

Europe **A** **n**
ntibiotic
wareness Day

**What do hospital
pharmacists know
about antibiotics and
antibiotic resistance?**



**Data collected by ECDC study on healthcare workers' knowledge and attitudes about antibiotics and antibiotic*

Executive summary

1204 hospital pharmacists in the European Union (EU)/European Economic Area (EEA) participated in the survey on healthcare workers' knowledge and attitudes about antibiotics and antibiotic resistance and the results demonstrate that best practices are already embedded in the profession. Hospital pharmacists demonstrated exceptional understanding of antibiotics, their possible risks and side-effects, and their appropriate use. With over 97% of hospital pharmacists stating that antibiotics are not effective against viruses, cold or flu, and that the use of antibiotics can lead to unwanted side-effects. 82% of hospital pharmacists agreed with the statement that anyone being treated with antibiotics are at risk of antibiotic resistant infections. However, only 58% of respondents agreed that there were opportunities present for them to provide advice on prudent antibiotic use to individuals.

The European Association of Hospital Pharmacists (EAHP) emphasised the importance of antibiotic stewardship teams in its position paper on antimicrobial resistance which was adopted in June 2018. The survey results reaffirm that hospital pharmacists have the expertise necessary to tackle the rise of antibiotic resistant infections and are already actively involved in promoting the prudent use of antibiotics in European hospitals. With 68% of hospital pharmacists who participated in the survey stating that they are currently involved in antimicrobial stewardship programmes.

However, the survey also revealed that there is still work to be done on antibiotic awareness. In many countries the uptake of stewardship teams should be increased and the awareness about the European Antibiotic Awareness Day (EAAD) and the World Antibiotic Awareness Week (WAAW) raised. This includes ensuring, in both the hospital and the community sector, that the European Commission's One Health Approach tackling antimicrobial resistance in the environment, food production and animal health, at the global, EU, national, regional and individual level is properly implemented.

The information displayed in this report results from a survey performed by Public Health England (PHE) for the European Centre for Disease Prevention and Control (ECDC) under a specific service contract (ECD.8836).

Public Health England (PHE) launched a multilingual survey on 28th January 2019, funded by the European Centre for Disease Prevention and Control (ECDC). The aim of the survey was to gain a greater understanding of European Healthcare workers' knowledge and attitudes towards antibiotics and antibiotic resistance. The results of the survey were released on 18th November 2019 to mark the 2019 European Antibiotic Awareness Day.¹

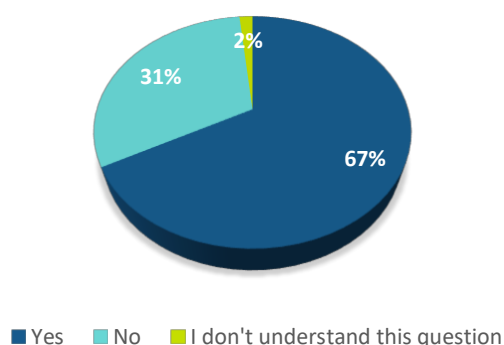
Country	Number of respondents	Country	Number of respondents
Austria	88	Italy	50
Belgium	58	Latvia	2
Bulgaria	5	Lithuania	1
Croatia	5	Luxembourg	5
Cyprus	2	Malta	6
Czech Republic	2	Netherlands	2
Denmark	4	Norway	20
Estonia	16	Poland	29
Finland	8	Portugal	20
France	197	Romania	31
Germany	144	Slovakia	11
Greece	52	Slovenia	4
Hungary	9	Spain	118
Iceland	1	Sweden	3
Ireland	18	United Kingdom	293

1204 hospital pharmacists from the European Union (EU)/European Economic Area (EEA) participated in the survey. The data presented in this survey by the European Association of Hospital Pharmacists (EAHP) was kindly shared by ECDC in order to disseminate it to a wider audience. The survey questions explored both the extend of the participants knowledge about antibiotics, their appropriate use, possible risks and side effects, as well as how informed, involved and supported hospital pharmacists felt in their efforts in promoting prudent use of antibiotics.

1. In your current role are you contributing to/leading antimicrobial stewardship programmes or tackling AMR?

The first question explored the prevalence of antimicrobial stewardship programmes in the EU/EAA. 67% (N= 809) of respondents pointed out that they are part of antimicrobial stewardship programmes in their hospital. The remaining hospital pharmacists that participated in the survey had either not the opportunity to engage in such teams (31% | N=376) or did not understand the question (1% | N=19).

¹ European Centre for Disease Prevention and Control, Survey of healthcare workers' knowledge, attitudes and behaviours on antibiotics, antibiotic use and antibiotic resistance in the EU/EEA, November 2019, Available at: <https://www.ecdc.europa.eu/en/publications-data/survey-healthcare-workers-knowledge-attitudes-and-behaviours-antibiotics>.



The European Association of Hospital Pharmacists (EAHP) picked up on the importance of antibiotic stewardship teams in its position paper on antimicrobial resistance.² In this paper the Association highlights the benefits of multi-professional stewardship teams which are responsible for the appropriate selection, dosing, route, and duration of antimicrobial therapy. Their primary goal is to optimise clinical outcomes while minimising unintended consequences of antimicrobial use. Core members of a multidisciplinary antimicrobial stewardship team include an infectious diseases physician and a clinical pharmacist with infectious diseases training, with the addition of a clinical microbiologist and further specialists being optimal.

To increase the uptake of antibiotic stewardship teams, ECDC has made available an infographic which highlights the threat that antibiotic resistance poses and the effectiveness of antibiotic stewardship programmes to address the issue from different angles.³ In addition, a set of key messages provides further information on why hospitals should be promoting antibiotic stewardship.⁴ These publicly available resources should be used by hospital pharmacists to advocate for the implementation of such teams in hospitals.

2. To what extent do you agree or disagree with the following statements?

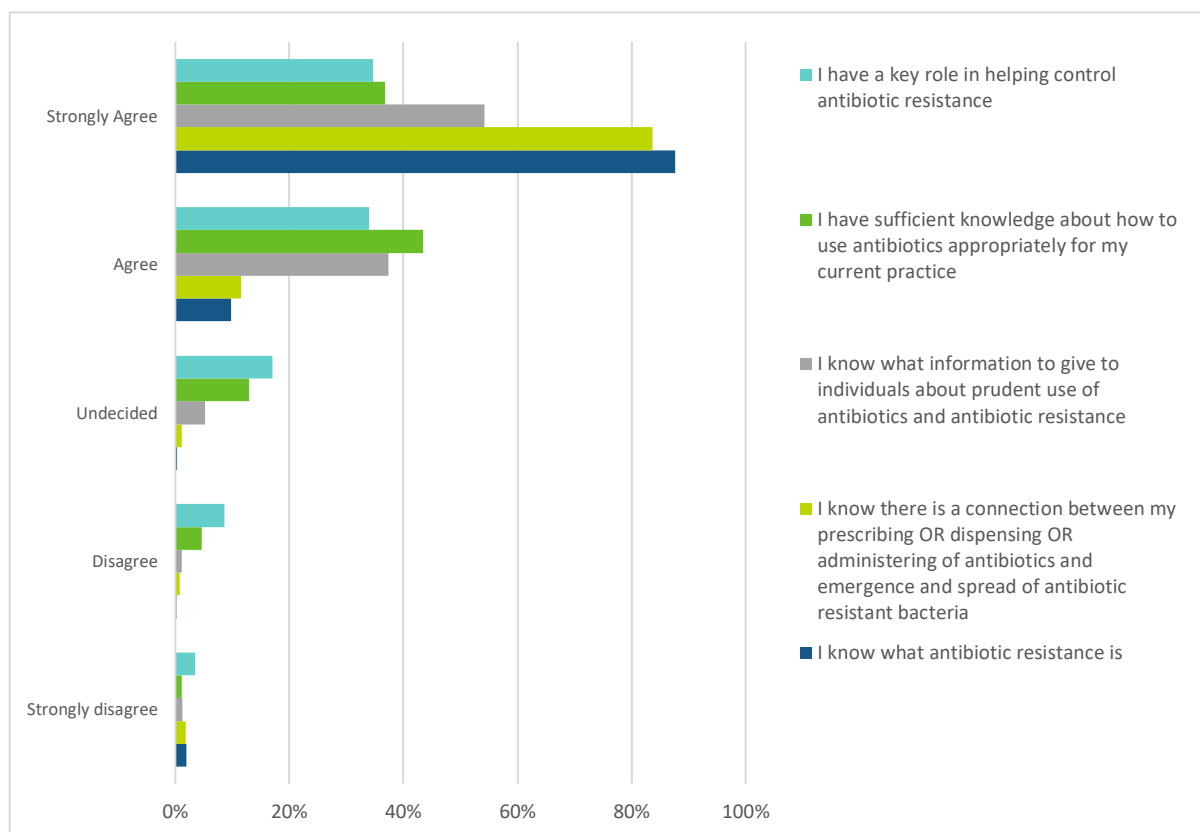
The second question collected information on the knowledge of hospital pharmacists in relation to antibiotics and antibiotic resistance. 5 Statements were scored by the 1204 respondents. Hospital Pharmacists consistently demonstrated that their knowledge on the proper use of antibiotics and antibiotic resistance is indisputable. When asked to rate on a scale of 1 (strongly disagree) to 5 (strongly agree) to what extent they agreed to the following statements displayed in the graphic above. An overwhelming majority of 1056 (88%) and 1008 (84%) of hospital pharmacists who answered, rated the first and the second statement with a 5. While under a tenth of respondents strongly disagreed or disagreed with any of the 5 statements.

