EUROPEAN ANTIBIOTIC AWARENESS DAY

A European Health Initiative

ecdc EUROPEAN CENTRE FOR DISEASE PREVENTION AND CONTROL

Summary of the latest data on antibiotic consumption in the European Union

November 2012

Highlights on antibiotic consumption

- Antibiotic use is one of the main factors responsible for the development and spread of antibiotic resistance.
- The vast majority of human consumption of antibiotics occurs in the community (outside hospitals).
- Nevertheless, antibiotic consumption in hospitals is a main driver for the spread of antibiotic-resistant bacteria responsible for healthcare-associated infections.
- During the last decade[*], there has been an increase in antibiotic consumption in the community overall in the EU, but the situation varies widely from country to country. Recent data from the European Surveillance of Antimicrobial Consumption Network (ESAC-Net) show that:

  In 2010 as in previous years, there was a 3.5 fold difference between the country having the lowest antibiotic consumption (Estonia) and the country having the highest antibiotic consumption in the community (Greece).

  Between 2009 and 2010, three countries (Iceland, Latvia and United Kingdom) showed an increase of more than 5% in antibiotic consumption in the community, expressed in Defined Daily Doses (DDD) per 1 000 inhabitants per day, between 2009 and 2010.

  During the same period, three other countries (Austria, Lithuania and Poland) showed a decrease in antibiotic consumption. In addition, between 2008 and 2010, antibiotic consumption in the community decreased continuously in four countries (Bulgaria, Estonia, Lithuania and Slovenia).

  Penicillins were the most frequently used group of antibiotics in the community in all countries. In the hospital sector, the penicillins often were, but not always the most frequently used group. The proportions of consumption of cephalosporins and other beta-lactams (including carbapenems) and of other J01 classes were generally higher in the hospital sector than in the community.
- Overall (hospital sector and community) consumption of carbapenems increased significantly in EU/EEA countries from 2007 to 2010. Fifteen of 19 countries with available data reported an increase during that period. Carbapenems represent a major last-line class of antibiotics to treat infections with multidrug resistant Gram-negative bacteria such as *Klebsiella pneumoniae* and *Escherichia coli* (*E. coli*).
- National antibiotic consumption data are publicly available from ESAC-Net[†] and thus provide a basis for healthcare professionals, authorities and the general public for monitoring progress towards a more prudent of antibiotics.

[*] Adriaenssens N, et al. European Surveillance of Antimicrobial Consumption (ESAC): outpatient antibiotic use in Europe (1997-2009). J Antimicrob Chemother 2011; Dec;66 Suppl 6:vi3-12.

[†] http://ecdc.europa.eu/en/activities/surveillance/ESAC-Net/about_ESAC-Net/Pages/about_network.aspx

