

1^{er} au 3 juin 2022
XXXII^e Congrès National de la Société
Française d'Hygiène Hospitalière



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Marie-Cécile Ploy

I have no link of interest.

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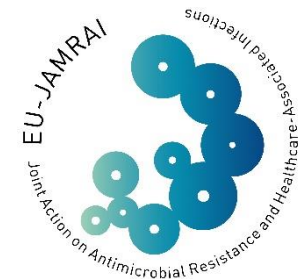
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Infection prevention and control research priorities

**What do we need to combat healthcare-associated
infections and antimicrobial resistance?**

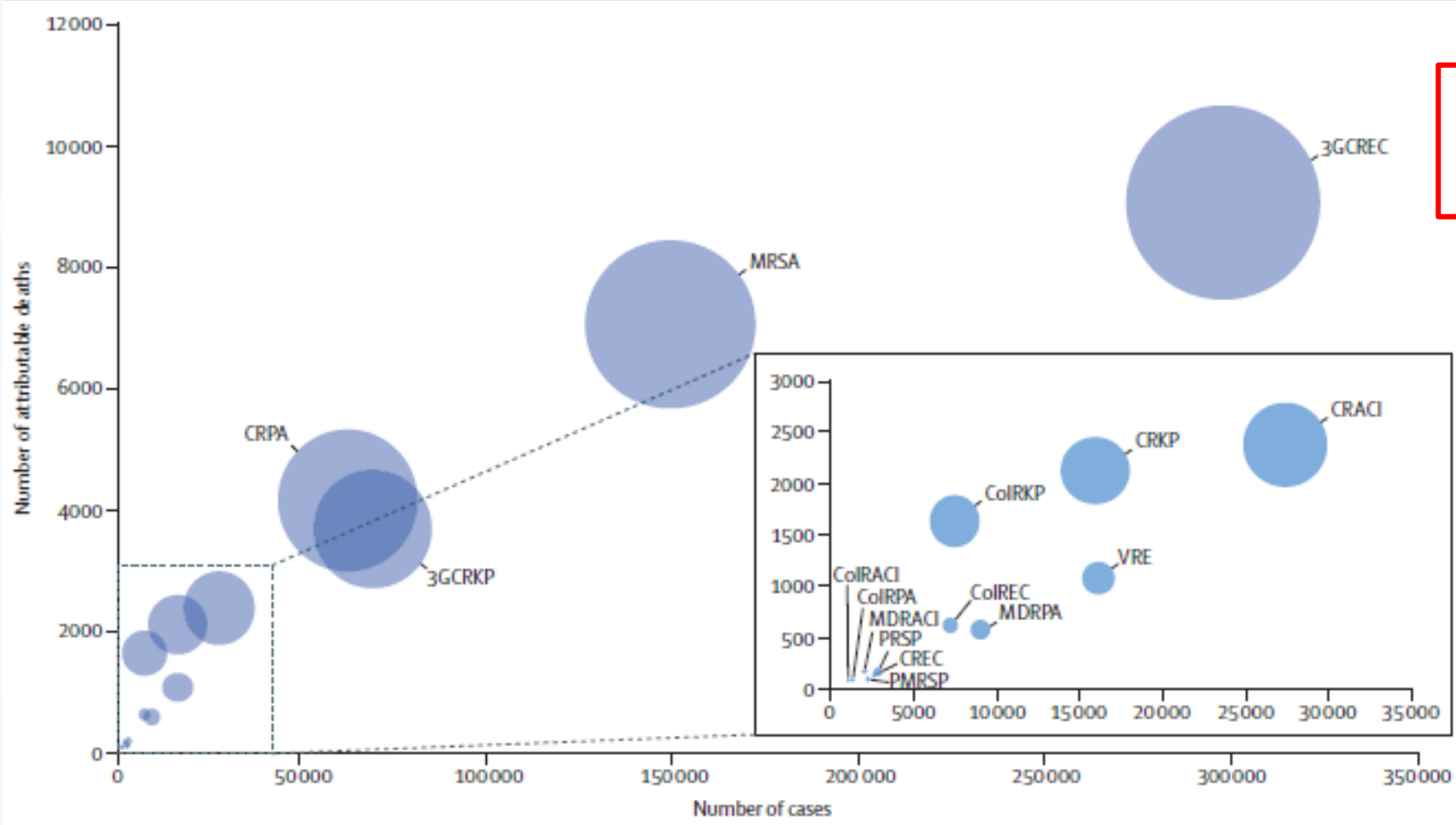
Results from the EU-JAMRAI

Marie-Cécile PLOY
Université de Limoges
UMR Inserm 1092
CHU Limoges



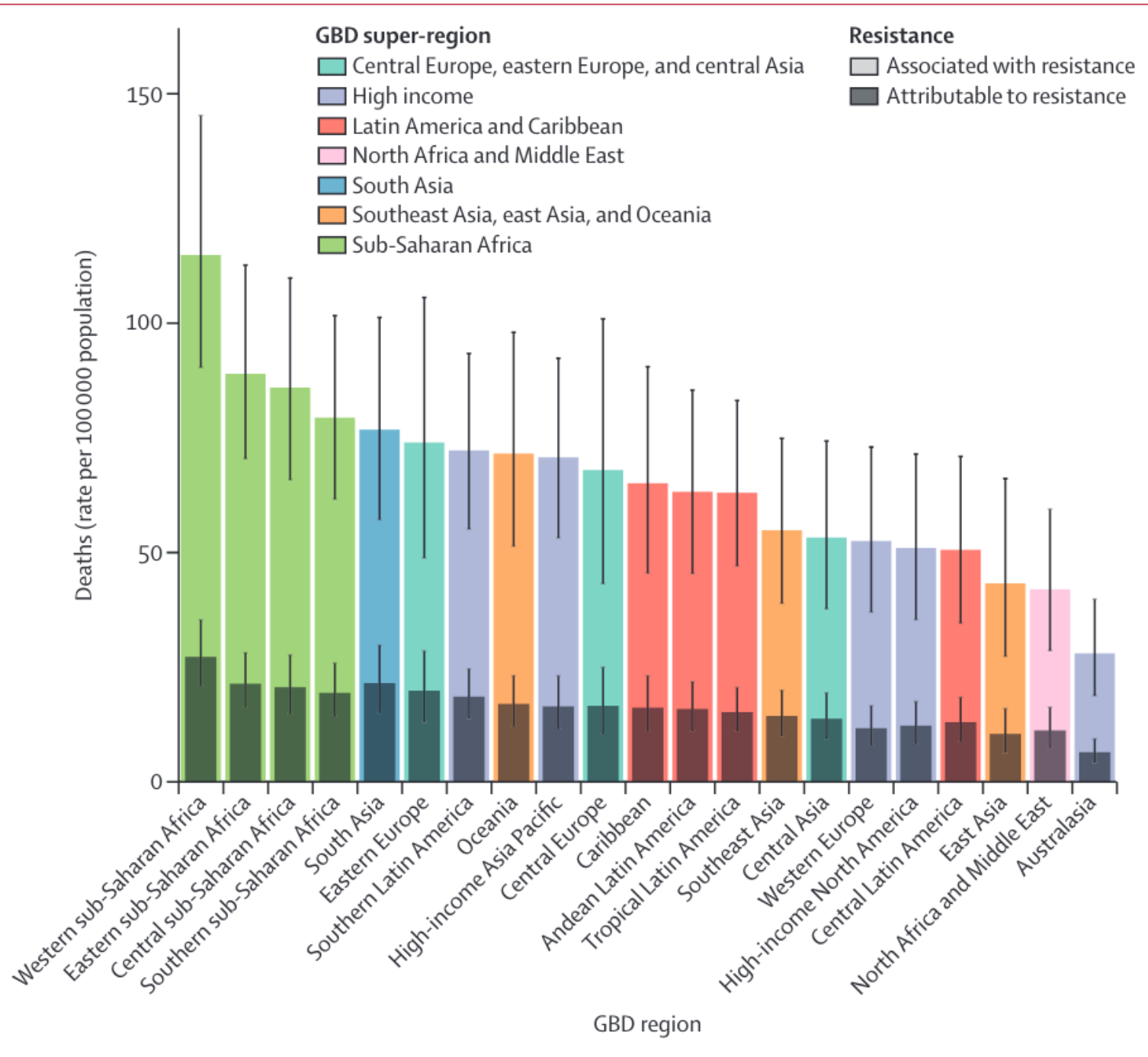


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**33,110 attributable deaths
 (6.4/100,000 hab)**

Cassini et al. Lancet ID 2018



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IPC is part of the solution to tackle AMR

→ IPC implementation is affordable, feasible and cost-effective

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- The Organisation for Economic Co-operation and Development (OECD) estimated that « *promoting simple IPC measures such as hand hygiene could reduce by about 40% the AMR health burden* »
- Improving IPC would also help to reduce the multitude of non-resistant healthcare-associated infections (HCAI) causing millions of extra days
- Several billions of euros per year in hospital



Cassini et al, Plos Med, 2016

World Health Organization. The Burden of Health Care-Associated Infection Worldwide A Summary.