² EAHP Position Paper on Antimicrobial Resistance (AMR), June 2018, available at:

https://www.eahp.eu/sites/default/files/eahp_position_paper_on_amr_june_2018_1.pdf.

³ European Centre for Disease Prevention and Control. Antibiotic Stewardship Programme Infographic, November 2017, available at: <https://antibiotic.ecdc.europa.eu/en/infographics-about-antibiotic-stewardship-programmes>.

⁴ European Centre for Disease Prevention and Control, General key messages for healthcare professionals in hospitals and other healthcare settings, available at: <https://antibiotic.ecdc.europa.eu/en/get-informed/key-messages/key-messages-professionals-hospitals-and-other-healthcare-settings-0>.



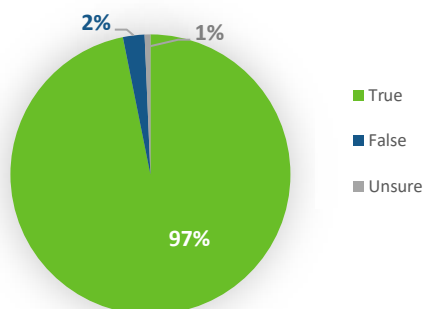
3. Please answer whether you believe these statements are true or false.

The following 8 different statements were presented in question 3.

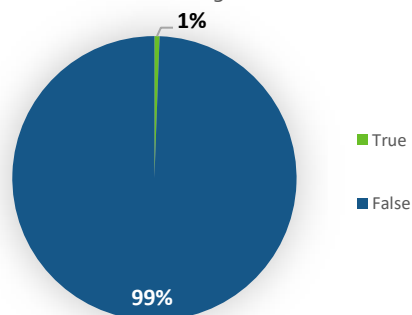
- ⇒ Antibiotics are effective against viruses.
- ⇒ Antibiotics are effective against cold and flu.
- ⇒ Unnecessary use of antibiotics make them become ineffective.
- ⇒ Taking antibiotics has associated side effects or risks such as diarrhoea, colitis, allergies.
- ⇒ Every person treated with antibiotics is at an increased risk of antibiotic resistant infection.
- ⇒ Antibiotic resistant bacteria can spread from person to person.
- ⇒ Healthy people can carry antibiotic resistant bacteria.
- ⇒ The use of antibiotics to stimulate growth in farm animals is legal in the EU.

The respondents were asked to rate these statements as true or false. The vast majority of the 1204 hospital pharmacists who answered stated that antibiotics are ineffective against viruses (99% | N=1194) as well as against cold and flu (98% | N=1186). The fact that unnecessary use of antibiotics risks making them ineffective was confirmed by 97% (N=1166) of respondents. While 99% (N=1192) acknowledged that the use of antibiotics can put a person at risk of side-effects such as diarrhoea, colitis, allergies. These results demonstrate that hospital pharmacists are among the health professionals best suited with the required expertise to tackle antibiotic resistant infections in the hospital.

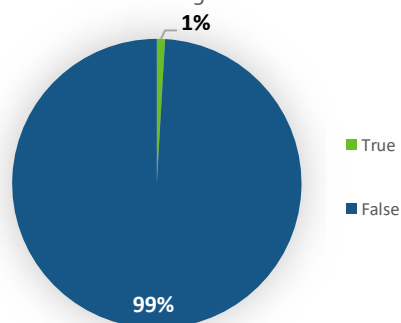
Unnecessary use of antibiotics makes them ineffective



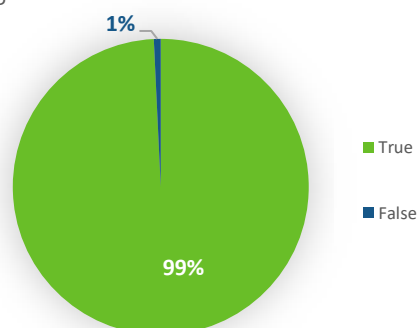
Antibiotics are effective against viruses



