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

ESAC-Net surveillance data
November 2016

- Provision of reliable and comparable national antimicrobial consumption data is a prerequisite for our understanding of antibiotic resistance epidemiology in Europe, since antibiotic use is one of the main factors responsible for antibiotic resistance.
- Although the majority of antibiotics are consumed in the community (outside hospitals), antibiotic use in hospitals is a major driver of the spread of multidrug-resistant bacteria responsible for healthcare-associated infections.
- During 2011–2015, overall antibiotic consumption in the community within the European Union/European Economic Area (EU/EEA) (expressed as defined daily doses (DDD) per 1 000 inhabitants and per day) showed no significant increasing trend. The large inter-country variation in antibiotic consumption remained, although some countries showed a significant decreasing trend. When expressing antibiotic consumption as a number of packages per 1 000 inhabitants and per day (used by ESAC-Net as the best available surrogate for prescriptions), six countries had experienced a significant decrease during the period 2011–2015.
- During 2011–2015, overall antibiotic consumption in the EU/EEA hospital sector (expressed as DDD per 1 000 inhabitants and per day) showed no significant trend. There was also no significant trend observed in the consumption of antibiotics for treatment of patients infected with serious multidrug-resistant bacteria during this period at EU level. However, at the national level significant increases were observed for several countries.

Recent national antibiotic consumption data for the community and the hospital sector are publicly available from the European Surveillance of Antimicrobial Consumption Network (ESAC-Net). These data at the EU and national level are specifically provided to healthcare professionals, to identify issues that can be addressed by national antimicrobial stewardship programmes or to help evaluate the effectiveness of awareness campaigns on the prudent use of antibiotics.

Antibiotic consumption in the community

In 2015, the EU/EEA population-weighted mean consumption of antibiotics for systemic use in the community was 22.4 DDD per 1 000 inhabitants and per day which, although higher than in previous years did not show any significant trend during 2011-2015. Finland, the Netherlands and Sweden showed a significant decreasing trend during the same period, whereas no significant increasing trend was observed at country level. In 2015, consumption ranged from 10.7 DDD per 1 000 inhabitants and per day (the Netherlands) to 36.1 DDD per 1 000 inhabitants and per day (Greece); a 3.4-fold difference, which is larger than in previous years.

Based on packages per 1 000 inhabitants and per day (used by ESAC-Net as the best available surrogate for prescriptions), the EU/EEA population-weighted mean consumption was 3.1 packages per 1 000 inhabitants per day and did not show any significant trend during the period 2011–2015. At country level, a significant decrease was observed for Estonia, Denmark, Finland, Luxembourg, Spain and Sweden. In 2015, consumption ranged from 1.0 package per 1 000 inhabitants and per day (Sweden) to 4.7 packages per 1 000 inhabitants and per day (France).

Antibiotic consumption in the hospital sector

In 2015, the EU/EEA population-weighted mean consumption of antibiotics for systemic use in the hospital sector was 2.1 DDD per 1 000 inhabitants and per day. Consumption ranged from 1.0 (the Netherlands) to 2.9 (Malta) DDD per 1 000 inhabitants and per day. The EU/EEA population-weighted mean consumption did not show any significant trend during 2011–2015. Denmark and Malta showed an increasing trend, while Finland and Luxembourg showed a decreasing trend.

The EU/EEA population-weighted mean consumption of carbapenems, a last-line group of antibiotics used to treat patients infected with multidrug-resistant bacteria, did not show any significant trend during 2011–2015. In six countries (Bulgaria, Croatia, Cyprus, Greece, Hungary and the Netherlands), there was a significant increasing trend during the same period.

The EU/EEA population-weighted mean consumption of polymyxins (e.g. colistin, which is used to treat infections with carbapenem-resistant bacteria) did not show any significant trend during 2011–2015. At country level, there were significant increases in eight countries (Bulgaria, Denmark, Greece, Hungary, Italy, Malta, Norway and Romania) during the same period.

Antibiotic consumption in Europe

Antibiotic consumption data presented in this summary were collected by the European Surveillance of Antimicrobial Consumption Network (ESAC-Net) at ECDC.

The indicator 'defined daily doses (DDD) per 1 000 inhabitants and per day', based on the Anatomical Therapeutic Chemical (ATC)/DDD index, is used to report antibiotic consumption in the community (i.e. outside hospitals) and in the hospital sector. DDD is an internationally accepted unit for measuring antibiotic consumption and for making comparisons between countries. This indicator takes into consideration the amount of antibiotics (doses) consumed in a country and its potential burden or ecological effect on the development of antimicrobial resistance.

For antibiotic consumption in the community, a second indicator - 'packages per 1 000 inhabitants and per day' - is reported for a subset of countries which have a policy of dispensing whole packages per antibiotic prescription in community pharmacies and which provided data on the number of packages consumed according to the ATC/DDD index. This indicator only considers orally administered antibiotics, which represent most of the antibiotics for systemic use consumed in the community. It does not take into account dosage information. Some studies have shown that the indicator 'packages per 1 000 inhabitants and per day' may be a valuable additional indicator to 'DDD per 1 000 inhabitants and per day' for assessing trends in antibiotic consumption when surveillance data on antibiotic prescriptions are not available, which is the case for ESAC-Net.