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EU-JAMRAI'S MISSION



EU-JAMRAI was born to bridge the gap between declarations and actions

- Fostering synergies among EU MS
- Proposing concrete steps to strengthen the implementation of efficient and evidence-based One Health policies to tackle AMR and reduce HCAIs



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EU-JAMRAI: RESULTS IN KEY AREAS TO TACKLE AMR

1
STRENGTHENING NETWORKS
AND SHARING BEST PRACTICES
BETWEEN MEMBER STATES

3
SURVEILLANCE

5
INFECTION
PREVENTION
AND CONTROL

2
RAISING AWARENESS AND
PROMOTING BEHAVIOUR CHANGE

4
ANTIMICROBIAL
STEWARDSHIP

6
RESEARCH AND INNOVATION
TO TACKLE AMR

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MAPPING TO IDENTIFY RESEARCH PRIORITIES AND GAPS ON AMR



With the help of 7 voluntary countries

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France, Greece, Netherlands,
 Norway, Slovenia, Spain, UK



Joint Programming Initiative
 on Antimicrobial Resistance

Incentives	Work on new economic incentives or funding to foster research and innovation
Interaction	Work to encourage International/European research collaborations Work to encourage private/public research collaborations Work to encourage interdisciplinary research collaborations
Structuring	Development of a "national steering committee" to coordinate actions regarding AMR Development of new antibiotic molecules
Development of new tools	Development of new alternatives to antibiotics (vaccines, phages, antibodies, peptides ...) Development of new diagnostic tools
Fundamental research	Research on the bacterial mechanisms involved in resistance Research on the causes and consequences of the appearance and dissemination of AMR Other specific research unrelated to animals nor environment Investigating new technologies to help developing antimicrobial molecules or diagnostic tools.



			microbiome
			genomic technologies

7 voluntary countries extracted
 research priorities from their nation
 research programs

on AMR



38 research priorities extracted
 different research areas

		France	Greece	Netherlands	Norway	Slovenia	Spain	
Development of new tools	Development of new antibiotic molecules							
	Development of new alternatives to antibiotics (vaccine, phages, antibodies, peptides ...)							
	Development of new diagnostic tools							
Fundamental research	Research on the bacterial mechanisms involved in resistance							
	Research on the causes and consequences of the appearance and dissemination of AMR							
	Other specific research unrelated to animals nor environment	Clostridium difficile		membrane biogenesis, microbial ecology	continued carriage, microbial ecology			mic
	Investigating new technologies to help developing antimicrobial molecules or diagnostic tools.	artificial intelligence		synthetic biology				g tech
Animal sector	Research on the interaction of AMR with the veterinary sector (transfer of resistances between animals and humans, dissemination of resistances, ...)							
	Research of new antibiotics for use in veterinary medicine							
	Improve understanding of the critical factors that lead to a high consumption of antibiotics in farms							
	Evaluate the impact of food additives used in animal feeds (copper, zinc, coccidiostats, ...) on the AMR							
	Implementation, testing and evaluation of diverse IPC measures in the veterinary sector							
Environmental sector	Research on the interaction of AMR with the environment (transfer of resistances between the environmental bacteria and human pathogens, dissemination of resistances, ...)							
	Explore the effect of different drivers of resistance (disinfectants, biocides and heavy metals, ...) in nature							
	Explore the impact of fertilizers, especially manure, on the spread of AMR							
	Investigate the cost-effectiveness of cleansing environment measures							
	Implementation, testing and evaluation of diverse IPC measures in the environmental sector							

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To summarize

European research priorities

High priority

- Improving fundamental knowledge on AMR
- Strengthening surveillance systems
- Implementing IPC measures (but more research needed)
- Developing innovative drugs or diagnostic tools
- Evaluating stewardship interventions
- Structuring research networks

Medium priority

- AMR in the animal field
- Involvement of socio-economic science
- Development of new economic tools to support R&D