Antibiotics are effective against cold and flu

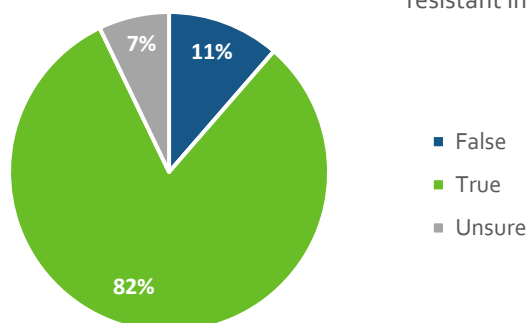


Taking antibiotics has associated side effects



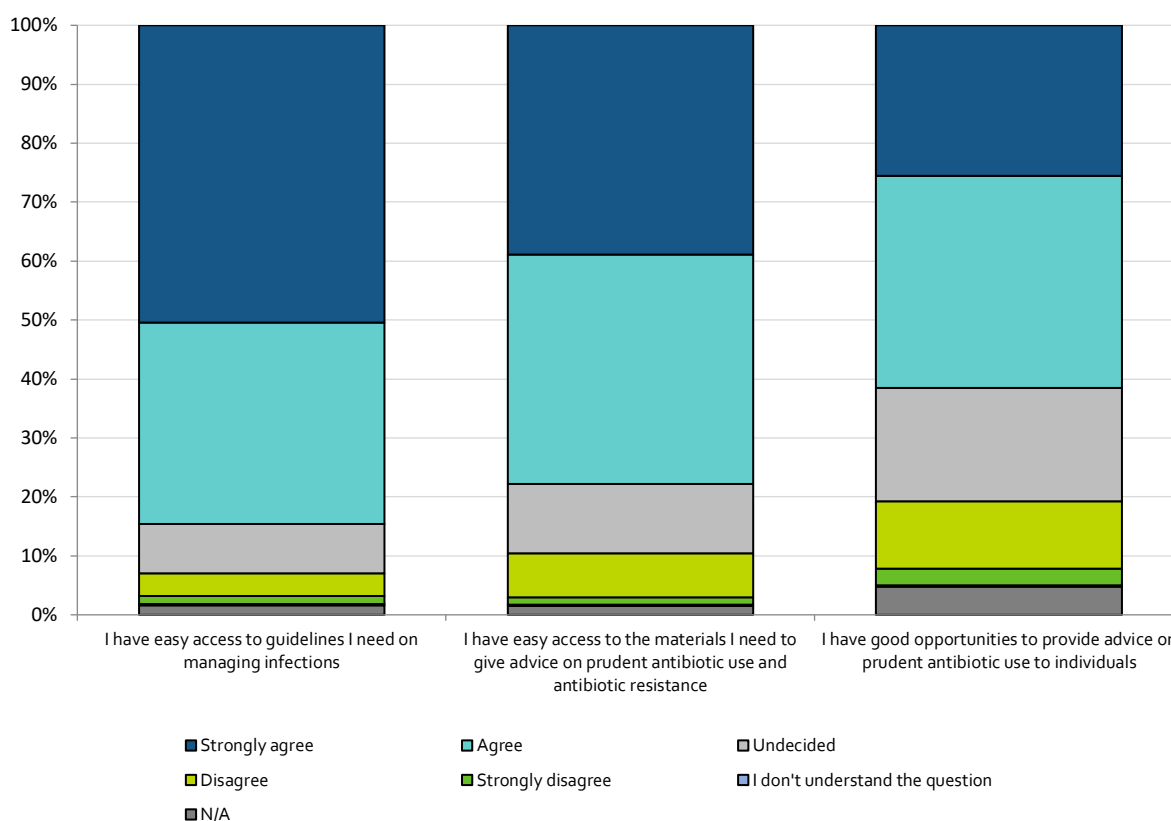
The fact that antibiotic resistant bacteria can spread from person to person was confirmed by 92% (N=1108) of respondents. The statement that healthy people can carry antibiotic resistant bacteria was affirmed by 94 % (N=1128) of respondents. In relation to the legality of the use of antibiotics to stimulate growth in farm animals in the EU, feedback was mixed. 30% (N=366) believed that this statement was false, while 30% (N=358) confirmed its validity and 40% (N=478) indicated that they were unsure of the answer. Crucially, 82% (N=981) of hospital pharmacists agreed that every person treated with antibiotics is at an increased risk of antibiotics resistant infection. This highlights not only the expertise of hospital pharmacists, but also the increased concerns within the profession of the increase prevalence and risk of antibiotic resistant infections.

Every person treated with antibiotics is at an increased risk of antibiotic resistant infection



4. To what extent do you agree or disagree with the following statements?

Question 4 asked survey participants to comment on 3 statements on the access to guidelines and the materials and opportunities for giving advice. Easy access to guidelines needed for managing infections was affirmed by 81% (N= 974) of respondents that agreed or strongly agreed with this statement.

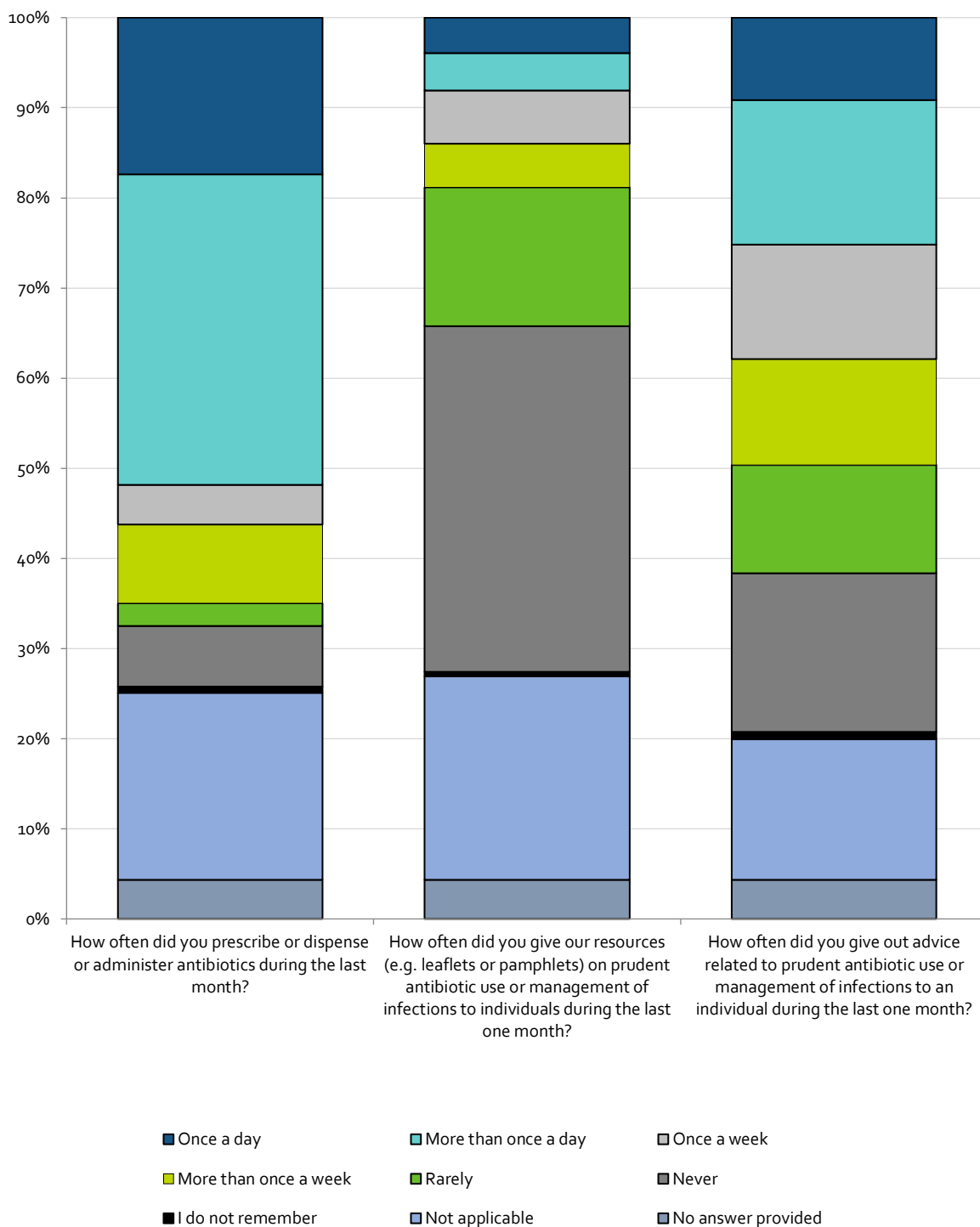


A similarly high number of respondents, namely 78% (N=940), agreed or strongly agreed with the statement touching on the easy access to the materials they need to give advice on prudent antibiotic use and antibiotic resistance. The presence of opportunities to provide advice on prudent antibiotic use to individuals was only identified by 58% (N=708) of respondents that agreed or strongly agreed with the statement, as being existent.

5. Considering the last one month only in your clinical practice, please rate how frequently the statements apply to you. If a question is not applicable then please choose N/A.

