

## 4. The use of antibiotics without a prescription in seven EU Member States

### Main findings

The results are based upon telephone interviews in seven Member States (Cyprus, Estonia, Greece, Hungary, Italy, Romania and Spain) with: 2 601 patients who had used an antibiotic without a prescription over the last 18 months; 712 GPs; and 702 pharmacists.

#### Patients

- The use of antibiotics without a prescription is still common in Cyprus, Greece, Hungary, Italy, Romania and Spain, but less common in Estonia.
- OTC buying is the most common source for obtaining antibiotics in Romania, Greece and Hungary. In the four other Member States (Cyprus, Estonia, Italy and Spain) most patients make use of antibiotics left over from previous courses. The internet is not an important source for obtaining antibiotics.
- Respondents from Greece and Cyprus are the most convinced that antibiotics can easily be obtained from GPs, pharmacists and members of their social network. Respondents from Estonia, Hungary and Italy are the least convinced.
- Knowledge about antibiotics among patients who use antibiotics without a prescription is lower than among the general population. As such, it is important to educate patients further on antibiotics.

#### HCPs

- A majority of GPs and pharmacists receive requests from patients to prescribe or dispense an antibiotic even though there is no medical indication. Most GPs and pharmacists do not always fulfil the requests from these patients. Yet some of them sometimes do prescribe or dispense an antibiotic in such cases, mainly because of patient pressure or as a result of shared decision-making with the patient. Pharmacists also fear that customers will go to another pharmacy.
- GPs and pharmacists are aware that the use of antibiotics is a problem in their respective Member States. A majority of the GPs and pharmacists interviewed believe that it is a greater problem in their own Member State than in others.
- Cooperation between pharmacists and GPs on the issue of antibiotic use is limited and could be strengthened.

### 4.1. Introduction

This chapter provides greater insight into the nature of non-prudent antibiotic use in seven EU Member States. We focus, especially, on the use of antibiotics without a prescription. The Member States we investigated are Cyprus, Estonia, Greece, Hungary, Italy, Romania and Spain. They were selected because they had a relatively high level of antibiotics that are used without a prescription (see also Section 2.4). Three surveys were carried out: one among patients who used an antibiotic without a prescription over the last 18 months, one with community pharmacists and one with GPs. A wide array of topics, all related to the use of antibiotics, were addressed in these surveys (see Section 4.2 and Annex A). The results were used as input for the country-dialogue meetings that were held in the ARNA countries. During these meetings stakeholders in each Member State discussed solutions to address the problem of the non-prudent use of antibiotics (see Chapter 6).



## 4.2. Methods

Three surveys were carried out between 1 December 2014 and 26 February 2015 by a research organisation in each individual Member State affiliated to the TNS NIPO. TNS NIPO coordinated the surveys. The following surveys were carried out.

- A patient survey in each Member State among a net sample of 400 patients who used an antibiotic without a prescription over the last 18 months (In Estonia 200 citizens were interviewed) (Section 4.2.1).
- A GP survey among a net sample of 100 GPs in each Member State (Section 4.2.2).
- A pharmacist survey among a net sample of 100 community pharmacists in each Member State (Section 4.2.2).

### 4.2.1. Patient survey

#### Data collection

Patients were approached for a telephone interview. Those respondents who wanted to participate were asked whether they had used antibiotics over the last 18 months and, if so, whether this was with or without a prescription. Respondents who answered that they either bought the antibiotic without a prescription (antibiotics bought OTC or via the internet) or used antibiotics left over from previous courses were included for further questions. All interviews were held in the national language of the respective Member State. Table 4.1 shows how the respondents were sampled for each Member State and when the fieldwork took place.

The data collection was concluded once 400 respondents had been interviewed who used antibiotics without a prescription. Between 4 000 and 20 000 people were called in each Member State in order to reach this number of patients. Of the 165 694 people who were approached, 65 103 agreed to participate in the survey and 29 647 of them had used an antibiotic over the last 18 months. A total of 2 601 respondents had used antibiotics without a prescription and were therefore involved in the interview. The other 62 502 had not used an antibiotic without a prescription. They were only asked for their age and gender. Appendix X includes a flow chart with more details about the response.

**Table 4.1.** Data collection among citizens in seven EU Member States (telephone interviews).

Member State	Sample selection	Number of interviews	Fieldwork dates		Number of citizens called
Cyprus	Random through telephone numbers	400	3.12.2014	16.1.2015	23 410
Estonia	Random through telephone numbers	200	21.1.2015	26.2.2015	26 780
Greece	Random through telephone numbers	400	15.12.2014	20.1.2015	28 358
Hungary	Random through telephone numbers	400	16.12.2014	23.2.2015	26 688
Italy	Random through telephone numbers	400	3.12.2014	9.2.2015	31 312
Romania	Random through telephone numbers	401	7.1.2015	20.2.2015	11 964
Spain	Random through national telephone number directories	400	9.12.2014	19.2.2015	17 182
<i>Total</i>		2 601			165 694

NB: The coverage for all Member States is national. For Cyprus and Estonia, the sample covers the areas under the control of the Republic of Cyprus and the Republic of Estonia.

### Questionnaire

The questionnaire included 34 topics. Firstly, respondents were asked about the last course of antibiotics they had taken without a prescription during the previous 18 months. They were then questioned about where the antibiotic was obtained, the reasons for taking it and the length of the course. The second part of the questionnaire contained questions about potential side effects and information received on how to use the antibiotics in a prudent manner. Thirdly, questions were asked about knowledge and attitudes towards antibiotics. Finally, there were questions about the sociodemographic status of the respondents. This included: gender, age, urbanisation, employment status, educational level, health insurance, the patient's GP, smoking behaviour, perceived health and chronic conditions. The complete questionnaire can be found in Appendix B.

### Statistical analyses

Descriptive analyses were performed (frequencies, means).

## 4.2.2. GPs and pharmacists survey

### Data collection

In each Member State, except Cyprus, data from pharmacists and GPs were collected in telephone interviews in the national language. In Cyprus data were collected through face-to-face interviews in Greek. In all Member States, we aimed to achieve a net sample of about 100 pharmacists and 100 GPs interviewed. Tables 4.2 and 4.3 include more information about the data sample selection, the number of professionals approached for an interview and the dates of the fieldwork. It shows that the response rates vary widely between Member States. In Italy and Spain especially the response was low. Response among GPs was lower than among pharmacists.

**Table 4.2.** Data collection from GPs in seven EU Member States.

Member State	Method	Sample selection	Number of interviews	Fieldwork dates		Population
Cyprus	Face-to-face	Randomly selected from Cyprus GP list	100	5.12.2014	13.1.2015	123
Estonia	Telephone interviews	Randomly from full list of Estonian GPs	100	16.1.2015	19.1.2015	214
Greece	Telephone interviews	Own list of the NIPO team	100	16.12.2014	9.1.2015	1 903
Hungary	Telephone interviews	TNS Hoffmann database	111	1.12.2014	15.1.2015	1 560
Italy	Telephone interviews	Sample was selected from the database of the provider	100	15.12.2014	4.2.2015	8 773
Romania	Telephone interviews	Sample was based on the incidence reported by the National Medical College	101	7.1.2015	13.2.2015	147
Spain	Telephone interviews	Random through a list of 11 000 contacts	100	5.12.2014	22.12.2014	4 230
<i>Total</i>			712			16 950

NB: The coverage for all countries is national. For Cyprus and Estonia, the sample covers the areas under the control of the Republic of Cyprus and the Republic of Estonia.

**Table 4.3.** Data collection from pharmacists in seven EU Member States.

Member State	Method	Sample selection	Number of interviews	Fieldwork dates		Population
Cyprus	Face-to-face	Randomly from the list of registered pharmacies in Cyprus	100	3.12.2014	10.1.2015	120
Estonia	Telephone interviews	Randomly through full list of Estonian pharmacies	100	16.1.2015	19.1.2015	196
Greece	Telephone interviews	Out of the own list of the TNS NIPO team	100	16.12.2014	9.1.2015	487
Hungary	Telephone interviews	TNS Hoffmann database	102	1.12.2014	15.1.2015	363
Italy	Telephone interviews	Sample was selected from the database of the provider	100	15.12.2014	15.1.2015	662
Romania	Telephone interviews	Sample was based on the incidence reported by the National Medical College	100	7.1.2015	13.2.2015	172
Spain	Telephone interviews	Random through a list of 5 000 contacts	100	5.12.2014	22.12.2014	4 837
<i>Total</i>			702			6 837

NB: The coverage for all countries is national. For Cyprus and Estonia, the sample covers the areas under the control of the Republic of Cyprus and the Republic of Estonia.

### Questionnaire

The questionnaires for GPs and pharmacists each contained 32 questions. The large majority of the questions were the same but some were different because of the different roles of GPs and pharmacists. Questions included seeking information on: patients who request antibiotics without a prescription; the response to these requests; the reasons patients buy antibiotics without a prescription; the information professionals provide to patients; misconceptions among patients; opinions on the use of antibiotics without a prescription; and possible solutions to diminish this use. Lastly, background information was gathered about age, gender, the year the HCP became qualified and the type of organisation they work in. The complete questionnaires for the GPs and pharmacists can be found in Appendix B.

### Statistical analyses

Descriptive analyses were performed to identify frequencies and means. It is important to note that many pharmacists answered 'no' to the question: 'Can patients buy certain oral antibiotics at your pharmacy without a prescription?'. The response rates to some of the subsequent questions are low as the questions were not applicable if the pharmacist did not dispense antibiotics without a prescription.