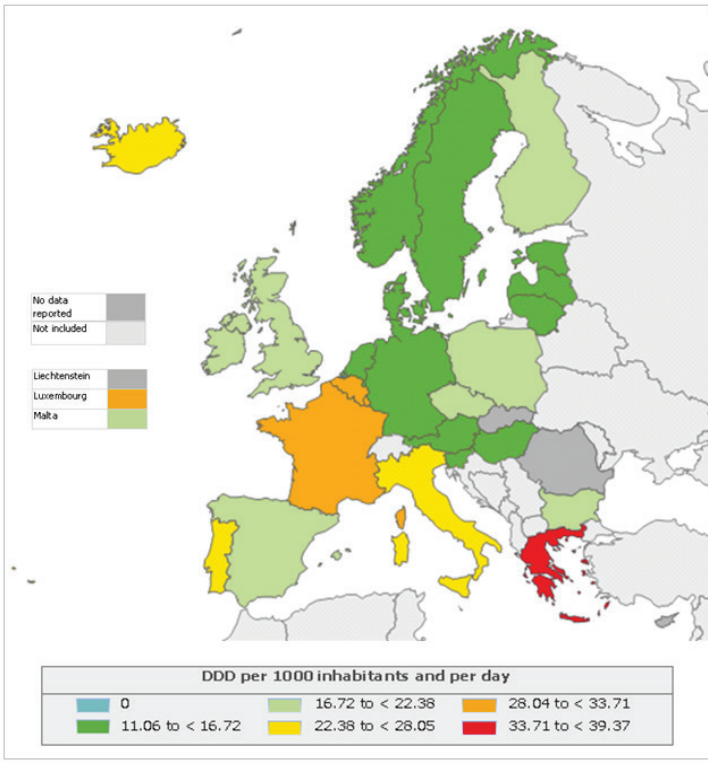
Antibiotic consumption in Europe

The data from 2010 presented in this section were collected by the European Surveillance of Antimicrobial Consumption Network (ESAC-Net). Since 1 July 2011, the European Centre for Disease Prevention and Control (ECDC) coordinates ESAC-Net, which was formerly coordinated by the University of Antwerp, Belgium, under the name European Surveillance of Antimicrobial Consumption (ESAC) project, and funded by ECDC. This is the first time that data on antibiotic consumption are published by ESAC-Net and ECDC.

ESAC-Net collects and analyses data on antibiotic consumption from EU/EAA countries, both in the community and in the hospital sector.

European data on consumption of antibiotics in patients in the community in 2010 are presented in Figures 1 and 2. These data represent antibiotic consumption outside hospitals and account for the largest proportion of human consumption of antibiotics. Data on antibiotic consumption are available from 29 EU/EEA countries and are measured in Defined Daily Doses (DDD per 1 000 inhabitants and per day according to the Anatomical Therapeutical Chemical (ATC)/DDD index. Antibiotic consumption expressed in DDD per 1000 inhabitants and per day is a potential indicator for healthcare professionals and policy makers to monitor national efforts towards a more prudent use of antibiotics in the community.

Figure 1. Consumption of antibiotics for systemic use in the community in EU/EEA countries, 2010*



In 2010 as in previous years, there was a 3.5 fold difference between the country having the lowest antibiotic consumption (Estonia) and the country having the highest antibiotic consumption in the community (Greece) (Figures 1 and 2).

Three countries (Iceland, Latvia and United Kingdom) showed an increase of more than 5% in antibiotic consumption in the community expressed in DDD per 1 000 inhabitants per day between 2009 and 2010. However, during the same period, three other countries (Austria, Lithuania and Poland) showed a decrease in antibiotic consumption.

Greece and Iceland provided total care (both community and hospital sector) data. On average, 90% of total care data correspond to consumption in the community.

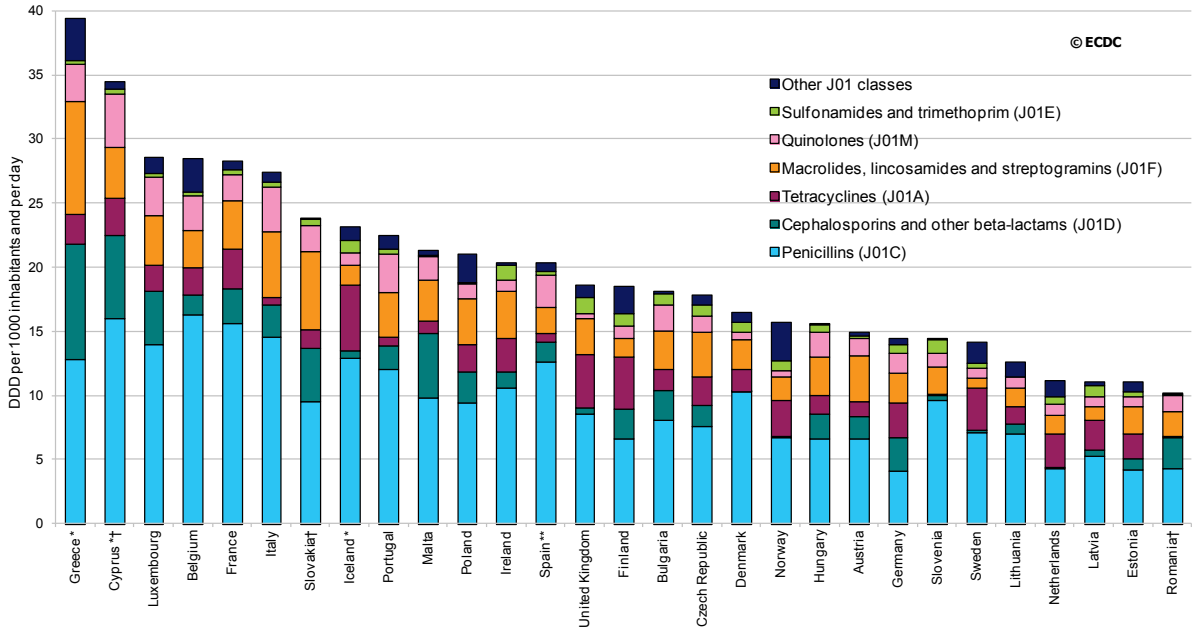
* Data expressed in DDD per 1 000 inhabitants and per day

