CAPACITY/CAPABILITY ASSESSMENT

ECDC country visit to Greece to discuss antimicrobial resistance issues

15–19 April 2024

Summary

This country visit to Greece to discuss antimicrobial resistance (AMR) issues took place upon request of the national authorities on 15–19 April 2024. Various ECDC teams had previously visited Greece with a focus on AMR, in 2007, 2008, and 2010. The findings of this visit show that the AMR and healthcare-associated infection situation of the country remains highly concerning due to the high levels of multidrug-resistant organisms (MDROs) and their frequent transmission to newly admitted patients. Surveillance systems document extremely high rates of resistance to last-resort antibiotics used to treat severe and life-threatening infections in hospitalised patients. In the hospitals we visited, there was worrying evidence of uncontrolled spread of various multidrug-resistant (MDR) and extensively drug-resistant (XDR) bacteria, including MDR and/or XDR *Klebsiella pneumoniae*, *Acinetobacter baumannii*, and *Pseudomonas aeruginosa*. In addition, although *Candida auris* was only recently introduced in hospitals in Greece, it has rapidly disseminated throughout the healthcare system, with hundreds of cases in the affected hospitals within less than five years.

The high number of patients infected or colonised with MDROs who require the application of enhanced infection prevention and control (IPC) measures overwhelms healthcare staff, which results in further transmission of these MDROs. This situation represents a serious threat to patient safety. At worst it could impact the ability of hospitals in Greece to provide high-quality patient care. The current levels of AMR also pose a major burden on the healthcare system and consume resources that could otherwise be invested into improving staffing levels and IPC measures. At the same time, the current low staffing levels and the lack of resources for IPC contribute to worsening transmission of MDROs resulting in a downward spiral of less resources and increased transmission. Infections with MDROs result in increased morbidity and mortality of patients and prolonged patient stays 'blocking' hospital beds. In addition, the required isolation precautions complicate medical care and rehabilitation, thus further harming the affected patients.

Several policies to control AMR were implemented since the previous ECDC visit. Several initiatives and interventions already made a difference including the implementation of prescription-only dispensing of antibiotics that resulted in a massive reduction in non-prescribed antibiotic use. The introduction by law of antimicrobial stewardship teams in hospitals enabled the establishment of the necessary infrastructure to promote appropriate use of antimicrobials.

The visiting team also observed numerous valuable initiatives in hospitals driven by knowledgeable and dedicated personnel. However, while having a positive impact on the respective hospital or specific area of intervention, these disjointed initiatives fail to address the extent of the alarming public health crisis caused by AMR in the country. Only an urgent nationally coordinated effort, mobilising all levels with strong political commitment, leadership, and coordination under the framework of a public health situation of the highest national priority could bring all actors together under a common approach. This approach, powered by the rapid implementation of control measures and funding matching the level of the current public health crisis caused by AMR in hospitals would impact the transmission of MDROs and its significant adverse consequences for patients and the healthcare system in Greece.

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1 Background

1.1 Rationale and purpose of ECDC country visits on antimicrobial resistance

Country visits are one of the initiatives set out in the European Union (EU) One Health Action Plan against antimicrobial resistance (AMR) and contribute to its aim of making the EU a best practice region in the fight against AMR. The importance of tackling AMR has been recognised globally, notably by the World Health Organization (WHO) Assembly which urged all its country members, including EU Member States, to develop and have in place by 2017 national action plans (NAPs) on AMR that are aligned with the objectives of the WHO global action plan on AMR, adopted at the 68th World Health Assembly in May 2015 and endorsed by the Food and Agriculture Organization of the United Nations (UN) and the World Organisation for Animal Health. In 2016, the 71st session of the UN General Assembly adopted a political resolution on antimicrobial resistance, reaffirming that the blueprint for tackling antimicrobial resistance is the WHO global action plan on AMR and its five overarching strategic objectives. In the EU, the 2016 Council Conclusions called on Member States to have NAPs based on a One Health approach and in line with the GAP objectives in place by mid-2017.

In the human health sector, ECDC has developed a process of country visits to discuss and assess the situation regarding the prevention and control of AMR through the prudent use of antibiotics and infection prevention and control (IPC). These are based on Council Recommendation of 15 November 2001 on the prudent use of antimicrobial agents in human medicine, which advocates a range of actions to be taken to prevent and control the development of AMR. The Council conclusions on AMR of 10 June 2008 reiterated the call for action to tackle AMR. On 9 June 2009, the Council adopted a Recommendation on patient safety including the prevention and control of healthcare-associated infections, which further stressed the importance of combating AMR as a patient safety issue. Furthermore, on 13 June 2023, the Council adopted a new Recommendation on stepping up EU actions to combat antimicrobial resistance using a One Health approach (2023/C 220/01).

The overall aim of the country visits is to provide a comprehensive overview of the efforts currently being made by the Member State visited to tackle AMR and, with the support of experts from other Member States, to highlight areas where further work would be beneficial in further developing and implementing the national AMR strategies and action plans. The objectives of the visit are:

- To discuss with the relevant competent authorities and national and local stakeholders, the current and planned efforts to prevent and control AMR, in particular to provide assistance with the development, review and implementation of the relevant national strategies and action plans;
- To exchange experience and knowledge on initiatives taken by other Member States which could potentially be helpful in further developing and implementing the national AMR strategies and plans;
- To document the current situation regarding AMR and control efforts being made in the visit report to highlight successful strategies and areas in need of further action. With agreement of the country visited, the report will be made publicly available as a resource for other countries.

Further details are outlined in the document 'ECDC terms of reference for joint One Health country visits on antimicrobial resistance'. The main output of the visit is a report from the ECDC team provided to the inviting national authority. To help the ECDC team ensure consistency of the visits and follow-up of progress of countries, an assessment tool has been developed. This assessment tool includes 10 topics regarded as core areas for successful prevention and control of AMR and are based on the Council Recommendation 2002/77/EC and on the Council Conclusions of 10 June 2008. The assessment tool is used as a guide for discussions during the visit.

The country visit to Greece took place, on the request of the national authorities, from 15 to 19 April 2024. The ECDC team for the country visit consisted of Anke Kohlenberg (Expert for Antimicrobial Resistance and Healthcare-Associated Infections), Aikaterini Mougkou (Expert for Antimicrobial Resistance and Healthcare-Associated Infections), Diamantis Plachouras (Principal Expert for Antimicrobial Resistance and Healthcare-Associated Infections), and two experts from EU Member States: Michael Borg (Malta) and Carlo Gagliotti (Italy), as well as Andrea Nilsson (ECDC communication expert, remote participation for the specific communications meeting). At national level, the visit was coordinated by Antonis Maragkos from the National Public Health Organisation (NPHO).