## 4.3. The use of antibiotics without a prescription: patients

### 4.3.1. The frequency of non-prescription use

#### Respondents who had used antibiotics

Of all the citizens in the seven EU Member States who were interviewed (n = 65 103), almost half (45.5 %) had used oral antibiotics in the last 18 months. Among those who had used antibiotics (n = 29 647), 8.7 % had used them without a prescription. The highest percentages of patients who had used antibiotics without a prescription were found in Greece, Cyprus and Romania. The lowest percentages were found in Hungary and Estonia (Table 4.4). Three quarters of the respondents (75 %) used their last course of non-prescribed antibiotics for themselves, the other quarter for their child (25 %). The number of persons who had used antibiotics without a prescription for their children is highest in Italy (35 %), Spain (29 %) and Hungary (25 %) <sup>(nn)</sup>.

**Table 4.4.** The number of people approached for an interview and the number of people who used antibiotics without a prescription in the last 18 months (percentage; calculated on the basis of the total number of respondents who used an antibiotic).

Country	Percentage of persons who used an antibiotics without a prescription of all interviewed respondents (n = 65 103)		Percentage of persons who used an antibiotics without a prescription of users of antibiotics (n = 29 647)	
	%	N*	%	N*
Cyprus	11.7 %	3 423	21.3 %	1 882
Estonia	1.2 %	16 779	3.0 %	6 312
Greece	12.0 %	3 330	26.9 %	1 487
Hungary	2.3 %	17 205	5.9 %	6 676
Italy	4.3 %	9 313	8.5 %	4 687
Romania	10.2 %	3 936	26.9 %	2 300
Spain	3.4 %	11 795	6.3 %	6 303

\* N for which percentage is calculated.

**NB: From now on, all results refer to the respondents who used antibiotics without a prescription as they are the respondents who completed the full interview (n = 2 601).**

<sup>(nn)</sup> The figures differ from those in the Eurobarometer data, as the Eurobarometer data ask for the last 12 months, whereas in this survey we asked for the last 18 months.



Among patients who took antibiotics without a prescription themselves, more than two thirds were aware of other antibiotic users in their social environment, such as their partner or family. Around one third of patients in Greece (34 %), Hungary (37 %) and Romania (32 %) were aware of others who use antibiotics without a prescription. Among patients who were aware of antibiotic users in their environment, over half of the respondents mentioned their extended family (56 %) and almost half mentioned their partner (46 %). The partner was most frequently mentioned in Hungary (49 %) and Italy (65 %); in other Member States, this was the extended family (Cyprus (57 %), Estonia (47 %), Greece (71 %), Spain (65 %) and Romania (53 %)).

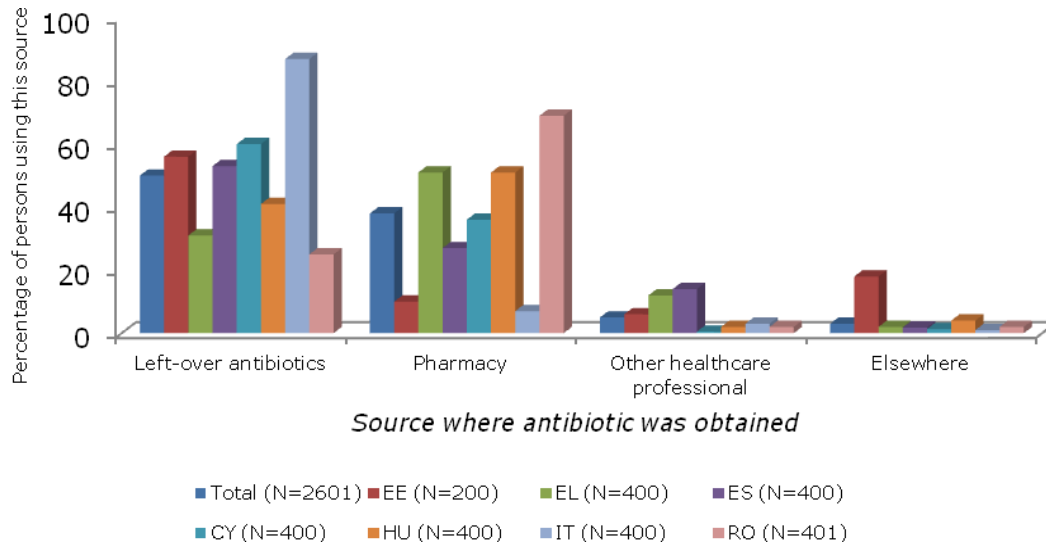
### **4.3.2. Where do patients get antibiotics without a prescription?**

#### **The source of the last course of antibiotics in the previous 18 months**

Respondents who used antibiotics without a prescription were asked how they obtained their last course (Figure 4.1). The pharmacy was the most frequently mentioned source in Romania (69 %), Greece (51 %), and Hungary (51 %). In the other Member States most people reported using antibiotics left over from previous courses (Italy (87 %), Cyprus (60 %), Estonia (56 %), Spain (53 %)). Internet sources such as e-pharmacies were hardly ever mentioned (not shown in Figure 4.1). The other sources are: without a prescription from a pharmacy during my holiday in my own country (1.5 %); without a prescription from a pharmacy during my holiday in another country (1.2 %); and without a prescription from a dentist, nurse or other HCP (5 %).

When patients use leftover antibiotics they most frequently use those antibiotics remaining from a previous course (71 %), followed by those remaining from their children's treatment (14 %). Other ways of obtaining such leftover antibiotics are through their partner (4 %), friends (0.5 %) or family (6 %). This trend is the same for all countries.

**Figure 4.1.** Source from which patients obtained the last course of antibiotics without a prescription in the previous 18 months <sup>(oo)</sup> (as a percentage of all persons who used an antibiotic without a prescription). (Source: ARNA patient survey among users of antibiotics without a prescription.)

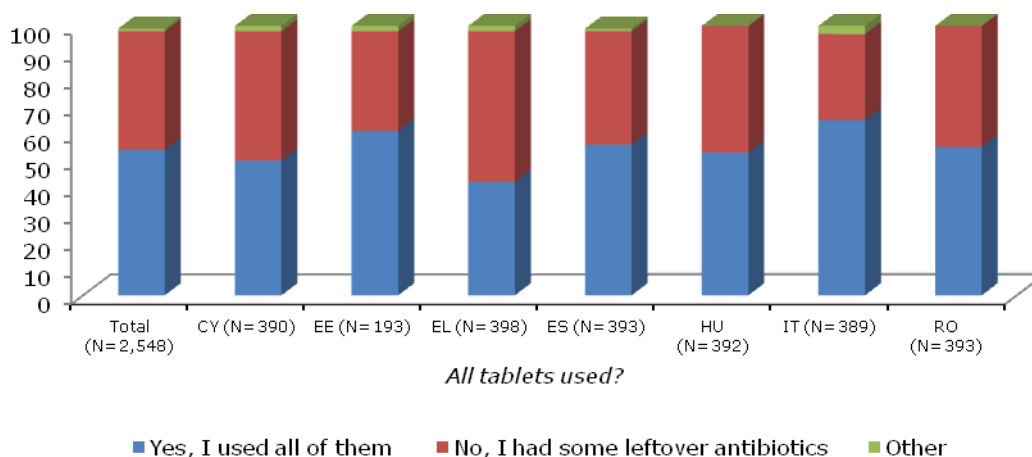


#### Respondents who store leftover antibiotics

More than half of the respondents from Greece (56 %) reported that they had leftover antibiotics from a previous course (Figure 4.2). In the six other Member States, the percentage of respondents who reported having leftover antibiotics is below 50 %, but is still one third in Italy (32 %) and more than one third in the other Member States.

<sup>(oo)</sup> The figure only presents the categories which included more than three per cent of the respondents.

**Figure 4.2.** Did the patient use all antibiotics dispensed for the last treatment or not? (As a percentage of all persons who used an antibiotic without a prescription.) (Source: ARNA patient survey among users of antibiotics without a prescription.)



#### 4.3.3. Reasons for use and side effects

Patients use antibiotics without a prescription for various reasons. Influenza, the common cold, sore throat, cough, fever and headache are all common reasons to use antibiotics without a prescription (45 % of users). Furthermore, patients use antibiotics on their own initiative for bronchitis (11 %) or urinary tract infections (6 %). Antibiotics are less often used for diseases such as pneumonia (3 %) or skin infections (4 %). There are no major differences between the Member States with regard to the reasons why patients use antibiotics without a prescription.

Side effects of non-prescription antibiotics are experienced by 7 % of all interviewed patients. The highest percentage of patients reporting side effects was found in Italy (8 %), the lowest in Romania (5 %). Because a small proportion mentioned side effects the absolute number of patients per Member State reporting a side effect was low (ranging from 14 in Estonia to 31 in Italy). Therefore, we only provide figures for the total group of patients ( $n = 169$ ). The most frequently mentioned side effect was an upset stomach (33 % of all patients who reported a side effect), followed by diarrhoea (30 %) and allergic reactions (12 %). Rash was mentioned by 5 % of the patients and two patients mentioned having experienced renal failure. It should be noted that 38 % reported 'other side effects' <sup>(pp)</sup>. Six patients (4 %) refused to answer the question or did not know.

