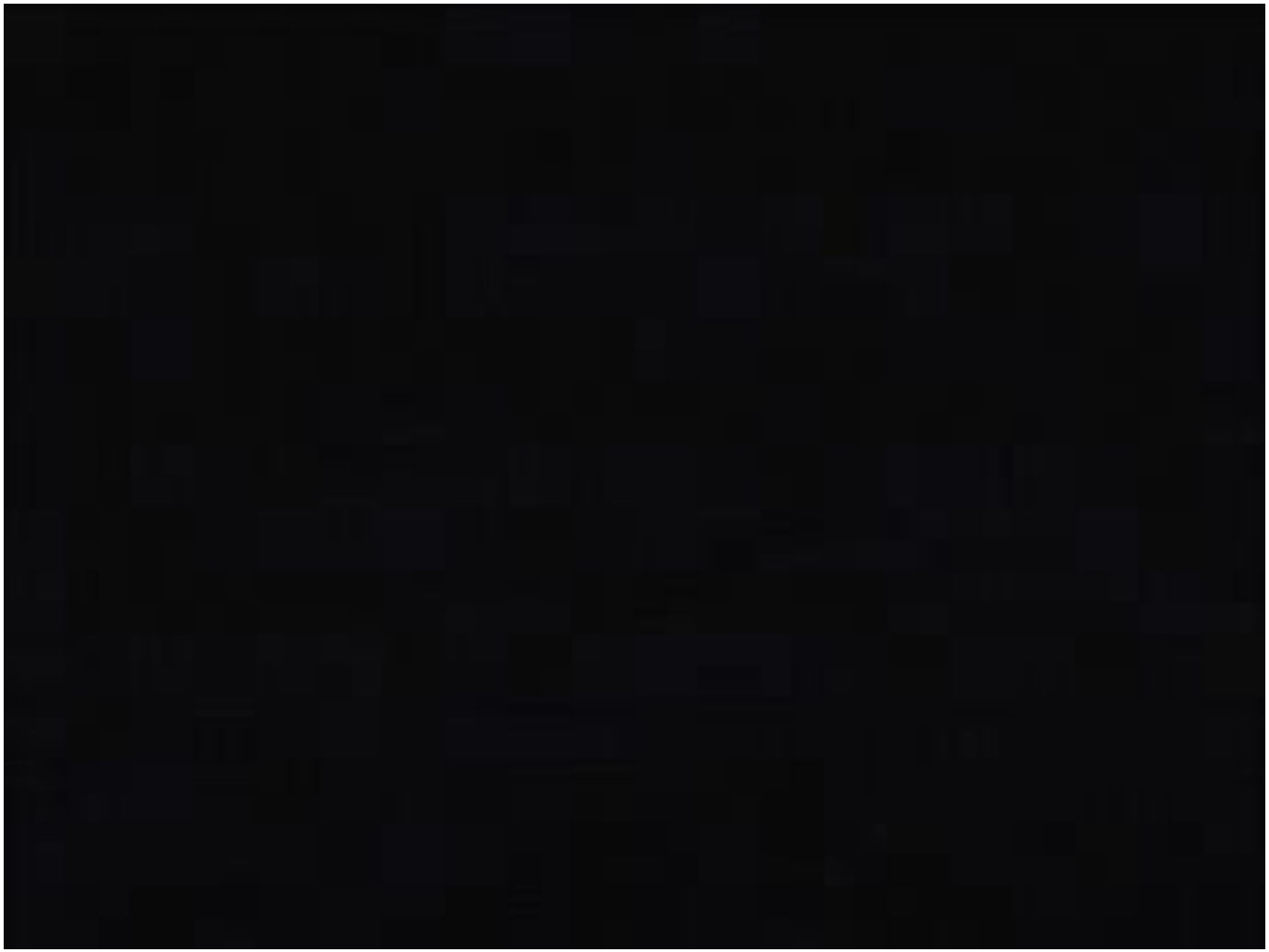
3. Campaigns & advocacy

World Health Organization



https://www.youtube.com/watch?v=nw9TMfqc3cE
https://youtu.be/G2PUBbeHyVs

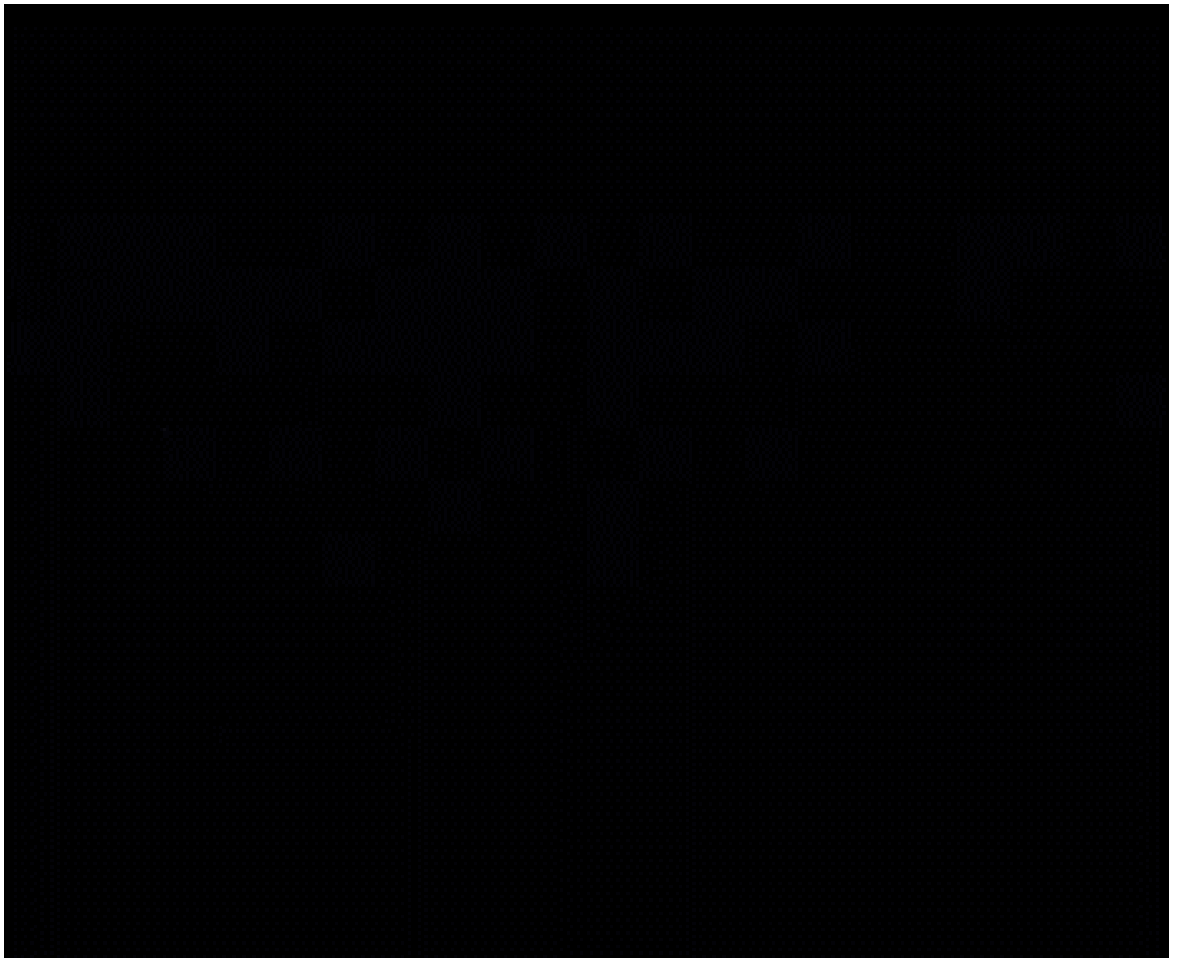
Una campagna di comunicazione che ha funzionato – (Francia)



https://www.youtube.com/watch?v=6JdRuhZnZpw

World Health Organization

Una che ha funzionato meno (Spagna)