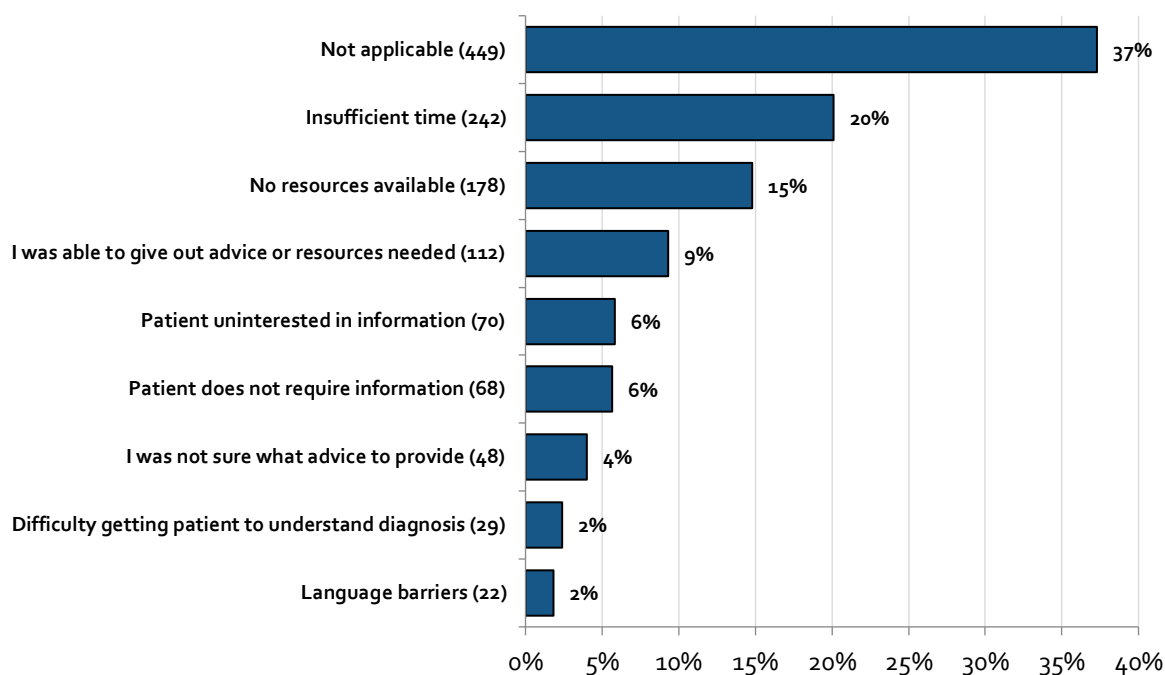
The statements listed in relation to question 5 touched upon the dispensing of antibiotics and the provision of advice which included also the distribution of materials on prudent antibiotic use and the management of infections. Respondents were asked to score these statements in accordance with their application. Answer possibilities included the following scoring: once a day, more than once a day, once a week, more than once a week, rarely and never. In addition, it was also possible for respondents to select the non-applicability of that statement to them or to indicate that they don't

remember. Some respondents (0.4% | N=52) choose not to answer this question. As indicated in the graphic. The responses to question 5 varied.



6. If you were not able to give out advice or resources as frequently as you prescribed OR dispensed OR administered antibiotics, why was this?

37% (N=449) indicated that the question was not applicable to them, while 20% (N=242) identified insufficient time as a cause for not being able to give out advice on the prudent use of antibiotics more frequently when dispensing these products to patients. Lack of resources was mentioned as one of the other main causes by 15% (N=178) of respondents. On the other spectrum, only 112 respondents (9%) were able to provide the advice to patients that they needed to convey to them.



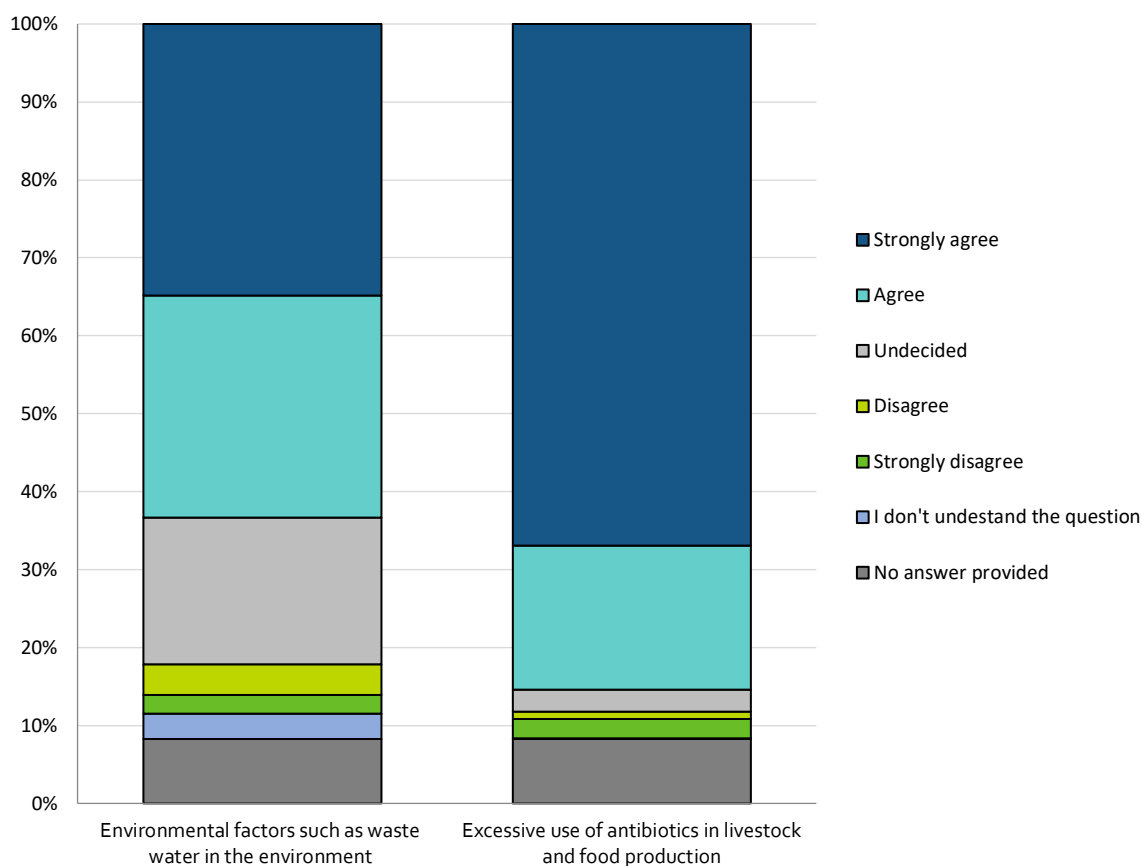
7. To what extent do you agree or disagree that the following environmental and animal health factors are important in contributing to antibiotic resistance in bacteria from humans?

In line with the One Health Approach taken by the Action Plan of the European Commission,⁵ question 7 inquired to what extent hospital pharmacists agree or disagree that environmental and animal health factors are impacting antibiotic resistance in bacteria from humans. In this regard 63% (N=762) of respondents agreed or strongly agreed that environmental factors such as waste water in the environment is a contributing factor. An even higher agreement rate was provided for the second statement asking respondents to comment on the excessive use of antibiotics in livestock and food production, which 85% (N=1028) of respondents identified as a contributing factor. This shows that the environment is increasingly acknowledged as a contributor to the development and spread of antimicrobial resistance by hospital pharmacists. Also EAHP in its position paper⁶ touched on the One Health Approach by acknowledging that the potency and efficacy of antimicrobial agents is

⁵ European Commission, A European One Health Action Plan against Antimicrobial Resistance (AMR), available at: https://ec.europa.eu/health/amr/sites/amr/files/amr_action_plan_2017_en.pdf.