#### 4.3.4. Why do patients self-medicate?

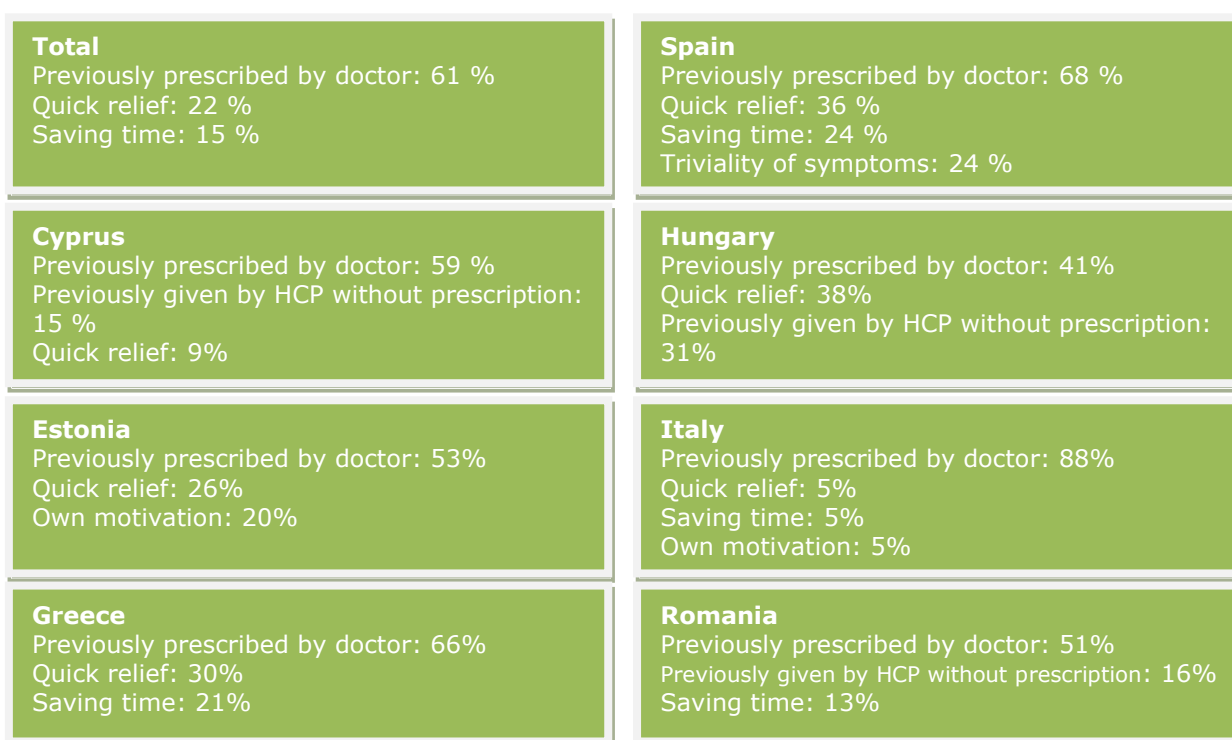
Patients have different motivations for using antibiotics without a prescription (Figure 4.3). The most frequently mentioned is that the same antibiotics were previously prescribed by a qualified doctor (61 % overall). In Italy, the percentage of patients who mentioned this as a reason was 88 %, which is the highest of all Member States. Other important reasons mentioned included an expectation of quick relief (22 %) and saving time instead of first going to the doctor (15 %). In Cyprus and Hungary, respectively 15 % and 31 % of patients indicated that they used leftover antibiotics without a prescription because they were previously provided by a pharmacist or chemist personnel without prescription. In Hungary, almost one quarter

<sup>(pp)</sup> These side effects were not further specified.



of patients (24 %) also mentioned that the triviality of their symptoms was a motivation.

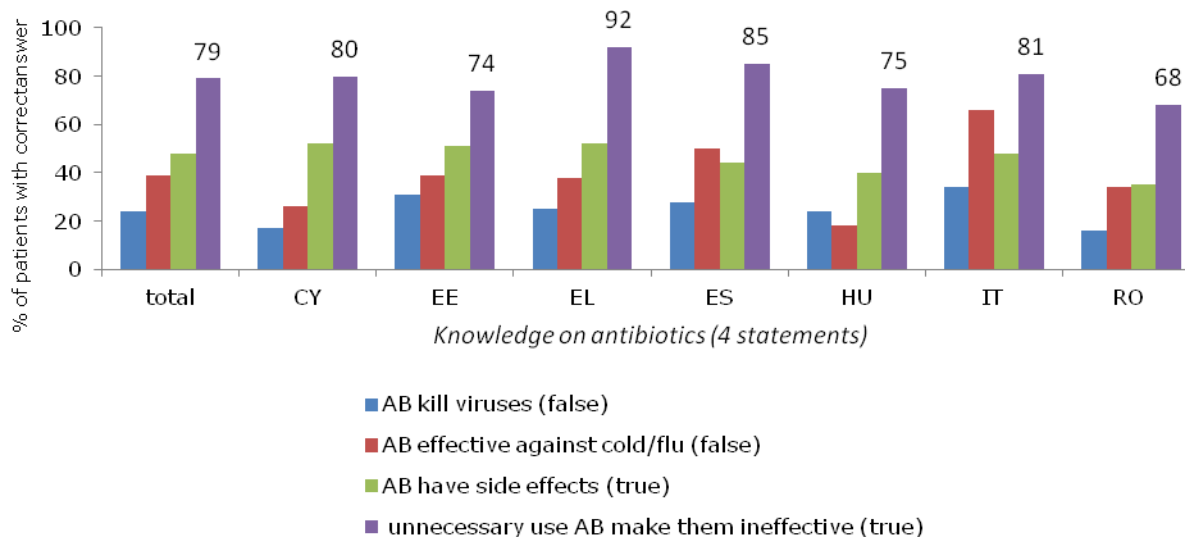
**Figure 4.3.** Most commonly mentioned motivations for using antibiotics without a prescription by users of non-prescription antibiotics (as a percentage of all persons who used an antibiotic without a prescription). (Source: ARNA patient survey among users of antibiotics without a prescription.)



### Does knowledge about antibiotics influence their effectiveness and appropriate use?

The respondents, who had all used an antibiotic without a prescription over the last 18 months, were asked about their knowledge of antibiotics. A minority of the respondents (24 %) knew that antibiotics are not effective against viruses. This is clearly lower than the percentage that was found among the general population in the 2016 Eurobarometer survey. Here 43 % provided the correct answer.<sup>8</sup> Respondents from Estonia (31 %) and Italy (34 %) most often provided the correct answer. Four out of ten respondents (39 %) correctly knew that antibiotics are ineffective against the flu and colds. Again, this percentage is lower than in the general population as measured in the Eurobarometer (56 %).<sup>8</sup> A large variation exists between the seven Member States in our survey. In Italy, two thirds of the users of antibiotics without a prescription provided the correct answer, while in Hungary this was only 18 %. There is less variation between Member States concerning the knowledge of side effects such as diarrhoea. Overall, 48 % of the respondents provided the correct answer. This figure was 66 % in the general population in the 2016 Eurobarometer data. In the ARNA survey, Romania stands out. There only 35 % of the users of antibiotics without a prescription correctly knew about side effects. A majority of users of antibiotics without a prescription knew that antibiotics become ineffective when used inappropriately (79 %). This is only slightly lower than in the general population in 2016 (84 %).<sup>8</sup> In Greece, 92 % of the users of antibiotics without a prescription knew antibiotics can become ineffective if used inappropriately. In Romania this is only 68 %.

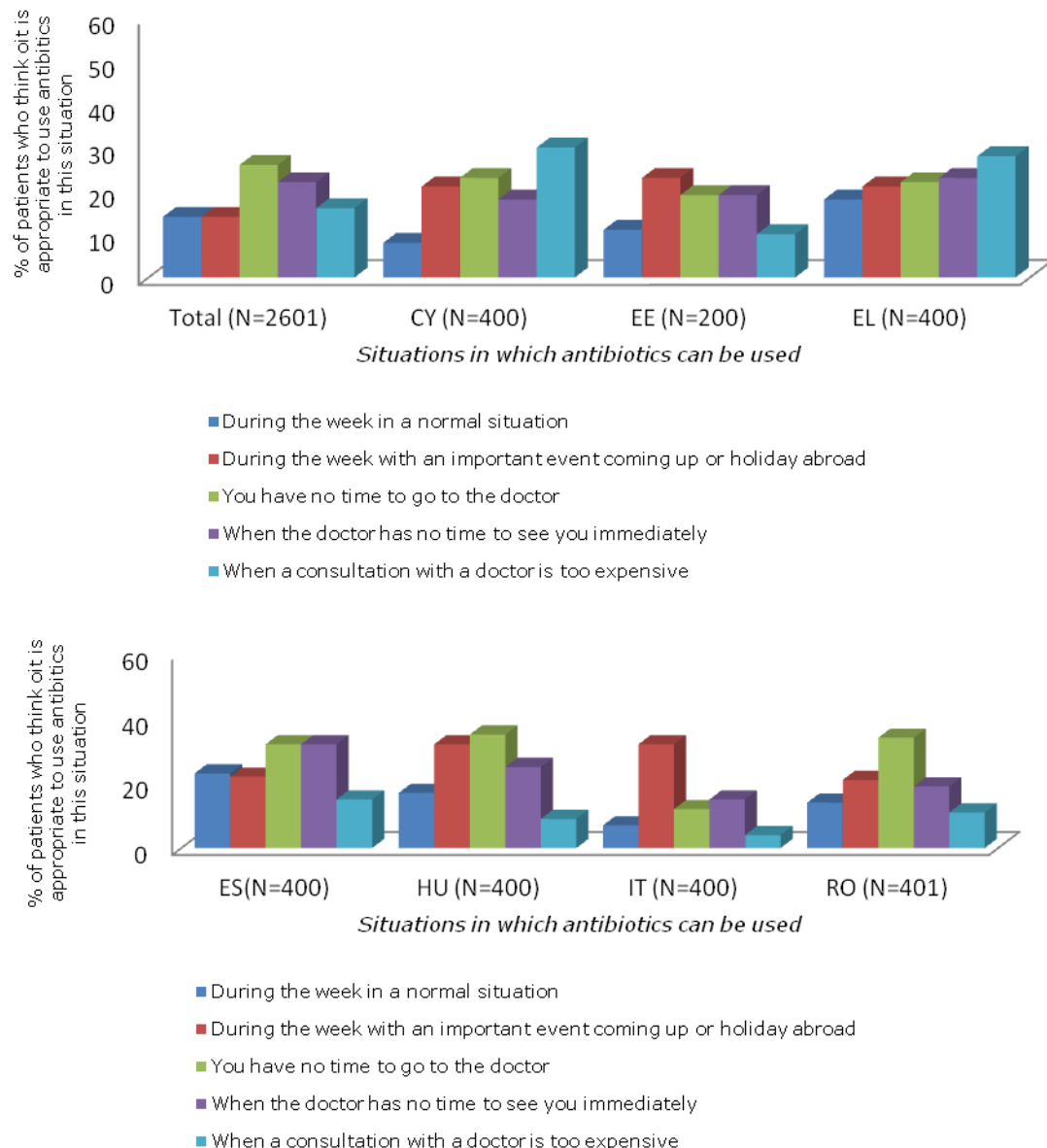
**Figure 4.4.** Knowledge about antibiotics among users of antibiotics without a prescription: percentage of respondents with correct answer (as a percentage of all persons who used an antibiotic without a prescription). (Source: ARNA patient survey among users of antibiotics without a prescription.)