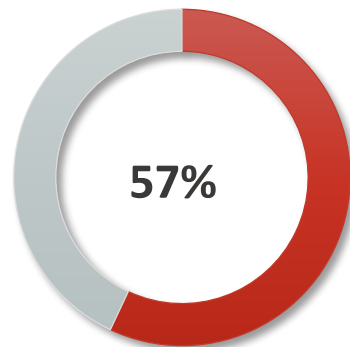
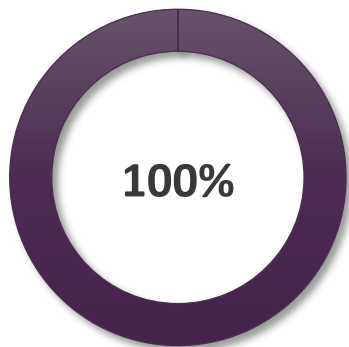
Low priority

- AMR in the environment
- AMR in the food chain
- Improvement of clinical trials

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***Participating countries
considering the
implementation of IPC
programmes in
healthcare facilities as a
priority***

***Participating countries
considering research
on IPC as a priority***

***---- STRONG EU willingness ----
to implement IPC programmes
----- BUT -----
FEW RESEARCH on the best way
to implement them or on their
----- Cost-effectiveness -----***

***Need for a specific HCAI & IPC
research priorities***

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« More research is needed to increase the evidence on the cost-effectiveness of IPC interventions, especially in LMICs. Indeed, only a limited number of studies exist on the cost-effectiveness of IPC interventions, and most of them have been carried out in HICs. »

**Global report on infection
prevention and control**



Identifying the research gaps

2-steps process

Lacotte et al. *Antimicrobial Resistance and Infection Control* (2020) 9:142
<https://doi.org/10.1186/s13756-020-00801-x>

Antimicrobial Resistance
and Infection Control

RESEARCH

Open Access

Infection prevention and control research priorities: what do we need to combat healthcare-associated infections and antimicrobial resistance? Results of a narrative literature review and survey analysis



Yohann Lacotte^{1*}, Christine Årdal², Marie-Cécile Ploy¹ and on behalf of the European Union Joint Action on Antimicrobial Resistance and Healthcare-Associated Infections (EU-JAMRAI)

**Narrative
literature
review**

- To identify research gap from literature
- To draft research priorities from literature evidence

Survey analysis

- To validate the draft research priorities with international experts
- To identify new gaps
- To prioritize the gaps

Narrative literature review

4-steps process

1.A-Methodology

Step 1

- Grey literature review
- *Aim:* define broad “gap areas” for in-depth screening of gaps
- *Source(s) of information:* WHO, ECDC websites, research agendas
- *Inclusion criteria:* any literature highlighting IPC research gaps

Step 2

- PubMed Screening
- *Aim:* gather scientific publications on each identified “gap areas”.
- *Source(s) of information:* PubMed (best matches with compelling title and abstract)
- *Keywords used:* IPC + identified “gap areas” + need/gap/challenge
- *Inclusion criteria:* published between 2012 and 2018, preferably meta-analysis or literature review and highlighting research gaps
- *Exclusion criteria:* vaccines, viral or parasitic diseases

Step 3

- Analysis of the retrieved literature
- *Aim:* Identify commonly mentioned gaps within our data set

Step 4

- Formulation of a draft research agenda
- *Aim:* Production of a list of research priorities

Enrichment:
Further screening allowed
with a limit of 1 addition
per potential gap

1.A-Methodology

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 per potential gap

1.B-Results

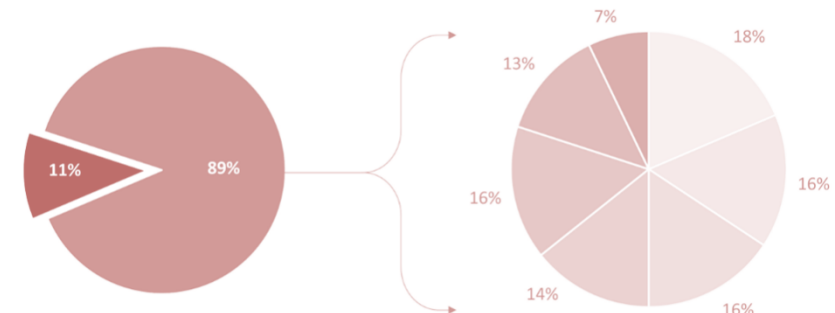
- **9 publications included**
- 7 broad "gap areas" identified

- **69 publications included**
- *Intervention:* 13
- *Guidelines:* 11
- *Training:* 11
- *Surveillance/Monitoring:* 9
- *Patient environment:* 11
- *Behavioural science:* 9
- *One Health:* 5