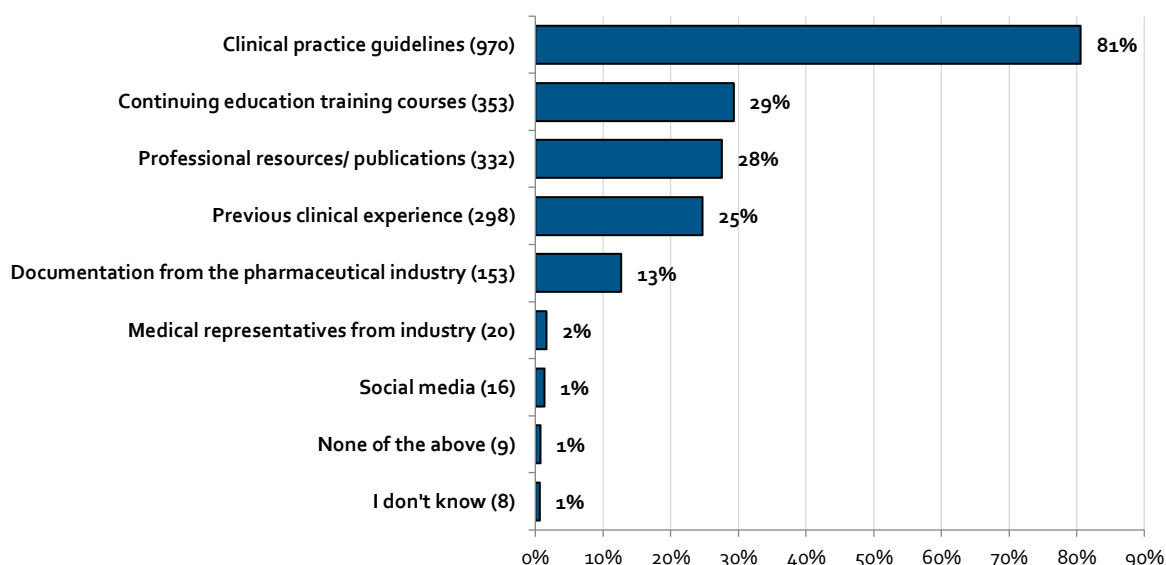
⁶ EAHP Position Paper on Antimicrobial Resistance (AMR), June 2018, available at: https://www.eahp.eu/sites/default/files/eahp_position_paper_on_amr_june_2018_1.pdf.

endangered not only due to inadequate use and overuse of antimicrobials in human and veterinary medicine, but also through intensive livestock farming as well as pharmaceuticals in the environment.



8. In the management of infections, which of these do you use regularly?

Clinical practice guidelines were identified by the large majority of respondents (81% | N=970) as a tool that is used frequently by hospital pharmacists to manage infections.

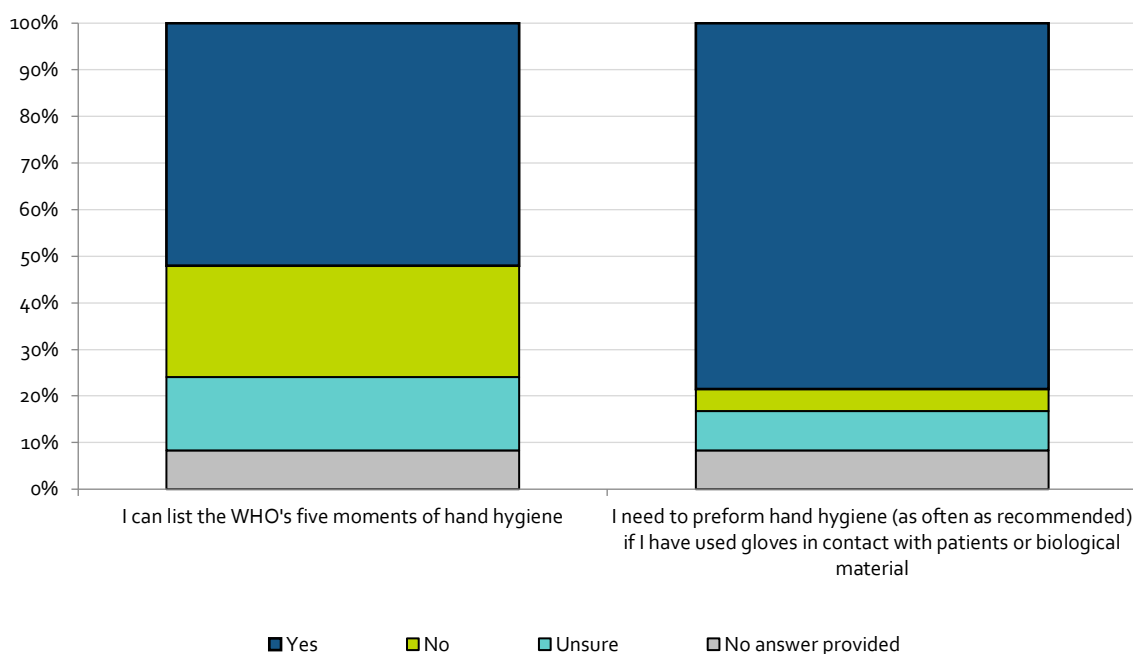


Other options that ranked high included continuing education training courses (29% | N=353), professional resources and publications (28% | N=332) and previous clinical experience (15% | N=298). Social media (1% | N=16) was identified as the least useful tool for the management of infections.

9. Please state "Yes", "No" or "Unsure" in regards to your knowledge on the following statements regarding hand hygiene.

In relation to hand hygiene, which is a useful measure that can help lower resistance rates, survey participants were asked to comment on guidance from the World Health Organisation (WHO) and their own practice. 52% (N=626) of respondents underlined that they are aware of the five moments of hand hygiene of WHO.⁷ This approach defines the key moments for healthcare workers when hand hygiene should be carried out. These include washing hands

- ⇒ before touching a patient,
- ⇒ before clean/aseptic procedures,
- ⇒ after body fluid exposure/risk,
- ⇒ after touching a patient, and
- ⇒ after touching patient surroundings.

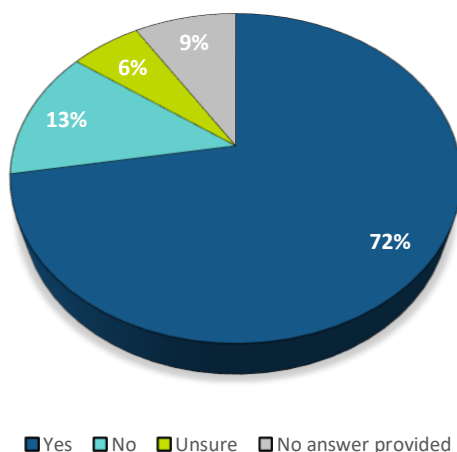


Based on the responses provided in relation to the second statement of question 9 it can be concluded that hand hygiene recommendations are followed since 78% (N=945) stressed that they comply with hand hygiene measures, as often as recommended, if they have used gloves in contact with patients or biological material.

⁷ WHO Guidelines on Hand Hygiene in Health Care, available at: https://apps.who.int/iris/bitstream/handle/10665/44102/9789241597906_eng.pdf;jsessionid=7E807C255A8EE21520160AA0063217B4?sequence=1.

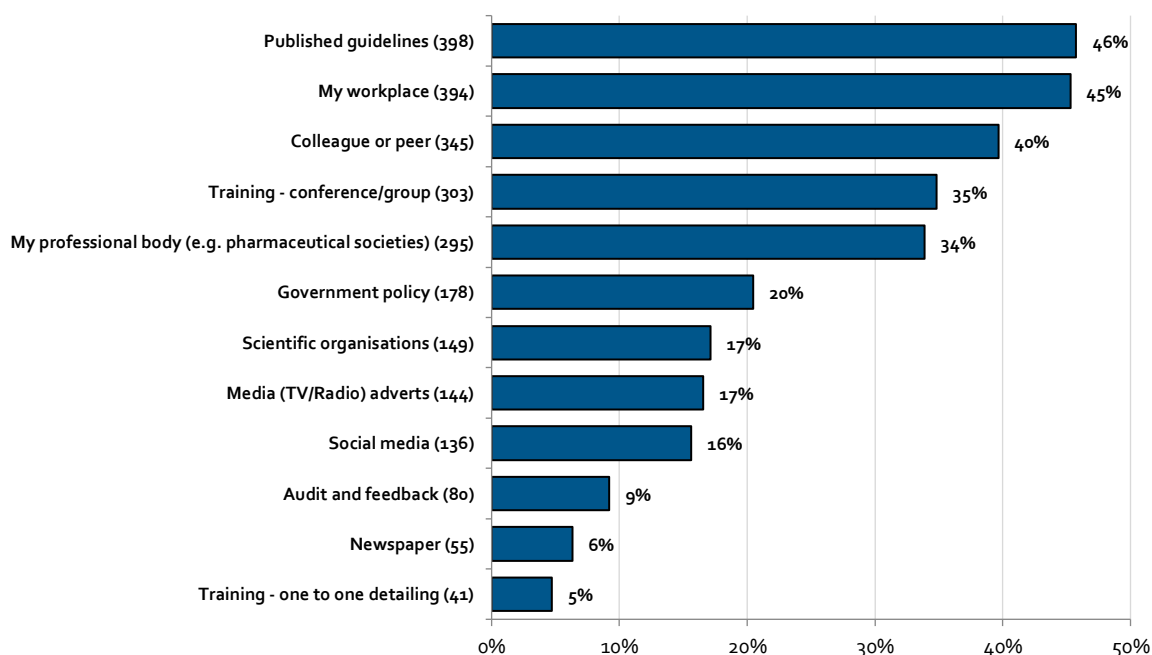
10.1 In the last 12 months, do you remember receiving information about avoiding unnecessary prescribing or administering or dispensing of antibiotics?