#### Can antibiotics treat bronchitis?

Respondents were asked whether, in a variety of situations, they believed it to be appropriate to get antibiotics without a prescription to treat bronchitis. (Figure 4.5). More than a quarter of the respondents thought it is appropriate to get antibiotics for bronchitis in cases where they have no time to go to the doctor (26 %). This percentage was highest in Hungary (35 %), Romania (34 %) and Spain (32 %). For other situations, the opinions of respondents from the different Member States were more specific. In Spain, almost a quarter of the respondents believed it to be appropriate to get antibiotics without a prescription in a normal situation during the week (23 %) and one third believed it to be appropriate in cases where the doctor has no time to see the patient immediately (32 %). One third of respondents from Hungary (32 %) and Italy (32 %) believed it to be appropriate to obtain antibiotics during the week without a prescription when there was an important event coming up or a holiday abroad. Respondents from Cyprus (30 %) and Greece (28 %) think non-prescription use is appropriate when a consultation with a doctor is too expensive. Again, it should be stressed that these figures apply to patients who had used an antibiotic without a prescription over the last 18 months.

**Figure 4.5.** The use of antibiotics without a prescription for bronchitis in different situations: percentage of patients who think it is appropriate to use an antibiotic in this situation (as a percentage of all persons who had used an antibiotic without a prescription.) (Source: ARNA patient survey among users of antibiotics without a prescription.)

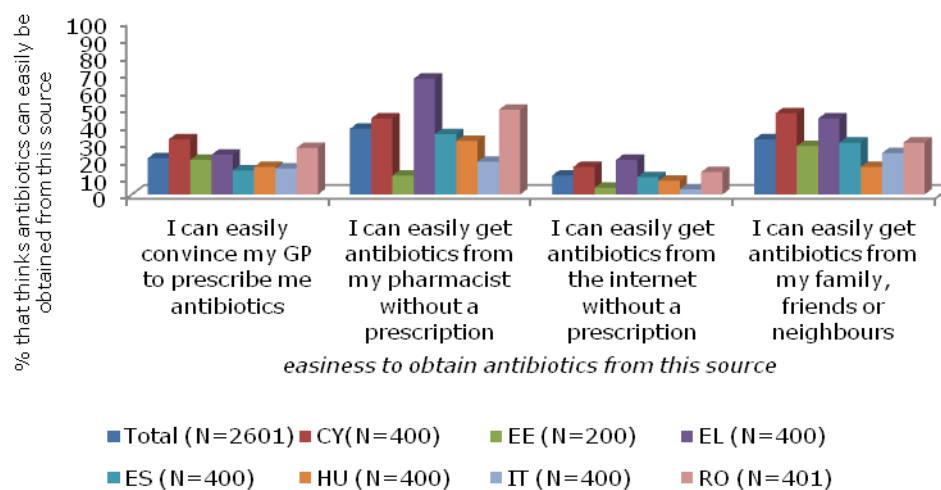


### The perceived availability of antibiotics among non-prescription users

Respondents were asked about the availability of antibiotics (Figure 4.6). One in five respondents (21 %) stated that they can easily convince their GP to prescribe an antibiotic. The highest percentage of respondents who stated they can convince their GP is found in Cyprus (32 %). The lowest is found in Spain (14 %), Italy (15 %) and Hungary (16 %). More than one third of all respondents (38 %) agreed that they can easily obtain antibiotics from their pharmacist without having a prescription. This opinion was most strongly held in Greece (67 %), Romania (49 %) and Cyprus (44 %), and least strongly held in Estonia (11 %). The internet is not considered a source from which antibiotics can easily be obtained according to the respondents.

Only one out of ten respondents (11 %) agreed with the statement that antibiotics are easily obtained via the internet. In Greece and Cyprus this percentage was higher than the average: 20 % and 16 % respectively. Family, friends and neighbours are a source where antibiotics without a prescription can easily be obtained according to one third (32 %) of all respondents. Again, in Greece (44 %) and Cyprus (47 %), more respondents than in the other countries state that they can easily obtain antibiotics without a prescription from family, friends and neighbours. In Hungary, for example, this percentage is only 16 %. Overall, respondents in Greece and Cyprus were most convinced that antibiotics can easily be obtained from the different sources, while respondents in Estonia, Hungary and Italy were least convinced. This pattern is in line with the level of antibiotic use without a prescription.

**Figure 4.6.** Percentage of persons who agree that antibiotics can easily be obtained from different sources\* (as a percentage of all persons who used an antibiotic without a prescription). (Source: ARNA patient survey among users of antibiotics without a prescription.)



\* Figures include respondents who agreed or strongly agreed with the statement.

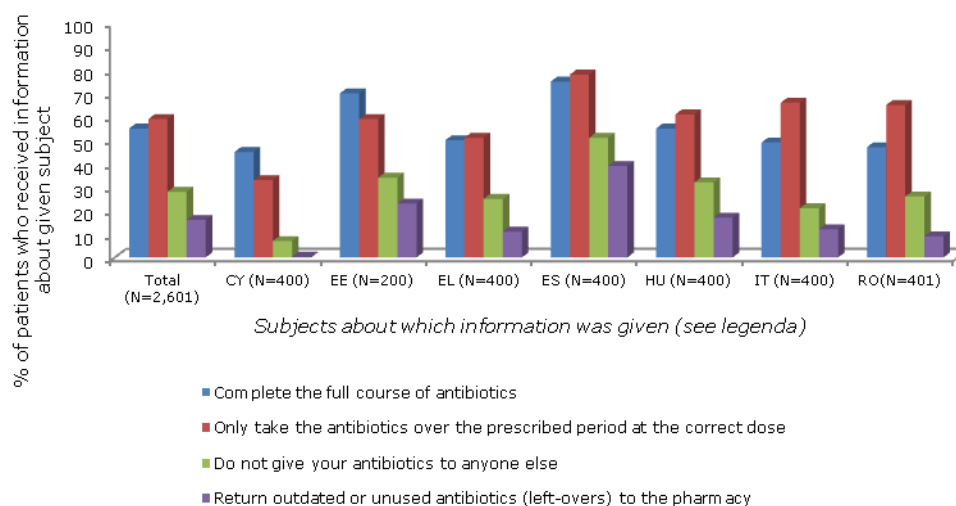
### 4.3.5. Information provision

#### The provision of information on how to use antibiotics

Among the respondents who obtained an antibiotic without a prescription, three quarters (74 %) received information about how to use them (Figure 4.7). The number of people who received information was highest in Hungary and Estonia (respectively 83 % and 81 %) and lowest in Greece and Italy (respectively 64 % and 67 %). In Romania this percentage was 79 %, in Spain 76 % and in Cyprus 69 %.

The highest proportion of respondents were instructed about the importance of completing the full course of antibiotics (55 % of all respondents) and the requirement to only take the antibiotics for the prescribed period and at the correct dosage (59 %) (Figure 4.6). About a quarter (28 %) of all respondents were told not to give the antibiotics to others such as family and friends. Only 16 % of all respondents were asked to return unused antibiotics to the pharmacy. For all items, the lowest proportion of respondents who reported being informed about these issues was found in Cyprus and the highest proportion in Spain.

**Figure 4.7.** Percentage of patients who received information on antibiotics (as a percentage of all persons who used an antibiotic without a prescription) (multiple answer question). (Source: ARNA patient survey among users of antibiotics without a prescription.)



\* Figures include respondents who said 'yes' to the statement.

### Who provides information?

Half of respondents who obtained antibiotics without a prescription received information about their proper use from a GP. For those receiving them from pharmacy staff, the figure was 43 %. The reason that the GP is the most mentioned source of information may be that respondents have previously obtained an antibiotic from their doctor for the same or another health symptom and as such received information about its use. Sources including other HCPs (9 %), the internet (3 %) or other media (1 %) seem to be less relevant. There were differences between the seven Member States in what the main source of information was. The GP was the most frequently mentioned source of information in Cyprus (57 %), Estonia (53 %), Greece (58 %), Spain (50 %) and Italy (87 %). In Hungary (57 %) and Romania (74 %), pharmacy staff members were the most frequently mentioned source for information.

## 4.4. Views from GPs and pharmacists

In total, 712 general practitioners and 702 pharmacists were interviewed about the use of antibiotics without a prescription.

### 4.4.1. The use of antibiotics without a prescription

Over the last 12 months, the majority of GPs (73 %) and of pharmacists (87 %) were confronted with patients who requested oral antibiotics even though these were not indicated for use with their diagnosis (Table 4.5a). The proportion of HCPs with this experience is highest in Cyprus (pharmacists: 98 %; GPs: 89 %) and lowest in Estonia (pharmacists: 53 %, GPs: 39 %).

**Table 4.5a.** The percentage of GPs who stated they have been asked by patients to prescribe an oral antibiotic for reasons that are not indicated by their diagnosis total and by Member State (as a percentage of all GPs interviewed). (Source: ARNA GP survey.)

	Total	Cyprus	Estonia	Greece	Hungary	Italy	Romania	Spain
Percentage of GPs	73	89	39	97	58	75	86	74
Number of respondents*	711	100	100	99	111	100	101	100

\* Total number that answered the question.

