Annex 2. Report by University of Galway

CONSENSUS BUILDING: TOWARDS THE EAAD TOOLKIT FOR HOSPITAL PRESCRIBERS

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Introduction

As part of the activities organised for the European Antibiotic Awareness Day (EAAD), the European Centre for Disease Prevention and Control (ECDC), is developing a toolkit of template materials to national health authorities to adapt and use as part of national campaigns on appropriate antibiotic use. The toolkit includes key messages and template educational materials promoting prudent antibiotic use with the primary target audience of hospital prescribers. Endeavours to assist intervention planners to understand, shape and develop effective communication strategies and tactics come under the rubric of formative evaluation (Coffman, 2002; Freimuth *et al.,* 2001). Formative evaluation of the toolkit has been undertaken through research with stakeholder groups with the aim of developing consensus on toolkit components. This formative evaluation comprised of two stages: a questionnaire survey (Burson Marsteller, 2010) followed by a consensus building exercise. This report is focused on the consensus building exercise and is divided into sections. The first presents the methods used with reference to the initial survey to provide context. The second section provides the results of the consensus exercise and finally, implications of the results for toolkit development are provided.

Methods

Questionnaire Survey

In cooperation with the Technical Advisory Committee for EAAD, the ECDC developed a proposal for the toolkit which was presented to various groups for feedback. These groups included: National Antimicrobial Resistance Focal Points/National Competent Bodies for Communication, relevant European Union level stakeholder groups and participants at the European Society of Clinical Microbiology and Infectious Diseases (ESCMID) post-graduate course on antibiotic stewardship. The feedback was gathered through a survey on toolkit components, with participants provided with the opportunity to make suggestions for the toolkits further development. For example, suggestions for additional messages were made. The data was analysed and results presented by Burson Marsteller (2010).

Consensus Exercise

Based on the data and analysis of the first survey, an online consensus building exercise was undertaken through a second survey, the design drawing on the Delphi technique using a panel of participants (Linstone & Turoff, 2002). The sample consisted of 30 participants from the ESCMID post-graduate course on antibiotic stewardship who had previously indicated that they would be willing to contribute to the ongoing toolkit developments. The participants were sent links embedded in email invitations, to an online survey created on the software Surveymonkey (www.surveymonkey.com). The survey consisted of 20 closed ended questions in a rating scale format. Participants were asked to rank their responses and suggestions from the first survey in order of importance. The consensus of each response was calculated using the median (found by arranging the values in order and then selecting the one in the middle). Where the responses had the same median after ranking, the consensus level was calculated to determine which was placed in the higher ranking order. Those with a higher degree of consensus were placed more highly (See Appendix 1).

The questions in the survey were categorised as follows:

a. Target groups
b. Key messages
c. Campaign slogans
d. Information materials
e. Visuals to help deliver the key messages
f. Best approach to communicate with specific target groups

This provides the framework for the summary of the results in the next section.

Results

Of the 30 participants sent the survey 24 replied resulting in a response rate of 80%. The results of the consensus exercise are presented in tables with each table including the 3-4 highest ranked proposed toolkit components followed by suggestions made by participants in the first survey. (All ranked components are reported in Appendix 2). The components and the suggestions are presented in rank order of the highest levels of agreement of importance.

a. Target groups

Table 1: Target groups

Rank	Target groups from toolkit
1	Hospital prescribers (e.g. doctors or nurses where applicable)
2	Hospital management
3	Hospital pharmaceutical committees/antibiotic stewardship committees
4	Hospital pharmacists
	Suggested in Survey 1
1	Clinical directors
2	Microbiologists
3	Infection control unit / infection control and antibiotic committee

b. Key Messages

Table 2: Overall key messages

Rank	Key messages from toolkit
1	The selection and spread of resistant bacteria in hospitals is a major patient safety issue
2	Infections with antibiotic resistant bacteria are known to increase morbidity and mortality, as well as the length of stay in hospitals.
3	Misuse of antibiotics is driving the development of resistance.
	Suggested in Survey 1
1	Early antibiotic therapy can be life-saving in severe infections, but only if: (i) Clinically indicated (ii) An appropriate antibiotic is chosen for the given infection (iii) The dose, duration and route of administration are correct
2	Record the need for antibiotics in the patient notes: (i) On day 2/3 switching from IV to oral antibiotic treatment (ii) Note a stop date for antibiotics (iii) Only day of antibiotic prophylaxis (except in cases of severe blood loss and after long operations)
3	Prudent use of antibiotics may help to reduce the cost of treatment and increase the quality of therapy

The participants were asked to rank key messages for the specific target groups in order of importance. The top 3 key messages in order of preference for each target group are:

Table 3: Key messages for specific target groups

Rank	Messages for hospital prescribers (e.g. doctors or nurses)
1	The selection and spread of resistant bacteria in hospitals is a major patient safety issue
2	Infections with antibiotic resistant bacteria are known to increase morbidity and mortality, as well as the length of stay in hospitals
3	Inappropriate prescribing' can include: (i) unnecessary prescription of antibiotics, (ii) inappropriate use of broad spectrum antibiotics, (iii) wrong selection of empiric antibiotics, (iv) lengthy durations of treatment
	Messages for hospital management
1	The selection and spread of resistant bacteria in hospitals is a major patient safety issue
2	Infections with antibiotic resistant bacteria are known to increase morbidity and mortality, as well as the length of stay in hospitals
3	Implementation of structured antimicrobial stewardship plans are proven to improve prudent use of antibiotics
	Messages for hospital pharmaceutical committees/antibiotic stewardship committees
1	The selection and spread of resistant bacteria in hospitals is a major patient safety issue
2	Implementation of structured antimicrobial stewardship plans are proven to improve prudent use of antibiotics
3	Local surveillance and microbiological data should inform hospital guidance and empirical antibiotic treatment
	Messages for hospital pharmacists
1	Implementation of structured antimicrobial stewardship plans are proven to improve prudent use of antibiotics

2	The selection and spread of resistant bacteria in hospitals is a major patient safety issue
3	Infections with antibiotic resistant bacteria are known to increase morbidity and mortality, as well as the length of stay in hospitals

c. Campaign Slogans

The participants were asked to rank 10 campaign slogans with sub-headers in the order of importance, and 13 additional slogans suggested in the initial feedback. The top 3 are:

Table 3: Overall campaign slogans

Rank	Campaign slogans from toolkit
1	Target antibiotic therapy: Take cultures before starting antibiotic therapy!
2	I love antibiotic prophylaxis: For less than 24 hours
3	Antibiotics - handle with care: Misuse of antibiotics leads to antibiotic resistance
	Suggested in Survey 1
1	Antibiotics : Reassess and De-escalate
2	Antibiotics: ask questions first, then shoot!
3	Antibiotics: think before you act

The participants were asked to rank campaign slogans for the specific target groups in order of importance. The top 3 slogans in order of preference for each target group are:

Table 4: Campaign slogans for specific target groups

Rank	Campaign slogans for hospital prescribers (e.g. doctors or nurses)
1	Target antibiotic therapy: Take cultures before starting antibiotic therapy!
2	Target antibiotic therapy: Check laboratory tests and target antibiotic therapy
3	Take that sample: Take cultures before starting antibiotic therapy!
	Campaign slogans for hospital management
1	Antibiotics: handle with care: Misuse of antibiotics leads to antibiotic resistance
2	Antibiotics: handle with care: Prudent use of antibiotics keeps them working
3	Keep antibiotics working: Prudent use of antibiotics keeps them working
	Campaign slogans for hospital pharmaceutical committees/antibiotic stewardship committees
1	Keep antibiotics working: Prudent use of antibiotics keeps them working
2	Antibiotics - reassess and target: Review and reassess antibiotic therapy!
3	Antibiotics: handle with care: Prudent use of antibiotics keeps them working
	Campaign slogans for hospital pharmacists
1	Keep antibiotics working: Prudent use of antibiotics keeps them working
2	Antibiotics: handle with care: Prudent use of antibiotics keeps them working
3	I love antibiotic prophylaxis: For less than 24 hours

d. Information materials

The participants were asked to rank 8 types of information materials in the order of importance, and 10 additional materials suggested in the initial feedback. The top 3 are:

Table 4: Overall Information materials

Rank	Information materials from toolkit
1	Factsheet
2	Presentation
3	Poster (Comment: would be good to see 4-5 key messages on the posters)
	Suggested in Survey 1
1	Audit materials; a point prevalence study on EAAD
2	Scientific newsletter, scientific film (DVD, CD-Roms) with scientific facts
3	"Viral" web clip (e.g. for hospital intranet, similar to "light bulb" TV ad)

The participants were asked to rank information materials for the specific target groups in order of importance. The top 3 information materials in order of preference for each target group are:

Table 5: Information materials for specific target groups

Rank	Information materials for hospital prescribers (e.g. doctors or nurses)
1	Pocket-sized checklist
2	Presentation
3	Factsheet
	Information materials for hospital management
1	Factsheet
2	Presentation
3	Letter
	Information materials for hospital pharmaceutical committees/antibiotic stewardship committees
1	Presentation
2	Factsheet
3	Brochure
	Information materials for hospital pharmacists
1	Factsheet
2	Presentation
3	Poster

e. *Visuals to help deliver the key messages*

The participants were asked to rank 6 types of visuals in the order of importance, and 10 additional visuals suggested in the initial feedback. The top 3 are:

Table 5: Visuals

Rank	Visuals from toolkit
1	Hedgehog putting on surgical gloves (Comment: it looks like an unpleasant examination is about to occur)
2	Hedgehog holding chart [wearing white coat] (Comment: White coats are no longer used in UK hospitals and it has long sleeves)
3	Hedgehog holding chart [wearing scrubs]
	Suggested in Survey 1
1	Hedgehog throwing tablets / syringes out of the window shouting out: "Good luck, Antibiotics! I'll call you when I need you!"
2	Hedgehog in a plane throwing tablets / syringes out of the window shouting out: "Only when needed! Not this time! Keep you power, Antibiotics!"
3	Hedgehog on medicine bag

f. *Approaches to communicate with target groups*

The participants were asked to recommend specific approaches to communicate the toolkit to the specific target groups in an open ended question in the initial feedback form. These approaches were collated in the survey questionnaire and the participants were asked to rank them in order of importance. The top 3 approaches in order of preference for each target group are:

Table 6: Best approach to communicate with specific target groups

Rank	Approaches for hospital prescribers (e.g. doctors or nurses)
1	Direct communication; education; feedback on own use benchmarked to that of others
2	Educative meetings aimed at producing initiatives for the hospital managers, organized by the MOH (twice per year)
3	Individual, small group meetings
	Approaches for hospital management
1	Via national health authorities
2	Directives from the General Directorate of Health and the national statutory health insurance administration
3	Official information by health authorities on AMR (letters, meetings, visits with discussions on AMR)
	Approaches for hospital pharmaceutical committees & antibiotic stewardship committees
1	Meetings
2	Trainings, symposia/lectures
3	Conferences
	Approaches for hospital pharmacists
1	Participation in the antibiotic stewardship committees
2	Meetings, direct contact

3	Updated information by leaflets, posters, presentations, letters, also by e-mails and websites

Implications for the Toolkit

Target groups

Not surprisingly there is consistent identification of hospital prescribers as the primary target group for the toolkit. In terms of suggested additional targets these are likely to be included in the groupings already identified. For example, clinical directors are likely to fall within the group hospital management so expanding the target list based on the surveys would have minimal benefit.

Key messages

The message *The selection and spread of resistant bacteria in hospitals is a major patient safety issue* identified as a key message overall is also in the top 3 for each target group. Similarly the message, *Infections with antibiotic resistant bacteria are known to increase mortality and morbidity as well as length of stay in hospitals*, is identified as a key message overall and in relation to 3 of the 4 target groups.

Target specific messages identified appear appropriate to the specific target group. For example the message *Inappropriate prescribing can include: (i) unnecessary prescription of antibiotics, (ii) inappropriate use of broad spectrum antibiotics, (iii) wrong selection of empiric antibiotics, (iv) lengthy durations of treatment* is identified for hospital prescribers only and appears fitting for this group. This is similar for the other target groups. It may be worth considering having generic messages for the toolkit as well as specific messages disseminated via the appropriate channels for specific target groups.

Campaign slogans

While there is general agreement in the selection of overall slogans and targeted slogans there is not the consistency across these as seen with the key messages.

Information materials

As with the pattern of key messages, agreement on factsheets and presentations as channels for information overall is identified and also for each of the target groups. Consider having messages identified as generic disseminated on generic channels and target specific messages delivered via targeted channels.

Visuals to help deliver the key messages

Comments from participants in the first survey were included in the consensus building exercise in relation to specific visuals. The visual that was consistently ranked highest included a negative comment which did not appear to deter overall agreement. The second ranked visual included a comment that is specific to one country and this suggests that the toolkit should include a range of visuals that users can choose from to facilitate toolkit components that are culturally appropriate.

Best approach to communicate with specific target groups

These approaches were identified by participants in the first survey and while agreement can be seen through them the approaches are not necessarily mutually exclusive. However, a common theme is communication at various levels including: intrapersonal, interpersonal, intragroup, intergroup and institutional/organisational (McQuail, 2000). These levels of communication may provide a framework through which to develop approaches for specific target groups.

References

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Appendix 1

Consensus level was determined by using the following formula for the semi-interquartile range:

(Q3-Q1)/2

The resulting value was graded as:

0 – 1	=	High level of consensus/agreement
1.1 – 2.0	=	Medium level of consensus/agreement
2.1+	=	Low level of consensus/agreement

For the responses that had the same median after ranking, the consensus level was used to determine which was placed in the higher ranking order. Those with a higher degree of consensus were placed more highly. The final stage of the consensus building on the toolkit comprised of a manual qualitative synthesis of the data. In this stage

Appendix 2

EAAD Toolkit 2010 Survey Analysis

Target Groups (4)	Rank	Median Rank	Consensus Value Q3-Q1/2	Consensus Level
Hospital prescribers (e.g. doctors or nurses where applicable)	1	1	0.25	High
Hospital management	2	2	1	High
Hospital pharmaceutical committees/antibiotic stewardship committees	3	2	1	High
Hospital pharmacists	4	3	0.5	High
Additional (8)				
Clinical directors	1	2	1.5	Medium
Microbiologists	2	2	2.25	Low
Infection control unit / infection control and antibiotic committee	3	3	2.25	Low
Universities / Undergraduate medical, nursing and pharmacy education programmes	4	4	1.25	Medium
Ministry of Health	5	4	2.25	Low
Hospital epidemiologist	6	5	1.75	Medium
Patients and relatives	7	5	2	Medium
Health insurance	8	6	1.25	Medium

