Hospital Antimicrobial Consumption Surveillance Results

2023 Q1 and Q2

KEY POINTS

- The median rate of antimicrobial consumption in 43 participating acute hospitals in Ireland for the first half of 2023 was 72.1 defined daily doses per 100 bed days used (range = 19.7 – 114.8), a slight increase from 67.9 DDD per 100 BDU in 2022. Similarly, the mean rate of hospital consumption increased slightly from 72.9 DDD per 100 BDU in 2022 to 77.7 DDD per 100 BDU in the first half of 2023.

- There was a slight increase in the consumption of penicillins, other beta lactams, macrolides, tetracyclines, glycopeptides, imidazoles and nitrofurans. A slight decrease was observed in the consumption of aminoglycosides, sulfonamides and trimethoprim and quinolones. The consumption of other beta lactams and tetracyclines reached its highest level to date.

- Penicillins were the most consumed ATC4 group accounting for more than half of antibiotic consumption in the hospital sector. Among penicillins, "combinations of penicillins, including beta-lactamase inhibitors (J01CR)" were the highest consumed group with 24.7 DDD per 100 BDU, an increase from 23.5 DDD per 100 BDU in 2022, followed by "beta-lactamase resistant penicillins (J01CF)". Consumption of beta-lactamase resistant penicillins increased from 8.1 in 2022 to 8.5 DDD per 100 BDU in 2023. Consumption of penicillins with extended spectrum and beta lactamase sensitive penicillins also increased slightly compared to 2022 levels .

Please see the full web-report on the HPSC website for details and the general notes.

Table 1: Annual Rate of Hospital Consumption of Systemic Antibacterial Drugs in DDD Per 100 BDU

	2018	2019	2020	2021	2022	2023*
National median	78.6	77.4	77.4	70.1	67.9	72.1
National minimum	27.2	28.9	20	25.8	22.9	19.7
National maximum	117.1	101.5	98.8	111.7	117.7	114.8
Overall national mean	78.4	76.9	73.6	72.1	72.9	77.7