72% (N= 870) of respondents pointed out that they have received information detailing how unnecessary dispensing of antibiotics can be avoided, while a quarter of respondents was not sure (1% | N=73), did not receive such information (13% | N=155) or did not comment (1% | N=106).



10.2. If yes, how did you first get this information about avoiding unnecessary prescribing or administering or dispensing of antibiotics?

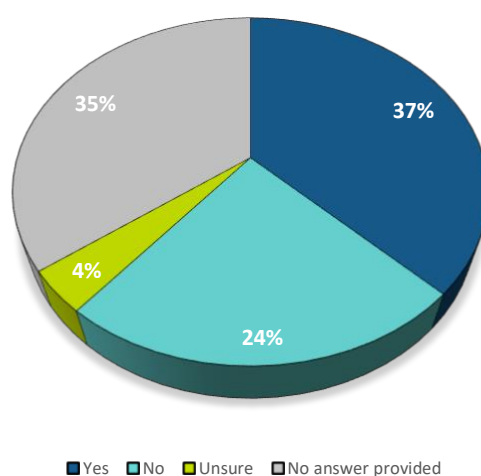
Those hospital pharmacists that respondent positively to question 10, were asked to further detail from whom they received information on the prudent use of antibiotics. Published guidelines (46% | N=398), the workplace (45% | N=394) and colleagues or peers (40% | N=345) were named as the sources that are being used most frequently used to obtain information.



Training in the form of one to one detailing (5% | N=41) and newspaper articles (6% | N=55) were only found useful by a very small group of respondents. Feedback from both scientific organisations (17% | N=149) and professional bodies (34% | N=295) such as for example the chamber of pharmacists or hospital pharmacy organisations ranked in the middle group.

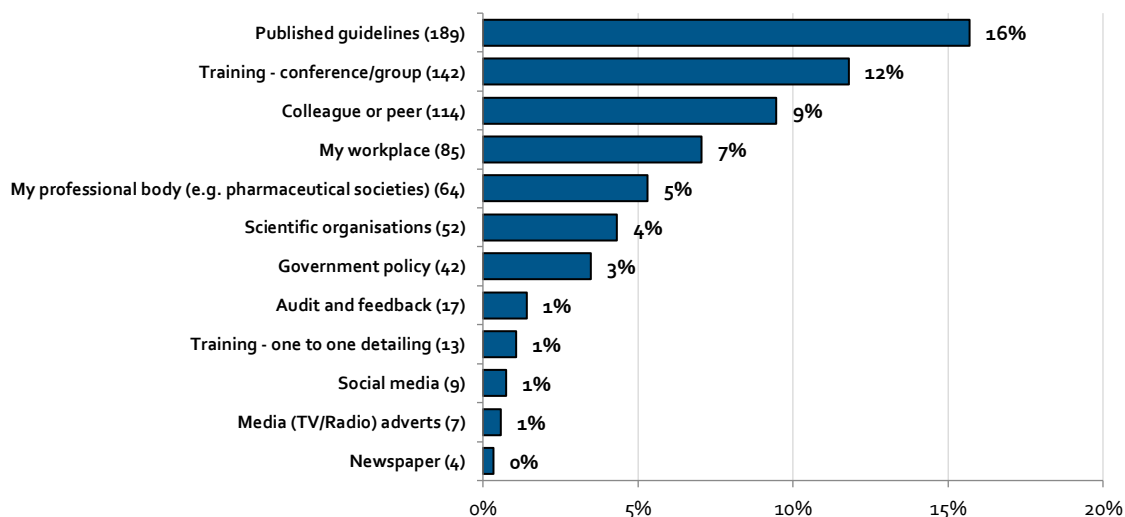
11.1 Did the information contribute to changing your views about avoiding unnecessary prescribing or administering or dispensing of antibiotics?

For 37% (N= 450) of respondents the information that they received on appropriate dispensing of antibiotics changed their views. A similar amount of respondents (35% | N=424) did not provide an answer to this question which shows that more could be done in terms of awareness raising about the prudent use of antibiotics, especially in hospitals.



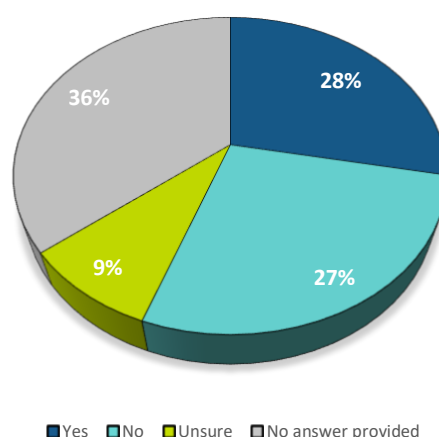
11.2 Which source(s) of information has had the most influence on changing your views?

Concerning the sources of information, 761 respondents chose not to provide feedback. Out of the remaining 443 respondents the majority choose published guidelines (16% | N=189) as their main source of information.



12.1 On the basis of the information you received, have you changed your practice on prescribing or administering or dispensing of antibiotics?

Information on appropriate dispensing has changed the practice for 28% (N=338) of respondents, while a similar amount of survey participants 27% (N=330) did not modify their behaviour after being provided with information on the prudent use of antibiotics.

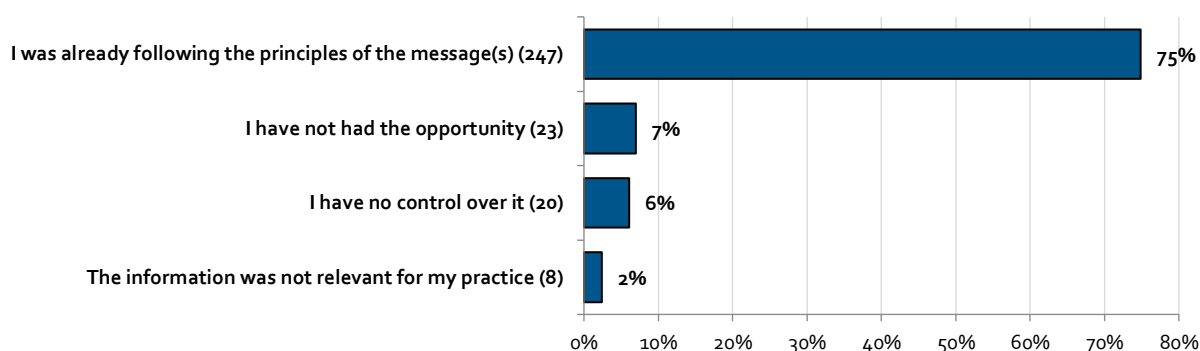


12.2 If yes, please list what has had the most influence on changing your practice.

Those that answered the previous question positively were asked to share further information on the factors that most influenced their decision to modify their practice. The free text responses provided showed that antimicrobial stewardship teams, guidelines – including those published by ECDC – colleagues and training most influenced their change in behaviour.