ECDC teams had previously visited Greece to discuss antimicrobial resistance issues in 2007, 2008, and 2010. Since then, various Intersectoral Committees on AMR have been appointed and NAPs published. The first 'National Action Plan for Combating Bacterial Resistance to Antibiotics and Healthcare-Associated Infections' was published in 2008 and the last one in 2019. However, as outlined below, the situation in terms of HAIs and AMR remains of great concern.

2 Overview of the epidemiological situation

2.1 Antimicrobial resistance

Greece has participated in the European Antimicrobial Resistance Surveillance Network (EARS-Net) from its foundation in 1995 through WHONET Greece, the country's electronic system for the surveillance of antimicrobial resistance. Population coverage of the network had decreased from 68% to 13% when the obligation to use the EUCAST guidelines to participate was introduced in 2019. The use of EUCAST guidelines increased in the following years and the population coverage of participating laboratories in EARS-Net returned to 68% in 2022 (EARS-Net report, 2023). The reported representativeness of the data also increased in 2022. Moreover, in 2022, data on *Streptococcus pneumoniae* were provided in EARS-Net in addition to the other seven microorganisms already reported.

The AMR percentages of the microorganisms included in EARS-Net appear significantly above the EU/European Economic Area (EEA) average for all considered microorganisms and combinations, especially for gram-negative bacteria. In 2022, the percentages of resistance to carbapenems were particularly high: 72.0% for *Klebsiella pneumoniae* (compared to 63.9% in 2018); 95.9% for *Acinetobacter* species (compared to 92.4% in 2018); 48.7% for *Pseudomonas aeruginosa* (compared to 37.5% in 2018); and 1.5% for *E. coli* (compared to 1% in 2018). High percentages of AMR were also observed for gram-positive bacteria with, for 2022, 49.1% vancomycin resistance in *Enterococcus faecium*; 46.7% penicillin non-wild-type *S. pneumoniae*; and 39% meticillin-resistant *Staphylococcus aureus* (MRSA) (EARS-Net report, 2023).

Greece also participates in the European Antimicrobial Resistance Genes Surveillance Network (EURGen-Net). Greece participated in the European survey of carbapenemase-producing Enterobacterales (EuSCAPE) in 2013–2014, the survey of carbapenem- and/or colistin-resistant Enterobacterales (CCRE survey) in 2019, and a related follow-up survey in 2022. Combining the results of these three surveys showed the persistent spread of previously established, as well as newly emerging, high-risk clones of carbapenemase-producing *K. pneumoniae* (CPKP) in Greece's healthcare system (Tryfinopoulou et al, *Eurosurveillance*, 2023). Within clonal complex (CC)258, *K. pneumoniae* sequence type (ST) 258/512 was replaced by ST11 as the most frequent ST in 2022. *K. pneumoniae* ST39 and ST323 carrying bla_{KPC-2} were absent in 2013 and 2014 but emerged in 2019 and 2022, respectively. Estimation of within-hospital transmission events demonstrated that the rapid spread of new CPKP STs can likely be attributed to frequent transmission within hospitals (Tryfinopoulou et al, *Eurosurveillance*, 2023).

2.2 Healthcare-associated infections

Greece has participated in all ECDC point prevalence surveys (PPS) of healthcare-associated infections (HAIs) and antimicrobial use in European acute care hospitals, as well as all ECDC PPSs of HAIs and antimicrobial use in long-term care facilities, although with poor or very poor representativeness in the latter. Greece also currently participates in the ECDC project on the development of surveillance of bloodstream infections from electronic health record data (HER-BSI). Greece does not implement ECDC surveillance of surgical site infections, infections acquired in intensive care units (ICUs), or *Clostridioides difficile* infections. In the ECDC PPS in acute care hospitals 2022–2023, the prevalence of HAIs was higher in Greece (12.2%) than the EU/EEA average (median of country means: 6.8%). Pneumonia accounted for 20% of HAIs (EU/EEA 20%), bloodstream infections for 20% (EU/EEA 12%), urinary tract infections for 13% (EU/EEA 20%), COVID-19 for 9% (EU/EEA 7%), surgical site infections for 7% (EU/EEA 17%), and *Clostridioides difficile* infection for 4% (EU/EEA 6%).

The most common microorganisms identified in HAIs in Greece's acute care hospitals were *Acinetobacter* spp., 15% (EU/EEA 3%); *Klebsiella* spp., 14% (EU/EEA 12%); and *Pseudomonas aeruginosa* 12% (EU/EEA 8%). Carbapenem resistance was reported in 58% of *Klebsiella* spp. isolates associated with HAIs, and 94% of *A. baumannii* isolates associated with HAIs. The median number of IPC nurse full-time equivalents (FTEs) was 1.38 per 250 beds compared to an EU/EEA median of 1.36, while the median number of IPC doctor FTEs was 0.00 per 250 beds compared to an EU/EEA median of 0.30. The median percentage of beds in single rooms was 4.5%, much lower than the EU/EEA median of 11.3%.

2.3 Antimicrobial consumption

In 2022, based on data from the European Surveillance Antimicrobial Consumption Network (ESAC-Net), Greece had the second highest overall consumption of antibiotics in the EU/EEA (32.9 DDD per 1 000 inhabitants per day, community and hospital sectors combined), 70% higher than the EU/EEA average (19.4 DDD per 1 000 inhabitants per day). The consumption trend was increasing before the COVID-19 pandemic and, after a significant decline in 2020 and 2021, antibiotic consumption returned to the pre-pandemic level in 2022. The largest differences between Greece and the EU/EEA average were found for 'other beta-lactams' (ATC J01D, includes cephalosporins and carbapenems), which was 3.3 times higher, 'macrolides, lincosamides and streptogramins' (ATC J01F), which was 2.3 times higher, and 'quinolones' (ATC J01M), which was 2.5 times

higher than the EU/EEA average. In 2022, Greece had the highest consumption of carbapenems (ATC J01DH) and ceftolozane with beta-lactamase inhibitor (ATC J01DI54) of all EU/EEA countries.

In the community sector (primary care), total antibiotic consumption in 2022 was 31.2 DDD per 1 000 inhabitants per day, 84% more than the EU/EEA average, with a clear preference for broad-spectrum antibiotics (Access/AWaRe percentage 42.6%). In the hospital sector, total antibiotic consumption as reported to ESAC-Net (1.73 DDD/1 000 inhabitants per day) was 7% above the EU/EEA average.