**Table 4.5b.** The percentage of pharmacists who stated they have been asked by patients to deliver an oral antibiotic without a prescription, total and by Member State (as a percentage of all pharmacists interviewed). (Source: ARNA pharmacist survey.)

	Total	Cyprus	Estonia	Greece	Hungary	Italy	Romania	Spain
Percentage of pharmacists	87	98	53	96	82	90	97	98
Number of respondents*	702	100	100	100	102	100	100	100

\* Total number that answered the question.

There are also differences between Member States and between HCPs in the average number of patients who had requested oral antibiotics in the last month as estimated by GPs and pharmacists (Tables 4.6a and 4.6b). Pharmacists who reported the highest numbers of patients during the last month are located in Greece (21 patients on average) and Italy (18). GPs in Romania (43) and Spain (34) reported the most requests for an antibiotic when their patient's diagnosis does not indicate prescribing one.

**Table 4.6a.** The average number of patients per month who, according to GPs, ask their GP for an oral antibiotic for reasons that are not indicated by their diagnosis, total and by Member State (n = 497 GPs). (Source: ARNA GP survey.)

	Total	Cyprus	Estonia	Greece	Hungary	Italy	Romania	Spain
Mean	12.9	10.6	4.3	21.2	6.0	17.6	12.1	10.7
Number of respondents	497	81	36	92	55	74	86	73

**Table 4.6b.** The average number of patients per month who, according to pharmacists, ask the pharmacist for oral antibiotics without having a prescription, total and by Member State (n = 594 pharmacists). (Source: ARNA pharmacist survey.)

	Total	Cyprus	Estonia	Greece	Hungary	Italy	Romania	Spain
Mean	21.2	14.3	4.0	14.9	3.7	23.8	43.4	34.3
Number of respondents	594	92	50	96	82	88	97	89

Pharmacists who sell OTC were asked which types of antibiotics they sell without a prescription. Table 4.7 shows that amoxicillin is clearly the most dispensed oral antibiotic without a prescription in all Member States. It is dispensed as monotherapy and as combination therapy. Other antibiotics that were frequently mentioned are clarithromycin, ciprofloxacin and azithromycin.

**Table 4.7.** Top five most-sold antibiotics without a prescription, percentage of by pharmacists who state that they sell over the counter, total and per Member State. (Source: ARNA pharmacist survey.)\*

Total (n = 136)	Amoxicillin	89 %
	Amoxicillin and enzyme inhibitor	29 %
	Clarithromycin	22 %
	Ciprofloxacin	17 %
	Azithromycin	15 %
Cyprus (n = 27)	Amoxicillin	93 %
	Amoxicillin and enzyme inhibitor	37 %
	Clarithromycin	22 %
	Ciprofloxacin	26 %
	Azithromycin	22 %
Greece (n = 62)	Amoxicillin	90 %
	Clarithromycin	32 %
	Cefaclor	19 %
	Amoxicillin and enzyme inhibitor	16 %
	Azithromycin	15 %
Italy (n = 13)	Amoxicillin	69 %
	Amoxicillin and enzyme inhibitor	46 %
	Cefixime	8 %
	Ciprofloxacin	15 %
	Clarithromycin	8 %
Romania (n = 26)	Amoxicillin	96 %
	Amoxicillin and enzyme inhibitor	50 %
	Ciprofloxacin	42 %
	Clarithromycin	31 %
	Cefalexin	27 %
	Cefuroxime	27 %
	Sulfamethoxazole-trimethoprim	27 %
Clarithromycin	27 %	

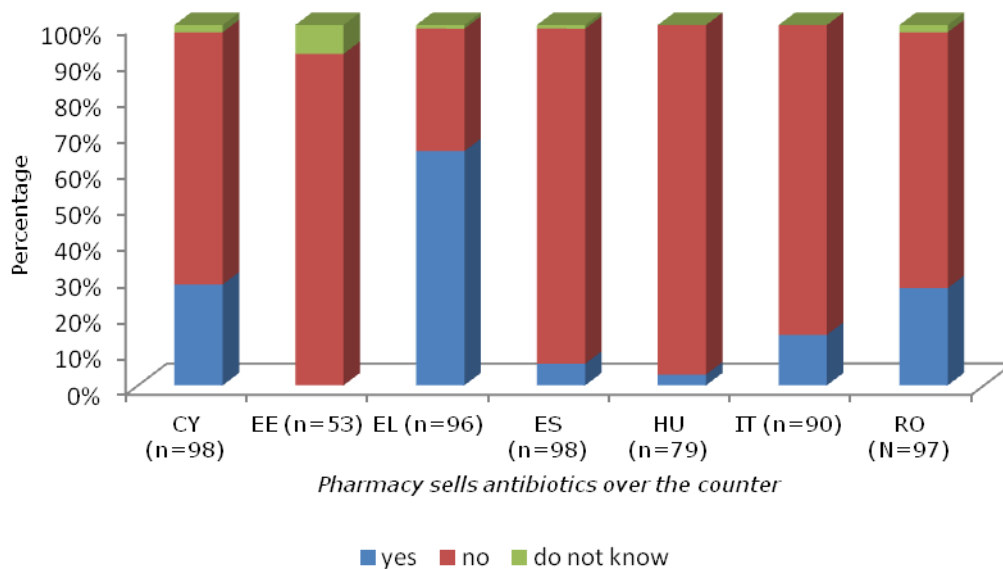
\* The number of pharmacists in Estonia, Hungary and Spain was too low to include them in this table but their answers are included in the total group.

#### 4.4.2. Where do patients get antibiotics without a prescription?

##### Buying antibiotics without a prescription at the pharmacy

Greece is the only Member State where a majority of pharmacists (65 %) indicated that patients can buy antibiotics without a prescription in their pharmacy. In Estonia, all the pharmacists we interviewed indicated that patients cannot buy antibiotics without a prescription. The same was true for a large majority of the pharmacists in the other five ARNA countries (Figure 4.8).

**Figure 4.8.** The proportion of pharmacists who indicated that customers can buy certain oral antibiotics at their pharmacy without a prescription (as a percentage of all pharmacists; n = 611 pharmacists). (Source: ARNA pharmacist survey.)

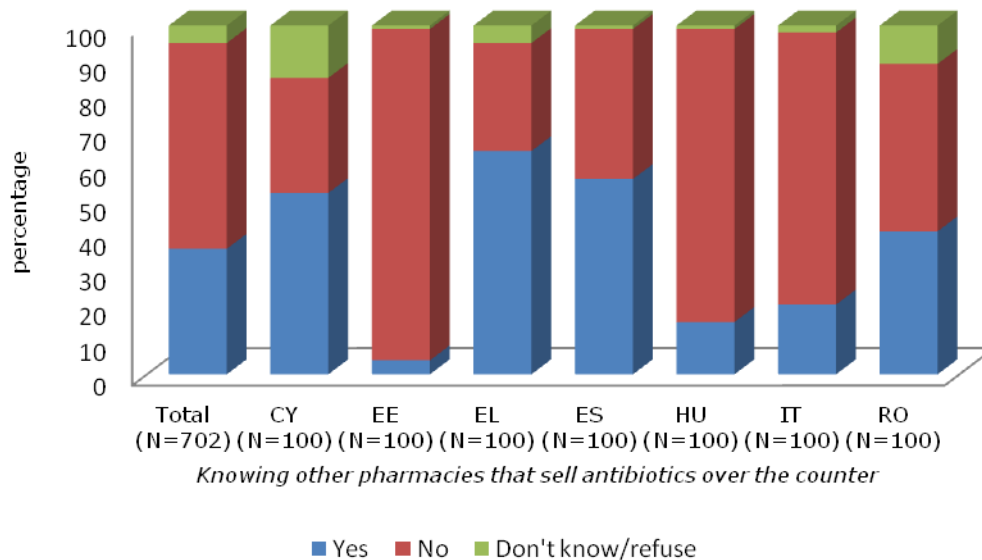


#### The number of other pharmacists who sell antibiotics OTC

Almost half of the GPs interviewed (46 %) stated that they know pharmacists who sell antibiotics without a prescription (Figure 4.9). This percentage is highest in Greece (97 %) and lowest in Estonia (3 %). These percentages are higher than those that pharmacists report about themselves. However, when asking pharmacists about OTC dispensing of antibiotics by other pharmacists, a similar pattern can be seen. They estimate that colleague pharmacists are more often inclined to sell antibiotics OTC (Figure 4.8). More than one third of the pharmacists stated that they know other pharmacists who sell antibiotics OTC (36 %). Again, this percentage is highest in Greece (64 %) and lowest in Estonia (4 %).



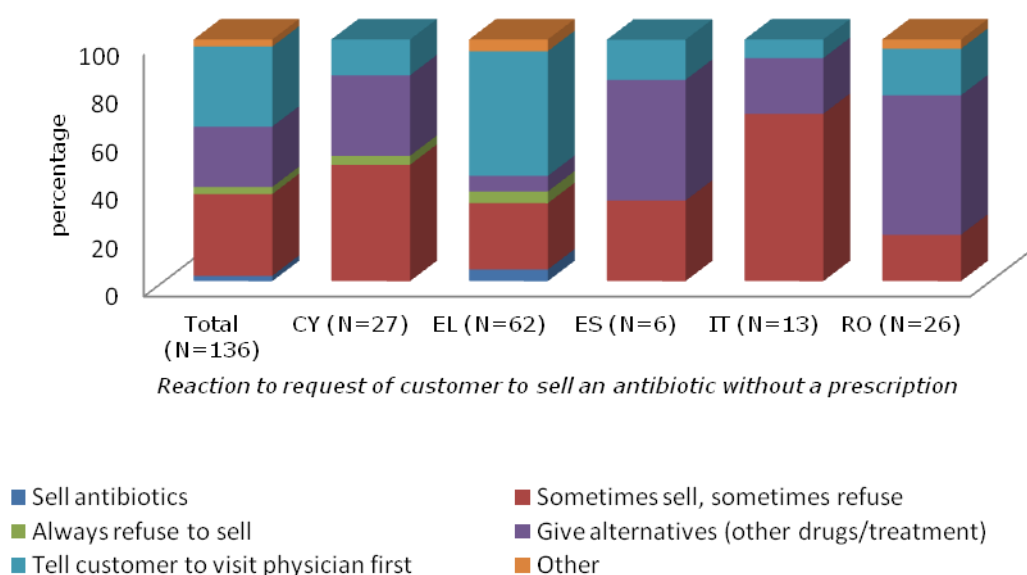
**Figure 4.9.** The number of pharmacists, total and by Member State, who personally know colleagues in their Member State who sell antibiotics OTC (as a percentage of all pharmacists; n = 702 pharmacists). (Source: ARNA pharmacist survey.)