*Results provisional for Q1 and Q2 2023

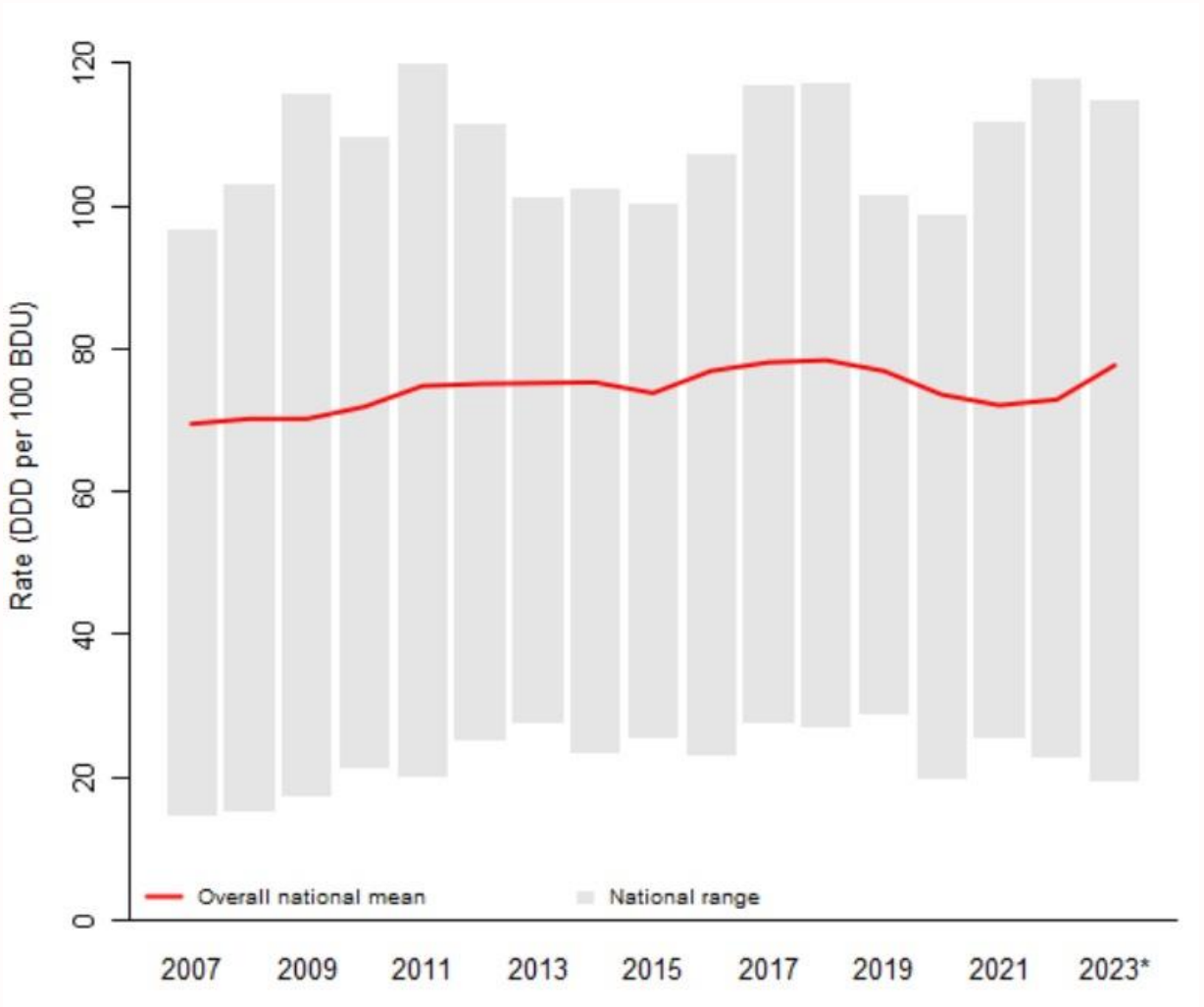

Figure 1: Annual Rate of Hospital Consumption of Systemic Antibacterial Drugs in DDD Per 100 BDU. The Grey Bars Show the Range Use (Lowest to Highest) And the Red Line Shows the Median (Average) Among Acute Hospitals.

*Results provisional for Q1 and Q2 2023

Table 2: Annual National Hospital Antibacterial Consumption Rate in DDD Per 100 BDU By Pharmacological Subgroup (ATC Level 3)

Antibiotic Class	2018	2019	2020	2021	2022	2023*
Penicillins (J01C)	38.2	37.3	35.4	34.9	35.8	38
Cephalosporins, Monobactams and Carbapenems (J01D)	8.4	9	9.6	10	10	11.2
Sulfonamides and Trimethoprims (J01E)	2.7	2.9	2.5	2.8	3	2.6
Macrolides, Lincosamides and Streptogramins (J01F)	10.1	9.4	8.5	7.2	7.7	8.6
Aminoglycosides (J01G)	3.3	3.6	3.1	2.8	2.7	2.6
Quinolones (J01M)	4.2	3.2	2.7	2.5	2.3	2.2
Glycopeptides, Imidazoles and Nitrofurans (J01X)	8.1	8.2	8.2	8.3	7.9	8.5
Tetracyclines, Amphicols and Other Systemic Antimicrobials	3.4	3.3	3.6	3.6	3.5	4

