Antimicrobial Resistance

Fieldwork: November - December 2009
Publication: April 2010

Summary

Survey commissioned by the Directorate-General for Health and Consumers and coordinated by the Directorate-General Communication ("Research and Political Analysis" Unit).

This document does not represent the views of the European Commission. The interpretations and opinions expressed are solely those of the authors.
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INTRODUCTION

We now know that an increasing number of patients are infected by micro-organisms which have developed a resistance to antimicrobial agents. In Europe as in the world as a whole, this resistance is now a real threat to public health.

The European Union has therefore put in place a Community strategy against antimicrobial resistance\(^1\), supported by initiatives to encourage the prudent use of these substances in human medicine\(^2\). To combat the misconceptions surrounding antibiotics, since 2008 the European Union has organised an annual antibiotic awareness campaign in the 27 European Union countries, coordinated by the European Centre for Disease Prevention and Control (ECDC).

In order to ascertain how knowledgeable Europeans are about antibiotics, the Directorate-General for Health and Consumers commissioned this survey. The study aims to determine the best ways of raising public awareness of the risk of the inappropriate use of antibiotics with the ultimate aim of changing behaviour.

The methodology used for this survey is that of the Eurobarometer surveys. A technical note on the way in which the interviews (which were carried out between 13 November and 9 December 2009) were conducted by the various polling institutes of the TNS Opinion & Social network is annexed to this report.

This summary is divided into three main parts, structured as follows:

- The use of antibiotics by Europeans.
- Public knowledge and preconceptions about antibiotics.
- The impact of antibiotic awareness campaigns on the knowledge and practices of Europeans in this area.

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A full report with a more detailed analysis of the results is also available.

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The Eurobarometer web site can be consulted at the following address:  

We would like to take this opportunity to thank all the respondents throughout the continent who gave their time to take part in this survey.  
Without their active participation, this survey would quite simply not have been possible.
In this report, the countries are referred to by their official abbreviation:

**ABREVIATIONS**

- EU27 European Union – 27 Member States
- DK Don’t know
- BE Belgium
- BG Bulgaria
- CZ Czech Republic
- DK Denmark
- DE Germany
- EE Estonia
- EL Greece
- ES Spain
- FR France
- IE Ireland
- IT Italy
- CY Republic of Cyprus
- LT Lithuania
- LV Latvia
- LU Luxembourg
- HU Hungary
- MT Malta
- NL The Netherlands
- AT Austria
- PL Poland
- PT Portugal
- RO Romania
- SI Slovenia
- SK Slovakia
- FI Finland
- SE Sweden
- UK United Kingdom
1. THE USE OF ANTIBIOTICS

1.1 Antibiotics taken during the last twelve months

40% of Europeans have taken antibiotics orally during the past year, either in the form of tablets, powder or syrup. These results are very much in line with those recorded in the 2002 Eurobarometer study on antibiotics (that survey was conducted in the then 15 Member States).

Nevertheless, this European average conceals fairly significant differences from one Member State to another. **Respondents in southern European Union countries are the most likely to use antibiotics:** in Italy (57%), Malta (55%), Spain (53%) and Romania (51%). On the other hand, the lowest rates of use are found in Sweden and Slovenia, at 22% and 27% respectively, followed by Germany (28%), Denmark and the Netherlands (30% each).
A socio-demographic analysis shows that women are more likely than men to say that they have taken antibiotics (43% versus 37%), as are young people aged 15-24 (46%), respondents who live in large towns (43%) and those with the least objective knowledge of medicines of this type (42%).
1.2 How citizens obtained their last course of antibiotics

Of all the ways of obtaining antibiotics, medical prescriptions and antibiotics administered by a medical practitioner were the methods cited most often by respondents. These methods were mentioned by 95% of respondents, whereas 3% said that they had obtained antibiotics without a prescription and 2% said that they had used antibiotics left over from a previous course of treatment. These results are very similar to those obtained at the time of the last Eurobarometer survey on this subject in 2002 (that survey was conducted in the then 15 Member States).