Furthermore, in the ECDC PPS for 2022–2023, Greece recorded the highest standardised antimicrobial use ratio (adjusted for patient case mix) in European acute care hospitals. Overall, 55.3% of patients observed on the day of the PPS received at least one antibiotic, with an average of 1.67 antibiotics per patient. The indication was 'medical prophylaxis' for 10.8% of patients receiving antimicrobials. Antimicrobials for surgical prophylaxis corresponded to 18.7% of the total treatments, and in 76% of cases surgical prophylaxis was administered for more than one day. The percentage of antimicrobials for which the route of administration was parenteral was more than 90% in Greece. In the ECDC PPS 2022-2023, the most commonly prescribed antimicrobial was piperacillin and enzyme inhibitor, followed by meropenem.

3 Observations

3.1.1 Inter-sectoral coordinating mechanism

There is awareness of the extent of the AMR situation in the country and the urgency of addressing it among key stakeholders, particularly among those working in healthcare. However, a formal intersectoral coordination mechanism with inclusion of relevant stakeholders, defined terms of reference and procedures has not yet been established. Collaboration with other sectors under a multisectoral One Health approach seemed to be challenging, as evidenced by the fact that it was not possible to organise a full One Health country visit on AMR with the cooperation of the Ministry for Agriculture.

3.1.2 National action plan

A national action plan (NAP) on AMR based on the WHO guidelines and in a One Health approach with involvement of the Ministry of Health, the Ministry of Agriculture and the Ministry for the Environment was in place during 2019-2023. The plan included a description of outcome, structure and process indicators, and targets as well as activities and responsible entities for the human health and animal health sectors. However, funding for this plan had not been secured, nor was there a clear timeline for the implementation of the activities. Eventually, the plan was not implemented due the COVID-19 pandemic. Consequently, there were no progress reports or any assessment of the effectiveness and impact of measures.

Initial intersectoral meetings to start working on a new NAP were reported as having taken place with the agreement that each sector will start preparing input for their respective area of responsibility. A draft NAP was not available at the time of the visit. A working group of NPHO had been tasked with coordinating the drafting of the human health part of the new NAP. An expert working group for the control of AMR has been established including 15 experts in public health, microbiology, infectious diseases and IPC. This group will support the development of the new NAP. However, there was neither a timeline for the publication of the updated NAP, nor a budget allocation at the time of the visit. Nevertheless, a separate operational action plan for the control of HAIs had been finalised and was planned to be integrated into the NAP. This plan addressed the key pillars of IPC, was actionable, and had a specified timeframe and budget, as well as measurable indicators and targets.

3.2 Organised multidisciplinary collaboration at local level

There was limited organised multidisciplinary collaboration at healthcare facility level outside the confines of established IPC and antimicrobial stewardship (AMS) teams. There were no local activities involving hospitals, long-term care facilities and primary care.

3.3 Clinical diagnostic and reference laboratory services

The ECDC team visited three microbiology laboratories of acute care hospitals. All of these had automated systems for species identification and antimicrobial susceptibility testing (AST) in place (MicroScan®, VITEK®). A recently received MALDI-TOF device for species identification was present in one hospital and staff was currently trained on its use. All laboratories visited were using breakpoints of the European Committee on AST (EUCAST). The detection of bacteria resistant to all antimicrobials tested in the standard panel required frequent extension of testing to include new last-resort antibiotics such as cefiderocol. The laboratories visited did not receive many samples from systematic regular screening for multidrug-resistant organisms (MDROs) and did not have the capacity to support larger scale screening. Two laboratories reported culture-based screening using CHROMagar® plates. Molecular testing was only implemented for *Candida auris*, but not for carbapenemase-producing Enterobacterales or other MDROs.

The opening hours of clinical microbiology services varied, but night and weekend hours were at least covered by technicians for urgent samples. Phone calls were made for urgent results such as positive blood or cerebrospinal fluid cultures. Collaboration between clinicians and microbiologists was reported to be good, and included visits of some microbiologists to the wards. Clinicians seemed to be satisfied with the speed and content of microbiological reports received from the laboratories. A laboratory information management system (LIMS) was in place in all laboratories visited, and clinicians had direct access to validated results. Restrictive reporting of AST results was not consistently implemented. In addition, the LIMS did not always support the preparation of reports on AMR statistics by department for feedback to clinicians. In at least one hospital, this required manual re-entry and reworking of the data.

The National Reference Laboratory (NRL) is part of NPHO but located in a separate building in Vari. Its AMR and HAI laboratory employs two scientists, three technicians and one assistant. The NRL provides phenotypic reference testing and identification of resistance genes with PCR and microarray (MDR Direct Flow Chip Kit®).

Results were provided to referring laboratories by email. Equipment for whole genome sequencing (WGS), e.g. Illumina Nextseq®, Miseq® and a MinION® device, was available at the NRL. Infrastructure for bioinformatic analysis was in place with an in-house computational cluster and use of the Galaxy server. Still, implementation of WGS for bacterial pathogens had been progressing slowly and the capacity of the NRL to support outbreak investigations was still very limited. At the time of the visit, the fourth WGS run had just been completed by the AMR and HAI laboratory. Nevertheless, WGS was now being used to support two recent outbreak investigations, i.e. a *Serratia marcescens* outbreak in an acute care hospital for which WGS had still been performed externally by Eurofins via the ECDC contract, and an MRSA outbreak in a neurological long-term care facility for which selected isolates were about to be sequenced in-house.

3.4 Monitoring of antimicrobial resistance

WHONET Greece was started in 1995 and the collected data had improved over time with the progressive increase in use of EUCAST breakpoints and the improvement in representativeness. At the time of the visit, coverage was reported as about 70% of the population of the country with inclusion of 46 hospitals in seven regional health directorates. The network makes use of routine data from hospital microbiology laboratories and includes data on isolates from other sample sites in addition to blood cultures. The resulting data are used to provide feedback reports to the participating hospitals and laboratories twice yearly and to produce a publicly accessible annual national report. At the time of the visit, work on a new WHONET Greece internet platform for improved data collection, analysis and visualisation was ongoing. In contrast, in the hospitals visited, clinicians were seldom provided with comprehensive microbiological data specific to their hospital or ward to assist them in making informed decisions regarding antimicrobial selection. Furthermore, data on AMR in the community and in private hospitals are still not available.