The EU/EEA figures refer to the corresponding population-weighted mean consumption, calculated by adding up the products of each country's consumption in DDD per 1 000 inhabitants and per day, multiplied by the country population as in Eurostat, and then dividing this sum by the total EU/EEA population.

In 2015, 30 EU/EEA countries reported data on antimicrobial consumption in the community expressed as DDD per 1 000 inhabitants and per day, and 21 (70%) of these countries were also able to report data on antibiotic packages. Two countries (Cyprus and Romania) were only able to report data on total consumption in the country – i.e. without differentiating between the community and the hospital sector.

In 2015, 23 countries reported data on antimicrobial consumption specifically for the hospital sector.

For both the community and the hospital sector, these data were mainly on sales of antimicrobials in the country, or a combination of sales and reimbursement data. Spain only provided reimbursement data (i.e. not including antibiotics obtained without a prescription and other non-reimbursed courses).

Inter-country comparisons of data presented in this summary should be made with caution. A few countries reported on total consumption (i.e. community plus hospital sector), while most of the other countries only reported data on community consumption. In addition, reporting practices may vary from year to year, even in the same country.

More details on the methods, collection, validation and reporting of European antimicrobial consumption data are available from the ESAC-Net pages at the ECDC website and also described in the ESAC-Net surveillance reports. The most recent data on antimicrobial consumption are available from the public ESAC-Net interactive database (data for 1997–2015) on the ECDC website.

Broadly accepted standards and metrics reflecting responsible antibiotic use have not been defined until now. The development of evidence-based and consensually validated quantity metrics to evaluate antibiotic use, both for community and hospital settings, is one of the objectives of the project 'Driving re-investment in Research & Development (R&D) and responsible antibiotic use' (DRIVE-AB), a public–private consortium funded by the EU Innovative Medicines Initiative (IMI). This project recently proposed quality indicators and quantity metrics for antibiotics use (http://drive-ab.eu/wp-content/uploads/2014/09/WP1A_Final-QMs-QIs_final.pdf).

Consumption of antibiotics in the community, DDD per 1 000 inhabitants and per day

In 2015, EU/EEA population-weighted mean consumption of antibiotics for systemic use in the community (i.e. outside hospitals) was 22.4 DDD per 1 000 inhabitants and per day, ranging from 10.7 in the Netherlands to 36.1 in Greece (Figure 1).

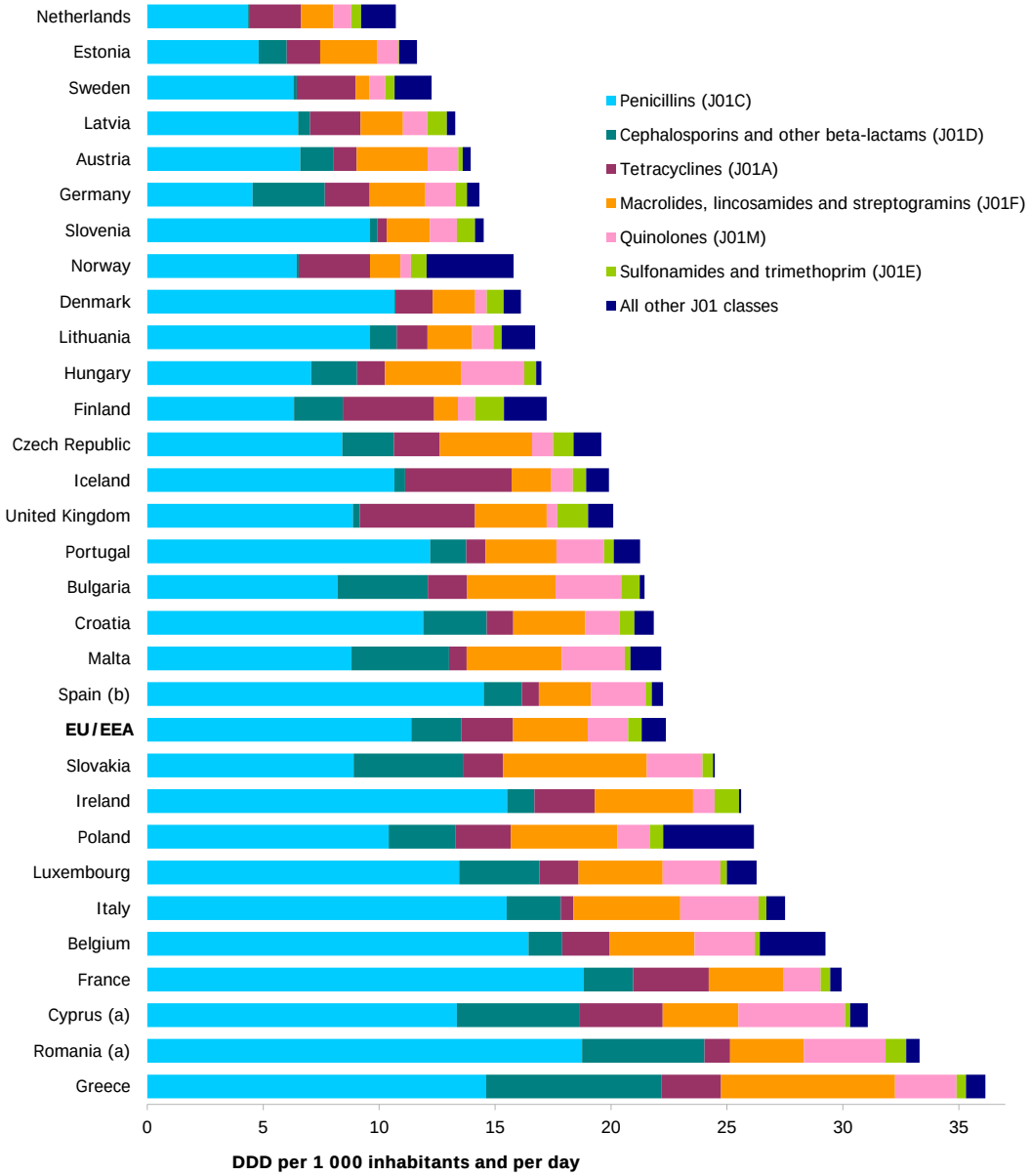
Cyprus and Romania provided data on total consumption (i.e. including both the community and the hospital sector.) Nevertheless, data from these two countries are shown together with community consumption from other countries, because on average, 90% of the total antibiotic consumption data refer to consumption in the community.