https://www.msssi.gob.es/campannas/campanas06/Antibioticos.htm

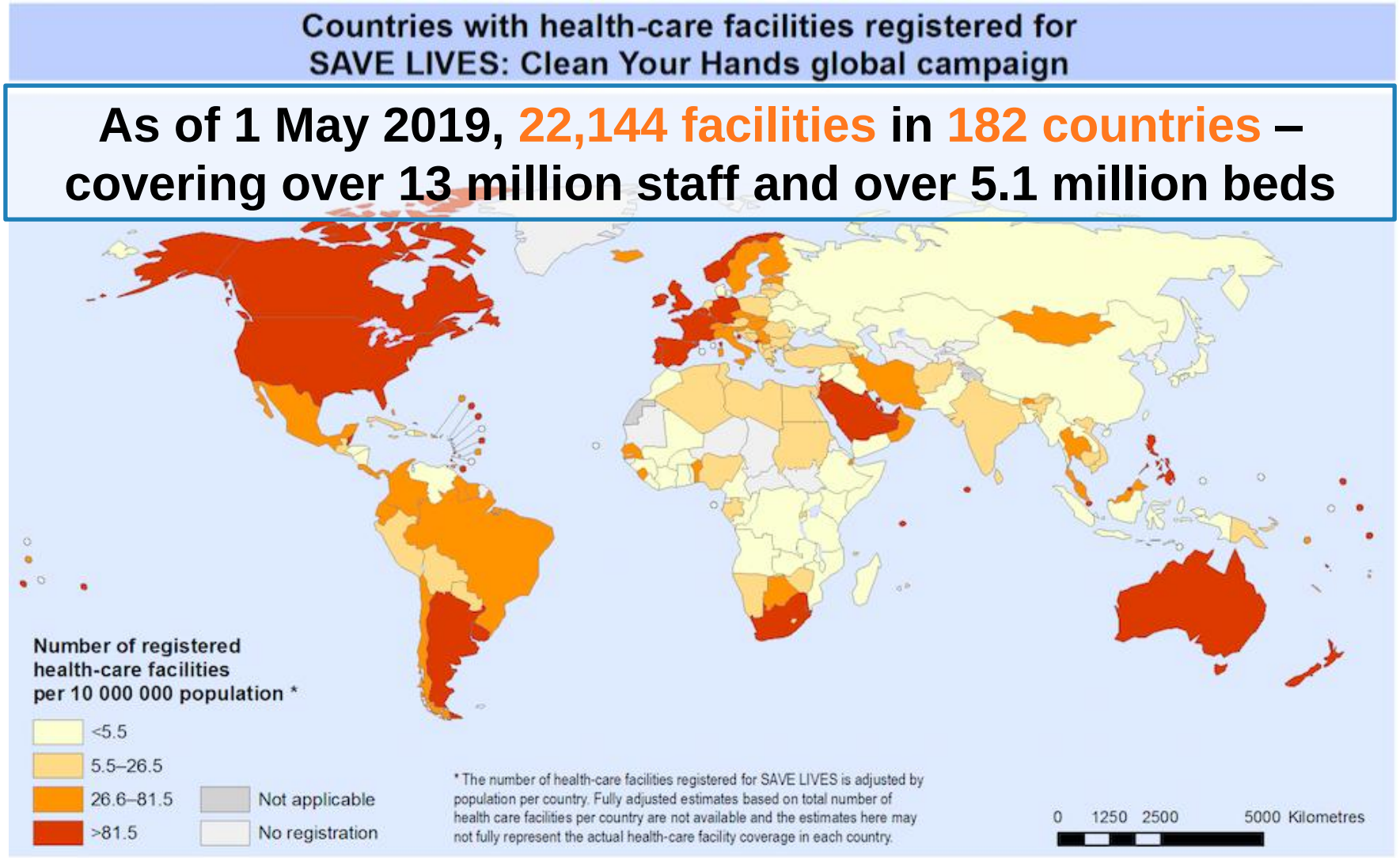
Adeguarsi alla storia e cultura: Polonia

https://www.youtube.com/watch?v=9M6oXpaTM7s

World Health Organization

SAVE LIVES: Clean Your Hands: an ongoing worldwide campaign

World Health Organization



http://www.who.int/infection-prevention/campaigns/clean-hands/register/en/

4. Capacity building:
IPC country support 2017-18

World Health Organization

Support and technical expertise for:

- National IPC programme strengthening
- IPC integration in the AMR NAPs
- Facility assessments & IPC Core components implementation
- IPC training
- National guidelines development
- HAI surveillance
- Injection Safety
- Integration with WASH /quality policy/AMR NAPs/WHE work

IPC Advanced Training Package

Active support to countries

- **Liberia**
- **Mauritania**
- **Senegal**
- **Togo**
- **Armenia**
- **Georgia**
- **Haiti**
- **India**
- **Thailand**
- **Egypt**
- **Pakistan**
- **Country groups (workshops): AFR, EUR, WPR, LAM, SEAR**

WHO IPC Training Package

- **Leadership and IPC program management**
- **Prevention of urinary tract infections**
- Prevention of catheter-associated bloodstream infections
- Prevention of respiratory tract infections
- **Prevention of surgical site infections**
- Reprocessing of medical devices
- Outbreak management in healthcare settings
- IPC to control antibiotic resistance
- HAI surveillance
- **Injection safety**

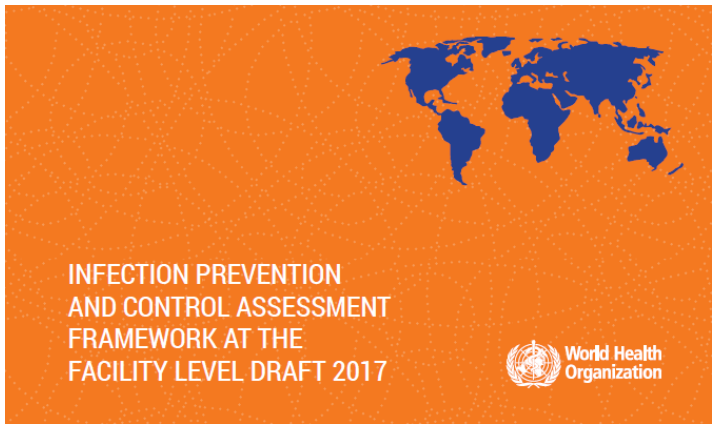
- **Slides deck**
- **Trainer's manual**
- **Student's handbook**
- **Videos**
- **E-learning module**

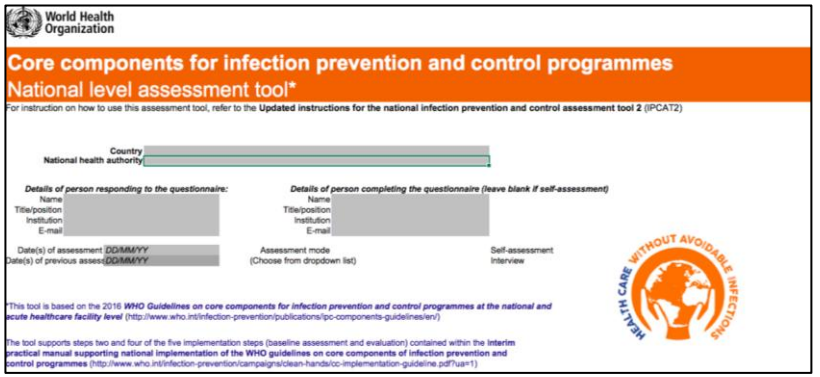
https://www.who.int/infection-prevention/en/