The first case of *C auris* had been reported in Greece in 2019 (Stathi et al, *Eurosurveillance*, 2019). At the time of the visit, *C. auris* had spread throughout Greece's healthcare system with hundreds of cases in hospitals and cases in all healthcare facilities visited, albeit to a different extent. The rehabilitation facility visited received so many patients already colonised or infected with *C. auris* from hospitals that they had to dedicate a specific ward area for caring for *C. auris*-positive patients. Voluntary surveillance of *C. auris* has been implemented, however, infections caused by MDROs including those caused by *C. auris*, do not require mandatory notification in Greece, which is not in line with the latest Council recommendation (2023/C 220/01).

3.5 Monitoring of antimicrobial consumption

To date, available antimicrobial consumption data are based on sales and aggregated at the national level. An electronic prescription system has been available since 2011 and was strictly implemented in 2020. The system allows patients to receive an antibiotic from local pharmacies only in the presence of a doctor's prescription documenting the diagnosis. Based on ICD-10 coding entered, a doctor can only prescribe specific antibiotics based on treatment protocols listed for a specific diagnosis. However, physicians repeatedly stated that it was possible to bypass these prescription rules implemented in the system by choosing another ICD-10 code allowing different antibiotics or documenting 'unknown infection'.

Starting from 2024, the extraction of electronic prescription data from the system, using defined daily doses (DDD) as units of measurement, is expected to provide statistics with greater granularity (geographical area, patient characteristics and prescriber characteristics such as age and specialty). There was also a plan to produce indicators at individual prescriber level, both quantitative (e.g. number of prescriptions) and qualitative indicators (e.g. percentage distribution of prescriptions by type of drug and percentage of antimicrobial agents in the 'Access' category of the WHO AWaRe classification). The above statistics would be provided for general practitioners and all specialists (public and private) in the community (outside of hospitals). For general practitioners (GPs), an antibiotic consumption rate (DDD rate per 1 000 patient-days) could also be calculated using the GP's patient list as the denominator.

In the hospitals visited, electronic patient charts were not available and prescriptions were made on paper forms, making the routine collection of data on antimicrobial treatment impossible. The pharmacies of the two general hospitals visited also did not have an electronic registration system to link the antibiotic prescription to an individual patient. The maximum level of disaggregation was per order placed to the pharmacy by each department. In both hospitals, the departments had internal medicine storage areas where antibiotics were available in considerable quantities. Access to and use of hospital pharmacy records involved several labour-intensive steps for both data extraction and conversion to DDD. In one of the two hospitals, the only available statistics were based on vials and covered only restricted antibiotics. In both hospitals, a restriction policy was in place for specific antibiotics (carbapenems alone, or novel beta-lactams and beta-lactam/beta-lactamase inhibitor combinations). Prescription of these antibiotics required approval from an infectious disease (ID) physician. Monitoring of the use of restricted antibiotics was based on manual data entry. In one of the two hospitals, the overall antibiotic consumption statistics were supplied once a year to the heads of departments; in the other, feedback was less systematic and limited to restricted antibiotics.

3.6 Antimicrobial stewardship and treatment guidelines

The effective enforcement of long-standing legislation that required antibiotics in the community to be dispensed only following a doctor's prescription has had a dramatic effect in a short period. The amount of antibiotics reported by the general public as being obtained without a prescription decreased from 20% in 2016 to the current level of 6%, as documented by the Eurobarometer surveys. In acute care hospitals, as well as in long-term care facilities, we identified several important factors that should support AMS interventions, including a network of enthusiastic ID physicians who provided input into stewardship of last-line antibiotics. The law mandates that each hospital should have an AMS team, and these were found to be in place in all the institutions we visited. We could also identify a general acknowledgement and appreciation of the importance of the correct prescribing of antimicrobials and the role that inappropriate prescribing has in driving AMR. Nevertheless, numerous challenges were noted that explain the high level of antimicrobial consumption in Greece (see above).

In the community, our observations suggest there is considerable overuse and possible misuse of antibiotics by both doctors as well as the public. It was clear from the feedback of stakeholders during our visit that there is still a strong perception among the public that antibiotics are needed for respiratory tract infections. Doctors face major difficulties in resisting the pressure from patients and subsequently prescribe antibiotics at levels that appear to be excessive. In addition, some primary care physicians have limited knowledge about the appropriate use of antibiotics, predominantly due to the absence of continuous educational opportunities. To compound matters, the antibiotics prescribed are most often broad spectrum, such as second-generation cephalosporins and even fluoroquinolones, which are more likely to drive AMR.

The situation is exacerbated by several factors, including that antibiotic prescribing in the community is driven by provision of care from a wide range of clinical specialists, who predominantly work in the private sector. Access to such care does not always appear to be determined by appropriateness criteria. Furthermore, antibiotics are prescribed in packages that often contain more than the necessary quantity for treatment, enabling individuals to accumulate stocks of antibiotics at home and utilise them as self-medication whenever they have a febrile illness.

National treatment guidelines place a heavy emphasis on second-generation cephalosporins, which are well recognised as being important drivers of extended-spectrum beta-lactamase (ESBL)-producing gram-negative bacteria. This, in turn, limits the antibiotic choices available to hospital physicians and drives an AMR spiral in which carbapenem use would then be empirically prescribed in hospitals to cover for the possibility of ESBL-producing bacteria, ultimately resulting in high levels of carbapenem resistance in hospitals. In addition, several community physicians claimed that they had difficulties in prescribing key narrow-spectrum antibiotics, including amoxicillin and flucloxacillin, because these were often unavailable in pharmacies.

Within hospitals, we noticed a heavy predominance of carbapenem use in empiric treatment of non-septic hospital infections, which then offers little option for escalating treatment other than colistin or the newer antibiotics. ID physicians are required by law to be present in each hospital. In addition, the establishment of multi-disciplinary AMS teams is mandated by law (388/2014 and Ministry of Health Bulletin 2019 on appropriate management of antimicrobial agents in hospital settings). In the hospitals visited, we identified varying staffing levels of ID physicians, and even more importantly, varying levels of involvement in AMS which is often an additional responsibility on top of the regular duties of ID physicians, without allocated time specifically dedicated to AMS activities. Within some hospitals, three or more ID physicians had such a specific role. However, in other hospitals it was clear that the ID physicians were struggling to cope with the additional workload related to AMS interventions, especially the approval of all requests for carbapenems as well as 72-hour review and de-escalation of empiric treatment. There was also evidence that prolonged surgical prophylaxis was consistently used, despite national and international evidence-based recommendations.

3.7 Infection prevention and control

The visiting team noted a highly enthusiastic and dedicated pool of IPC nurses in all the hospitals and institutions visited. Multidisciplinary IPC committees were found in all the hospitals, in line with national law. The hospitals visited were also taking part in projects funded by third parties, whether EU- or privately funded initiatives such as the pREVention and management tools for rEducing antibiotic Resistance in high prevalence SEttings (REVERSE) project and the Greek Infection Prevention Programme (GRIPP). These have provided opportunities to recruit additional IPC nurses in the participating hospitals that now reach the national recommendation of one IPC nurse per 250 beds.

