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**Antimicrobials: Antibiotic usage**

**Antimicrobial use in Montenegro: first results of the WHO/Europe-ESAC project**

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**Objectives**

There is no reliable data on antimicrobial use in non-European-Union (EU) south-eastern European countries (SEE) and newly independent states (NIS). We aimed to collect valid, representative, comparable total national wholesales data on systemic antimicrobial use in Montenegro, a SEE country with a population of 632.300 (<http://hdrstats.undp.org>).

**Methods**

Valid 2011 total antimicrobial use data of Montenegro were analysed according to the WHO Anatomical Therapeutic Chemical (ATC)/Defined Daily Doses (DDD) methodology and expressed in DDD/1000 inhabitants/day (DID). Wholesales data on antibacterials (ATC group J01), antimycotics (J02) and antifungals (D01BA); which were split up for the ambulatory and hospital care sector; were provided by the Medicinal Agency, covering 100% of the population.

**Results**

Total antibacterial use was 38.5 DID: 36.7 DID (representing 95% of total antibacterial use) for the ambulatory care and 1.8 DID (5%) for the hospital care sector. The top 5 antibacterial subgroups (ATC level 3) were: penicillins, ATC group J01C (17.0 DID, 44.3% of all antibacterials); other beta-lactam antibacterials, ATC group J01D (6.5 DID, 17.0%); macrolides, lincosamides and streptogramins, ATC group J01F (6.1 DID, 15.8%); quinolones, ATC group J01M (4.4 DID, 11.4%) and tetracyclines, ATC group J01A (1.7 DID, 4.4%). The top 5 antibacterials (ATC level 5) were: amoxicillin (9.1 DID, 23.6%); amoxicillin and enzyme inhibitor (co-amoxiclav, 4.9 DID, 12.6%); azithromycin, a long-acting macrolide (3.4 DID, 8.7%); cephalexin, a first-generation cephalosporin (2.9 DID, 7.6%); and ciprofloxacin (2.8 DID, 7.3%). Montenegro also reported a high use of the oral third-generation cephalosporin cefixime (2.1 DID, 5.5%) and piperimidic acid (1.4 DID, 3.7%). Total antimycotic and antifungal use was low (0.26 DID). The top 3 were: fluconazole (0.14 DID, 52.7% of all antimycotics and antifungals), ketoconazole (0.08 DID, 32.4%) and terbinafine (0.02 DID, 9.5%).

**Conclusions**

We present for the first time a standardised and validated data set of systemic antimicrobial use in Montenegro. Overall systemic antibacterial use is high (particularly of azithromycin), and comparable to that observed for the southern European countries. The use of piperimidic acid is historical: it is still produced in former Yugoslavian countries and used for treatment of urinary tract infections. These data facilitate auditing of antimicrobial use and evaluation of the implementation of guidelines and public health policies to promote its judicious use.