Spain provided reimbursement data, i.e. not including antibiotics obtained without a prescription and other non-reimbursed courses.

The distribution into main antibiotic classes of community antibiotic consumption expressed in DDD per 1 000 inhabitants and per day is presented in Figure 2. Each bar refers to a specific country while the colours indicate the recorded consumption of the different antibiotic classes in that country.

Total community antibiotic consumption ranged from 11.1 DDD per 1 000 inhabitants and per day in Estonia to 39.4 DDD per 1 000 inhabitants and per day in Greece. As in previous years, penicillins were the most frequently used group of antibiotics in the community in all countries (Figure 2).

Figure 2. Consumption of antibiotics for systemic use in the community by antibiotic class in 29 EU/EEA countries, 2010 or latest year available*



**For Cyprus, Greece and Iceland: total care data, (both community and hospital sector)*

***Spain: reimbursement data, i.e. not including over-the-counter sales without a prescription and other non-reimbursed courses*

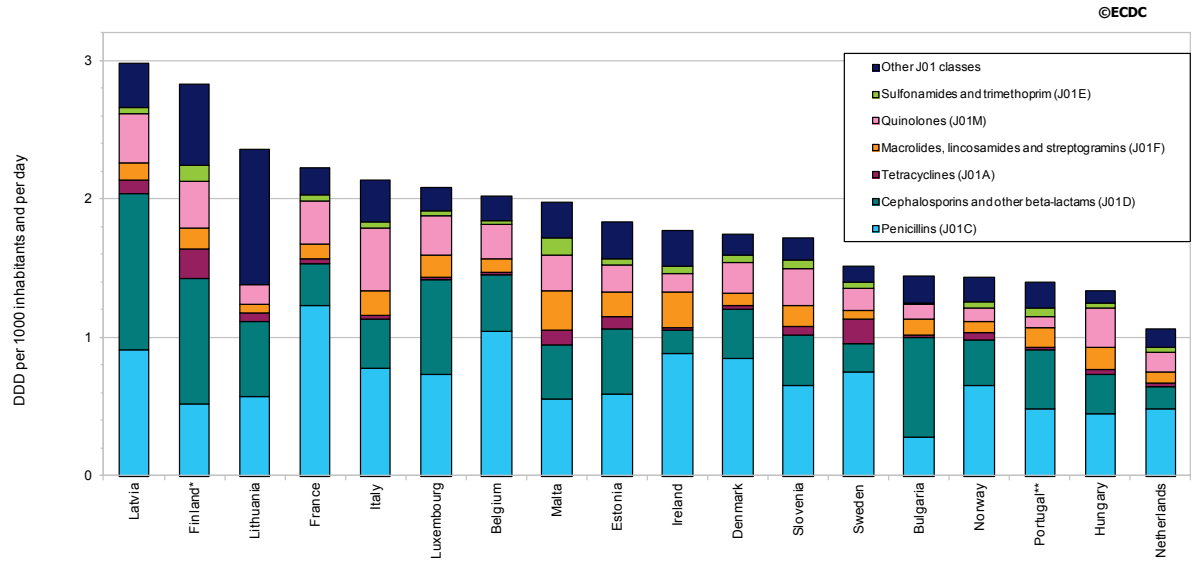
† Cyprus, Romania and Slovakia: 2009 data (Source: ESAC project)