On the national level, there is mandatory surveillance of several multidrug-resistant organisms (MDROs) in bloodstream infections in the national surveillance system called 'Prokroustis'. The results have been useful as hospital quality indicators and are in line with the levels of AMR in HAIs already reported from other surveillance networks as well as in the ECDC point prevalence surveys. In addition, the Agency for Quality Assurance in Health (AQAH SA – ODIPY) was established in 2020 with the aim of supporting healthcare providers in improving the quality of care in Greece. ODIPY oversees the implementation of the GRIPP, among other activities.

The visiting team identified several significant hospital infrastructural challenges, especially the widespread absence of single rooms, which precludes effective isolation of patients infected or colonised by MDROs (MDRO-positive patients). Alcohol hand rub containers were found in most of the wards visited, but they did not always seem to be sufficient for the hand hygiene requirements; in several instances containers were placed in inappropriate or inaccessible locations despite alternative suggestions from the IPC nurses. We were informed that the number of IPC nurses in other hospitals, i.e. not participating in REVERSE and GRIPP were at lower levels than those in the hospitals visited. In all instances, the overall nurse staffing level was very low, especially in general wards. This correlates with previously published statistics showing Greece having one of the lowest per capita nursing levels in the EU/EEA. This is a major area of concern because it is well documented that understaffing and high patient-to-nurse ratios invariably lead to suboptimal IPC compliance by nurses who are overwhelmed by workload demands. There is limited surveillance of HAIs other than the ones monitored by 'Prokroustis' which focuses on bacteraemia by specific MDROs.

We also identified several practices and policies that are likely to be contributing to the spread of MDROs in hospitals. All the hospitals visited stated that they adopted 'universal contact precautions' because of the high incidence of MDROs. However, our observations did not support this assertion. Indeed, it is almost impossible to effectively implement 'universal contact precautions' with the current nurse staffing levels. In addition, the current practice of rotating admitting hospitals carries several risks in relation to AMR because MDRO-positive patients, discharged from one hospital, will be admitted in a different hospital if they require hospital readmission in the following days. The risk of cross-transmission is significant and exacerbated by the lack of a centralised database allowing admitting hospitals to access information on MDRO status. As a result, the hospitals visited acknowledged that MDRO-positive patients are often missed and therefore contribute to the spread of MDROs between hospitals.

In all the intensive care units (ICUs) that we visited, we identified patients with multiple MDROs. Frequently, these patients had been in the ICU for many weeks, if not months, mainly as a result of a lack of options for transferring these patients to another facility for long-term, high-dependency care. In these ICUs, these patients then were a constant source of MDRO transmission to newly admitted patients. Although there is limited screening for *C. auris* carriage in ICU patients, we saw little evidence of concerted screening programmes for gram-negative MDROs, which probably pose a greater risk on patient safety. Even where present, screening efforts were mainly restricted to ICUs and only conducted primarily on patient admission.

An annual IPC action plan defining targets, actions and resources is mandated by law (388/2014) for all healthcare facilities, but it was unclear to what extent such plans are in place, implemented and monitored. The organisation of IPC in hospitals is primarily undertaken through the IPC committee to which IPC nurses report. The hospitals visited reached the recommended level of one IPC nurse per 250 beds. However, this was only because additional resources had been afforded from participation in the previously mentioned time-limited projects. Other hospitals in the country struggle to achieve this benchmark, which already seems too low for the challenges and commitment needed from IPC nurses. The presence and input of IPC doctors was heterogeneous, but often minimal with ID physicians mainly involved in AMS rather than IPC.

In the hospitals visited, IPC nurses found it very difficult to implement IPC policies, often for cultural reasons. One of the reasons is that, whenever they regularly encounter non-compliance or obstruction, they have no recourse other than to refer to the IPC committee which meets at most every month and is ultimately advisory in nature. The IPC committee is therefore not in a position to effectively support the execution of day-to-day IPC decision making. We also observed several practices that suggest sub-optimal application of evidence-based IPC practices and instead focus on unsupported dogmas. For example, in more than one hospital we were asked to put on gowns and wear gloves simply to visit an ICU, which is not based on scientific evidence. While staff in every hospital department that we visited talked about the importance of IPC, we could identify few accountability measures to ensure appropriate user ownership and responsibility for IPC compliance. As an example, one of the CEOs that we spoke to, even admitted that the hospital was unable to discipline people or staff who were persistently and repeatedly non-compliant with IPC policies.

3.8 Education on antimicrobial resistance and infection prevention and control

AMR and AMS are not stand-alone topics in the undergraduate medical curriculum but are covered indirectly in related areas (e.g. microbiology and pharmacology).

IPC is not incorporated in the medical curriculum. In contrast, the curriculum of nursing schools includes IPC, but other topics related to AMR are not usually taught. There were some additional educational initiatives set up by enthusiastic individuals such as an interactive hand hygiene module for students in Athens' nursing school. However, these courses were not standardised, and curricula may differ between universities.

Participation of doctors and nurses in continuous professional education activities and attendance at conferences appeared to be predominantly sponsored by the pharmaceutical industry. Accreditation through these activities did not appear to provide significant career benefits. Postgraduate courses and compulsory educational programmes focusing specifically on AMR, AMS, and IPC tailored for medical doctors including residents, GPs, and paediatricians were lacking.

3.9 Public information and behavioural change interventions for antimicrobial resistance

Greece used to be very active in European Antibiotic Awareness Day (EAAD) and had several campaigns to raise awareness about AMR and the importance of prudent antibiotic use. These campaigns targeted the general public and healthcare professionals and included a variety of channels and outputs. In 2019, the National Organisation for Medicines updated its guidance for physicians, a resource accessible to medical professionals and students nationwide, but without a surrounding communication campaign. However, there were One Health initiatives by other organisations (not present as part of the assessment).

Although there have been successes in other areas, such as campaigns for hand hygiene in hospitals or the strong community engagement and education activities for HIV, and media and stakeholder collaborations, sustained efforts to raise awareness about AMR were not present at the time of the visit. Communication campaigns on AMR have not been conducted in recent years because of five main factors: the COVID-19 pandemic, a perceived lack of will from the leadership across organisations, communication being underestimated as an area of practice overall, lack of staff, and limited possibilities to procure external services when required. Despite budget being available for communication campaigns, cumbersome procurement and planning procedures hindered the implementation of effective communication strategies and campaigns on AMR, with reliance primarily on basic website and social media dissemination.