12.3 If not, why not.

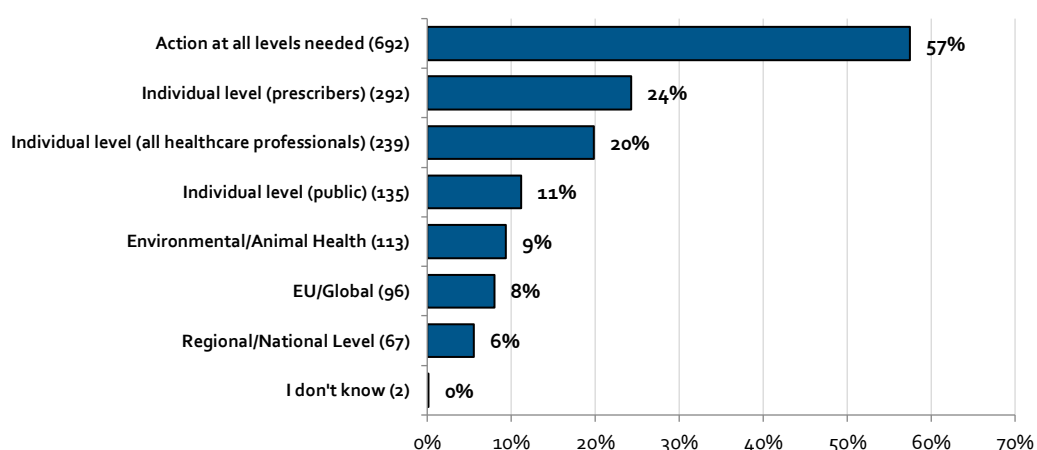
Similarly, also the group that did not change its behaviour (27% of respondents | N=330) was asked to comment on the reasons why such a change did not happen. The large majority of this group (75% | N=147) pointed out that they were already following the principles of the messages on the prudent use and therefore did not see a need to further modify their behaviour. The remaining respondents stressed that the information received was not relevant (2% | N=8) or that they had no opportunity (6% | N=20) or control (7% | N=23) over changing their behaviour.



None of the respondents chose the answer possibilities “I forgot about the message” and “I do not think the message is important”.

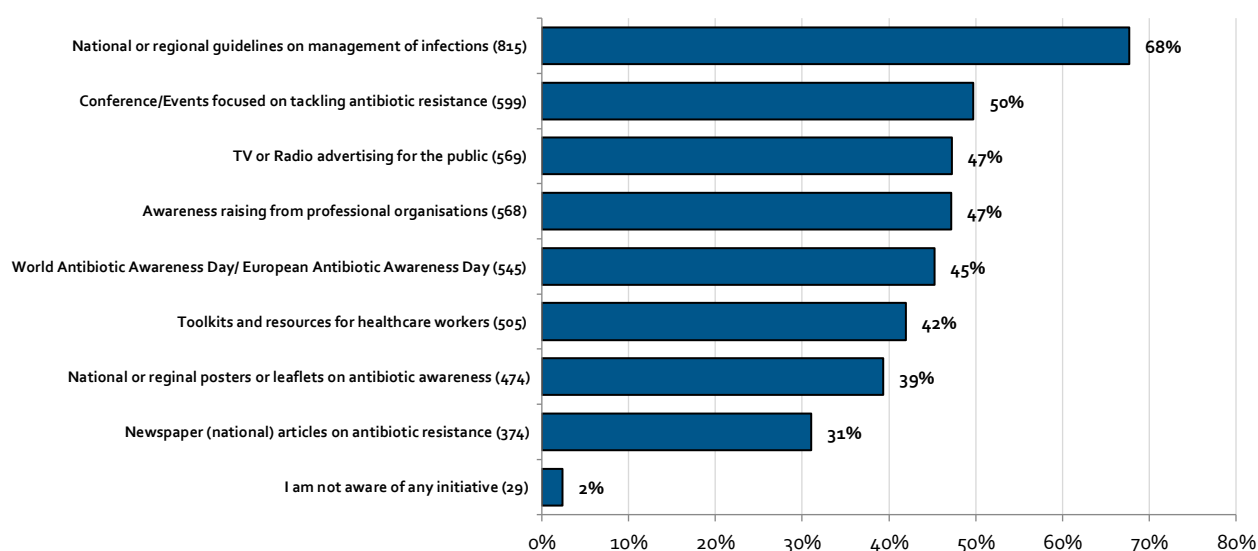
13. At what level do you think it is most effective to tackle resistance to antibiotics?

In relation to the level at which antibiotics should be tackled over half of the respondents (57% | N=692) highlighted that it would be wise to address the issue at global, EU, national, regional and individual level. In addition, this group also agreed that environment and animal health aspects need to be considered. The other half of the respondents focused their response on one single aspect.



14. What initiatives are you aware of in your country which focus on antibiotic awareness and resistance?

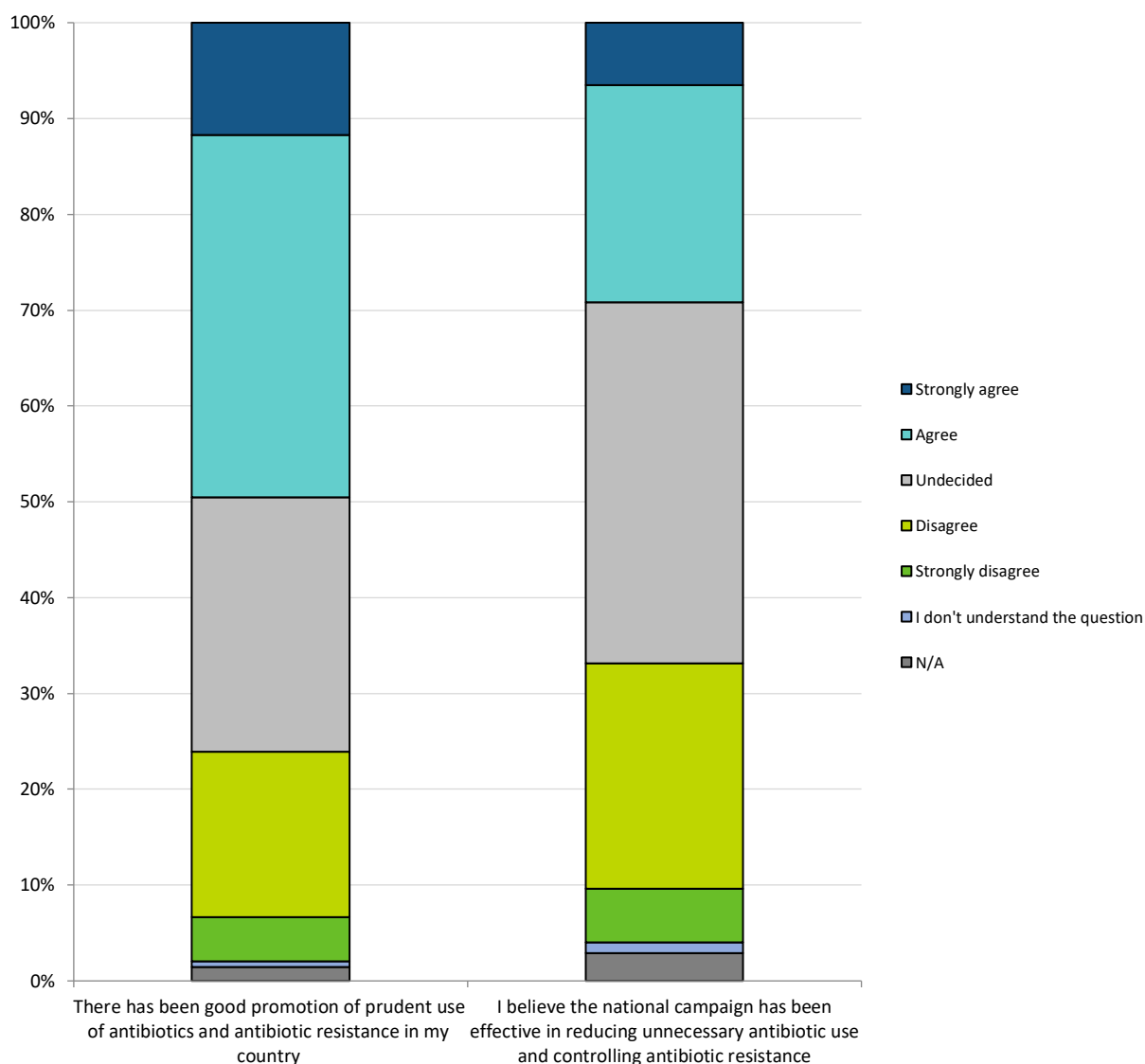
The responses to the awareness about national measures were quite mixed, with a large majority (68% | N=815) however opting for national or regional guidelines on management of infections. Other measures included conferences and events focused on tackling antibiotic resistance (50% | N=599), advertising (47% | N=569) and awareness raising by professional organisations (47% | N=568).