Almost all respondents in Finland (99%), Sweden, Germany, Luxembourg, Portugal and the Czech Republic (all 98%) said that they had taken either medically prescribed antibiotics or antibiotics administered by a medical practitioner. Romania was the only European country where fewer than eight out of ten citizens had obtained antibiotics from a doctor (79%).
Unemployed people are the least likely to have obtained antibiotics under medical supervision (91%). The older the respondents are the more likely they are to have obtained antibiotics from a medical practitioner: 93% of those aged between 15 and 24 compared with 97% of those aged 55 or over.
1.3 The reason why respondents last took antibiotics

A relative majority of respondents (20%) said that they last took antibiotics for flu, although it is known that antibiotics are ineffective against viruses. 14% also said that they had taken them for a cold, 17% to treat bronchitis and 15% for a sore throat.

Respondents in Spain (32%), followed by those in Austria (31%), Cyprus (28%), Bulgaria and Malta (26%), Greece (25%), Slovakia (24%), Italy and Germany (23%) are the most likely to have taken antibiotics for flu. Likewise, citizens in Romania (40%), Bulgaria (32%), Latvia (30%), Greece and Cyprus (27% each), Spain (24%) and Hungary and Austria (23% each) are the most likely to have made the mistake of taking antibiotics to treat a cold.

Young people are more likely than older respondents to take antibiotics (23% of those in the 15-24 age group have taken them for flu, compared with 16% of those aged 55 or over; the same applies to their use to treat colds, at 16% and 11% respectively.

Respondents with a better objective knowledge of antibiotics seem to behave more responsibly: thus, among the most knowledgeable respondents, only 8% have taken antibiotics for flu and 3% for a cold.
2. KNOWLEDGE ABOUT ANTIBIOTICS

Only 20% of the people interviewed during the survey gave four right answers to the following statements (the European average number of right answers stands at 2.3 out of 4): Antibiotics kill viruses (false), Antibiotics are effective against colds and flu (false), Unnecessary use of antibiotics makes them become ineffective (true), Taking antibiotics often has side-effects, such as diarrhoea (true).

Respondents in northern countries are clearly among the best informed about the effects of antibiotics, with most respondents giving four right answers in Finland (44%), Sweden (39%) and Denmark (37%), followed by Slovenia, Belgium and France (33% each), and Great Britain (31%).
The least well-informed respondents (whose average number of right answers was less than or equal to 2) are mainly found in Romania (1.5), Portugal and Hungary (1.8), Austria (1.9) and Bulgaria (2.0).

The socio-demographic analysis shows that the categories who achieved the highest average scores are the respondents who studied until at least age 20 (2.7), managers (2.8), and the people who say that they have received information advising them not to take antibiotics unnecessarily (2.7).
2.1. Do antibiotics kill viruses?

53% of Europeans wrongly believed that “Antibiotics kill viruses”. Only a third (36%) knew that this was false.

Respondents were most likely to get this wrong in Portugal and Romania (both 14%), Austria (17%) and Malta (18%). Conversely, the highest proportion of correct answers was recorded in Sweden (73%), Finland and France (58%).

Women seem to be better informed than men (39% compared with 34% of men). Respondents aged 40-54 (42%), those who studied until age 20 or beyond, and respondents who have been exposed to information about antibiotics during the last 12 months (46%) also have higher scores.
2.2 Are antibiotics effective against colds and flu?

47% of Europeans wrongly believed that “Antibiotics are effective against colds and flu”, while a similar proportion (46%) rightly said that the statement was false.

The best informed respondents are found in Finland (72%), Belgium (69%), Sweden (68%), the Netherlands (66%), Denmark and the United Kingdom (65%). Those who are most likely to give the wrong answer are found in Portugal (18%) and Cyprus (23%) and also in Austria (26%) and Bulgaria (27%).

The socio-demographic variables suggest that women are slightly better informed than men (48% compared with 42%). Those aged 40-54 (50%), the respondents who studied longest (59%), managers (64%) and those who have been exposed to information about antibiotics also have higher scores.
2.3 Does the unnecessary use of antibiotics make them ineffective?

83% of Europeans are aware that the unnecessary use of antibiotics makes them ineffective.