The distribution of antibiotic consumption by country and main antibiotic groups is shown in Figure 1.

As in previous years, penicillins were the most frequently used antibiotics in all countries, ranging from 32% (Germany) to 66% (Denmark and Slovenia) of the total consumption in the community, whereas the proportion of other antibiotic groups varied more widely between countries (e.g. cephalosporins and other beta-lactams, from 0.2% (Denmark) to 22% (Germany); macrolides, lincosamides and streptogramins, from 5% (Sweden) to 25% (Slovakia); and quinolones, from 2% (United Kingdom) to 16% (Hungary) (Figure 1).

Trends in antibiotic consumption in the community for 2011–2015 are presented in Table 1. The EU/EEA population-weighted mean consumption increased from 21.5 to 22.4 DDD per 1 000 inhabitants and per day during this period, but there was no significant trend. No country showed a significant increasing trend for the period 2011–2015. However, a significant decreasing trend was observed for Finland, the Netherlands and Sweden.

Figure 1. Consumption of antibiotics for systemic use in the community by antibiotic group, EU/EEA countries, 2015 (expressed in DDD per 1 000 inhabitants and per day)



The EU/EEA bar refers to the corresponding population-weighted mean consumption.

(a) Cyprus and Romania provided total care data (i.e. including the hospital sector).
(b) Spain provided reimbursement data (i.e. not including consumption of antibiotics obtained without a prescription and other non-reimbursed courses).

Table 1. Trends in consumption of antibiotics for systemic use within the community, EU/EEA countries, 2011–2015 (expressed as DDD per 1 000 inhabitants and per day)

Country	2011	2012	2013	2014	2015	Trends in antimicrobial consumption, 2011–2015	Average annual change 2011–2015	Statistically significant trend
Netherlands	11.4	11.3	10.8	10.6	10.7		-0.21	<
Estonia	12.2	11.7	11.7	11.7	11.6		-0.11	
Sweden	14.3	14.1	13.0	13.0	12.3		-0.51	<
Latvia	12.8	13.0	13.5	12.6	13.3		0.06	
Austria	14.5	14.0	16.3	13.9	14.0		-0.12	
Germany	13.9	14.8	15.7	14.6	14.3		0.07	
Slovenia	14.4	14.3	14.5	14.2	14.5		0.01	
Norway	16.5	16.9	16.2	15.9	15.8		-0.24	
Denmark	17.4	16.4	16.4	15.9	16.1		-0.32	
Lithuania	19.0*	16.2	18.5	16.0	16.7			N/A
Hungary	15.9	15.0	15.5	16.2	17.0		0.33	
Finland	20.1	19.5	18.3	18.1	17.2		-0.71	<
Czech Republic	18.5	17.5	19.0	19.2	19.6		0.38	
Iceland	22.3*	22.1*	21.9*	19.3	19.9			N/A
United Kingdom	18.8	20.1	20.6	20.8	20.1		0.35	
Portugal (a)	23.2	22.7	19.6†	20.3†	21.3†			N/A
Bulgaria	19.5	18.5	19.9	21.2	21.4		0.67	
Croatia	19.4	21.7	21.1	21.4	21.8		0.45	
Malta	23.4	22.5	23.8	23.7	22.2		-0.14	
Spain	20.9†	19.7†	20.3†	21.6†	22.2†		0.47	
EU/EEA	**21.5**	**21.7**	**22.2**	**21.9**	**22.4**		**0.19**	
Slovakia	23.8*	20.0	23.6	20.9	24.5			N/A
Ireland	22.6	23.0	23.8	23.1	25.6		0.60	
Poland (a)	21.7†	22.9	23.6	22.8	26.2			N/A
Luxembourg	27.8	27.7	27.7	25.8	26.3		-0.48	
Italy	28.2	27.6	28.6	27.8	27.5		-0.12	
Belgium	29.0	29.8	29.6	28.4	29.2		-0.09	
France	28.7	29.7	30.1	29.0	29.9		0.18	
Cyprus	32.0*	29.7*	28.3*	26.1*	31.1*		-0.54	
Romania	30.9*	30.4*	31.6*	31.2*	33.3*		0.56	
Greece	35.7	32.5	32.2	35.1	36.1		0.34	

The numbers for the EU/EEA refer to the corresponding population-weighted mean consumption.

* Total care data, including the hospital sector.

† Reimbursement data (i.e. not including consumption without a prescription and other non-reimbursed courses).

