

Quinolone use in eastern Europe: Results of the WHO/Europe-ESAC project.

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Introduction and purpose

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 these non-EU countries of the World Health Organization (WHO) European Region. We report on systemic quinolone use.

Methods

Valid 2011 total (outpatients and hospital care) data on quinolone (ATC group J01M) use of 5 SEE (Bosnia and Herzegovina, Montenegro, Serbia, Turkey – plus Kosovo) and 7 NIS (Armenia, Azerbaijan, Belarus, Georgia, Kyrgyzstan, Republic of Moldova, Tajikistan) and Croatia (a SEE country not reporting 2011 data to ESAC-Net), were analysed according to the WHO Anatomical Therapeutic Chemical (ATC)/Defined Daily Doses (DDD) methodology and expressed in DDD/1000inhabitants/day (DID). Quinolone substances were classified according to three generations based on their chemical structure and antimicrobial activity (Adriaenssens N et al, *JAC*, 2011;66 Suppl 6:vi47-vi56). Quarterly data was analysed for Armenia, Azerbaijan, Belarus, Turkey and Kosovo allowing studying seasonal variation. The data were further compared to 2011 total care (ambulatory and hospital care) ESAC-Net data of the ECDC

(www.ecdc.europa.eu/en/healthtopics/antimicrobial_resistance/esac-net-database/Pages/database)