In ten European Union countries, more than nine out of ten of the people interviewed replied that the unnecessary use of antibiotics makes them ineffective. The ten countries were: Sweden (97%), Denmark (96%), Cyprus, Slovenia and Malta (94%), the Netherlands (93%), Greece and Finland (92%), the Czech Republic (91%) and Slovakia (90%).

The least knowledgeable respondents on this subject were found in Romania (57%), followed by Italy (65%), Hungary (75%) and Estonia (78%).

89% of Europeans who studied up to at least the age of 20 rightly answered that the unnecessary use of antibiotics renders them less effective, as did 90% of managers.
2.4 Does taking antibiotics often give rise to side-effects such as diarrhoea?

More than two-thirds of respondents (68%) knew that taking antibiotics could have side-effects such as diarrhoea. 15% were unaware of this, and 17% gave no answer.

Respondents in Finland (82%), Estonia and Cyprus (78%), Lithuania, Germany, Poland and Slovakia (74% each) are the best informed about these potential side-effects, while respondents in Hungary and Romania (50%), the Netherlands (55%) and the Czech Republic (57%) seem least aware of the side-effects of antibiotics.

The socio-demographic analysis reveals that there is a difference of six points between men (65%) and women (71%). The best informed groups are those aged 40-54, respondents from the most well-off backgrounds, and those who recall receiving information on antibiotics during the last 12 months (76% compared with 63% who have no such memory).
3. THE ANTIBIOTIC AWARENESS CAMPAIGN

3.1 Taking information on board

37% of Europeans remember receiving information advising them not to take antibiotics unnecessarily.

Respondents in France (67%), Finland (60%), Luxembourg (56%), Spain and Belgium (51%) and Slovenia (50%) are the most likely to remember receiving such information.

Respondents in Portugal (13%), the Netherlands (15%), Hungary (19%), Estonia (21%) and Austria (23%) are the least likely to remember receiving this type of information.
Women are slightly more likely than men to remember receiving this type of information (39% and 35% respectively), as are Europeans aged between 40 and 54 (40%), respondents who studied the longest (50%), managers (48%) and those with a good objective knowledge of antibiotics (53%).
3.2 Means of conveying information

When asked to identify their sources of information about not taking antibiotics unnecessarily, almost a third of Europeans (30%) replied that they had been advised by their doctor. 29% said they had seen an advertisement on television, while 15% said that their source was a newspaper article or the TV news.

The role played by doctors is particularly important in Hungary and Italy (59% each), Romania (53%), the Czech Republic (48%)\(^3\). However, respondents in France (10%), Sweden (13%), Malta (16%), Ireland and Latvia (19%) were the least likely to mention a doctor as a source of information.

Respondents in France (71% compared with a European average of 29%) are by far the most likely to have seen a TV advertisement on the subject, followed by those in Belgium (51%), Luxembourg (40%), Spain (33%), Greece (32%) and Malta (30%). Respondents in Sweden (47%), Finland (35%), Germany and Cyprus (34% each) are the most likely to have obtained the information from a newspaper or the TV news (compared with a European average of 15%).
The respondents who are most likely to obtain this information from their doctor are those who studied the least, mainly house persons and employees. They tend to live in urban areas. This also applies to 35% of respondents who never use the Internet. On the other hand, the people interviewed who obtained information on antibiotics from a TV advertisement tend to be unemployed people (35%), people looking after the home and manual workers (32%). They live in rural areas and position themselves at the bottom of the social scale (36% of the latter group).

### 3.3 The influence of information on opinions on antibiotics

Almost two-thirds of Europeans (62%) said that the information they had received had not changed their views on antibiotics.

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3 The results for this question must be analysed with caution given the weakness of some bases in some countries.
Respondents in Slovakia (57%), Ireland (54%), Spain and Romania (53%) seem to have been the most impacted by the information they received. However, respondents in the Netherlands (19%), Denmark (22%), Finland (24%), Portugal and Germany (27% each) were the least likely to be influenced.

The categories which have been most willing to change their views of antibiotics are young people aged 15-24 (42%), students (43%), house persons (41%), the unemployed (42%) and interviewees who have taken antibiotics during the last twelve months (40%).