(a) Poland and Portugal changed the type of reported data (reimbursement versus sales data) between 2011 and 2015.

< significantly decreasing trend

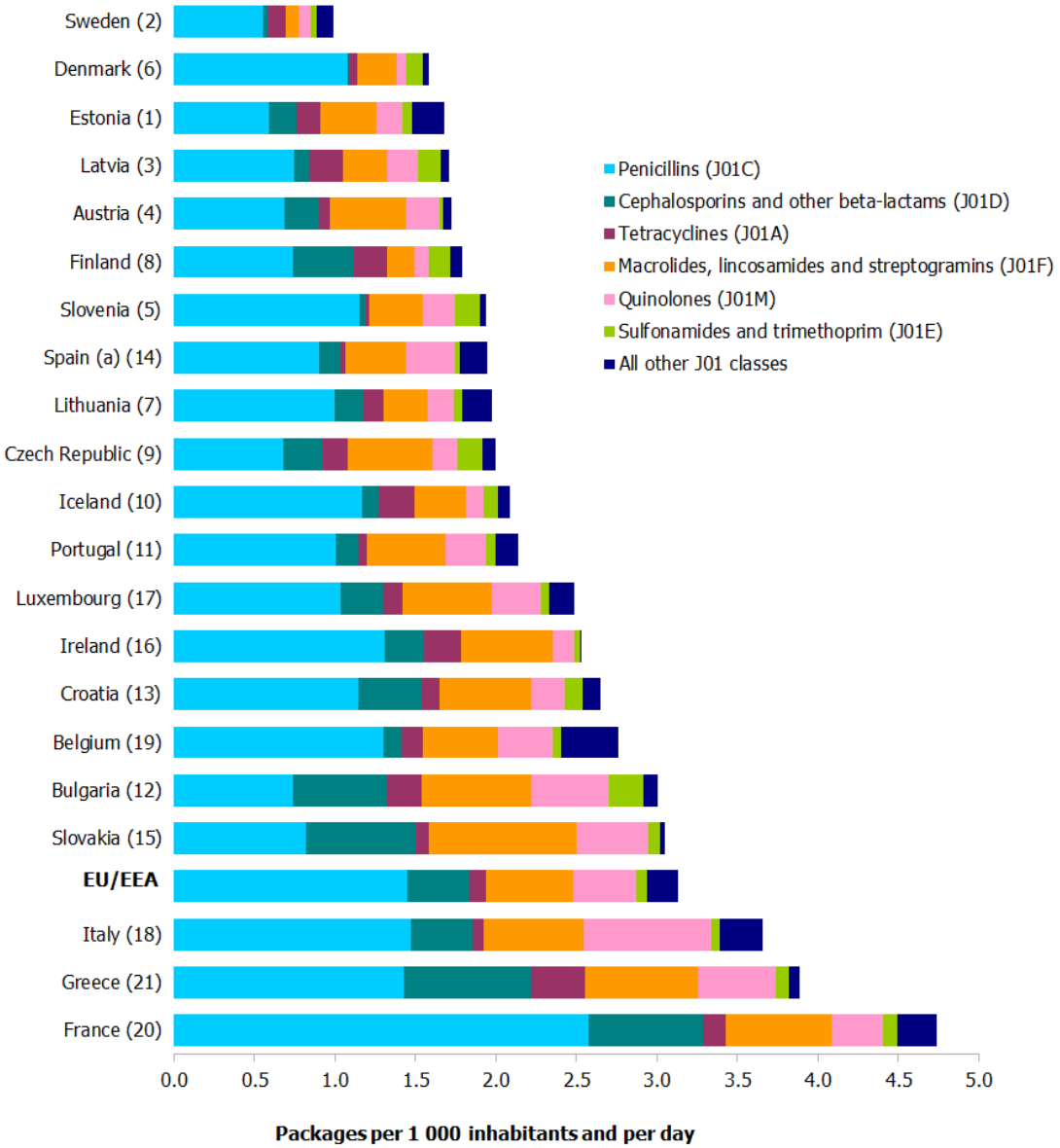
N/A. = not applicable; linear regression was not applied due to missing data, changes in the type of data or changes of sector for which data were reported (community versus total care data) between 2011 and 2015.

Consumption of antibiotics in the community, packages per 1 000 inhabitants per day

In 2015, the EU/EEA population-weighted mean consumption of antibiotics for systemic use in the community (i.e. outside hospitals) was 3.13 packages per 1 000 inhabitants and per day, ranging from 0.99 in Sweden to 4.7 in France (Figure 2).

Differences in the ranking of countries according to antibiotic consumption in the community expressed as 'DDD per 1 000 inhabitants per day' and as 'packages per 1 000 inhabitants per day' probably reflect differences in the number of items or the dose per item of antibiotics in antibiotic packages.

Figure 2. Consumption of antibiotics for systemic use in the community by antibiotic group, EU/EEA countries, 2015 (expressed as packages per 1 000 inhabitants and per day)



The EU/EEA bar refers to the corresponding population-weighted mean consumption.

The numbers in parentheses indicate the ranking of each of the 20 countries when community consumption of antibiotics for systemic use is expressed as 'DDD per 1 000 inhabitants and per day' (see Figure 1).