Also the World Antibiotic Awareness Day and the European Antibiotic Awareness Day were mentioned by 47% (N=545) of respondents as a tool that is used in their country to raise awareness about antibiotic resistance.

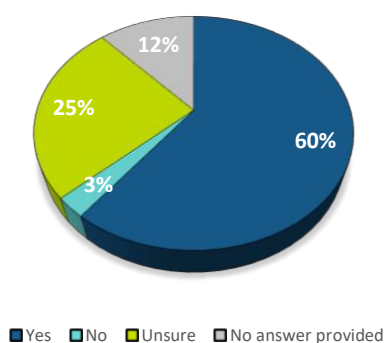
15. To what extent do you agree or disagree with the following statements regarding the national initiatives about prudent use of antibiotics in your country?

46% (N=549) of respondents agreed or strongly agreed that there has been good promotion of prudent use of antibiotics and antibiotic resistance in their country. Another quarter (24% | N=294) could not decide whether to agree or disagree with the statement. Regarding the effectiveness of national campaigns, only 26% (N=310) of respondents agreed or strongly agreed that these have contributed to reducing unnecessary antibiotic use and controlling antibiotic resistance. The same amount of people (26% | N=309) disagreed or strongly disagreed with this statement.



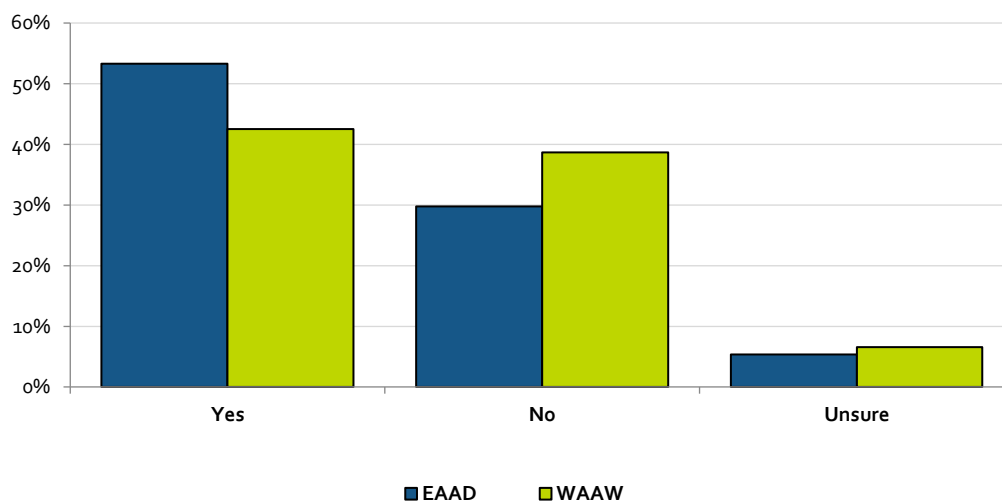
16. Does your country have a national action plan on antimicrobial resistance?

60% (N=727) of respondents remarked that their country has a national action plan in place, while a quarter of respondents (N=303) was unsure about the existence of such a plan. This shows that a good understanding already exists among hospital pharmacists, but at the same time also highlights that further steps can be taken to raise the awareness about national action plan.



17. Have you heard of European Antibiotic Awareness Day (EAAD) or World Antibiotic Awareness Week (WAAW)?

When being asked about the European Antibiotic Awareness Day (EAAD), 53% (N=624) of hospital pharmacists stressed that they have heard about it. A similar rate of positive responses was received for the awareness about the World Antibiotic Awareness Week (WAAW) which was identified by 43% (N=512) of respondents as a known event.

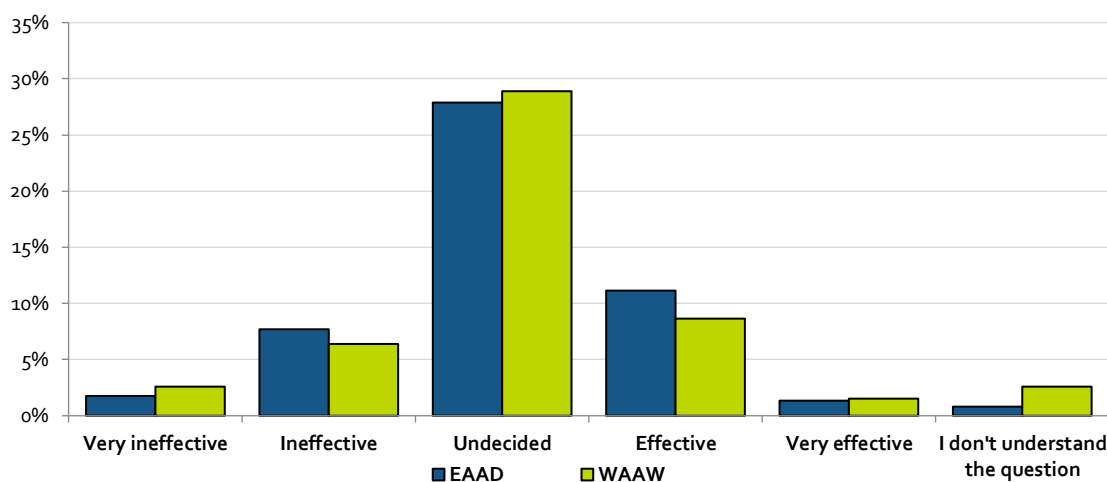


The feedback shared by respondents shows that the effort taken at both national and European level is going into the right direction. Opportunities should however be used throughout the year, to increase the awareness about EAAD and WAAW among survey participants and the hospital pharmacy community at large. EAHP already has measures in place which ensure that the member organisations of the Association are adequately informed about EAAD/WAAW prior to the event. The toolkit that is

being shared with hospital pharmacists, also includes information on how individuals can engage in (social media) campaigns at national level.

18. How effective do you believe EAAD and WAAW have been in raising awareness about prudent use of antibiotics and antibiotic resistance in your country?

In relation to the effectiveness of EAAD and WAAW the main group seemed to be undecided (EAAD 28% | N=336 / WAAW 29% | N=348) about the impact of both events in their country. Only 12% (N=150) of respondents deemed EAAD effective or very effective, while 10% (N=122) of respondents provided the same answer for WAAW.



Overall it can be concluded that the hospital pharmacists that participated in the study on healthcare workers' knowledge and attitudes about antibiotics and antibiotic resistance have a good knowledge about their prudent use. Areas for improvement that were identified included increasing the provision of advice to patients, enhancing the uptake of antibiotic stewardship teams in hospitals and continuing to ensure that the knowledge about resistance and the prudent use of hospital pharmacists remains up to date. The key messages put together by ECDC for hospital pharmacists are a great tool that helps with identifying tasks related to improving antibiotic use.⁸

⁸ European Centre for Disease Prevention and Control, Key messages for hospital pharmacists, available at: <https://antibiotic.ecdc.europa.eu/en/get-informed/key-messages/key-messages-professionals-hospitals-and-other-healthcare-settings/key-7>.

Europe **A**n
ntibiotic
wareness Day



**Data collected by ECDC study on healthcare workers' knowledge and attitudes about antibiotics and antibiotic*