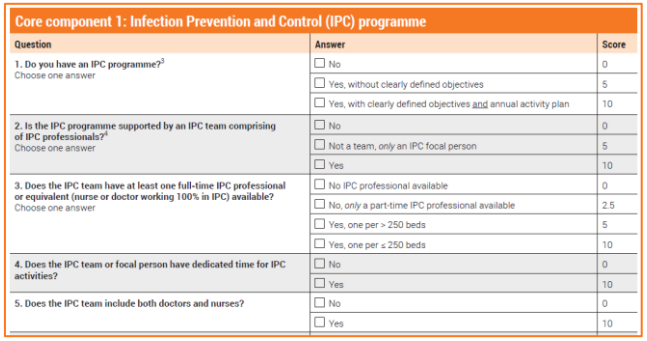
World Health Organization

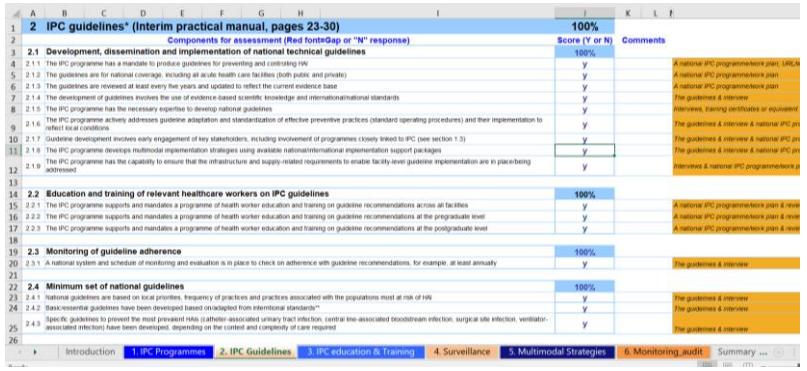
5. Measuring & learning

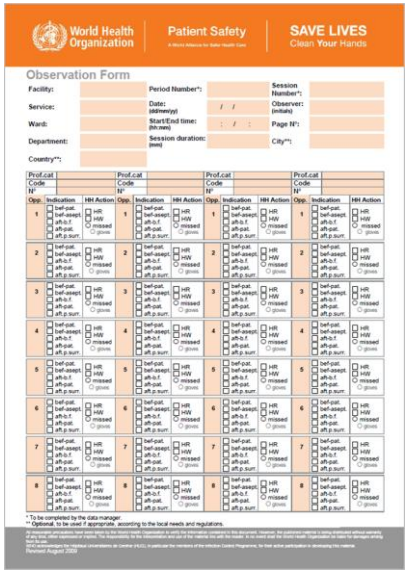
National & facility-level assessment tools











- Hand hygiene as a national indicator
- Global IPC and hand hygiene facility surveys
- Global survey of national IPC programmes

World Health Organization

Core component 1: Infection Prevention and Control (IPC) programme		
Question	**Answer**	**Score**
1. Do you have an IPC programme?[3] Choose one answer	☐ No	0
	☐ Yes, without clearly defined objectives	5
	☐ Yes, with clearly defined objectives and annual activity plan	10
2. Is the IPC programme supported by an IPC team comprising of IPC professionals?[4] Choose one answer	☐ No	0
	☐ Not a team, *only* an IPC focal person	5
	☐ Yes	10
3. Does the IPC team have at least one full-time IPC professional or equivalent (nurse or doctor working 100% in IPC) available? Choose one answer	☐ No IPC professional available	0
	☐ No, *only* a part-time IPC professional available	2.5
	☐ Yes, one per > 250 beds	5
	☐ Yes, one per ≤ 250 beds	10
4. Does the IPC team or focal person have dedicated time for IPC activities?	☐ No	0
	☐ Yes	10
5. Does the IPC team include both doctors and nurses?	☐ No	0
	☐ Yes	10
6. Do you have an IPC committee[5] **actively supporting the IPC team?**	☐ No	0
	☐ Yes	10

Box 8. IPCAF scoring interpretation

Score		Interpretation
0-200	Inadequate	IPC core components' implementation is deficient. Significant improvement is required.
201-400	Basic	Some aspects of the IPC core components are in place, but not sufficiently implemented. Further improvement is required.
401-600	Intermediate	Most aspects of IPC core components are appropriately implemented. Continue to improve the scope and quality of implementation and focus on the development of long-term plans to sustain and further promote the existing IPC programme.
601-800	Advanced	The IPC core components are fully implemented according to the WHO recommendations and appropriate to the needs of your facility.