### How do pharmacists react to patients' requests for antibiotics without a prescription?

Pharmacists who indicated that they sometimes sell antibiotics were asked what their principal reaction is to requests from patients who want antibiotics without a prescription (Figure 4.10). One-third (34 %) said that they sometimes do sell them and sometimes do not. One-third (33 %) advise customers to first visit a GP. A quarter (25 %) advise using alternatives. In Cyprus and Italy the most frequently mentioned reaction is to sometimes sell and sometimes not. In Greece, the most frequently mentioned reaction is to advise the customer to go to the GP first, whereas in Spain and Romania it is to provide alternatives for antibiotics. These results should be interpreted with caution, however, given the small number of respondents.

**Figure 4.10.** The reaction of pharmacists, total and by Member State, to requests from patients for an antibiotic without a prescription <sup>(qq)</sup> as reported by pharmacists (as a percentage of pharmacists who sell antibiotics OTC; n = 136 pharmacists). (Source: ARNA pharmacist survey; Estonia and Hungary are excluded from the figure as the number of respondents was fewer than five.)

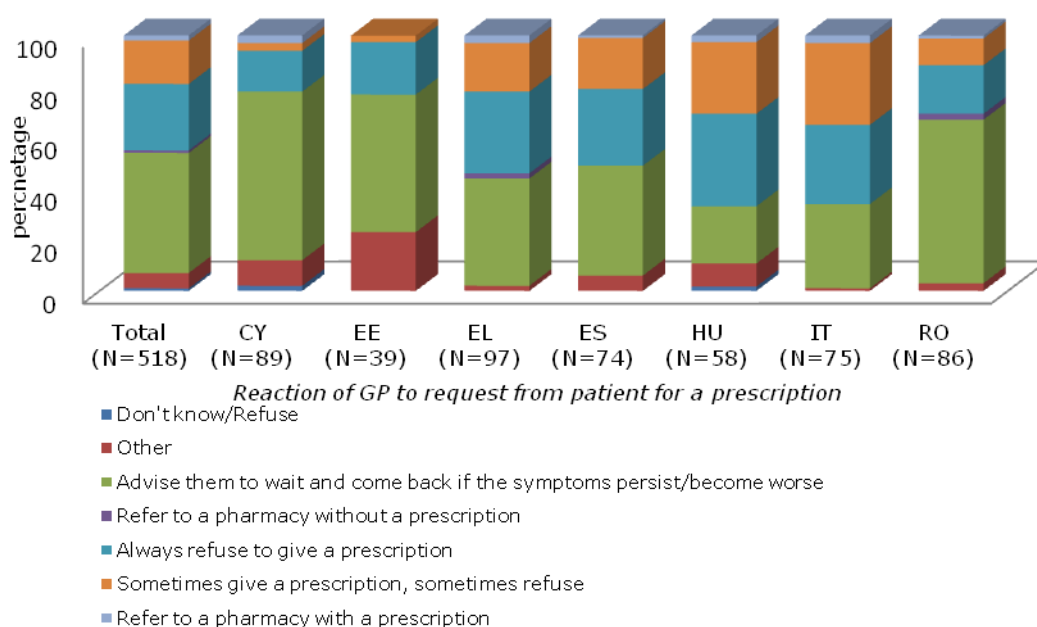


### How do GPs react to patients' requests for antibiotics?

GPs were asked what their principal reaction is when a patient asks for a prescription for antibiotics when there is no indication to use an antibiotic (Figure 4.11). The principal reaction of almost half of the GPs (47 %) is to advise the patient to wait and come back if the symptoms persist or become worse. A quarter (26 %) always refuse to prescribe an antibiotic, while 17 % sometimes prescribe an antibiotic and sometimes refuse. In Estonia (54 %), Cyprus (66 %), Romania (64 %), Spain (43 %) and Greece (42 %), the most frequently mentioned principal reaction is to advise the patient to wait and come back if the symptoms continue or become worse. In Hungary and Italy three reactions are equally common. These are: sometimes to give a prescription and sometimes not; always to refuse; and to advise to wait and come back if the symptoms persist or get worse (Figure 4.10).

<sup>(qq)</sup> There were no responses from Estonia to this question.

**Figure 4.11.** The reaction of GPs, total and by Member State, to requests from patients for an antibiotic when an antibiotic is not indicated as reported by GPs themselves (as a percentage of all GPs; n = 518 GPs). (Source: ARNA GP survey.)



### Reasons for prescribing or dispensing antibiotics even though there was no medical indication

GPs and pharmacists who prescribed or delivered antibiotics when they were not indicated were asked why they did so. Not all GPs and pharmacists answered this question as not all of them reported prescribing or dispensing antibiotics when not indicated. The results are only presented for Member States where more than 10 GPs or pharmacists responded. For GPs these were: Greece (12); Estonia (16); Hungary (18); and Italy (26). For pharmacists these were: Cyprus (13); Greece (20); and Italy (13). The main reasons given by both GPs and pharmacists for prescribing or dispensing antibiotics while not indicated are pressure from the customer (GPs: 45 %, pharmacists: 39 %) and as a result of shared decision-making with the customer (GPs: 41 %, pharmacists: 45 %). The fear that customers will go to another pharmacy where they would probably get the antibiotics anyway is a reason for 29 % of the pharmacists to sell antibiotics in cases where these are not indicated.

### Guidelines

GPs were asked if their colleagues generally adhere to antibiotic prescribing guidelines. Overall, more than two thirds of GPs (68 %) have the impression that their colleagues always, or mostly, adhere to national guidelines. GPs are most confident in Estonia, with 93 % believing that their colleagues always or mostly follow the guidelines. Other Member States where two thirds or more of the GPs think that their colleagues always or mostly follow the guidelines include: Spain (90 %); Hungary (71 %); Romania (70 %); and Italy (67 %). In Greece (45 %) and Cyprus (37 %), fewer than half of the GPs interviewed believe that their colleagues always or mostly follow the guidelines. In Cyprus, 23 % of the GPs interviewed believe that their colleagues do not follow the guidelines at all. In Greece this percentage is 7 %.

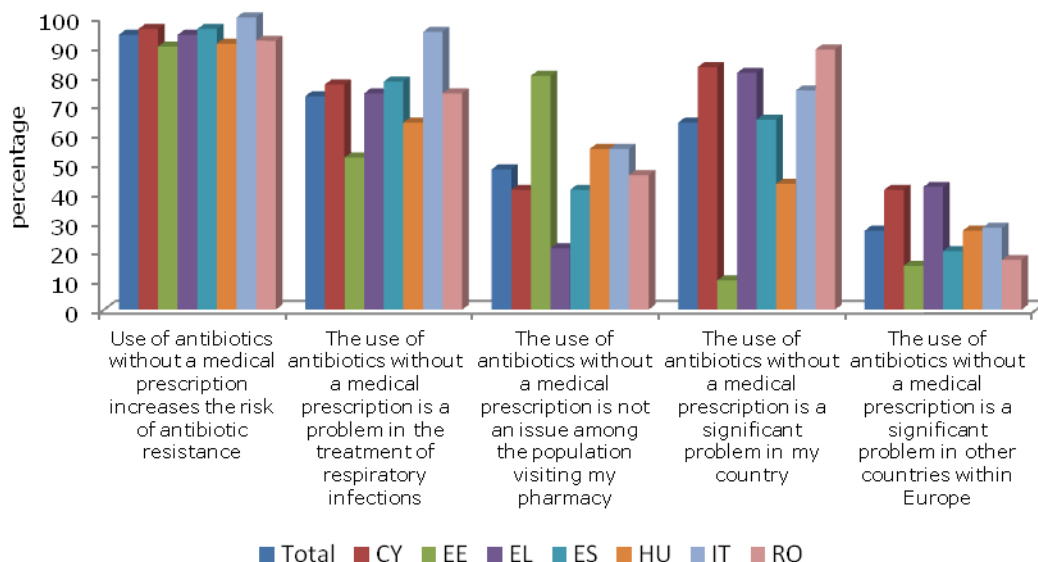
#### 4.4.3. Opinions on the use of antibiotics

Pharmacists and GPs were asked about their opinion on five statements regarding antibiotic use. The statement most widely supported is that the use of antibiotics without a prescription increases the risk of antibiotic resistance (Figures 4.12 and 4.13). In almost all Member States over 90 % of pharmacists and GPs agreed with this statement. A majority of pharmacists in all Member States (from 52 % in Estonia to 95 % in Italy) and GPs (from 60 % in Estonia to 98 % in Cyprus) agreed that the use of antibiotics without a prescription is a problem in the treatment of respiratory infections.