- **15 potential gaps identified**
- 1 extra-search, + 1 publication

- **15 research priorities**
- *Drafted from a total of 79 publications*

1.C-Distribution



■ Grey literature ■ Scientific literature

■ Intervention
 ■ Guidelines
 ■ Training
 ■ Surveillance/monitoring
 ■ Patient environment
 ■ Behavioural science
 ■ One Health

*1st campaign:
Survey
sent to
18 European IPC
experts
(from 11
countries)*

**Response rate of 61%
(11/18)**

EU-JAMRAI - Research priorities for Infection Prevention and Control (IPC)

The EU Joint Action on Antimicrobial Resistance and Healthcare-Associated Infections (EU-JAMRAI) is undertaking a survey to identify the research priorities of Infection Prevention and Control (IPC). The aim of this survey is to develop an IPC research agenda that can inform research funders of the pressing research needs of IPC.

As member of the ESCMID/EUCIC group, we would greatly appreciate if you could take few minutes to complete this survey. We estimate that it will take approximately 10-15 minutes. Your responses will be treated confidentially.

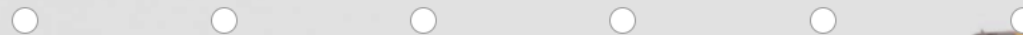
If you have any questions, please feel free to contact Dr. Yohann Lacotte (yohann.lacotte@inserm.fr) or Dr. Christine Årdal (chaa@fhi.no).

Thank you!

* 1. In your opinion, what priority level are the following research gaps?

Not a priority Low priority Medium priority High priority Critical priority I don't know

1. There is a lack of high quality studies addressing the effectiveness of hospital-based IPC programmes, including the impact, cost-effectiveness, and ideal composition of IPC programmes.