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

Trends in community antibiotic consumption expressed as packages per 1 000 inhabitants and per day for the period 2011–2015 are presented in Table 2. The EU/EEA population-weighted mean consumption did not show any significant trend during the period 2011–2015. No country showed a significant increasing trend. A significant decreasing trend was observed for Denmark, Estonia, Finland, Luxembourg, Spain and Sweden. The decrease in community antibiotic consumption expressed as packages per 1 000 inhabitants and per day in these countries likely reflects a decrease in antibiotic prescriptions between 2011 and 2015, although this should be confirmed with national data from other sources.

Table 2. Trends in consumption of antibiotics for systemic use in the community, EU/EEA countries, 2011–2015 (expressed as packages per 1 000 inhabitants and per day)

Country	2011	2012	2013	2014	2015	Trends in consumption of antibiotics, 2011–2015	Average annual change 2011–2015	Statistically significant trend
Sweden	1.18	1.14	1.05	1.00	0.99		-0.05	<
Denmark	1.85	1.70	1.67	1.62	1.58		-0.06	<
Estonia	1.82	1.77	1.74	1.68	1.68		-0.04	<
Latvia	1.73	1.70	1.76	1.65	1.71		-0.01	
Austria	1.81	1.76	2.03	1.73	1.73		-0.02	
Finland	2.13	2.04	1.91	1.89	1.79		-0.08	<
Slovenia	2.02	1.96	1.97	1.91	1.94		-0.02	
Spain	2.17†	2.01†	1.99†	1.93†	1.95†		-0.05	<
Lithuania (a)		1.99	2.24	1.94	1.98			N/A
Czech Republic	1.94	1.84	1.99	1.98	2.00		0.02	
Iceland (a)				2.06	2.09			N/A
Portugal	2.38	2.33	1.99†	2.04†	2.14†			N/A
Luxembourg	2.74	2.68	2.67	2.53	2.48		-0.07	<
Ireland	2.49	2.52	2.55	2.36	2.53		-0.01	
Croatia	2.48	2.67	2.61	2.64	2.65		0.03	
Belgium	2.53	2.54	2.51	2.41	2.76		0.03	
Bulgaria	2.92	2.78	2.90	3.04	3.01		0.04	
Slovakia (a)		2.53	3.02	1.94	3.05			N/A
EU/EEA	**3.15**	**3.15**	**3.18**	**3.05**	**3.13**		**-0.03**	
Italy	3.78	3.70	3.83	3.70	3.65		-0.03	
Greece	3.86	3.48	3.51	3.60	3.89		0.02	
France	4.86	4.86	4.85	4.59	4.74		-0.05	

The numbers for EU/EEA refer to the corresponding population-weighted mean consumption.

† Reimbursement data (i.e. not including consumption without a prescription and other non-reimbursed courses).
(a) Countries that did not report data for all years during the period 2011–2015.

