

Antibiotic use in acute care hospitals : comparison of Switzerland with other European countries

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Introduction and objectives

A monitoring of antibiotic use is helpful to understand the main determinants of bacterial resistance, to predict the evolution of this resistance, to plan interventions fostering an appropriate use of antibiotics and to measure the impact of these interventions. Two European projects have been initiated to measure this use : **ARPAC**¹ (139 hospitals) and **ESAC**^{2,3} (15 countries).

The goal of the study was to compare the inpatient antibiotic consumption of Switzerland with other European countries.

Method

Two sources of data were used. In both, aggregated data were converted into defined daily doses (DDD) :

- data provided by hospital pharmacists setting up a sentinel network of 51 acute care hospitals that we used to adjust the consumption to hospital days (DDD/100 bed-days) and describe the distribution of antibiotic families (Fig.1,2,5).
- data provided by IMS-IHA, a private provider of manufacturers's sales that we used to adjust the consumption to the population (DDD/1000 inhabitants/day).



Fig.1 Distribution of acute care hospitals participating to the sentinel network in Switzerland

Results

The use density in the sentinel network (50.6 DDD/100 bed-days) was close to the use of the Western (53.6) and Northern (48.3) European regions (in ARPAC) (Fig.2). Swiss hospitals showed a stable use density from 1.98 to 2.10 DDD/1000 inhabitants/day over 4 years (European median in ESAC, 2.10) (Fig 3). The most frequently used individual antibiotic, amoxicillin/clavulanic acid, made up 74% of the penicillins used (45 to 75% in ESAC). Among the cephalosporins, the third and fourth generations made up 53% of the use (10 to 50% in ESAC) (Fig. 4,5).

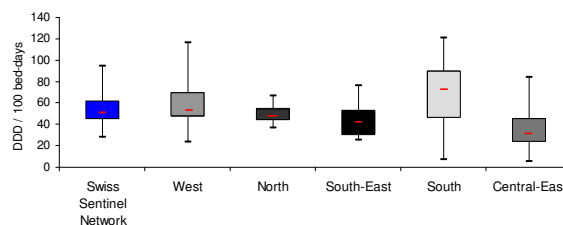
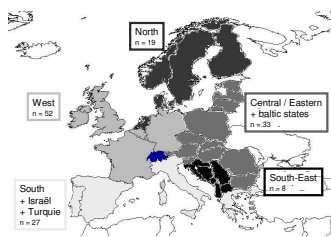


Fig. 2 Density of global antibiotic use in the Swiss sentinel network (2006) and in the ARPAC regions (2001)

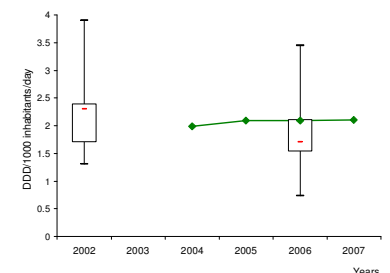


Fig. 3 Density of global antibiotic use in Switzerland (in green, 2004 – 2007) and in European countries (ESAC, box plot, 2002 and 2006)

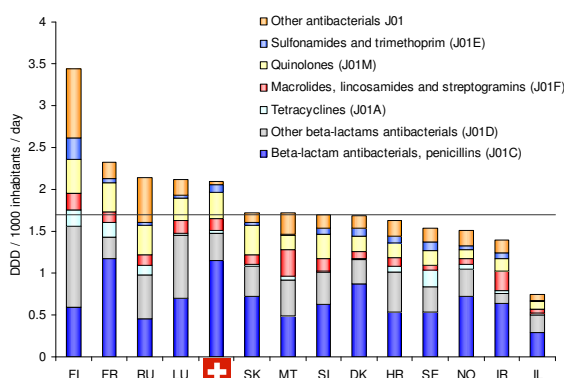


Fig. 4 Distribution of antibiotic families in Switzerland and in countries participating to ESAC survey in 2006

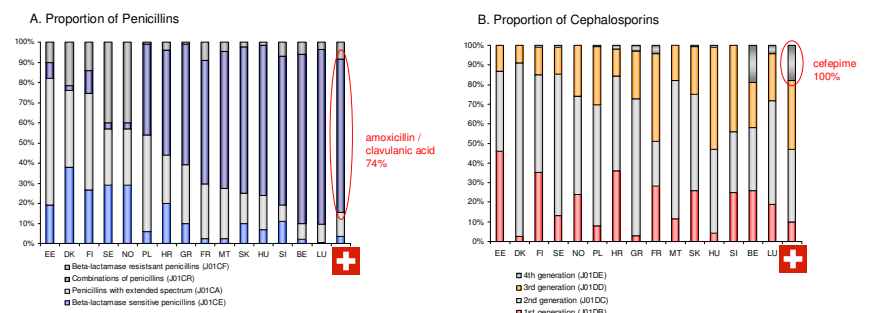


Fig. 5 Proportion of penicillins (A) and cephalosporins (B) in Switzerland and in the countries participating to ESAC survey: Estonie (EE), Danemark (DK), Finlande (FI), Suède (SE), Norvège (NO), Pologne (PL), Croatie (HR), Grèce (GR), France (FR), Malte (MT), Slovaquie (SK), Hongrie (HU), Slovénie (SI), Belgique (BE), Luxembourg (LU) (2002) .

Conclusions

- The present study shows for the first time the national level of antibiotic use in the acute care hospitals in Switzerland.
- The global antibiotic use in the Swiss hospitals was close to the European median. However, the proportion of amoxicillin / clavulanic acid and cefepime were among the highest in Europe.