There were also major skill gaps, varying depending on the organisation. For example, there was a lack of web and social media staff at the National Organisation for Medicines and of graphic designers at the NPHO. The lack of web and social media staff resulted in low activity on media channels, or a website being used mostly as a notice board (National Organisation for Medicines). In contrast, a positive point to highlight is the availability of social and behavioural scientists who contribute to other campaigns and could also contribute to campaigns focused on AMR.

The NPHO was undergoing a reorganisation at the time of the assessment, which might provide an opportunity to further strengthen teams, with expertise in communication, behavioural sciences, and public relations, among other areas. Furthermore, across organisations, the communication teams did not feel empowered to make decisions or to drive effective communication strategies without these being directed by higher levels. Further and strengthened collaboration for communication efforts between the Ministry of Health, the NPHO, and the National Organisation of Medicines, together with a stronger decision-making power for communication purposes, would therefore be important. Evaluation mechanisms have remained underdeveloped, reflecting broader issues in campaign planning and execution. While feedback from stakeholders exists, as well as process indicators such as web visits and social media counts, formal evaluation processes and discussions around lessons learned, pain points, or the impact of communication activities on the behaviour of the target groups are lacking.

3.10 Marketing-related issues

In the electronic prescription system, the default setting is prescription by generic name, rather than by brand name. While educational activities are often sponsored by the pharmaceutical industry, the National Organisation for Medicines regulates and monitors sponsorship and gifts from the pharmaceutical industry. Access for industry representatives to doctors is not restricted.

4 Conclusion and recommendations

4.1 Conclusions

The findings of this visit show that the AMR and healthcare-associated infection situation in Greece remains highly concerning due to the high levels of MDROs and their frequent transmission to newly admitted patients. Surveillance systems on the national as well as international level document extremely high rates of resistance to last-resort antibiotics used to treat severe and life-threatening infections in hospitalised patients. For example, Greece reports one of the highest rates of carbapenem resistance (72.2%) in *K. pneumoniae* in the EU/EEA. In the hospitals visited, there was worrying evidence of uncontrolled spread of various multidrug-resistant (MDR) and extensively drug-resistant (XDR) gram-negative bacteria including MDR and/or XDR *K. pneumoniae*, *A. baumannii* and *P. aeruginosa*.

Another alarming finding was that resistance to most conventional antibiotics forced clinicians to use last-resort antimicrobials for which there is also already resistance development. In addition, although *C. auris* was only recently introduced in hospitals in Greece, it rapidly disseminated throughout the healthcare system with hundreds of cases in affected hospitals within less than five years. ICUs were identified as a hotspot for the spread of MDROs. The high number of patients infected or colonised with MDROs who require enhanced IPC measures overwhelms healthcare staff, which results in further transmission of these MDROs. The visiting team became concerned about repeatedly hearing that within a few days every new patient admitted to ICUs becomes colonised with one or more MDROs. This situation represents a serious threat to patient safety. At worst it could impact the ability of hospitals in Greece to provide high-quality patient care.

This situation is driven by various factors including the frequent and inappropriate use of broad-spectrum antibiotics in the community and in hospitals as well as sub-optimal IPC practices including hand hygiene, isolation of MDRO-positive patients and, in general, the prevention of HAIs. The extremely low nurse-to-patient ratio makes adequate compliance with IPC measures unachievable, and the few IPC nurses lack sufficient support in their daily work. Clinical microbiology laboratories lack the capacity for processing screening samples for an effective MDRO screening policy. Finally, there are structural factors in the healthcare system that promote the spread of MDROs, such as the current practice of rotating admitting hospitals. This practice results in a constant movement of patients through the hospital network, as well as prolonged patient stays due to the absence of post-acute care units and services, and high workloads due to hospitals often providing primary care services to cover for the limitations of the primary care system.

The current levels of AMR pose a major burden on Greece's healthcare system and consume resources that could be invested into improving staffing levels and IPC measures. At the same time, the current low staffing levels and the lack of resources for IPC contribute to worsening transmission of resistant bacteria resulting in a downward spiral of less resources and increased transmission. Infections with MDROs resulted in increased morbidity and mortality of patients and prolonged patient stays 'blocking' hospital beds. Finally, the required isolation precautions complicate medical care and rehabilitation, thus furthing harming the affected patients.

Several policies to control AMR had been implemented since the previous ECDC visit. However, the COVID-19 pandemic had a negative impact on these policies, at both national and local levels. At the time of the visit, several initiatives and interventions had already made a difference, including the implementation of prescription-only dispensing of antibiotics, which resulted in a massive reduction in non-prescribed antibiotic use. Initiatives such as the GRIPP and the REVERSE project have contributed to improved IPC staffing levels and training, better availability of surveillance data and the succesful implementation of IPC interventions. The introduction by law of AMS teams in all hospitals enabled the establishment of the necessary infrastructure to promote appropriate use of antimicrobials. The visiting team also observed numerous valuable initiatives in hospitals driven by knowledgeable and dedicated personnel.

However, while having a positive impact on the respective hospital or specific area of intervention, these disjointed initiatives fail to address the extent of the alarming public health crisis caused by AMR in the country. Only an urgent nationally coordinated effort, mobilising all levels and with strong political commitment, leadership and coordination, could bring all actors together under a common approach. This approach, powered by the rapid implementation of control measures and funding matching the level of the current public health situation of the highest national priority on AMR in hospitals, would make an impact on the transmission of MDROs and its significant adverse consequences for patients and the healthcare system in Greece.

4.2 Recommendations

Priority recommendations

- The scale of the AMR crisis in healthcare facilities witnessed by the ECDC team justifies **declaring antimicrobial resistance a public health situation of the highest national priority.** This will not only focus attention to the current crisis but should facilitate effective resource allocation to address it.
- Ensuring that the national action plan (NAP) on AMR is finalised as soon as possible. This should, however, not delay the urgent implementation of actions in human health pending finalisation of the NAP.
- Establishing a focused core task force with expertise in IPC that will visit hospitals, support interventions, and review individual progress.
- Strengthening IPC in hospitals, especially in ICUs, by ensuring appropriate human and material resources for sustainable implementation of interventions.
- Resuming national campaigns on the prudent use of antibiotics, to address the prevalent expectation of antibiotics by the public and consequent pressure on doctors.
- Using the electronic prescribing system to introduce motivational interventions to improve antibiotic prescribing in the community, for example by promotion of the use of the already established treatment protocols and feedback reports. Introducing an electronic prescribing system in hospitals.