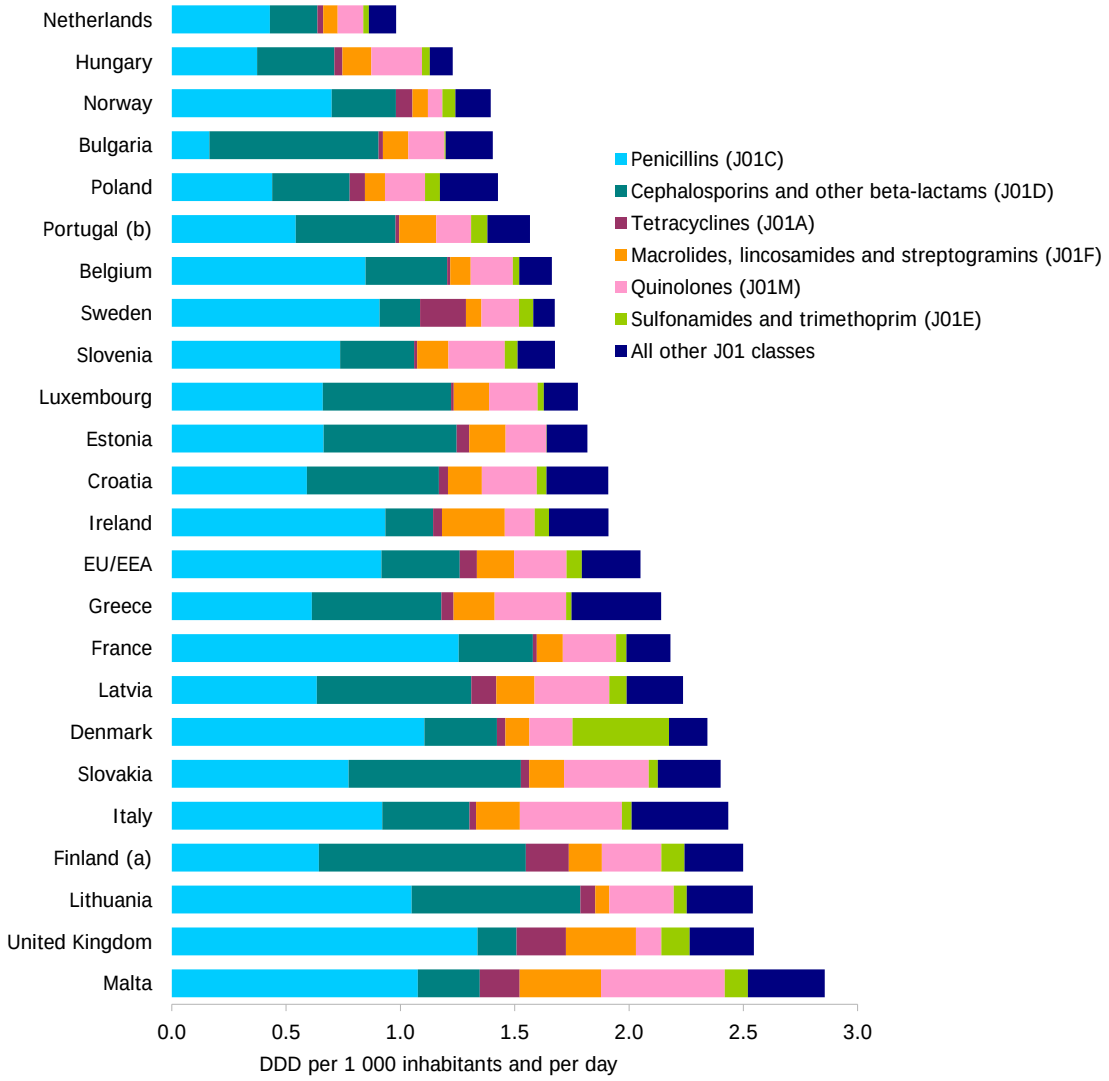
< significantly decreasing trend

N/A. = not applicable; linear regression was not applied due to missing data, changes in the type of data or changes of sector for which data were reported (community versus total care data) between 2011 and 2015.

Consumption of antibiotics in the hospital sector

In 2015, the EU/EEA population-weighted mean consumption of antibiotics for systemic use in the hospital sector was 2.0 DDD per 1 000 inhabitants and per day, ranging from 1.0 in the Netherlands to 2.9 in Malta (Figure 3). The data from Finland are not exclusively reported from hospitals and include consumption in remote primary healthcare centres and nursing homes.

Figure 3. Consumption of antibiotics for systemic use in the hospital sector by antibiotic group, EU/EEA countries, 2015 (expressed as DDD per 1 000 inhabitants and per day)



The EU/EEA bar refers to the corresponding population-weighted mean consumption.

(a) Finland: data include consumption in remote primary healthcare centres and nursing homes.
(b) Portugal: data relate to public hospitals only.

In contrast to prescribing practices in the community, penicillins were not the most frequently prescribed antibiotic group in the hospital sector for all countries (Figure 3). The proportions of cephalosporins, other beta-lactams (including carbapenems), and other groups of antibiotics were generally higher than in the community. However, substantial variations were reported across countries: consumption of cephalosporins and other beta-lactams including carbapenems ranged from 7% in the United Kingdom to 54% in Bulgaria; consumption of macrolides, lincosamides and streptogramins from 4% in Sweden to 17% in Ireland, and consumption of quinolones from 4% in the United Kingdom to 19% in Malta.

Trends in the consumption of antibiotics for systemic use in the hospital sector expressed as DDD per 1 000 inhabitants and per day for the period 2011–2015 are presented in Table 3. The EU/EEA population-weighted mean consumption did not show any significant trend during the period 2011–2015. A significant increasing trend was observed for Denmark and Malta and a significant decreasing trend for Finland and Luxembourg.

Table 3. Trends in consumption of antibiotics for systemic use in the hospital sector, EU/EEA countries, 2011–2015 (expressed as DDD per 1 000 inhabitants and per day)

Country	2011	2012	2013	2014	2015	Trends in antimicrobial consumption, 2011–2015	Average annual change 2011–2015	Statistically singificant trend
Netherlands	0.97	0.96	0.95	0.95	0.98		<0.01	
Hungary	1.20	1.23	1.20	1.25	1.23		0.01	
Norway	1.47	1.44	1.39	1.41	1.40		-0.02	
Bulgaria	1.45	1.40	1.41	1.45	1.40		<0.01	
Poland (a)				1.43	1.43			N/A
Portugal (c)	1.45	1.46	1.64	1.55	1.57		0.03	
Belgium	2.02	1.71	1.67	1.60	1.66		-0.08	
Sweden	1.60	1.65	1.67	1.57	1.67		0.01	
Slovenia	1.66	1.56	1.55	1.61	1.68		0.01	
Luxembourg	2.02	2.02	2.00	1.81	1.78		-0.07	<
Estonia	1.86	2.11	1.91	1.94	1.82		-0.03	
Croatia	1.88	1.98	1.80	1.86	1.91		-0.01	
Ireland	1.79	1.76	1.79	1.66	1.91		0.01	
EU/EEA	**1.96**	**1.98**	**2.05**	**2.01**	**2.05**		**0.02**	
Greece	2.18	2.08	2.00	2.11	2.14		-0.01	
France	2.12	2.12	2.17	2.20	2.18		0.02	
Latvia	2.39	2.27	2.30	2.25	2.24		-0.03	
Denmark	1.74	1.78	2.02	2.13	2.34		0.16	>
Slovakia (a)		2.02	2.30	2.47	2.40			N/A
Italy	2.32	2.46	2.23	2.22	2.43		<0.01	
Finland (b)	3.09	2.79	2.77	2.64	2.50		-0.13	<
Lithuania (a)		2.39	2.38	2.35	2.54			N/A
United Kingdom (a)			2.45	2.59	2.55			N/A
Malta	1.67	1.44	1.75	2.18	2.86		0.31	>

The numbers for the EU/EEA refer to the corresponding population-weighted mean consumption.