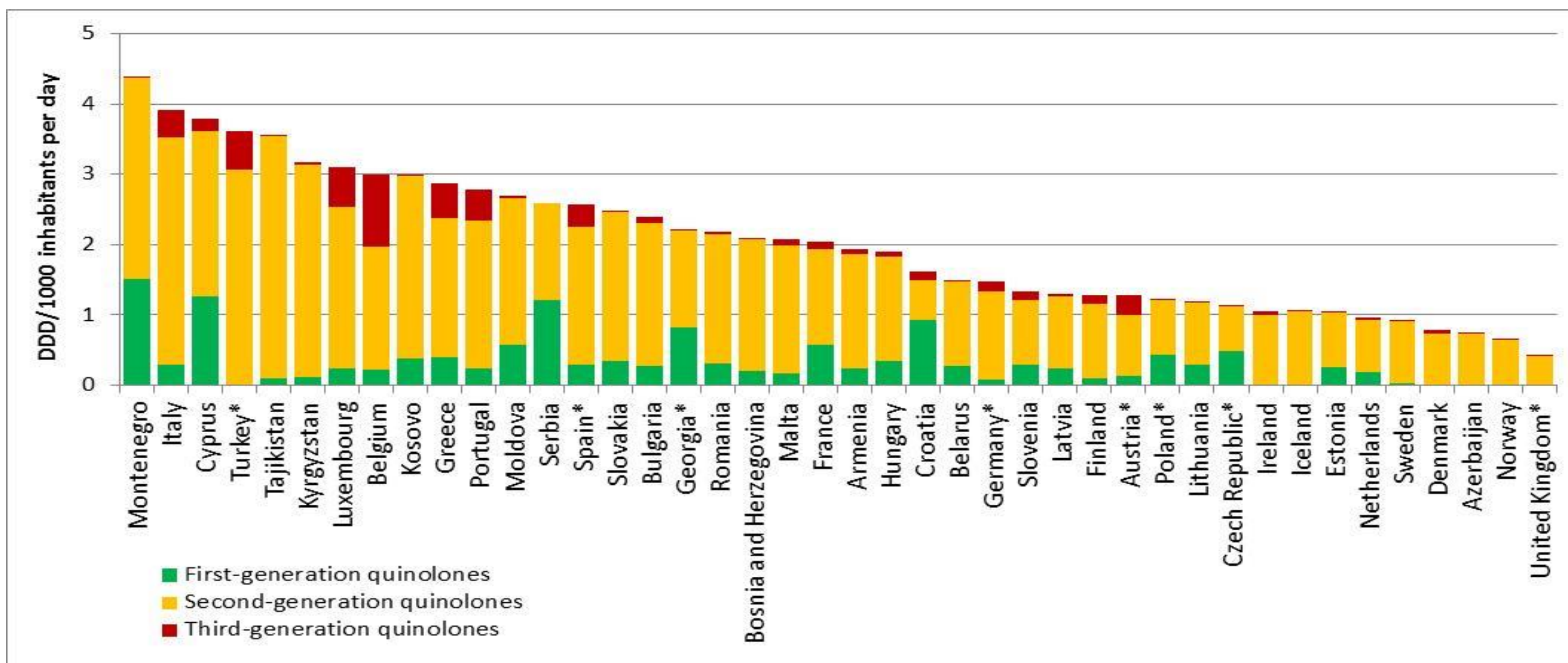


Figure 2. Total quinolone (J01M) use subdivided into 3 main subgroups, expressed in number of DDD/1000 inhabitants/day in 2011, in 12 European countries and Kosovo as compared to 29 ESAC-Net countries.

DDD=defined daily doses. *Countries reporting only outpatient antibiotic use Kosovo (in accordance with UN Security Council resolution 1244 (1999))

Reference: Versporten A, Bolokhovets G, Ghazaryan L, Abilova V, Pyshnik G, Spasojevic T, Korinteli I, Raka L, Kambaralieva B, Cizmovic L, Carp A, Radonjic V, Maqsdova N, Celik H, Payerl-Pal M, Pedersen H, Sautenkova N, Goossens H on behalf of the WHO/Europe-ESAC Project Group. Antibiotic use in eastern Europe: a cross-national database study in coordination with the WHO Regional Office for Europe. *Lancet Infect Dis* 2014 May;14(5):381-7.