http://www.who.int/infection-prevention/tools/core-components/en/

www.who-ipc-survey.org

WHO 2019 Global Survey on Infection Prevention and Control and Hand Hygiene

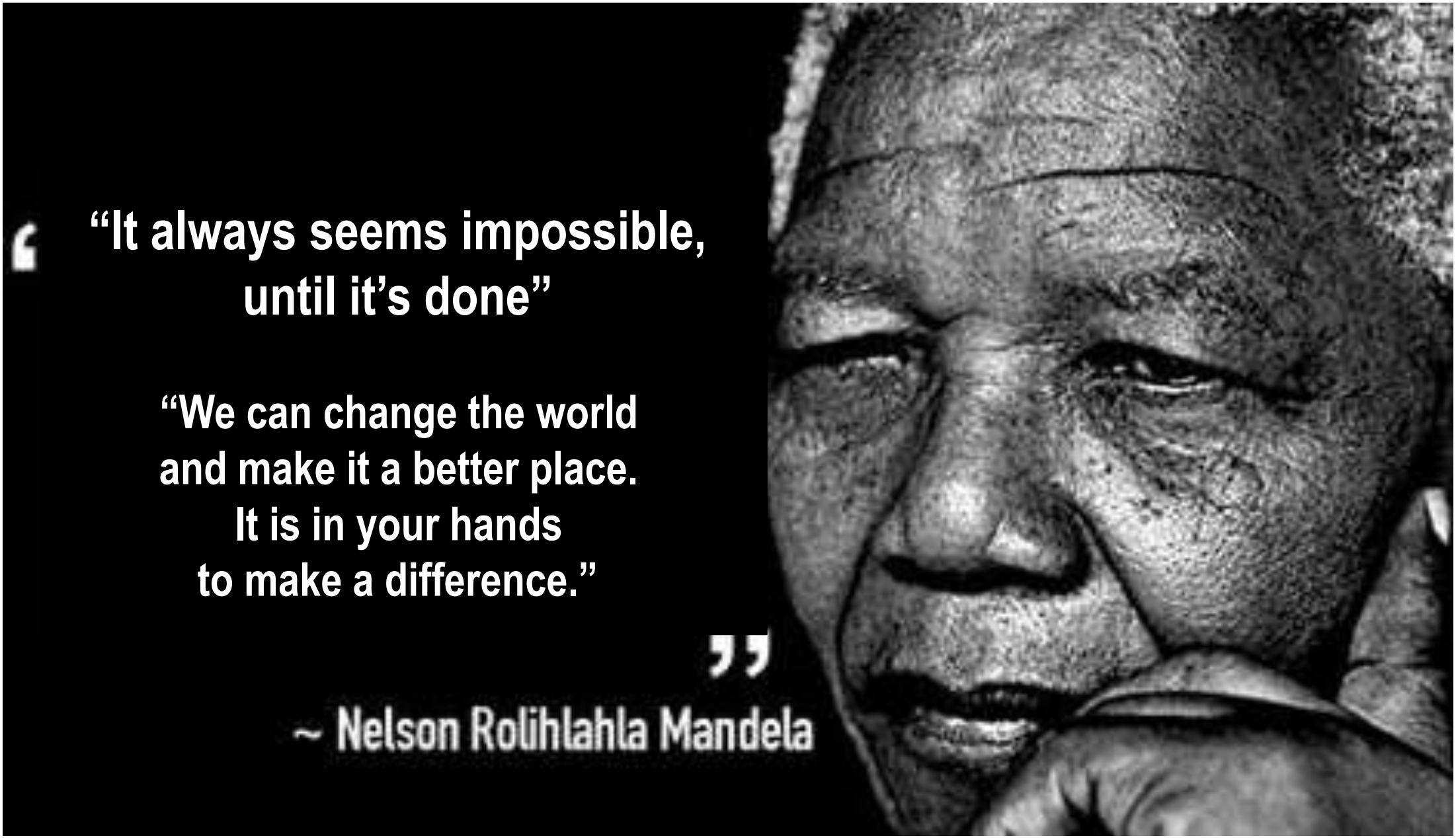
Facility-level assessments in a spirit of improvement

16 January – 16 July

All health care facilities and countries are invited to participate!

Find instructions here https://www.who.int/infection-prevention/campaigns/ipc-global-survey-2019/en/

Submit here: www.who-ipc-survey.org



World Health Organization