Messages (10)	Rank	Median Rank	Consensus Value Q3-Q1/2	Consensus Level
The selection and spread of resistant bacteria in hospitals is a major patient safety issue	1	1	1.5	Medium
Infections with antibiotic resistant bacteria are known to increase morbidity and mortality, as well as the length of stay in hospitals.	2	2	0.5	High
Misuse of antibiotics is driving the development of resistance.	3	3	3.5	Low
Inappropriate prescribing' can include: i. unnecessary prescription of antibiotics, ii. inappropriate use of broad spectrum antibiotics, iii. wrong selection of empiric antibiotics, iv. lengthy durations of treatment	4	4	1.5	Medium
There will be no effective antibiotics for treatment if resistance in bacteria continues to grow, as the current pipeline for new antibiotics is limited.	5	4	3	Low
Misuse of antibiotics may cause patients to become increasingly colonised or infected with resistant bacteria, examples of which are MRSA, Vancomycin resistant bacteria and multi resistant E. coli.	6	5	1.75	Medium
Implementation of structured antimicrobial stewardship plans are proven to improve prudent use of antibiotics.	7	5	2	Medium
Regular assessment of patients, feedback and microbiological data should guide possible changes of antibiotic therapy.	8	6	2	Medium
Rising levels of antibiotic resistance could be curbed by targeted antibiotic therapy in hospitals.	9	7	2.25	Low
Local surveillance and microbiological data should inform hospital guidance and empirical antibiotic treatment.	10	7	2.5	Low
Additional (9)				
Early antibiotic therapy can be life-saving in severe infections, but only if: (i) Clinically indicated (ii) An appropriate antibiotic is chosen for the given infection (iii) The dose, duration and route of administration are correct	1	2	1	High
Record the need for antibiotics in the patient notes: (i) On day 2/3 switching from IV to oral antibiotic treatment (ii) Note a stop date for antibiotics (iii) Only day of antibiotic prophylaxis (except in cases of severe blood loss and after long operations)	2	2	1.5	Medium
Prudent use of antibiotics may help to reduce the cost of treatment and increase the quality of therapy	3	3	1.75	Medium
Infection control is key	4	4	2.25	Low
Antibiotics aren't automatic	5	4	3	Low
Antibiotics are one of the commonest causes of adverse drug reactions in hospitals.	6	5	1.75	Medium
Strict adherence to infection control, especially standard precautions and contact isolation is needed to stop the spread of resistant bacteria and contain antibiotic resistance	7	5	2.5	Low
Learn - train yourself continuously!	8	7	2.25	Low
Regulation / restriction of antimicrobial promotion by pharma companies in hospitals	9	7	2.5	Low

Campaign Slogans (10)	Rank	Median Rank	Consensus Value Q3-Q1/2	Consensus Level
Target antibiotic therapy: Take cultures before starting antibiotic therapy!	1	2	1.5	Medium
I love antibiotic prophylaxis: For less than 24 hours	2	2	1.5	Medium
Antibiotics - handle with care: Misuse of antibiotics leads to antibiotic resistance	3	3	1.5	Medium
Keep antibiotics working: Prudent use of antibiotics keeps them working	4	3	2	Medium
Antibiotics - handle with care: Prudent use of antibiotics keeps them working	5	4	2.5	Low
Keep antibiotics working: Prudent antibiotic prescribing - asses, re-check, act!	6	4	2.75	Low
Target antibiotic therapy: Check laboratory tests and target antibiotic therapy	7	5	2.87	Low
Antibiotics - reassess and target: Prudent antibiotic prescribing - asses, re-check, act!	8	6	2.5	Low
Take that sample: Take cultures before starting antibiotic therapy!	9	6	2.75	Low
Antibiotics - reassess and target: Review and reassess antibiotic therapy!	10	6	2.75	Low
Additional (13)				
Antibiotics : Reassess and De-escalate	1	2	1.5	Medium
Antibiotics: ask questions first, then shoot!	2	2	2	Medium
Antibiotics: think before you act	3	3	1.25	Medium
Use the right drug for the right bug	4	3	1.75	Medium
Protect antibiotics	5	4	3.25	Low
Antibiotics: think twice before use	6	5	2.75	Low
You can keep antibiotics effective!	7	5	3.25	Low
Antibiotics are life saving drugs. Do not waste them - keep their effectiveness for life threatening situations	8	6	3.25	Low
Clear target → Right action →Victory	9	7	3.5	Low
Get RID of inappropriate antibiotic prescribing	10	8	2.75	Low
Make antibiotics your allies not enemies!	11	8	3.5	Low
Laboratory tests before prescription imply success!	12	9	3	Low
Antibiotic are of equal responsibility!	13	10	3.5	Low