Step 2: Validation of
the document by experts
through an online survey

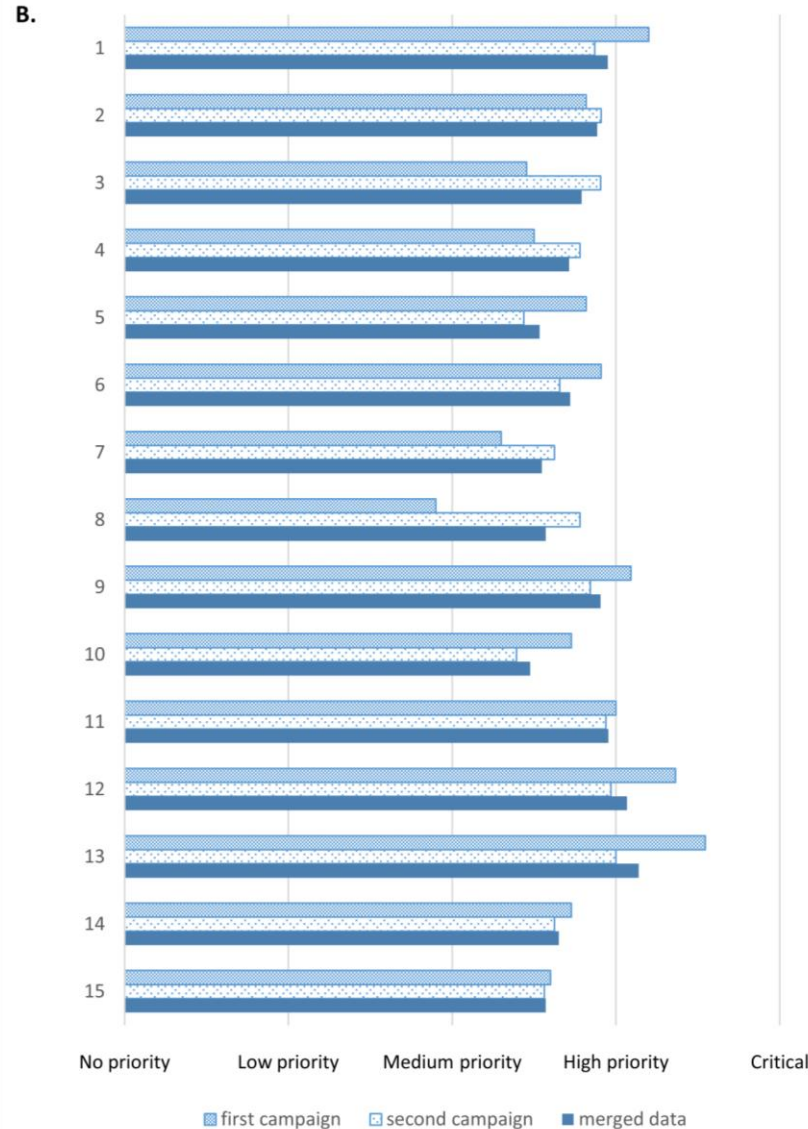
33 answers

*2nd campaign:
Survey shared
within the
EUCIC group*



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- A.**
- Composition and impact of IPC programmes**
1. Need for high quality studies addressing the effectiveness of IPC programmes (impact, cost-effectiveness, ideal composition,...)
- IPC guidelines evaluation and implementation**
2. Need to strengthen the evidences supporting IPC guidelines.
 3. Need to perform situational analyses in different country and healthcare settings to adapt IPC guidelines.
 4. Need to better understand the different patient screening strategies for risk management. Research should include both clinical impact and cost-effectiveness.
- Training**
5. Need to develop and implement additional tools to evaluate ICP training programmes.
 6. Need to evaluate the impact of new innovative training tools (e-learning, simulation, self-directed training modules, mentorship) on the practice change and HAI rate in healthcare facilities.
 7. Need to investigate minimal standard requirements for the recruitment and training of ICP professional.
- Surveillance and monitoring**
8. Need to assess and validate the reliability of surveillance based on available patient clinical information (syndromic-based surveillance) rather than microbiological data or prescription databases.
 9. Need to develop evidence-based standardized audit protocols to monitor IPC practices beyond hand hygiene.
 10. Need to assess innovative tools (electronic or infrared devices for instance) to monitor compliance to IPC practices.
- Impact of patient environment on HCAI and AMR reduction**
11. Need to evaluate the impact of infrastructural changes at the facility level on the reduction of HCAI and AMR.
 12. Evaluation of the impact of patient-to-bed ratio, bed occupancy, staff workload and visitor frequency on the spread of HCAI and AMR.
- Behavioral science**
13. Need to assess the demographic, organizational, economic, sociological, and behavioral barriers and factors facilitating for the implementation of effective IPC programmes.
 14. Need to evaluate the impact of patient and family-oriented education and communication campaign (involving patients associations) on the spread of HCAI and AMR.
- One Health**
15. Need to assess the impact of IPC measures in different operational contexts including small farms, industrial farms, feedlots, slaughterhouses, fish farms, and more.



Overall agreement between groups on classification

Overall agreement between groups on priority ranking

Strong alignment on the top 5 priorities

Top 5 priorities

Need to assess the demographic, organizational, economic, sociological, and behavioral barriers and factors facilitating for the implementation of effective IPC programmes.

Evaluation of the impact of patient-to-bed ratio, bed occupancy, staff workload and visitor frequency on the spread of HCAI and AMR.

Need to evaluate the impact of infrastructural changes at the facility level on the reduction of HCAI and AMR.

Need for high quality studies addressing the effectiveness of IPC programmes (impact, cost-effectiveness, ideal composition,...)

Need to develop evidence-based standardized audit protocols to monitor IPC practices beyond hand hygiene.

Highest priority



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From research to actions

THE PROBLEM

Effective Infection Prevention and Control (IPC) measures are necessary to control the spread of infections, like COVID-19, as well as minimise everyday healthcare-associated infections. Fewer infections in hospitals result in lower consumption of antibiotics, thereby reducing antibiotic resistance. Yet, despite the critical importance of IPC measures, its research needs are often neglected.



THE RECOMMENDATION



Behavioural science

- Studies are needed to assess the demographic, organizational, economic, sociological, and behavioural factors facilitating success but also the barriers and challenges to implement effective IPC programmes.
- Patients and their families are key elements in the chain of transmission in healthcare facilities. Studies addressing the impact of patient and family-oriented education and communication campaigns (involving patients associations) on the rate of hospital-acquired infections are needed.

POLICY BRIEF

THE URGENT NEED TO FOSTER RESEARCH ON INFECTION PREVENTION AND CONTROL TO IMPROVE HEALTH SECURITY



Co-funded by
the Health Programme
of the European Union

EU-JAMRAI Policy brief: The urgent need to foster research on infection prevention and control to improve health security.

www.eu-jamrai.eu



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Thank you for your attention



Joint Action
Antimicrobial Resistance and
Healthcare-Associated Infections



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Instituts
thématiques



Inserm

Institut national
de la santé et de la recherche médicale



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