*Results provisional for Q1 and Q2 2023

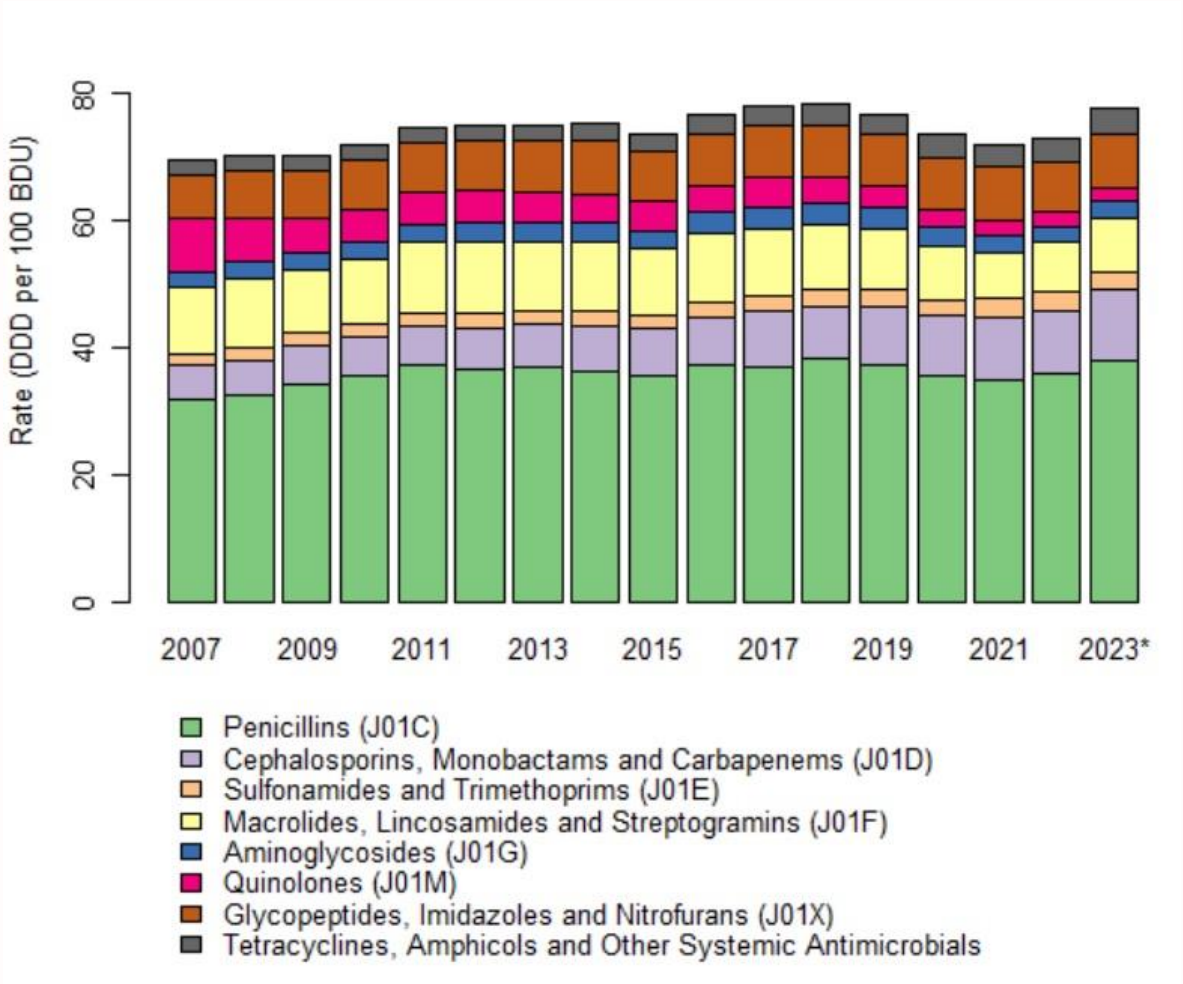

Figure 2: Annual National Hospital Antibacterial Consumption Rate in DDD Per 100 BDU By Pharmacological Subgroup (ATC Level 3)

*Results provisional for Q1 and Q2 2023

Table 3: Annual National Hospital Consumption Rate in DDD Per 100 BDU Of Penicillin Subgroups

Antibiotic Class	2018	2019	2020	2021	2022	2023*
Penicillins with extended spectrum (J01CA)	2.3	2.4	2	1.9	2.1	2.4
Beta-lactamase sensitive penicillins (J01CE)	3.9	3.5	2.8	2.2	2.1	2.5
Beta-lactamase resistant penicillins (J01CF)	8.9	8.8	8.4	8.5	8.1	8.5
Combinations of penicillins (J01CR)	23.1	22.7	22.2	22.2	23.5	24.7