Information Materials (8)	Rank	Median Rank	Consensus Value Q3-Q1/2	Consensus Level
Factsheet	1	1	0.75	High
Presentation	2	2	1	High
Poster (Comment: would be good to see 4-5 key messages on the posters)	3	2	1	High
Gimmick e.g. stress ball, mug, paper clip container with key messages (Comment: it was felt that often most gimmicks cannot be used in a ward environment and are therefore not helpful)	4	4	1.75	Medium
Leaflet (Comment: would prefer the 4-5 key messages suggested for the leaflet to appear on a poster instead)	5	4	2	Medium
Pocket-sized checklist (Comment: we felt this would be too country specific to be of generic use)	6	4	2	Medium
Brochure	7	5	2.5	Low
Letter	8	6	2.75	Low
Additional (10)				
Audit materials; a point prevalence study on EAAD	1	1	1.25	Medium
Scientific newsletter, scientific film (DVD, CD-Roms) with scientific facts	2	2	1.5	Medium
"Viral" web clip (e.g. for hospital intranet, similar to "light bulb" TV ad)	3	3	2.75	Low
Screensavers that could be installed on hospital computers.	4	3	2.25	Low
Drink coasters; pens; post-it notes	5	4	2.25	Low
Scientific article at the level of hospital prescribers	6	4	2.25	Low
Local materials (societies, authorities) with the ECDC general logo	7	4	2.5	Low
Social media (facebook, twitter, RSS, etc)	8	4	3	Low
Logo, tea cups, stickers	9	5	3.25	Low
Video post	10	6	3.75	Low

Visuals (6)	Rank	Median Rank	Consensus Value Q3-Q1/2	Consensus Level
Hedgehog putting on surgical gloves (Comment: it looks like an unpleasant examination is about to occur)	1	1	0.75	High
Hedgehog holding chart [wearing white coat] (Comment: White coats are no longer used in UK hospitals and it has long sleeves)	2	2	1	High
Hedgehog holding chart [wearing scrubs]	3	3	1	High
Hedgehog in bed (without monitor)	4	3	2	Medium
Hedgehog holding syringe (Comment: Inappropriate as not often used in UK hospitals to deliver antibiotic treatment)	5	4	1.5	Medium
Hedgehog in bed [with monitor] (Difficult to see that this was a monitor)	6	4	1.75	Medium
Additional (9)				
Hedgehog throwing tablets / syringes out of the window shouting out: "Good luck, Antibiotics! I'll call you when I need you!"	1	2	1.5	Medium
Hedgehog in a plane throwing tablets / syringes out of the window shouting out: "Only when needed! Not this time! Keep you power, Antibiotics!"".	2	2	1.75	Medium
Hedgehog on medicine bag	3	3	1.75	Medium
Hedgehog on prescription	4	3	1.75	Medium
Tablets begging the hedgehog on their knees: "Please protect us! We want to stay effective for you!"	5	3	2.75	Low
Hedgehog throwing tablets / syringes out of the window shouting out: "Good bye antibiotics! Welcome common sense!"	6	4	2.5	Low
Hedgehog kicking away tablets shouting out: "Infection? Better and healthier without antibiotics!"	7	5	2.75	Low
Hedgehog in a plane throwing tablets / syringes out of the window shouting out: "A better way to Health!"	8	6	1.75	Medium
Hedgehog returning tablets to the pharmacy shouting out: "Better and healthier without antibiotics!"	9	6	2.5	Low