Figure 3 shows the distribution into main antibiotic classes of antibiotic consumption in the hospital sector expressed in DDD per 1 000 inhabitants and per day. Each bar refers to a specific country while the colours indicate the recorded consumption of the different antibiotic classes in that country.

Antibiotic consumption in the hospital sector ranged from 1.1 DDD per 1 000 inhabitants and per day in the Netherlands to 3.0 DDD per 1 000 inhabitants and per day in Latvia. Contrary to consumption in the community, penicillins were not the most frequently used group of antibiotics in the hospital sector in all countries (Figure 3). The proportions of consumption of cephalosporins and other beta-lactams (including carbapenems) and of other J01 classes were generally higher in the hospital sector than in the community

* Data expressed in DDD per 1 000 inhabitants and per day

Figure 3. Consumption of antibiotics for systemic use in the hospital sector by antibiotic class in 18 EU/EEA countries, 2010.*



** Finland: data include consumption in remote primary health care centres and nursing homes.*

*** Portugal: data only correspond to public hospitals only*

Consumption of carbapenems in Europe

One main driver for the selection and spread of multidrug-resistant bacteria responsible for healthcare-associated infections in hospitalised patients is the use of antibiotics in hospitals.

Carbapenems is a last-line class of antibiotics, which belongs to ATC group J01D (other beta-lactams antibacterials) and is used in a large majority in hospitals. Overuse of carbapenems contributes to the selection of carbapenem-resistant bacteria and prior use of a carbapenem antibiotic is a risk factor for the acquisition of carbapenemase-producing *Enterobacteriaceae*[†].