Intersectoral collaboration and national action plan (NAP)

- Establishing the intersectoral committee with involvement of the animal health and environmental sectors under a One Health approach.
- Urgently developing the national action plan (NAP) on AMR with set timelines.
- Prioritising actions addressing the acute problem of dissemination of carbapenem-resistant gram-negative bacteria and *C. auris* in healthcare settings.
- Including measurable indicators and targets into the NAP, taking into account the Council recommendation on stepping up EU actions to combat antimicrobial resistance in a One Health approach (2023/C 220/01).
- Allocating sufficient budget to all activities specified in the NAP.

Infection prevention and control (IPC)

Strengthening of infrastructure and human resources for IPC

- Improving effective regulatory oversight and support to hospitals. The AMR department within the NPHO is undertaking highly valuable work towards improvement of the AMR situation in Greece, especially through the national surveillance system 'Prokroustis'. However, considering the scale of the problem, we recommend expanding the current team that is working on AMR and HAIs to ensure that there is sufficient staffing in the AMR department to achieve all the objectives.
- Establishing a dedicated core expert task force on the national level working full time on IPC improvement in hospitals.
- Increasing full time IPC nurse staff levels across all hospitals irrespective of research funds and ensure sustainability of effective IPC initiatives in the long term. A staffing level of one IPC nurse FTE per 100 beds was previously suggested and is justified by the magnitude of the problem.
- Establishing training with certification, including hands-on training and career pathways for IPC nurses. Career pathways are necessary to ensure that experienced IPC nurses do not need to move to a management post to progress in their career, with the obvious loss to IPC programmes.
- Formally establishing effective Infection Control Teams (ICTs) to ensure that IPC efforts are focused and coordinated. Acute care hospitals should employ a dedicated IPC doctor with expertise in microbiology, infectious diseases or public health. The doctor's specific job description should focus exclusively on IPC. A staffing level of one IPC doctor FTE per 500 beds could be a potentially useful benchmark. The ICT needs to have direct communication and support of executive line management. In line with the experiences of other countries, the ICT would form part of the office of the Chief Executive Officer (CEO) or of the Medical Director of the hospital. This will shift executive support of IPC policies from the IPC Committee to senior management. The IPC Committee would then function as the multidisciplinary oversight body reviewing progress and providing direction to the IPC programme.
- Increasing the number of nurses in hospitals. Effective implementation of IPC policies is extremely difficult with current nursing staff levels, as already indicated in the ECDC country visit in 2010. While appreciating that this will require substantial investment, increasing the nursing contingent from 3.7 per 1 000 population closer to the EU average of 9.7 per 1 000 should undoubtedly be a priority in Greece's strategy to improve the AMR situation.
- Increasing the number of single rooms. While understanding that this is a major undertaking, unless improved isolation facilities are constructed in hospitals, it is difficult to envisage major inroads to address the current AMR situation.

- Exploring solutions for patient and nurse cohorting. Whereas the current lack of single rooms is undoubtedly challenging, targeted and effective contact precautions are still possible using patient and nurse cohorting for identified MDRO-positive patients. Healthcare facilities should explore options for establishing cohort wards with dedicated staff. The policy of universal contact precautions (which has not had any appreciable effect) implemented in some healthcare facilities needs to be reviewed.
- Expanding screening for gram-negative MDROs. It is critical that hospitals increase the level of MDRO screening, especially in ICUs. As a start, patients admitted to ICUs should be screened for CRE and carbapenem-resistant *Acinetobacter* spp. on admission and then regularly (e.g. weekly). In general wards, regular point prevalence screening could be done (e.g. every three months) to monitor levels and trends of colonisation by MDRO.
- Developing a basic IT system which will allow IPC nurses to automatically extract laboratory results and receive notifications. Such systems should also facilitate epidemiological analysis.
- Considering establishing separate post-acute care entities to avoid prolonged patient stays in ICUs and acute care wards.

Improvement of IPC practices

- Establishing minimum national standards for hospital IPC programmes with specific components and processes that hospitals must implement.
- Implementing regular visits by the core expert task force to each individual hospital in the country. The task force should start visiting tertiary hospitals to review IPC practices, assess the establishment of the minimum national standards, discuss challenges, and most importantly, identify and support interventions, which could rapidly be implemented. The task force will then follow up at regular intervals to ensure that the agreed interventions have been implemented and evaluate the progress achieved.
- Intensifying audits of all key IPC-related practices, including hand hygiene, in hospitals and other healthcare facilities.
- Introducing accountability structures. Process key performance indicators (KPIs) for IPC should be established at the ministry level to track progress in implementation of change. These KPIs should be part of the performance evaluation of senior hospital management including CEOs and Medical Directors, especially when contract renewals are undertaken, as well as of an accreditation process for hospitals. Above all, there needs to be a culture of accountability for poor IPC compliance extending from hospital management to healthcare workers and other staff with activities relevant to IPC, such as cleaning staff. Close collaboration and synergy between IPC, patient safety and quality of care services needs to be ensured.
- Requiring mandatory training on IPC skills on induction and on a yearly basis, in all hospitals. Training should be mandatory for all staff in contact with patients and include competency assessment.
- Ensuring that targeted contact precautions are implemented for all patients identified as infected of colonised by MDROs (MDRO-positive patients).
- Reviewing the current system for emergency hospital admissions. Although it is beyond the remit of the visit to comment on the current practice of rotating hospitals that admit patients, there is no doubt that this practice potentially is a major contributor to the current AMR situation. For this reason, we recommend a review. If this practice is to continue, then it is paramount that a system is introduced so that if patients are discharged while still colonised or infected with a MDRO, these patients are flagged so they can easily be identified if readmitted to another hospital. This would ideally be through an electronic network linking all hospitals but if this is beyond the current capabilities, at least MDRO-positive patients could be given a simple notification card and instructed to take it with them if they are readmitted to the same or another hospital.

Antimicrobial stewardship (AMS) and treatment guidelines

Community

- Increasing availability of and promote prescribing of narrow-spectrum antibiotics. In the community, it is important that narrow-spectrum antibiotics such as amoxicillin and flucloxacillin become more widely available and are the first-line treatment for infections where no risk factors are present. National treatment guidelines should be revised to have less emphasis on cephalosporins, making it clear that narrow-spectrum antibiotics are the first line options.
- Using the electronic prescribing system to introduce motivational interventions to improve antibiotic prescribing in the community. The electronic prescribing system which is now in place offers an excellent opportunity for monitoring antibiotic prescribing. Efforts are in place to improve data extraction and mining of the national database to identify prescribing patterns of individual doctors. This could allow the identification of high-end prescribers, both in terms of antibiotic quantities as well as types of antibiotics prescribed, as well as facilitate individual communication and accountability of these individuals.
- Increasing the accountability of private care providers through accreditation criteria for healthcare practices such as the use of national guidelines, provision of data and participation in mandatory continuing professional development (CPD)/continuing medical education (CME) in antibiotic prescribing for employed doctors.