Approaches / Hospital prescribers (15)	Rank	Median Rank	Consensus Value Q3-Q1/2	Consensus Level
Direct communication; education; feedback on own use benchmarked to that of others	1	1	0.5	High
Educative meetings aimed at producing initiatives for the hospital managers, organized by the MOH (twice per year)	2	2	3.5	Low
Individual, small group meetings	3	3	2.75	Low
Through antibiotic Committees and Scientific Societies	4	3	3.25	Low
Via clinical directors or medical board/senior clinicians (i.e. opinion leaders) at individual hospital level, or via professional societies and postgraduate institutes at national level	5	4	2.25	Low
Workshop with few participants	6	4	3.25	Low
PowerPoint presentation, adapted from ECDC's, with international, national, and local data on antimicrobial resistance in addition to others approaches like the brochure or the factsheet	7	4	3.75	Low
Tools which can be used very easily and very quickly, like pocket-sized checklists.	8	4	4.5	Low
Recommendations from the General Directorate of Health, guidelines through the hospital medical management	9	5	3.25	Low
Presentations by microbiologists and epidemiologists. Factsheet, brochure sent by post	10	5	3.25	Low
Organise meetings on AMR, perhaps visits to hospital prescribers like the visits of pharma reps promoting drugs, but on the subject of AMR and good antibiotic prescribing practices	11	5	4.75	Low
Conference, workshop, meeting, social media	12	7	4.25	Low
Information on scientific facts and cost-effectiveness of prudent approach	13	9	5.5	Low
Hospital intranets. General hospital meetings. Lists of professional societies in general	14	11	4.75	Low
Stand with a banner/posters within the hospital	15	11	4.75	Low
Approaches / Hospital management (8)				
Via national health authorities	1	1	1.25	Medium
Directives from the General Directorate of Health and the national statutory health insurance administration	2	2	1	High
Official information by health authorities on AMR (letters, meetings, visits with discussions on AMR)	3	3	1.25	Medium
Emails, letters and fact-sheets	4	3	3.25	Low
Monthly update on budget for antibiotic use, cost/effectiveness analysis	5	4	1.25	Medium
Power point presentation, adapted from the ECDC's , with international, national, and local data on AMR	6	5	2.25	Low
Advanced studies	7	5	3	Low
Committee meetings	8	5	3	Low
Approach / Hospital pharmaceutical committees & antibiotic stewardship committees (10)				
Meetings	1	2	1	High
Trainings, symposia/lectures	2	2	2.5	Low
Conferences	3	3	2.25	Low
Directives from the general Directorate of health and the national statutory health insurance administration and trainings , information on evidence based studies	4	3	3	Low
PowerPoint presentation, adapted from the ECDC's, with international, national, and local data on antimicrobial resistance in addition with others approaches as the brochure or the factsheet	5	3	3.25	Low
Via medical boards or hospital managers	6	4	2.5	Low
Brief pieces of scientific information	7	4	3	Low
Through teams	8	5	2.25	Low
Letters and factsheet	9	5	3	Low
Via inter-sectoral mechanism	10	7	3.5	Low
Approach / Hospital pharmacists (9)				
Participation in the antibiotic stewardship committees	1	2	0.75	High
Meetings, direct contact	2	2	1	High
Updated information by leaflets, posters, presentations, letters, also by e-mails and websites	3	3	1.5	Medium
Via hospital managers, or via professional organisations / scientific societies	4	4	2	Medium
Trainings on scientific information with visual aids	5	4	2	Medium
Power point presentation adapted from the ECDC's with international, national, and local data on antimicrobial resistance, in addition with others approaches as the brochure or the factsheet	6	4	2.5	Low
Meetings for hospital pharmacist organised by the Ministry of Health	7	5	2.5	Low
Legislation	8	7	3.75	Low
Social media	9	8	2	Medium

