

# Antimicrobial resistance surveillance among Extended-spectrum $\beta$ -lactamase and Carbapenemase-Producing *Klebsiella pneumoniae* in Europe

Isabel Carvalho<sup>1-5\*</sup>, Sandra Martínez-Álvarez<sup>5</sup>, Gilberto Igrejas<sup>2-4</sup>, Carmen Torres<sup>5</sup> and Patrícia Poeta<sup>1,4</sup>

<sup>1</sup> Microbiology and Antibiotic Resistance Team (MicroART), Department of Veterinary Sciences, University of Trás-os-Montes and Alto Douro, Vila Real, Portugal;

<sup>2</sup> Department of Genetics and Biotechnology, UTAD, Vila Real, Portugal;

<sup>3</sup> Functional Genomics and Proteomics Unit, UTAD, Vila Real, Portugal;

<sup>4</sup> Laboratory Associated for Green Chemistry (LAQV-REQUIMTE), New University of Lisbon, Monte da Caparica, Portugal;

<sup>5</sup> Area Biochemistry and Molecular Biology, University of La Rioja, Logroño, Spain.

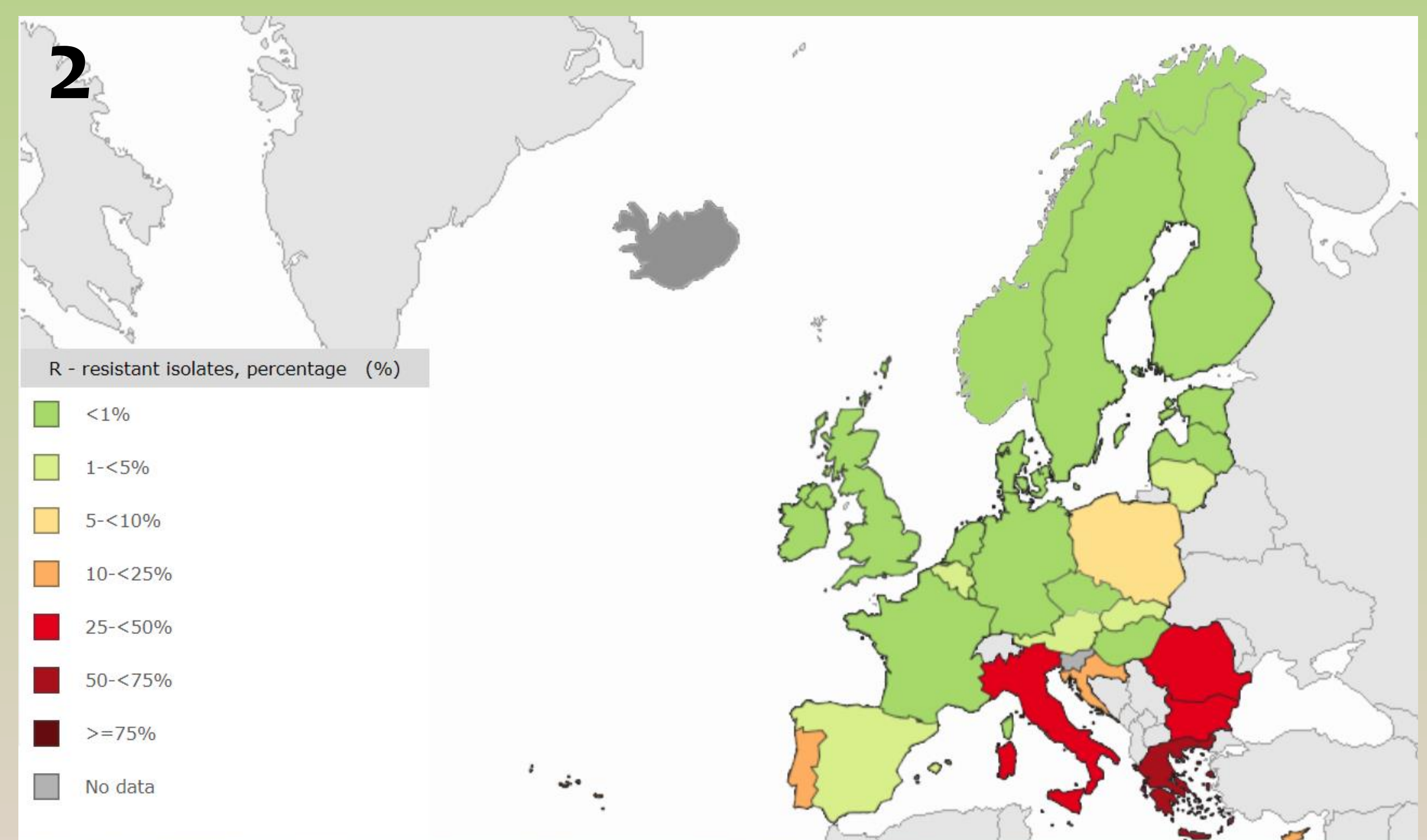
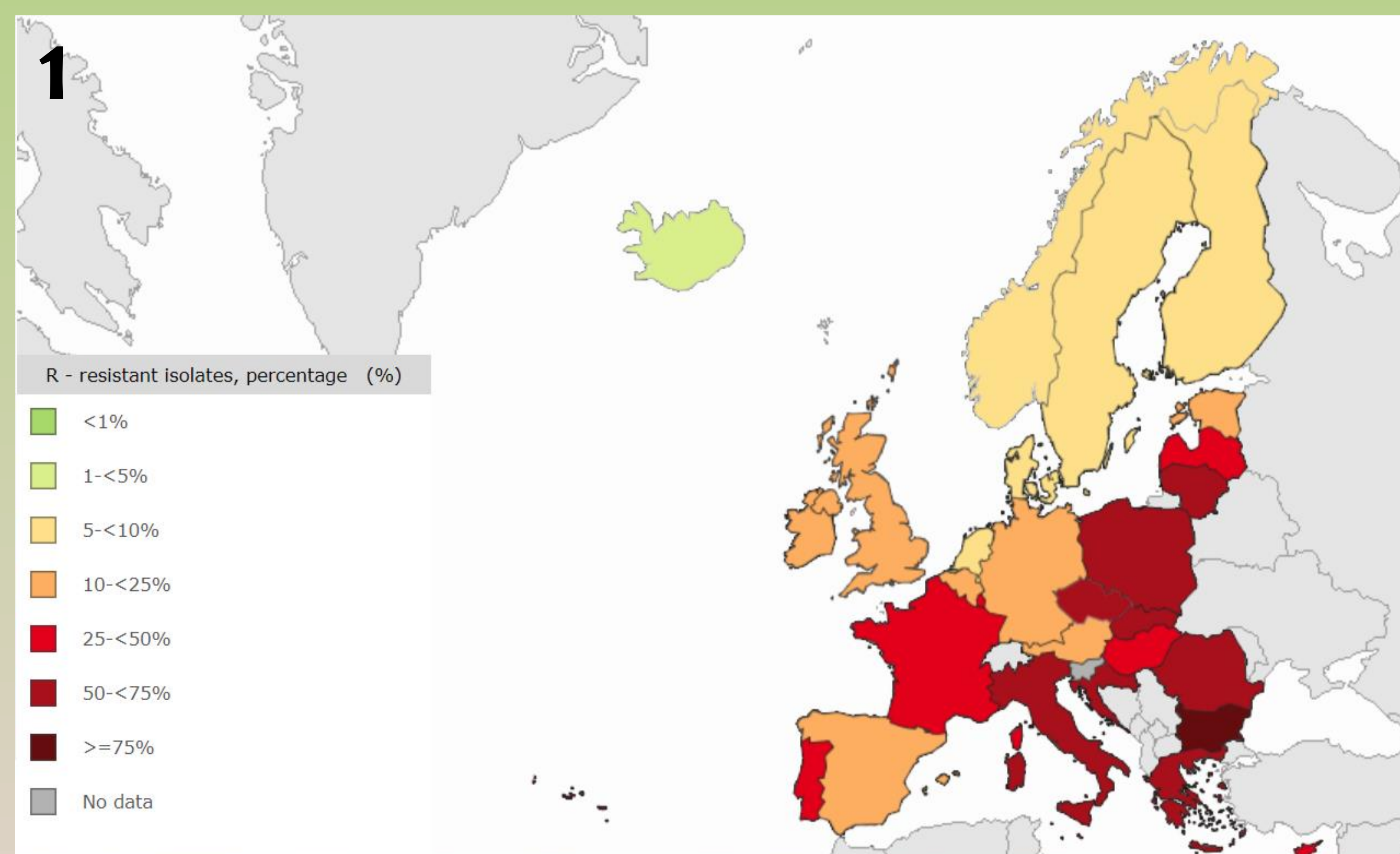
\*isabelbarrosocarvalho@utad.pt; [www.researchgate.net/profile/Isabel-Carvalho-14](http://www.researchgate.net/profile/Isabel-Carvalho-14)