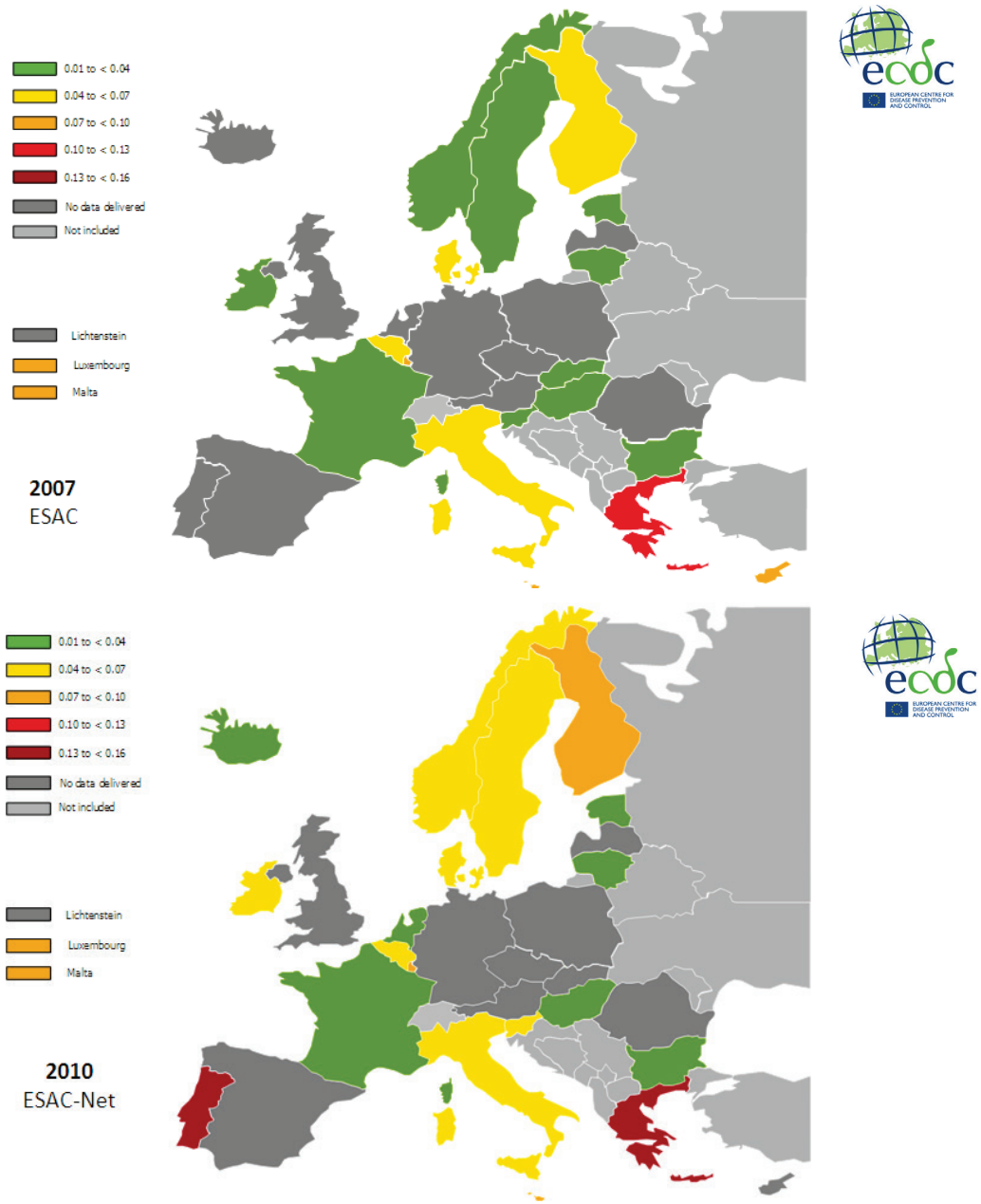
From 2007 to 2010, overall (hospital sector and community) consumption of carbapenems increased significantly in EU/EEA countries, with 15 out of 19 EU/EEA countries with available data reporting an increase during that period.

Reporting of hospital antibiotic consumption data to ESAC-Net should be consolidated and represents the next challenge for this type of surveillance at ECDC. For instance, collecting data at the hospital level in EU/EEA countries would allow better linking of antibiotic consumption data from ESAC-Net with antibiotic resistance data from the European Antimicrobial Resistance Surveillance Network (EARS-Net).

* Data expressed in DDD per 1 000 inhabitants and per day.

† ECDC. Risk assessment on the spread of carbapenemase-producing Enterobacteriaceae (CPE) through patient transfer between healthcare facilities with special emphasis on cross-border transfer. Available at: http://ecdc.europa.eu/en/publications/Publications/110913_Risk_assessment_resistant_CPE.pdf

Figure 4. Overall (hospital sector and community) consumption of carbapenems in EU/EEA countries, 2007 and 2010*



Carbapenem consumption, expressed DDD per 1 000 inhabitants and per day, in the hospital sector and in the community for 18 countries in 2007 and 19 countries in 2010 is presented in Figure 4.

In 2007, overall consumption of carbapenems ranged from 0.009 (Slovakia) to 0.10 (Greece) DDD per 1 000 inhabitants and per day. In 2010, overall consumption of carbapenems ranged from 0.01 (Bulgaria) to 0.16 (Greece) DDD per 1 000 inhabitants and per day.

* Data expressed in DDD per 1 000 inhabitants and per day