Messages / target groups (10)	Rank	Median Rank	Consensus Value Q3-Q1/2	Consensus Level
Hospital prescribers (e.g. doctors or nurses)				
The selection and spread of resistant bacteria in hospitals is a major patient safety issue	1	1	2.25	Low
Infections with antibiotic resistant bacteria are known to increase morbidity and mortality, as well as the length of stay in hospitals.	2	2	1.25	Medium
Inappropriate prescribing' can include: (i) unnecessary prescription of antibiotics, (ii) inappropriate use of broad spectrum antibiotics, (iii) wrong selection of empiric antibiotics, (iv) lengthy durations of treatment	3	2	1.75	Medium
Regular assessment of patients, feedback and microbiological data should guide possible changes of antibiotic therapy.	4	2	2.25	Low
Implementation of structured antimicrobial stewardship plans are proven to improve prudent use of antibiotics.	5	3	3	Low
Misuse of antibiotics may cause patients to become increasingly colonised or infected with resistant bacteria, examples of which are MRSA, Vancomycin resistant bacteria and multi resistant E. coli.	6	3	3	Low
There will be no effective antibiotics for treatment if resistance in bacteria continues to grow, as the current pipeline for new antibiotics is limited.	7	3	3.75	Low
Misuse of antibiotics is driving the development of resistance.	8	3	3.75	Low
Rising levels of antibiotic resistance could be curbed by targeted antibiotic therapy in hospitals.	9	3	4	Low
Local surveillance and microbiological data should inform hospital guidance and empirical antibiotic treatment.	10	4	2.25	Low
Hospital management				
The selection and spread of resistant bacteria in hospitals is a major patient safety issue	1	1	1.25	Medium
Infections with antibiotic resistant bacteria are known to increase morbidity and mortality, as well as the length of stay in hospitals.	2	1	1.75	Medium
Implementation of structured antimicrobial stewardship plans are proven to improve prudent use of antibiotics.	3	2	0.75	High
Misuse of antibiotics may cause patients to become increasingly colonised or infected with resistant bacteria, examples of which are MRSA, Vancomycin resistant bacteria and multi resistant E. coli.	4	3	2.75	Low
Rising levels of antibiotic resistance could be curbed by targeted antibiotic therapy in hospitals.	5	3	3	Low
Local surveillance and microbiological data should inform hospital guidance and empirical antibiotic treatment.	6	4	3	Low
There will be no effective antibiotics for treatment if resistance in bacteria continues to grow, as the current pipeline for new antibiotics is limited.	7	4	3.25	Low
Misuse of antibiotics is driving the development of resistance.	8	4	3.25	Low
Inappropriate prescribing' can include: (i) unnecessary prescription of antibiotics, (ii) inappropriate use of broad spectrum antibiotics, (iii) wrong selection of empiric antibiotics, (iv) lengthy durations of treatment	9	5	4	Low
Regular assessment of patients, feedback and microbiological data should guide possible changes of antibiotic therapy.	10	6	3	Low
Hospital pharmaceutical committees/antibiotic stewardship committees				
The selection and spread of resistant bacteria in hospitals is a major patient safety issue	1	1	1.5	Medium
Implementation of structured antimicrobial stewardship plans are proven to improve prudent use of antibiotics.	2	1	1.5	Medium
Local surveillance and microbiological data should inform hospital guidance and empirical antibiotic treatment.	3	2	1.75	Medium
Infections with antibiotic resistant bacteria are known to increase morbidity and mortality, as well as the length of stay in hospitals.	4	2	2.75	Low
Rising levels of antibiotic resistance could be curbed by targeted antibiotic therapy in hospitals.	5	2	3.5	Low
Inappropriate prescribing' can include: (i) unnecessary prescription of antibiotics, (ii) inappropriate use of broad spectrum antibiotics, (iii) wrong selection of empiric antibiotics, (iv) lengthy durations of treatment	6	3	2.5	Low
Misuse of antibiotics may cause patients to become increasingly colonised or infected with resistant bacteria, examples of which are MRSA, Vancomycin resistant bacteria and multi resistant E. coli.	7	3	3	Low
Regular assessment of patients, feedback and microbiological data should guide possible changes of antibiotic therapy.	8	3.5	2.37	Low
Misuse of antibiotics is driving the development of resistance.	9	4	3.75	Low
There will be no effective antibiotics for treatment if resistance in bacteria continues to grow, as the current pipeline for new antibiotics is limited.	10	4	4	Low
Hospital pharmacists				
Implementation of structured antimicrobial stewardship plans are proven to improve prudent use of antibiotics.	1	2	1.75	Medium
The selection and spread of resistant bacteria in hospitals is a major patient safety issue	2	2	2.25	Low
Infections with antibiotic resistant bacteria are known to increase morbidity and mortality, as well as the length of stay in hospitals.	3	2	2.25	Low
There will be no effective antibiotics for treatment if resistance in bacteria continues to grow, as the current pipeline for new antibiotics is limited.	4	2	3	Low
Inappropriate prescribing' can include: (i) unnecessary prescription of antibiotics, (ii) inappropriate use of broad spectrum antibiotics, (iii) wrong selection of empiric antibiotics, (iv) lengthy durations of treatment	5	3	1.75	Medium
Misuse of antibiotics is driving the development of resistance.	6	3	3	Low
Rising levels of antibiotic resistance could be curbed by targeted antibiotic therapy in hospitals.	7	3	3.5	Low
Local surveillance and microbiological data should inform hospital guidance and empirical antibiotic treatment.	8	4	2.75	Low
Misuse of antibiotics may cause patients to become increasingly colonised or infected with resistant bacteria, examples of which are MRSA, Vancomycin resistant bacteria and multi resistant E. coli.	9	4	3.25	Low
Regular assessment of patients, feedback and microbiological data should guide possible changes of antibiotic therapy.	10	5	2.25	Low

