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## Publication Only

### Antimicrobials: Antibiotic usage

#### Antimicrobial use in Azerbaijan: 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 Azerbaijan, a NIS with a population of 9.111.100 (<http://www.azstat.org>).

## Methods

Valid 2011 total antimicrobial use data of Azerbaijan 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) were provided by the Ministry of Health, Analytical Expertise Center for Medicines, covering 100% of the population. Quarterly data was also submitted allowing studying seasonal variation.

## Results

Total (outpatients and hospital care) antibacterial use was 17.3 DID. The top 5 antibacterial subgroups (ATC level 3) were: penicillins, ATC group J01C (11.4 DID, 66.0% of all antibacterials); tetracyclines, ATC group J01A (1.4 DID, 8.1%); macrolides, lincosamides and streptogramins, ATC group J01F (1.1 DID, 6.3%); sulfonamides and trimethoprim, ATC group J01E (0.9 DID, 4.6%); and other beta-lactam antibacterials, ATC group J01D (0.8 DID, 4.3%). The top 5 antibacterials (ATC level 5) were: ampicillin (5.6 DID, 32.4%); amoxicillin (4.1 DID, 23.5%); combination of benzylpenicillin/procainbenzylpenicillin/benzathinebenzylpenicillin (1.0 DID, 6.0%); tetracycline (0.9 DID, 5.4%); and sulfamethoxazole/trimethoprim (0.7 DID, 4.2%). Use of amphenicols was 0.5 DID (2.9%); mainly oral use. Total quinolone and combinations of penicillins (co-amoxiclav) use in Azerbaijan was low (0.7 and 0.5 DID, respectively). Proportional parenteral antibiotic use was very high representing 46.4% of total antibiotic use (8.0 DID) and included mainly ampicillin (5.3 DID) and the combination of benzylpenicillin/procainbenzylpenicillin/benzathine benzylpenicillin (1.0 DID). Seasonal variation of quinolones showed a six-fold increased use of levofloxacin during the winter season in Azerbaijan. Total antimycotic and antifungal use was 0.45 DID and represented fluconazole (0.34 DID, 76.1%); ketoconazole (0.08DID, 18.6%), terbinafine (0.02 DID, 3.3%) and itraconazole (0.01 DID, 2.0%).

## Conclusions

We present for the first time a standardised and validated data set of systemic antimicrobial use in Azerbaijan. More in depth studies are needed to understand the remarkably high parenteral use of antibiotics, which cannot only be explained by hospital use, and the level of over the counter use. Seasonal variation of quinolones may indicate inappropriate use for respiratory tract infections during the winter season. These data facilitate auditing of antimicrobial use and evaluation of the implementation of guidelines and public health policies to promote its judicious use.