*Results provisional for Q1 and Q2 2023

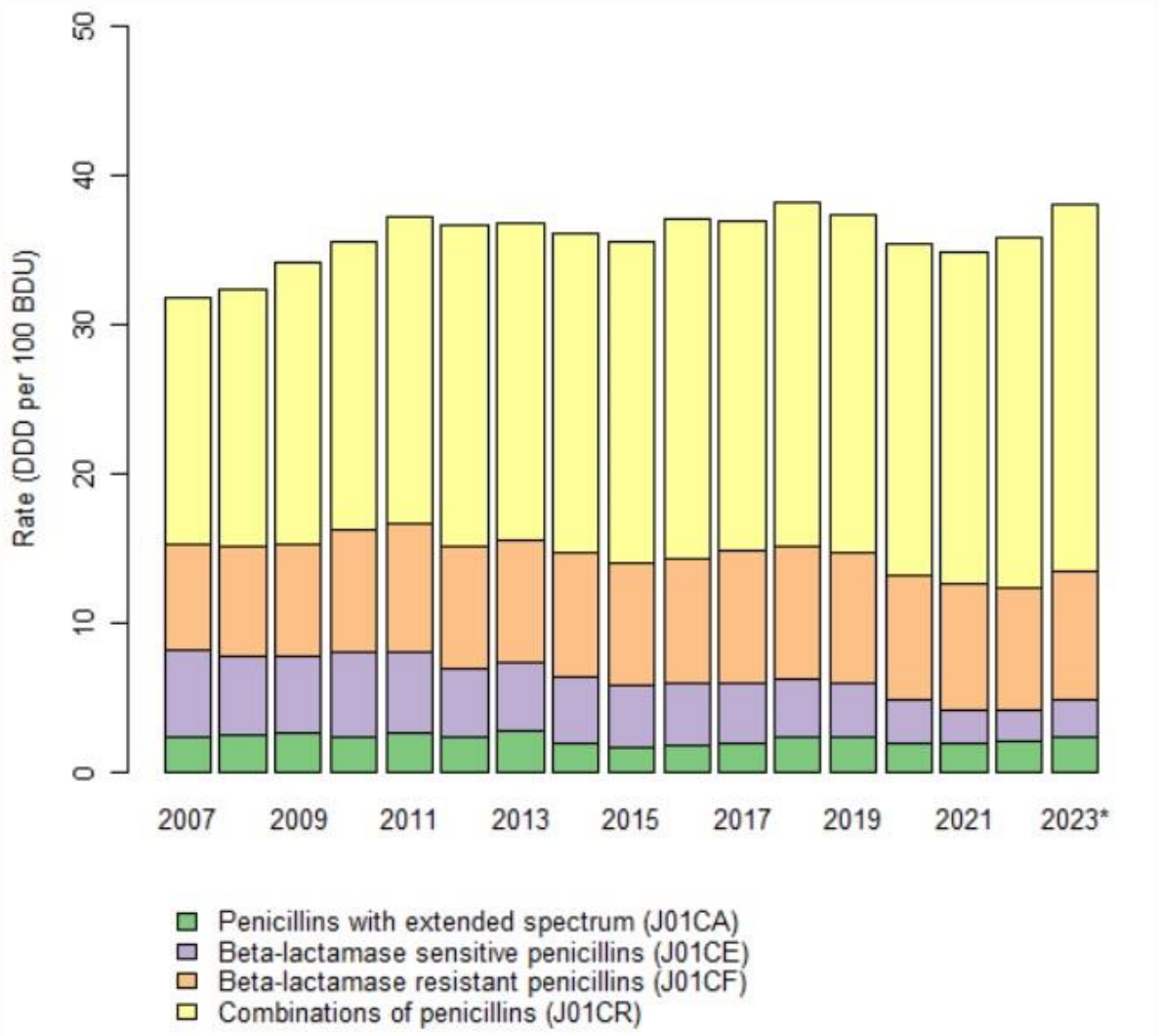

Figure 3: Annual National Hospital Consumption Rate in DDD Per 100 BDU Of Penicillin Subgroups