Slogans / target groups (10)	Rank	Median Rank	Consensus Value Q3-Q1/2	Consensus Level
Hospital prescribers (e.g. doctors or nurses)				
Target antibiotic therapy: Take cultures before starting antibiotic therapy!	1	1	0.25	High
Target antibiotic therapy: Check laboratory tests and target antibiotic therapy	2	1	2.5	Low
Take that sample: Take cultures before starting antibiotic therapy!	3	1	2.75	Low
Keep antibiotics working: Prudent antibiotic prescribing: asses, re-check, act!	4	1	2.75	Low
Antibiotics: handle with care: Prudent use of antibiotics keeps them working	5	1	3.25	Low
I love antibiotic prophylaxis: For less than 24 hours	6	2	0.5	High
Keep antibiotics working: Prudent use of antibiotics keeps them working	7	2	2	Medium
Antibiotics - reassess and target: Review and reassess antibiotic therapy!	8	2	3.5	Low
Antibiotics: handle with care: Misuse of antibiotics leads to antibiotic resistance	9	3	1.5	Medium
Antibiotics - reassess and target: Prudent antibiotic prescribing: asses, re-check, act!	10	3	3.75	Low
Hospital management				
Antibiotics: handle with care: Misuse of antibiotics leads to antibiotic resistance	1	2	1.25	Medium
Antibiotics: handle with care: Prudent use of antibiotics keeps them working	2	2	1.75	Medium
Keep antibiotics working: Prudent use of antibiotics keeps them working	3	2	2	Medium
I love antibiotic prophylaxis: For less than 24 hours	4	3	2.5	Low
Target antibiotic therapy: Take cultures before starting antibiotic therapy!	5	3	3.5	Low
Keep antibiotics working: Prudent antibiotic prescribing: asses, re-check, act!	6	4	3.25	Low
Antibiotics - reassess and target: Review and reassess antibiotic therapy!	7	5	3	Low
Antibiotics - reassess and target: Prudent antibiotic prescribing: asses, re-check, act!	8	5	3.25	Low
Target antibiotic therapy: Check laboratory tests and target antibiotic therapy	9	5	4	Low
Take that sample: Take cultures before starting antibiotic therapy!	10	6	3.5	Low
Hospital pharmaceutical committees/antibiotic stewardship committees				
Keep antibiotics working: Prudent use of antibiotics keeps them working	1	1	2.25	Low
Antibiotics - reassess and target: Review and reassess antibiotic therapy!	2	1	2.5	Low
Antibiotics: handle with care: Prudent use of antibiotics keeps them working	3	1	2.75	Low
Target antibiotic therapy: Take cultures before starting antibiotic therapy!	4	1.5	1.37	Medium
I love antibiotic prophylaxis: For less than 24 hours	5	2	1	High
Antibiotics: handle with care: Misuse of antibiotics leads to antibiotic resistance	6	2	1.75	Medium
Keep antibiotics working: Prudent antibiotic prescribing: asses, re-check, act!	7	2	2.5	Low
Take that sample: Take cultures before starting antibiotic therapy!	8	2	3.25	Low
Target antibiotic therapy: Check laboratory tests and target antibiotic therapy	9	3	3	Low
Antibiotics - reassess and target: Prudent antibiotic prescribing: asses, re-check, act!	10	3	3	Low
Hospital pharmacists				
Keep antibiotics working: Prudent use of antibiotics keeps them working	1	2	2.25	Low
Antibiotics: handle with care: Prudent use of antibiotics keeps them working	2	2	3	Low
I love antibiotic prophylaxis: For less than 24 hours	3	3	1.75	Medium
Antibiotics: handle with care: Misuse of antibiotics leads to antibiotic resistance	4	3	2	Medium
Antibiotics - reassess and target: Prudent antibiotic prescribing: asses, re-check, act!	5	3	3.5	Low
Target antibiotic therapy: Take cultures before starting antibiotic therapy!	6	4	2.5	Low
Antibiotics - reassess and target: Review and reassess antibiotic therapy!	7	4	2.5	Low
Keep antibiotics working: Prudent antibiotic prescribing: asses, re-check, act!	8	4	3	Low
Target antibiotic therapy: Check laboratory tests and target antibiotic therapy	9	5	3	Low
Take that sample: Take cultures before starting antibiotic therapy!	10	6	3.5	Low

Materials / target groups (8)	Rank	Median Rank	Consensus Value Q3-Q1/2	Consensus Level
Hospital prescribers (e.g. doctors or nurses)				
Pocket-sized checklist	1	1	0.75	High
Presentation	2	1	1.25	Medium
Factsheet	3	2	1.25	Medium
Poster	4	2	2	Medium
Gimmick e.g. stress ball, mug, paper clip container with key messages	5	2	2.5	Low
Leaflet	6	3	2.5	Low
Brochure	7	4	3.25	Low
Letter	8	6	3.5	Low
Hospital management				
Factsheet	1	2	1	High
Presentation	2	2	1	High
Letter	3	2	1.25	Medium
Brochure	4	4	2	Medium
Poster	5	4	2.25	Low
Leaflet	6	5	2.5	Low
Gimmick e.g. stress ball, mug, paper clip container with key messages	7	5	3.75	Low
Pocket-sized checklist	8	7	3.5	Low
Hospital pharmaceutical committees/antibiotic stewardship committees				
Presentation	2	1	0.75	High
Factsheet	1	1	1.25	Medium
Brochure	3	2	2.25	Low
Leaflet	4	3	2.25	Low
Letter	6	3	2.25	Low
Pocket-sized checklist	5	3	2.75	Low
Poster	7	4	2.25	Low
Gimmick e.g. stress ball, mug, paper clip container with key messages	8	5	3.5	Low
Hospital pharmacists				
Factsheet	1	2	0.75	High
Presentation	2	2	0.75	High
Poster	3	3	2.25	Low
Brochure	4	3	2.25	Low
Letter	5	3	2.5	Low
Leaflet	6	4	2	Medium
Pocket-sized checklist	7	4	2.5	Low
Gimmick e.g. stress ball, mug, paper clip container with key messages	8	4	3	Low