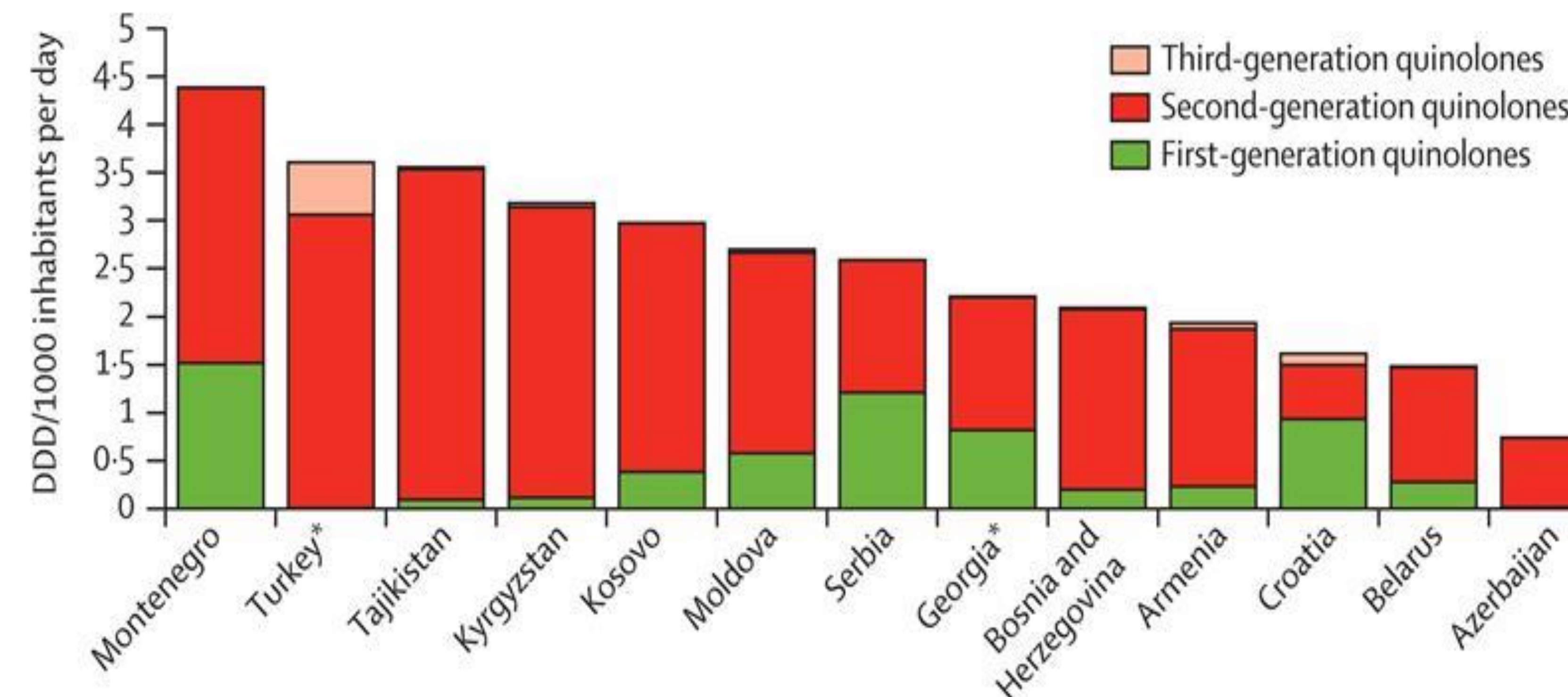


Figure 1: Total quinolone (J01M) use subdivided into three main subgroups in 12 European countries and Kosovo, 2011

DDD=defined daily doses. *Countries reporting only outpatient antibiotic use Kosovo (in accordance with UN Security Council resolution 1244 (1999))

Results

Total quinolone use varied from 0.7 DID (4% of total antibiotic use) for Azerbaijan to 4.4 DID (11%) for Montenegro (Fig.1). Highest use of first-generation quinolones (mainly pipemidic acid) was reported for Montenegro (1.5 DID, 4%) and Serbia (1.2 DID, 5%) followed by Georgia (0.8 DID, 4% mainly norfloxacin); and lowest use was noted for Turkey (0.01 DID, 0.02%). Highest use of second-generation quinolones (mainly ciprofloxacin) was reported for Tajikistan, Turkey, Kyrgyzstan, Montenegro and Kosovo (from 3.4 DID to 2.6 DID, 7-12%); and lowest use was noted for Azerbaijan (0.7 DID, 4%). Highest use of third-generation quinolones was observed for Turkey (0.5 DID, 1%, mainly moxifloxacin); comparable with use in some EU European countries (Luxembourg, Greece, Portugal, with Belgium showing highest moxifloxacin use) (Fig.2). Minor use was reported for all other non-EU European countries (Fig.1).

Seasonal variation of quinolones showed an (up to ten-fold) increased use of levofloxacin during the winter season in Turkey, Armenia and Azerbaijan. A seven-fold increased use of moxifloxacin was reported during the winter season in Turkey. No increase during winter season was observed for the other quinolones (Fig.3).