## Introduction

The threat of antimicrobial resistance (AMR) is an increasingly problem with economic, clinical and social impacts. *Klebsiella pneumoniae* is considered one of the most challenging multidrug-resistant (MDR) pathogen with public health significance. Recent studies reported that the infections caused by MDR will increase and it is expected to cause 3 million deaths each year by 2050 [1, 2].

*K. pneumoniae*, belonging to the Enterobacteriaceae family, is known to spread easily. It is responsible for nosocomial infections, mainly respiratory and urinary tract infections. Three of the most clinically relevant antimicrobial resistance mechanisms are the production of Extended-spectrum  $\beta$ -lactamase (ESBL), acquired AmpC-type  $\beta$ -lactamases (qAmpC) and carbapenemases production [1, 2].

According to the World Health Organization (WHO) [3], a global priority list of antibiotic-resistant bacteria was developed, in which third-generation cephalosporin and/or carbapenem-resistant Enterobacteriaceae were included in the Priority 1 group. Moreover, the European Centre for Disease Prevention and Control ECDC (2019) [4] reported a European map according to the resistance level of third-generation cephalosporins (Figures 1 and 2). Bulgaria (75.7%), Greece (66.5%), and Romania (64.1%) are the three countries that lead this rating; Portugal is in 11th position (47.6%), while Spain is in 17th position rating (23.9%) (Figure 1). Regarding the carbapenem resistance among European countries (Figure 2), Greece is the country with the highest level (58.3%), Romania (32.3%), and Italy (28.5%). Portugal is in 7th position (10.9%), while Spain is in 11th position rating (4.4%).



**Legend:** Proportion of 3rd generation cephalosporin-resistant (Figure 1) and carbapenem-resistant *K. pneumoniae* isolates (Figure 2) in participating countries in 2019. Source: ECDC (2019) [4].

## Conclusions

The dissemination of resistant strains and the possible implications involved in transferring these AMR to other animals or to humans worry the scientific community and population in general. So, the actual global challenge of AMR requires a shared responsibility by all countries to protect citizen health.

### Four actions to fight antibiotic resistance

Preventing the spread of resistance

Tracking

Improving antibiotic prescribing

Developing new drugs and diagnostic tests

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## References

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