(a) These countries did not report data for all years during the period 2011–2015.
(b) Finland: data include consumption in remote primary healthcare centres and nursing homes.
(c) Portugal: data relate to public hospitals only.

< significantly decreasing trend

> significantly increasing trend

N/A.= not applicable; linear regression was not applied due to missing data, changes in the type of data or changes of sector for which data were reported (community versus total care data) between 2011 and 2015.

Consumption of specific antibiotic groups used for the treatment of patients infected with multidrug-resistant bacteria

The spread of multidrug-resistant bacteria in hospitals and other healthcare facilities has become a public health threat. One significant driver for the selection of multidrug-resistant bacteria responsible for healthcare-associated infections in hospitalised patients is the use of specific, mostly reserve or last-line antibiotics in hospitals. Patients receiving antibiotics are more likely to be colonised with multidrug-resistant bacteria and therefore are at greater risk of developing subsequent infections with these bacteria than patients who do not receive antibiotics. Additionally, antibiotic pressure due to high levels of antibiotic use in hospitals can be a risk factor for the acquisition of multidrug-resistant bacteria.

Carbapenems and polymyxins are antibiotic groups used for treating serious infections caused by multidrug-resistant gram-negative bacteria. In addition, penicillins combined with beta-lactamase inhibitors (e.g. piperacillin/tazobactam) represent another group of antibiotics to treat infections caused by extended-spectrum-beta-lactamase (ESBL)-producing gram-negative bacteria.

Carbapenems are a last-line group of antibiotics and are mainly used in hospitals for treatment of patients with confirmed or suspected infections involving a multidrug-resistant bacterium. Use of a carbapenem antibiotic is a risk factor for subsequent infection with a carbapenem-resistant bacterium such as carbapenem-resistant Enterobacteriaceae (CRE, often through production of a carbapenemase enzyme), carbapenem-resistant *Acinetobacter baumannii* or carbapenem-resistant *Pseudomonas aeruginos*a. Carbapenem-resistant bacteria are highly drug-resistant and only a few antibiotic groups such as polymyxins, are available for the treatment of patients infected with such bacteria.

In 2015, a joint report from ECDC, the European Food Safety Authority (EFSA) and the European Medicines Agency (EMA) showed a strong association between carbapenem consumption and the percentage of carbapenem-resistant invasive *Klebsiella pneumoniae* isolates in EU/EEA countries reporting these data[1]. In 2015, consumption of carbapenems was 0.05 DDD per 1 000 inhabitants and per day (Table 4). Assuming that the average duration of treatment is 10 days, this corresponds to more than one million carbapenem prescriptions issued in the EU/EEA each year. Trends in the consumption of carbapenems for the period 2011–2015 are presented in Table 4. During this period, the EU/EEA population-weighted mean consumption of carbapenems did not show a significant change. A significant increase was observed for six countries (Bulgaria, Croatia, Cyprus, Greece, Hungary and the Netherlands). None of the countries that reported data for all years during the period 2011–2015 showed a significant decreasing trend.

Polymyxins - mainly colistin - have been used as last resort antibiotics to treat infections caused by multidrug-resistant gram-negative bacteria that are resistant to carbapenems. Trends in the consumption of polymyxins for the period 2011–2015 are presented in Table 5. The EU/EEA population-weighted mean consumption of polymyxins did not significantly change during this period. In 2015, the consumption of polymyxins was 0.015 DDD per 1 000 inhabitants and per day. A significant increase was observed for eight countries (Bulgaria, Denmark, Greece, Italy, Hungary, Malta, Norway and Romania). None of the countries reporting comparable data for all years during 2011–2015 showed a significant decreasing trend.

Piperacillin/tazobactam is a wide-spectrum antibiotic active against *Pseudomonas aeruginosa* and Enterobacteriaceae. Increased consumption of this antibiotic may indicate increased rates of ESBL-producing isolates or antimicrobial stewardship measures recommending piperacillin/tazobactam as a first-line agent for empiric treatment of serious infections presumed to be caused by ESBL-producing microorganisms (e.g. to avoid overuse of carbapenems). The EU/EEA population-weighted mean consumption of piperacillin/tazobactam showed a significant increasing trend for the period 2011-2015, as did most of the countries reporting hospital sector data.

In the EU/EEA, consumption of carbapenems and polymyxins is still at a low level compared to the overall consumption of antibiotics for systemic use in the hospital sector, but significant increasing trends in the consumption of these antibiotic groups were reported from several countries.

[1] ECDC (European Centre for Disease Prevention and Control), EFSA (European Food Safety Authority) and EMA (European Medicines Agency). ECDC/EFSA/EMA first joint report on the integrated analysis of the consumption of antimicrobial agents and occurrence of antimicrobial resistance in bacteria from humans and food-producing animals. Stockholm/Parma/London: ECDC/EFSA/EMA, 2015. EFSA Journal 2015;13(1):4006, 114 pp. doi:10.2903/j.efsa.2015.4006

Table 4. Trends in consumption of carbapenems in the hospital sector, EU/EEA countries, 2011–2015 (expressed as DDD per 1 000 inhabitants and per day)