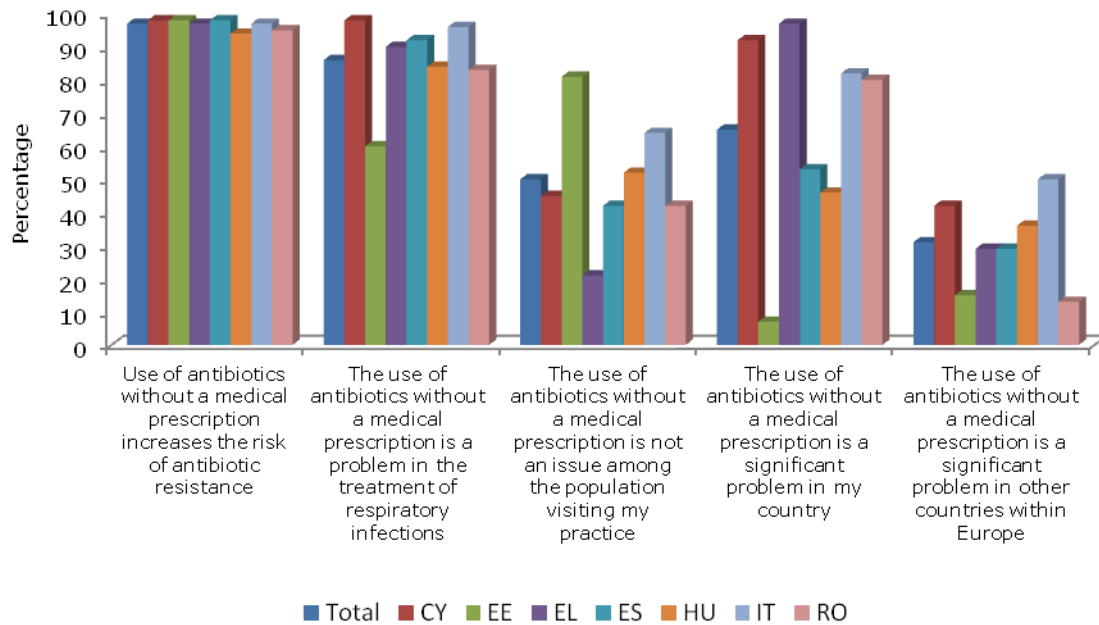
Pharmacists and GPs were more divided over whether the use of antibiotics without a prescription is not an issue among the population visiting their respective pharmacies or practices. A majority of pharmacists and GPs in Estonia (80 %/81 %), Hungary (55 %/53 %) and Italy (55 %/64 %) agreed with this statement, whereas a majority of pharmacists and GPs in Greece disagreed (61 %/73 %).

In all Member States except for Estonia and Hungary, the majority of pharmacists and GPs agreed that the use of antibiotics without a prescription is a significant problem in their own Member State. In Hungary, almost half of the GPs and pharmacists thought that the use of antibiotics without a prescription is a problem, whereas in Estonia only a small minority believe there is a problem. GPs and pharmacists were also asked whether the use of antibiotics without a prescription is a significant problem in Member States other than their own. Except for Estonia, GPs and pharmacists in all Member States believe that other Member States have fewer problems than their own when it comes to the use of antibiotics.

**Figure 4.12.** The percentage of pharmacists (strongly) agreeing with five statements on antibiotic use, total and by Member State (as a percentage of all pharmacists; n = 702 pharmacists). (Source: ARNA pharmacist survey.)



**Figure 4.13.** Number of GPs (strongly) agreeing with five statements on antibiotic use, total and by Member State (as a percentage of all GPs; n = 712 GPs). (Source: ARNA GP survey.)

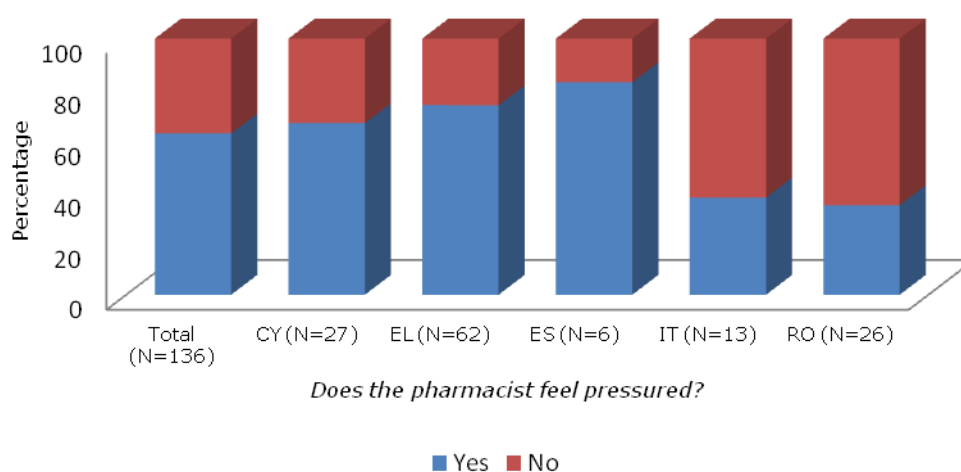


## Pressure to prescribe or dispense antibiotics

### Pharmacists

In Greece, Spain and Cyprus, a majority of pharmacists who sell antibiotics OTC reported feeling under pressure to do so. In Italy and Romania, a majority of pharmacists who sell antibiotics OTC indicated that they did not feel this pressure (Figure 4.14). Overall, empowered customers (80 %) and the fear that customers will go to another pharmacy (36 %) are the most important reasons for feeling this pressure. This was the case in all Member States.

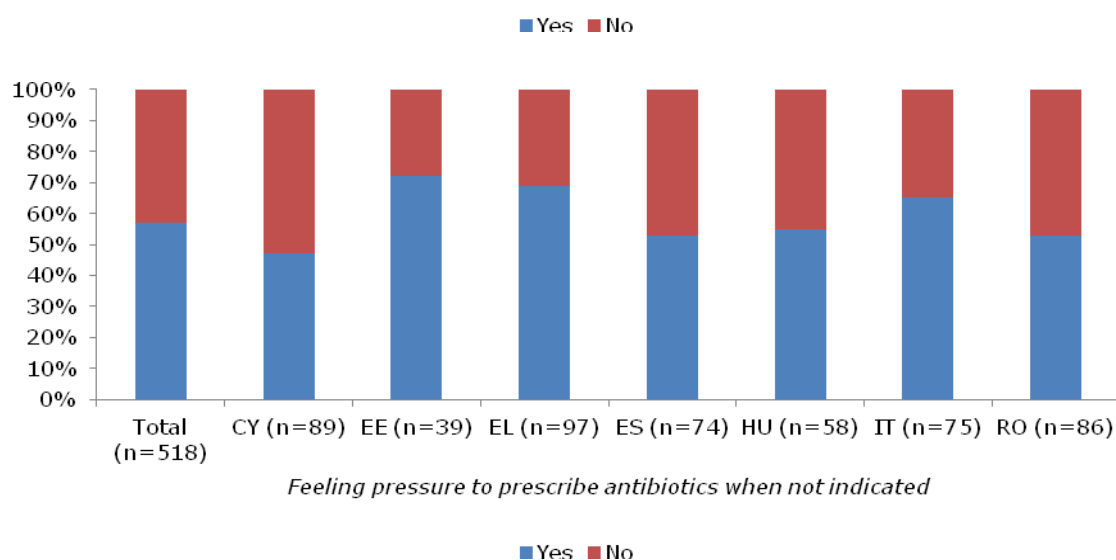
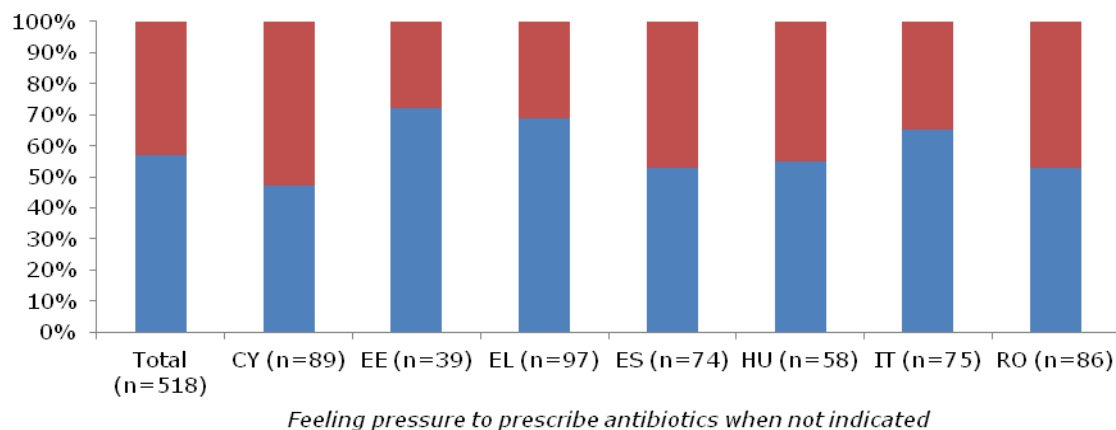
**Figure 4.14.** The percentage of pharmacists who feel pressured by patients to sell antibiotics without a prescription, total and by Member State (as a percentage of all pharmacist who sell antibiotics over the counter; n = 136 pharmacists). (Source: ARNA pharmacist survey; Estonia and Hungary were excluded because there were fewer than five respondents.)



### GPs

A clear majority of GPs in Estonia (72 %), Greece (69 %) and Italy (65 %) reported that they sometimes felt under pressure to prescribe antibiotics when they are not indicated. In Spain (53 %) and Hungary (55 %) just over half of the GPs indicated that they felt the same, while in Cyprus (47 %) and Romania (41 %) slightly fewer than half of the GPs feel this pressure (Figure 4.15). The main reasons for feeling pressured are comparable to those that were mentioned by the pharmacists: empowered patients (63 %) and the fear that patients will go to another GP (18 %).