*Results provisional for Q1 and Q2 2023

Table 4: Annual National Hospital Cephalosporin Subgroup, Monobactams And Carbapenems Consumption Rate in DDD Per 100 BDU

Antibiotic Class	2018	2019	2020	2021	2022	2023*
First-generation cephalosporins (J01DB)	0.5	0.6	0.7	0.7	0.8	0.9
Second-generation cephalosporins (J01DC)	2.7	2.9	3	3	3	3.2
Third-generation cephalosporins (J01DD)	3	3.1	3.3	3.4	3.4	3.9
Fourth-generation cephalosporins (J01DE)	0	0	0	0	0	0
Monobactams (J01DF)	0.4	0.5	0.5	0.6	0.6	0.8
Carbapenems (J01DH)	1.8	2	2.1	2.3	2.2	2.4
Other cephalosporins (J01DI)	0	0.1	0.1	0	0	0

*Results provisional for Q1 and Q2 2023

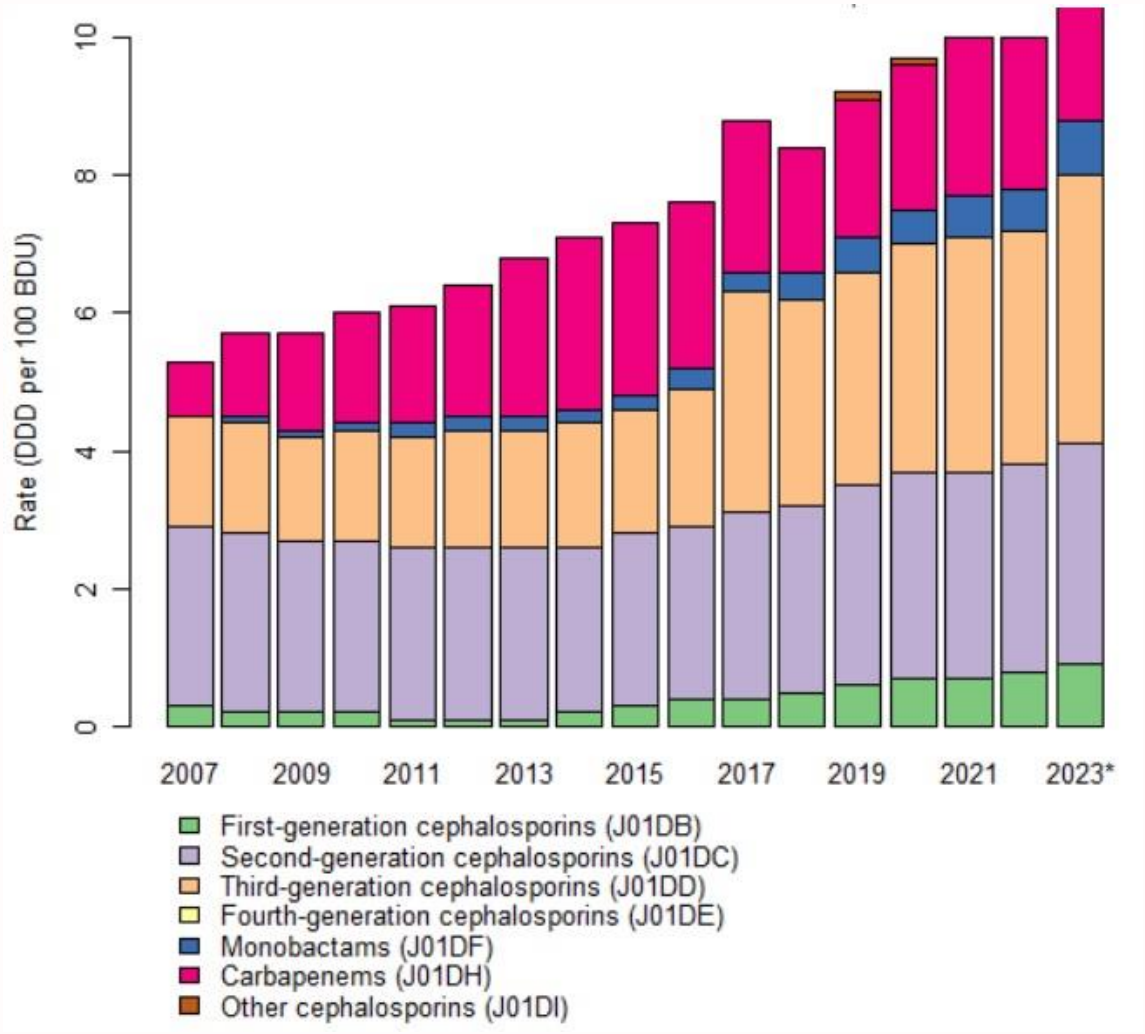

Figure 4: Overall Annual National Hospital Cephalosporin Subgroup, Monobactams And Carbapenems Consumption Rate in DDD Per 100 BDU

*Results provisional for Q1 and Q2 2023

General Notes

Background

Using a protocol developed in conjunction with clinical pharmacists, quarterly antimicrobial data were extracted from appropriate hospital computer systems that record data on dispensed drugs. At the HPSC, the data from individual hospitals were converted to standardised units of doses. Only consumption relating to inpatients was taken further for rate calculation. HPSC's web-based analysis tool, MicroB used for data management.

In this report the Anatomical Therapeutic Chemical (ATC) index is used to classify all drugs used in human medicine into a hierarchical system with five levels. Each systemic antimicrobial substance in conjunction with the route of administration (oral or intravenous) is given a defined daily dose (DDD), which is the assumed average maintenance dose per day for a drug used for its main indication in adults. Figures in this report refer to systemic antibacterial drugs only which are classed as J01.

Limitations