Country	2011	2012	2013	2014	2015	Trends in consumption of carbapenems, 2011–2015	Average annual change 2011–2015	Statistically significant trend
Bulgaria	0.013	0.013	0.014	0.020	0.019		0.002	>
Poland (a)				0.024	0.020			N/A
Netherlands	0.018	0.019	0.020	0.019	0.021		0.001	>
Latvia	0.029	0.019	0.022	0.027	0.033		0.002	
France	0.030	0.021	0.033	0.033	0.035		0.002	
Norway	0.044	0.045	0.046	0.047	0.039		-0.001	
Hungary	0.028	0.032	0.037	0.042	0.046		0.005	>
Lithuania (a)		0.026	0.026	0.033	0.046			N/A
Slovakia (a)		0.027	0.034	0.042	0.048			N/A
Romania	0.023*	0.024*	0.024*	0.032*	0.049*		0.006	
Estonia	0.036	0.036	0.033	0.043	0.050		0.003	
Sweden	0.052	0.053	0.056	0.053	0.050		<0.001	
EU/EEA	**0.048**	**0.053**	**0.060**	**0.058**	**0.054**		**0.002**	
Italy	0.039	0.073	0.076	0.081	0.056		0.004	
Finland (b)	0.094	0.074	0.088	0.081	0.065		-0.005	
Belgium	0.079	0.062	0.062	0.063	0.065		-0.003	
United Kingdom (a)			0.064	0.071	0.071			N/A
Slovenia	0.078	0.074	0.061	0.066	0.072		-0.002	
Croatia	0.058	0.065	0.060	0.073	0.079		0.005	>
Denmark	0.060	0.063	0.087	0.085	0.083		0.007	
Luxembourg	0.086	0.101	0.095	0.087	0.089		-0.001	
Ireland	0.057	0.061	0.088	0.109	0.091		0.011	
Malta	0.105	0.052	0.066	0.101	0.107		0.005	
Cyprus	0.087*	0.102*	0.118*	0.121*	0.132*		0.011	>
Portugal (c)	0.139	0.143	0.146	0.139	0.133		-0.002	
Greece	0.130	0.133	0.135	0.143	0.137		0.002	>

The numbers for the EU/EEA refer to the corresponding population-weighted mean consumption.

* Total care data, including consumption in the community. Data from Cyprus and Romania were not used to calculate the EU/EEA population-weighted average.

(a) These countries did not report data for all years during the period 2011–2015.
(b) Finland: data include consumption in remote primary healthcare centres and nursing homes.
(c) Portugal: data relate to public hospitals only.

> significantly increasing trend

N/A. = not applicable; linear regression was not applied due to missing data, changes in the type of data or changes of sector for which data were reported (community versus total care data) between 2011 and 2015.

Table 5. Trends in consumption of polymyxins in the hospital sector, EU/EEA countries, 2011–2015 (expressed as DDD per 1 000 inhabitants and per day)

Country	2011	2012	2013	2014	2015	Trends in consumption of polymyxins, 2011–2015	Average annual change 2011–2015	Statistically significant trend
Finland (b)	0	0	0	0	0		<0.001	
Lithuania (a)		0	0	0	0			N/A
Latvia	0	0.003	0.002	0.001	<0.001		<0.001	
Norway	0.0004	0.0006	0.0006	0.0006	0.0007		<0.001	>
Sweden	0.001	0.001	0.001	0.001	0.001		<0.001	
Netherlands	0.003	0.002	0.003	0.002	0.003		<0.001	
Estonia	<0.001	0.002	0	0.002	0.003		0.001	
Bulgaria	0	0	0	0.002	0.004		0.001	>
Luxembourg	0.005	0.005	0.006	0.003	0.005		<0.001	
Denmark	0.002	0.002	0.001	0.003	0.005		0.001	>
Slovenia	0.002	0.003	0.003	0.005	0.005		0.001	
United Kingdom (a)			0.005	0.006	0.006			N/A
Belgium	0.009	0.006	0.008	0.008	0.007		<0.001	
France	0.008	0.008	0.008	0.008	0.007		<0.001	
Ireland	0.014	0.015	0.015	0.013	0.008		-0.001	
Hungary	0.004	0.005	0.006	0.007	0.008		0.001	>
EU/EEA	**0.011**	**0.014**	**0.012**	**0.012**	**0.015**		**<0.001**	
Croatia	0.010	0.029	0.003	0.019	0.018		0.001	
Malta	0.004	0.002	0.006	0.011	0.020		0.004	>
Poland (a)				0.001	0.020			N/A
Portugal (c)	0.018	0.019	0.020	0.019	0.022		0.001	
Cyprus	0.014*	0.013*	0.023*	0.023*	0.023*		0.003	
Slovakia (a)		0.020	0.023	0.025	0.024			N/A
Italy	0.011	0.019	0.023	0.025	0.027		0.004	>
Romania	0.019*	0.020*	0.026*	0.027*	0.034*		0.004	>
Greece	0.078	0.085	0.084	0.095	0.095		0.004	>

The numbers for the EU/EEA refer to the corresponding population-weighted mean consumption.

* Total care data, including consumption in the community. Data from Cyprus and Romania were not used to calculate the EU/EEA population-weighted average.

(a) These countries did not report data for all years during the period 2011–2015.
(b) Finland: data include consumption in remote primary healthcare centres and nursing homes.
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> significantly increasing trend

N/A.= not applicable; linear regression was not applied due to missing data, changes in the type of data or changes of sector for which data were reported (community versus total care data) between 2011 and 2015.