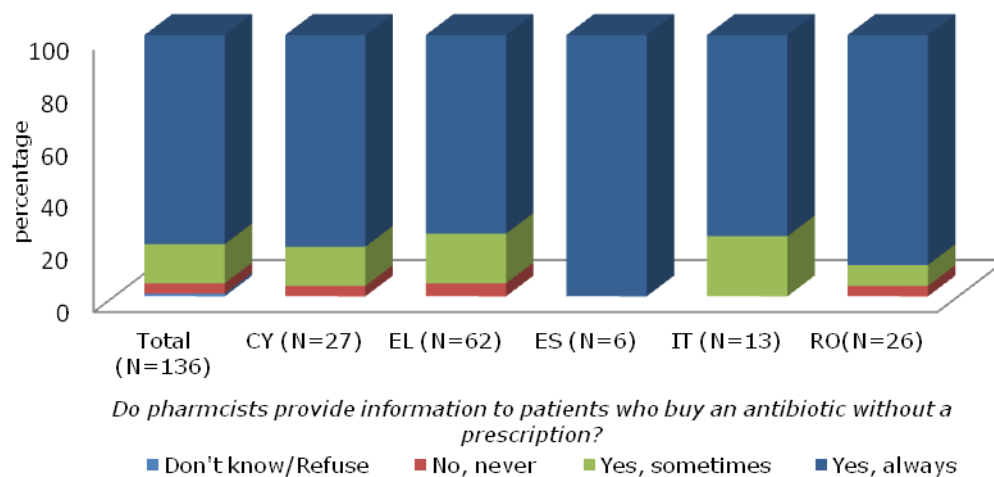
**Figure 4.15.** The percentage of GPs who feel under pressure to prescribe antibiotics when not indicated, total and by Member State (as a percentage of all GPs; n = 518 GPs). (Source: ARNA GP survey.)



Pharmacists who reported selling antibiotics OTC and all GPs were asked whether or not they feel constraints put upon them in what they can do as an HCP to prevent the use of antibiotics without a prescription. More than half of the GPs (59 %) and pharmacists (52 %; n = 49) stated that they do not feel constrained in what they can do. Among those who feel constrained, the most frequently mentioned reasons were patient pressure (GPs: 50 %; pharmacists: 52 %) and, for pharmacists, the feeling they have to do everything possible to cure the patient (50 %). GPs from Cyprus, Greece and Spain appear to believe that there need to be changes in the behaviour of pharmacists as almost half of these GPs (49 %) feel constrained because of OTC selling of antibiotics by pharmacists.

A majority, 80 % on average, of pharmacists who dispense antibiotics OTC reported that they always provide information about the use and side effects of antibiotics to patients who buy them without a prescription. Only 4 %, on average, say they never provide information (Figure 4.16).

**Figure 4.16.** Pharmacists providing information to patients who receive an antibiotic without a prescription as reported by pharmacists, total and by Member State (percentage of all pharmacists who sell over the counter; n = 136 pharmacists). (*Source:* ARNA pharmacist survey; Estonia and Hungary excluded because there were fewer than five respondents.)



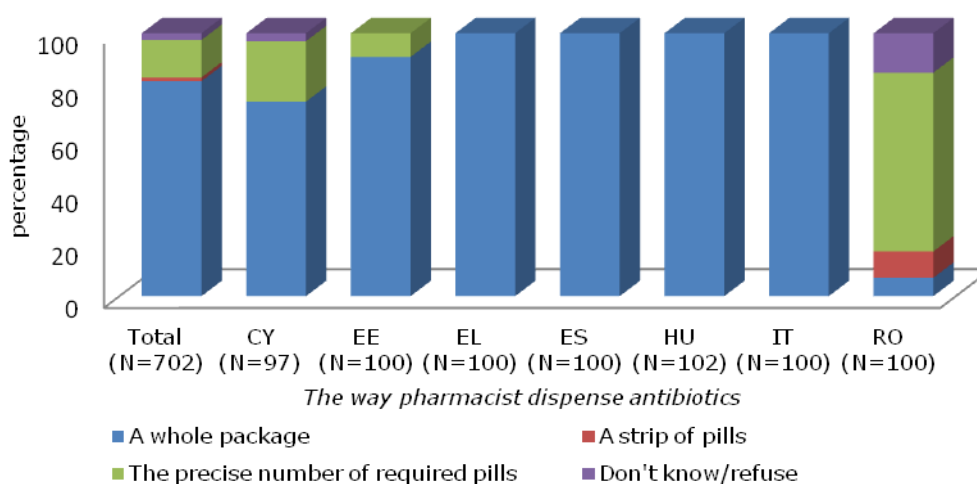
#### 4.4.4. Interventions by GPs and pharmacists

##### The system of dispensing antibiotics

It was shown in Chapter 3 that in some Member States whole packages of antibiotics are dispensed even when they contain more antibiotics than needed. This is reflected in the answers given by the pharmacists in the surveys. In all Member States, a large majority of pharmacists dispense antibiotics in whole packages. The exception was Romania, where more than two thirds of the pharmacists said they dispense the precise number of prescribed units (tablets, capsules). In Greece, Spain, Hungary and Italy all pharmacists said they dispensed a whole package. In Estonia this was 91 % and in Cyprus 74 % (Figure 4.17).



**Figure 4.17.** The way pharmacists dispense antibiotics (precise number of pills, strip of pills, whole package), total and by Member State (as a percentage of all pharmacists; n = 702 pharmacists). (Source: ARNA pharmacist survey.)



#### Professional meetings between HCPs

In all seven Member States where the survey was held a minority of the GPs and pharmacists stated that they collaborate with the other profession. Overall, 3 % of GPs (range 1 %-9 %) and 7 % of pharmacists (range 1 %-18 %) reported participating in a meeting together with the other profession. Having meetings with colleagues from the same profession (only pharmacists or only GPs) is more common. The figure was 20 % among GPs and 17 % among pharmacists.

#### National campaigns to reduce the use of OTC antibiotics

Four out of ten pharmacists are aware of national campaigns in their Member State to reduce the use of OTC antibiotics. More than half of the pharmacists are aware of such campaigns in Cyprus (56 %), Greece (55 %), Italy (59 %) and Spain (58 %). In the other Member States this percentage is lower: Romania (29 %), Hungary (14 %), Estonia (8 %). For GPs the pattern is the same.

#### The need to reduce non-prescription antibiotics

The majority of GPs (89 %) and pharmacists (81 %) interviewed believe that patients should use fewer non-prescription antibiotics. Both professions agree that public education is an absolute necessity if this goal is to be attained (GPs: 83 %; pharmacists: 88 %). However, GPs and pharmacists do not agree on other ways to achieve a reduction in non-prescription antibiotics. While GPs consider it necessary to enforce the law by regulating the sale of antibiotics (56 %) and strengthening pharmacy regulations (49 %), pharmacists believe it is more important to prevent self-medication from other sources (54 %) and to provide information on local patterns of antibiotic resistance (54 %).

### 4.5. Summary and discussion

Chapter 2 showed that, in 2016, between 2 % (Sweden) and 20 % (Greece) of all antibiotics that were used in EU Member States were used without a prescription. The ARNA survey was performed in seven Member States with a relatively high level of non-prescription use of antibiotics. It specifically focused on use without a prescription during the last 18 months. The results showed that in the seven Member States selected, the use of antibiotics without a prescription is still common in all except



Estonia. Purchasing antibiotics OTC is the most common source in Romania, Greece, and Hungary. In the four other Member States (Cyprus, Estonia, Italy, Spain), most people make use of leftover antibiotics from previous courses. The internet is not an important source for obtaining antibiotics.

Respondents from Greece and Cyprus were most convinced that antibiotics can easily be obtained from GPs, pharmacists and members of their social network, while respondents from Estonia, Hungary and Italy were least convinced about this. Influenza, the common cold, sore throat, cough, fever and headache were all common reasons to use antibiotics without a prescription. A previously prescribed antibiotic treatment is the main motivation for patients in all seven Member States to use antibiotics without a prescription.

Knowledge about antibiotics among patients who use antibiotics without a prescription is lower than among the general population (Eurobarometer 2016). In Chapter 3 it is shown that knowledge is an important determinant of antibiotic use without a prescription. As such, it is important to educate patients further about antibiotic use. Pharmacists and GPs can play an important role in this process.

Pharmacists and GPs were also interviewed within the context of the ARNA project, and an important finding was that a large majority are asked by their patients to prescribe or dispense an antibiotic even though there is no medical indication. Most GPs and pharmacists do not always fulfil these requests. As such, they try to avoid irrational use of antibiotics. However, some agree that they sometimes prescribe or deliver an antibiotic in such a situation, mainly because of patient pressure or as a result of shared decision-making with the patient. Moreover, in some Member States pharmacists fear that patients will otherwise simply go to another pharmacy. The surveys also found that GPs and pharmacists are aware that the use of antibiotics is a problem in their respective Member States. Interestingly, a majority of the GPs and pharmacists interviewed believe that it is a bigger problem in their own Member State than in other countries in Europe.

There are some limitations to the surveys, such as the low response rates, especially in the GP and pharmacist surveys (e.g. Estonia). As a non-response analysis was not possible, it is not clear whether the GPs and pharmacists who participated in the surveys are representative of their overall group. Moreover, self-reports are known to sometimes lead to outcomes that are too positive, for example because of a tendency towards providing socially desirable answers. In addition, despite the explanation about what an antibiotic is, we are not sure that every respondent has understood this well, and that they may have confused antibiotics with other medicines. Nevertheless, the findings provide insights into the views of patients, GPs and pharmacists on antibiotics. It also showed that they find antibiotic use without a prescription a problem in their respective Member States. As such, the findings were valuable for the rest of the ARNA project where solutions and interventions were discussed with stakeholders in the country-dialogue meetings (see Chapter 6). For each Member State, factsheets were made with the results from the surveys comparing the results for the country to the overall results for all Member States. It should be noted that Estonia stood out in all three surveys, indicating that the problem of antibiotic use without a prescription was less important than anticipated. On the basis of these results, it was decided that no country-dialogue meeting was necessary in Estonia.