### 3.4 The impact of the campaign on behaviour

Among the people who had received information on antibiotics in the last twelve months and who had changed their views a very large majority (76%) said that in the future they would always consult a doctor if they thought they needed an antibiotic.

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4 The results for this question must be analysed with caution given the weakness of some bases in some countries.
Respondents in Cyprus (90%), Malta (88%), Greece (86%), Bulgaria and Romania (84%)\(^5\) are the most likely to say that in future they will always consult a doctor if they think they need an antibiotic. Respondents in Denmark (56%), Cyprus (41%), Estonia (40%), Malta, the Netherlands, Romania and Sweden (35%) are the most likely to say that they will no longer take antibiotics without a doctor’s prescription.

The highest scores for stopping self-medication were recorded in Romania (39%), Bulgaria (34%), Latvia (30%) and Denmark (27%).

### 3.5 The most trustworthy sources of information

When asked which source of information they would use to obtain trustworthy information about antibiotics, a very large majority of Europeans said that they would choose a doctor (88% on average).

<table>
<thead>
<tr>
<th>Question</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A doctor</td>
<td>88%</td>
</tr>
<tr>
<td>A pharmacy</td>
<td>42%</td>
</tr>
<tr>
<td>A hospital</td>
<td>18%</td>
</tr>
<tr>
<td>A nurse</td>
<td>10%</td>
</tr>
<tr>
<td>Family or friends</td>
<td>6%</td>
</tr>
<tr>
<td>Another health care facility</td>
<td>5%</td>
</tr>
<tr>
<td>The Internet site from the National Government/the Ministry of Health</td>
<td>5%</td>
</tr>
<tr>
<td>The Internet site from the (NATIONAL PUBLIC HEALTH INSTITUTE)</td>
<td>5%</td>
</tr>
<tr>
<td>Another health related Internet site</td>
<td>4%</td>
</tr>
<tr>
<td>A Health Medical Encyclopedia</td>
<td>4%</td>
</tr>
<tr>
<td>The Internet site on Public Health from the EU</td>
<td>2%</td>
</tr>
<tr>
<td>A national, independent public health body or organisation</td>
<td>2%</td>
</tr>
<tr>
<td>A health related magazine</td>
<td>2%</td>
</tr>
<tr>
<td>A newspaper or magazine</td>
<td>1%</td>
</tr>
<tr>
<td>I am not looking for information on antibiotics (SPONTANEOUS)</td>
<td>3%</td>
</tr>
<tr>
<td>Other (SPONTANEOUS)</td>
<td>1%</td>
</tr>
</tbody>
</table>

\(^5\) The results for this question must be analysed with caution given the weakness of some bases in some countries
As many as nine out of ten respondents made this choice in Cyprus (96%), the Czech Republic, Luxembourg and Malta (95% each), Spain and Austria (93% each), Slovakia and Germany (91% each), followed by Greece, Portugal, Romania and Great Britain (90% each).

The second most frequently mentioned source was a pharmacy, with an average score of 42%. The highest scores for this choice were recorded in Ireland (62%), the Netherlands (61%) and Sweden (59%).

### 3.6 The fact that everyone has a role to play to ensure that antibiotics remain effective

Eight out of ten Europeans (exactly 81%) share the view that “Everyone has a role to play to ensure that antibiotics remain effective”.

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QD2b. Please tell me to what extent you agree or disagree with the following statement: Everyone has a role to play to ensure that antibiotics remain effective.
This view is shared by more than nine out of ten respondents in the Czech Republic (93%), Malta and Denmark (92% each), Greece (91%) and Belgium (90%). Respondents in Poland (61%), Bulgaria (68%), the Baltic States (around 70%) and Austria (72%) tend to be the least convinced. However, these lower scores can be explained to some extent by the levels of DK answers in some of these countries.

This consensus applies to all the socio-demographic and socio-professional categories considered in this survey, with few exceptions, though young people aged between 15 and 24 are the least likely to agree with the statement (76% versus 81% for the European average and for respondents aged 55 or over).

It should also be noted that 88% of respondents who have changed their views on antibiotics agree with the QD2b statement.
CONCLUSION

Let us recall the main lessons of this survey:

- Firstly, 40% of Europeans have taken antibiotics during the last twelve months. Antibiotic use is the highest in southern European Union countries, and among the youngest respondents.