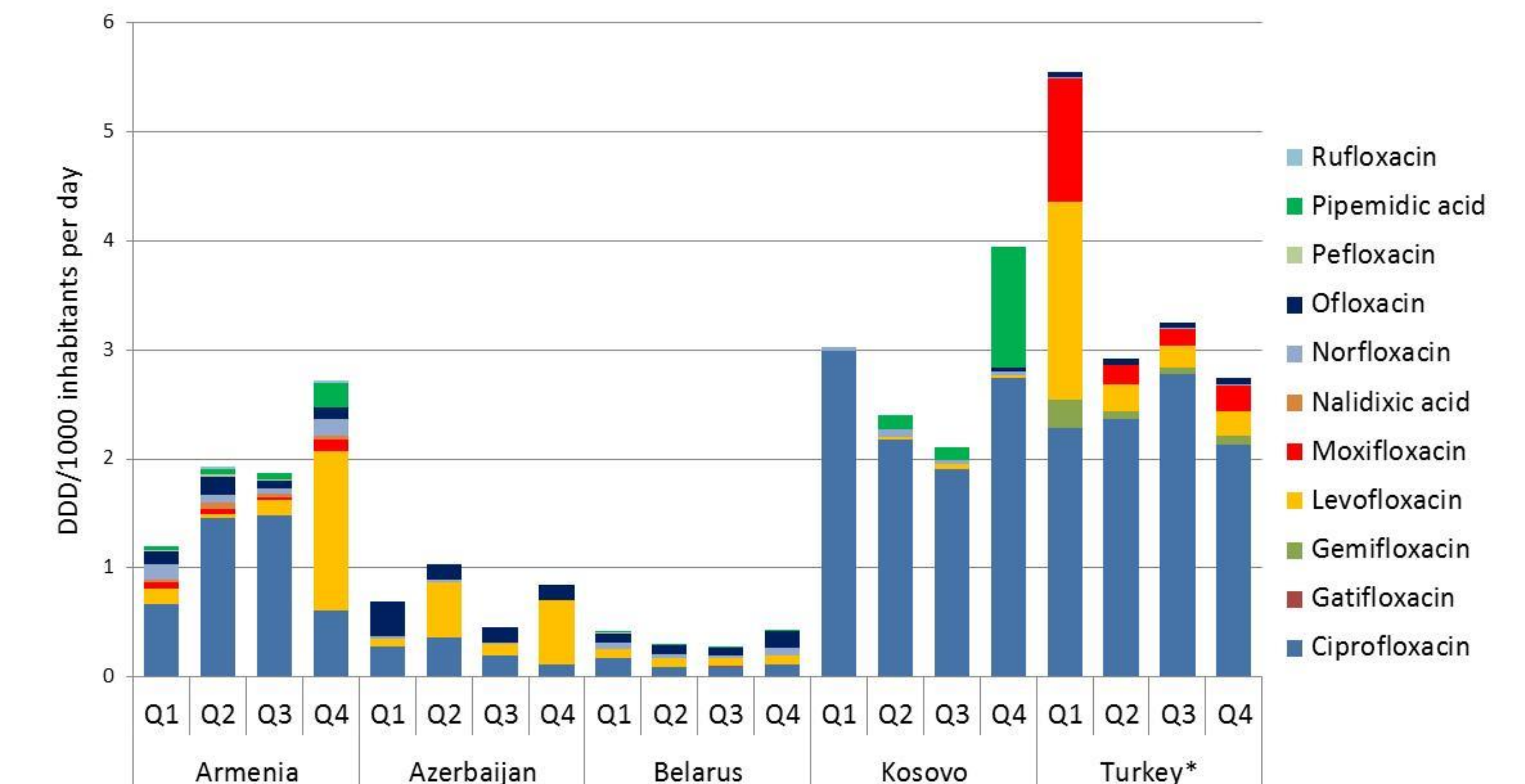


Figure 3: Total quinolone (J01M) use in 4 WHO/Europe-ESAC countries and Kosovo by quarter, 2011.

DDD=defined daily doses.*Country reporting only outpatient antibiotic use Kosovo (in accordance with UN Security Council resolution 1244 (1999))

Conclusion

We present for the first time a standardised and validated data set of systemic quinolone use in eastern Europe. Ciprofloxacin was the most commonly used quinolone in most countries. Old drugs, such as pipemidic acid, are still used at considerable amounts in Serbia and Montenegro. Seasonal variation of respiratory quinolones (levofloxacin and moxifloxacin) may indicate inappropriate use for respiratory tract infections during the winter season. Quinolones are not recommended as first-line therapy for the treatment of many infectious diseases, its high use observed in some of the countries included in this study raises concern, especially for prevention and control of multiple drug resistance and extensive drug resistant *Mycobacterium tuberculosis*. These data will facilitate auditing of antimicrobial use and evaluation of the implementation of guidelines and public health policies to promote its judicious use.