- Improving prescriber training in antibiotic prescribing. There is currently no requirement for CPD/CME in antibiotic prescribing. CPD/CME in antibiotic prescribing should become mandatory for all doctors prescribing antibiotics in the community. In addition, efforts should address the accountability of private care providers by, for example, introducing accreditation criteria for healthcare practice that would incorporate use of national guidelines and participation in antibiotic training.

Hospitals

- Appointing at least one dedicated ID physician per 500 beds with sole AMS duties.
- Increasing audits of antibiotic prescribing by hospitals to review the proportion of treatments started without the appropriate indication, duration of surgical prophylaxis, etc.
- Addressing the empiric use of last-resort antibiotics (especially carbapenems) to ensure that:
  - samples are taken before treatment is started;
  - empiric prescribing is approved by an ID physician; and
  - a review is undertaken within 72 hours and de-escalation undertaken as often as possible.

Diagnostic laboratory services

- Increasing the capacity of clinical laboratories for screening for MDROs and ensuring adequate budget.
- Increasing the capacity of the NRL to support investigation of MDRO outbreaks including allocation of financial and human resources for WGS.
- Defining criteria for routine referral of isolates to the NRL.

Monitoring of AMR

- Collecting data on AMR at the community level from private laboratories.
- Including private hospitals and providing timely feedback.
- Considering extending and harmonising notification of infections caused by microorganisms resistant to last-line treatment according to the 'Council recommendations on stepping EU actions to combat antimicrobial resistance in a One Health Approach'.

Monitoring of antimicrobial consumption

- Implementing the plan to breakdown community antibiotic consumption between different geographical areas and between different prescribers at an individual level by antimicrobial class and category of indication/infection to provide feedback to prescribers and guide AMS activities.
- Urgently establishing hospital pharmacy information systems that allow consumption data to be easily extracted, used to produce reports, provide feedback and linked to other hospital information systems.
- Providing antimicrobial consumption data for all individual hospitals, disaggregated by department or area.

AMR and IPC education

- Ensuring the integration of AMR, AMS, and IPC into undergraduate curricula for students (medical, nurses, pharmacologists).
- Offering in-person and online courses on AMR, IPC, and appropriate antimicrobial use for healthcare professionals in primary care and hospital sectors, including pharmacists and clinical pharmacologists providing incentives (such as a study leave) to encourage broad participation. Interactive webinars and online courses may be offered, featuring national experts (IPC and AMS champions) who will discuss the appropriate antibiotic prescribing, diagnostic stewardship, IPC, and patient education. Antibiotic prescription guidelines and other published scientific evidence tailored to the local epidemiology may also be part of the discussion e.g. dissemination of knowledge on appropriate use of antibiotics for respiratory infections by choosing penicillins over macrolides and fluoroquinolones. This way healthcare professionals can attend remotely and earn continuing education points.
- Introducing mandatory CPD/continuing education activities for physicians and nurses.
- Offering opportunities for CPD/continuing education for nurses employed in primary healthcare facilities, focusing on the prudent use of antibiotics. The educational resources, may include online courses and materials, aiming to empower nurses to effectively communicate and educate patients about the use of antibiotics.
- Ensuring the availability of CPD/CME activities on AMR, AMS, and IPC that are not sponsored by the pharmaceutical industry.
- Implementing educational programmes at schools to promote knowledge of the appropriate use of antibiotics among children and teenagers.
- Establishing a focused induction programme on AMR, AMS, and IPC for new healthcare workers in hospitals.
- Implement training programmes for other hospital staff such as hospital cleaners to improve cleaning and disinfection practices in hospitals.

Public information and behaviour change interventions for AMR

- Planning and implementing annual campaigns to raise awareness about AMR and the importance of prudent use of antibiotics, for the general public and for healthcare professionals, but also in collaboration with the animal sector to ensure a One Health approach.
- Establishing interactions and collaboration with communication staff in professional organisations, to enhance outreach to professionals across the country.
- Organising awareness raising events for the general public, for students and for professionals as in the past. Even if it is not possible to organise these events face-to-face, digital events, digital conferences or webinars could be an option which is not costly and remains effective to reach out to wider audiences.
- Providing communication tools and further education for healthcare professionals so they can teach patients and the general public when and how to use antibiotics, and to help these professionals provide a different treatment/solution when antibiotics are not needed, i.e. instead of only denying antibiotics.
- Enhancing direct engagement with journalists, pitching stories and providing exclusive interviews with high-level speakers ahead of EAAD, or ahead of the launch of specific reports or guidelines. This will ensure in-depth journalistic pieces that can reach the general public and other target audiences. Producing materials for journalists, such as infographics that can be used in print, video recordings, sound bites, and briefings with top key messages.
- Ensuring that there is strong collaboration between the Ministry of Health, the NPHO, and the National Organisation for Medicines to align efforts and optimise the use of resources.
- Planning and requesting well in advance, even though the complexity of planning cycles and procurement processes is high, the resources needed for the campaign, and assigning a contract manager in the team to make sure that it is possible to buy the services needed for the campaign. This person should have knowledge of procurement, contracts, as well as of communication practices and needs.
- Adapting ECDC videos in a way that the subtitles are shown and featuring them in hospital waiting rooms and other places where people seeking healthcare need to sit down and wait.
- Considering working with micro- and mid-range social media influencers, covering target audiences in the age range of 24 to 65 years. Focusing on using digital platforms, including social media accounts such as TikTok and Snapchat to reach younger audiences.
- Implementing an outcome evaluation of the campaign to test whether it is effective or if improvements are needed. This can be in the form of a survey or focus groups. Establishing a set of communication key performance indicators such as counts of website visits, returning visitors to websites, social media likes, impressions and comments, media clippings, and media interviews, and reviewing and possibly revising these indicators regularly.
- Using the lessons learned from other successful initiatives such as vaccination and HIV prevention campaigns and translating these lessons into actions that can be used for an awareness campaign on AMR and prudent antibiotic use, while bringing in social and behavioural insights to understand the drivers of antibiotic use in the general public and by healthcare professionals.
- Using the results of the latest Eurobarometer on AMR to develop further communication strategies, with a focus on the knowledge levels of the general public in Greece.