- Secondly, antibiotic use is highest among the people whose objective knowledge is the poorest. The respondents who are the better informed about antibiotics seem to behave more responsibly.

- Although the vast majority of Europeans are aware that taking too many antibiotics makes them ineffective (83%), their knowledge of antibiotics could be improved. The main reason given by Europeans for taking antibiotics is to treat flu (20%).

- In addition, the respondents who gave the fewest wrong answers are those who said that they had received information advising against taking antibiotics unnecessarily. This result suggests that the information seems to have been absorbed by the people exposed to it. The respondents who are the least familiar with the effects and role of antibiotics are also the most likely to have changed their views on antibiotics.

In order for antibiotic awareness campaigns to achieve their goal, it is necessary therefore not only to prove the public health benefits but also to demonstrate that antibiotics are totally ineffective against viruses. Campaigns must be ongoing, and they must also reflect local conditions. This survey has shown that there are significant differences between Member States.

General practitioners seem to be best placed to convey this type of message and must be involved in these campaigns, although awareness campaigns via TV advertisements targeting the general public remain pertinent as a way of reaching the widest possible audience. A mix of media and sources of information (including television) might therefore be used in order to raise awareness and have as broad and lasting an impact as possible.
TECHNICAL SPECIFICATIONS
Between the 13th of November and the 9th of December 2009, TNS Opinion & Social, a consortium created between TNS plc and TNS opinion, carried out wave 72.5 of the EUROBAROMETER, on request of the EUROPEAN COMMISSION, Directorate-General for Communication, "Research and Political Analysis".

The SPECIAL EUROBAROMETER Nº338 is part of wave 72.5 and covers the population of the respective nationalities of the European Union Member States, resident in each of the Member States and aged 15 years and over. The basic sample design applied in all states is a multi-stage, random (probability) one. In each country, a number of sampling points was drawn with probability proportional to population size (for a total coverage of the country) and to population density.

In order to do so, the sampling points were drawn systematically from each of the "administrative regional units", after stratification by individual unit and type of area. They thus represent the whole territory of the countries surveyed according to the EUROSTAT NUTS II (or equivalent) and according to the distribution of the resident population of the respective nationalities in terms of metropolitan, urban and rural areas. In each of the selected sampling points, a starting address was drawn, at random. Further addresses (every Nth address) were selected by standard "random route" procedures, from the initial address. In each household, the respondent was drawn, at random (following the "closest birthday rule"). All interviews were conducted face-to-face in people's homes and in the appropriate national language. As far as the data capture is concerned, CAPI (Computer Assisted Personal Interview) was used in those countries where this technique was available.
<table>
<thead>
<tr>
<th>ABBREVIATIONS</th>
<th>COUNTRIES</th>
<th>INSTITUTES</th>
<th>Nº INTERVIEWS</th>
<th>FIELDWORK DATES</th>
<th>POPULATION 15+</th>
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</tbody>
</table>
For each country a comparison between the sample and the universe was carried out. The Universe description was derived from Eurostat population data or from national statistics offices. For all countries surveyed, a national weighting procedure, using marginal and intercellular weighting, was carried out based on this Universe description. In all countries, gender, age, region and size of locality were introduced in the iteration procedure. For international weighting (i.e. EU averages), TNS Opinion & Social applies the official population figures as provided by EUROSTAT or national statistic offices. The total population figures for input in this post-weighting procedure are listed above.

Readers are reminded that survey results are estimations, the accuracy of which, everything being equal, rests upon the sample size and upon the observed percentage. With samples of about 1,000 interviews, the real percentages vary within the following confidence limits:

<table>
<thead>
<tr>
<th>Observed percentages</th>
<th>10% or 90%</th>
<th>20% or 80%</th>
<th>30% or 70%</th>
<th>40% or 60%</th>
<th>50%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confidence limits</td>
<td>± 1.9 points</td>
<td>± 2.5 points</td>
<td>± 2.7 points</td>
<td>± 3.0 points</td>
<td>± 3.1 points</td>
</tr>
</tbody>
</table>