The main limitation for the ATC-DDD system is that the quantities refer to the usual dose that would be prescribed for adults. There are many hospitals in the sample that provide maternity services and/or paediatric care, therefore there is an inherent bias in the system. A further limitation with the ATC-DDD system is that the measure is for the main indication only, but a single drug can be used to treat several different conditions. Additionally the rates for an individual hospital may vary due to changes in case-mix, guidelines for the optimal dosage regimen of an antimicrobial drug, and overall hospital activity levels.

The consumption data are based on the volume of antimicrobial drugs supplied to inpatient areas by hospital pharmacies. The data are not based on individual prescriptions and do not measure the appropriateness of antimicrobial therapy. Thus a hospital may report a high rate of antimicrobial consumption, but this rate may be appropriate to the specific patient population served by that hospital.

Measure Presented

Total acute inpatient antibacterial consumption in Defined Daily Doses per 100 Bed-Days Used (DDD/100BDU) for each hospital is presented. Acute inpatient means that data on drugs dispensed to outpatients, day cases and external facilities are excluded. The denominator data were obtained from the Business Intelligence Unit of the HSE.

Methodological Changes

Starting from 2017, returned items to the dispensary are subtracted from the overall consumption rates. For the 2017 Q1 and Q2 data, this has resulted in a decrease of the overall rate by 1.5-2% for the mean and median values of the major classes of drugs, with decreases to the total antibacterial consumption for individual hospitals ranging from 0% to 9%.

This report uses the 2019 version of the ATC/DDD calculation method, therefore, figures in this report will be different from prior reports where the methodological changes have not been applied.

Links

Main HPSC reports on antimicrobial consumption in Ireland

European Surveillance of Antimicrobial Consumption Network (ESAC-Net)

Hospital Pharmacists Association of Ireland

WHO Collaborative Centre for ATC/DDD index

Antibiotics section on HPSC website