

Analysis of the changes in antibiotic use in the community in Belgium between 2004 and 2012: Comparison between DDDs and prescriptions, position of the fluoroquinolones, and impact of public campaigns

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Abstract (abridged)

Background:

Belgium, a country with high antibiotic consumption, ran since 2000 yearly public campaigns aiming at reducing antibiotic use in the community. National reimbursement data, however, showed an increase (13.9%) of Defined Daily Doses (DDD) in the 2000-2014 period. Our aim was to cross these data with data concerning the actual number prescriptions.

Material & methods:

Data source: Database of one of the major Belgian health social organization (*Mutualités socialistes* [Solidaris]; channeling drug reimbursement from the National Social Security to about 40% of the Belgian population)

Results:

The number of prescriptions per reimbursed patient remained stable between 2004 and 2012, with a large predominance of beta-lactams (~40%) while fluoroquinolones represented only ~5.5% of all DDDs.

Conclusions:

Public campaigns undertaken in Belgium are not associated with a decrease in patients' global antibiotic exposure (DDD) or in number of individual prescriptions (in the population analyzed).

Background and Objectives

Belgium is known for a large use of antibiotics in the community, with Defined Daily Doses (DDD) per 1,000 inhabitants and per year reaching values about 3-fold those of the Netherlands, an adjacent country with a similar climate and economical environment [1].

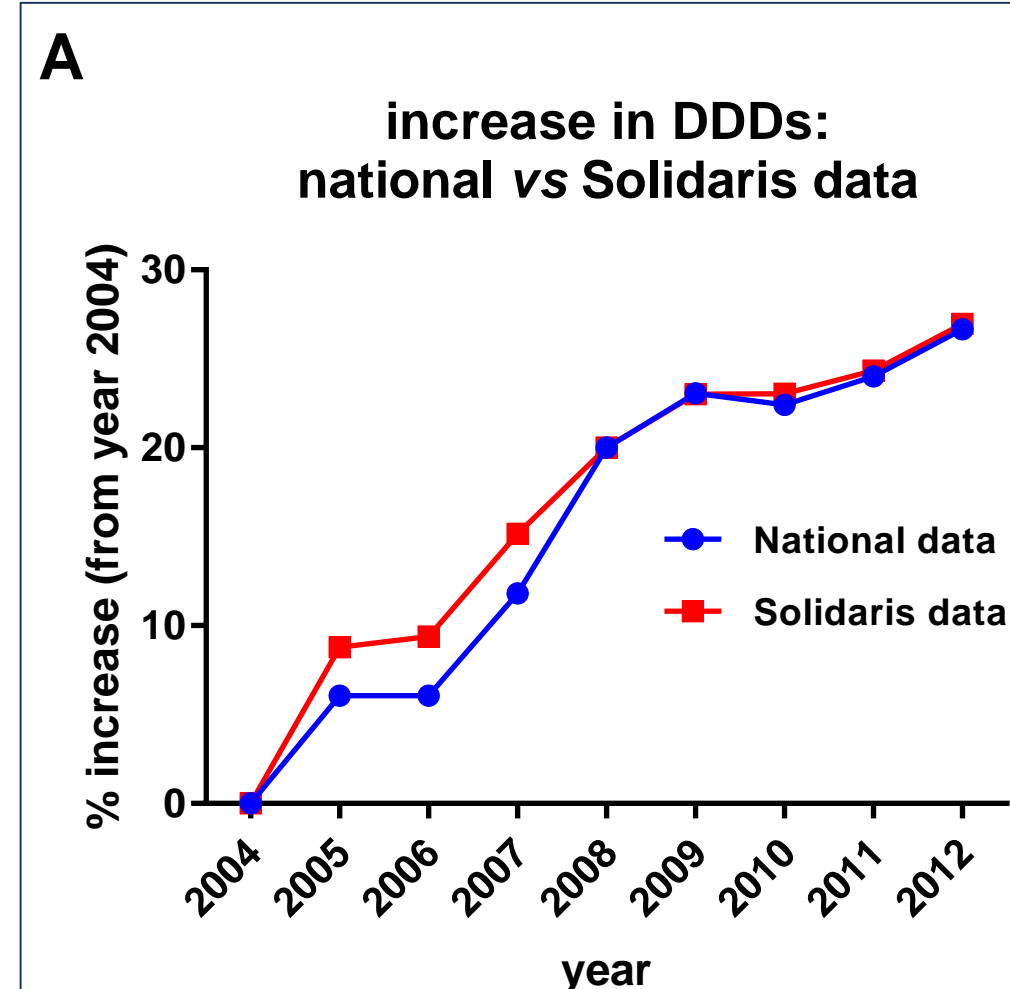
Belgian authorities have launched yearly public campaigns since 2000 in order to warn the population about antibiotic overconsumption and associated risks and to decrease demand from the patients to the prescribers for antibiotics when unjustified (all antibiotics are under prescription in Belgium).

Yet, in spite of an initial modest success [2], long-term analyses examining the changes in DDDs (National reimbursement data) showed actually an increase in global exposure of ~14% over the 2000-2014 period [3].

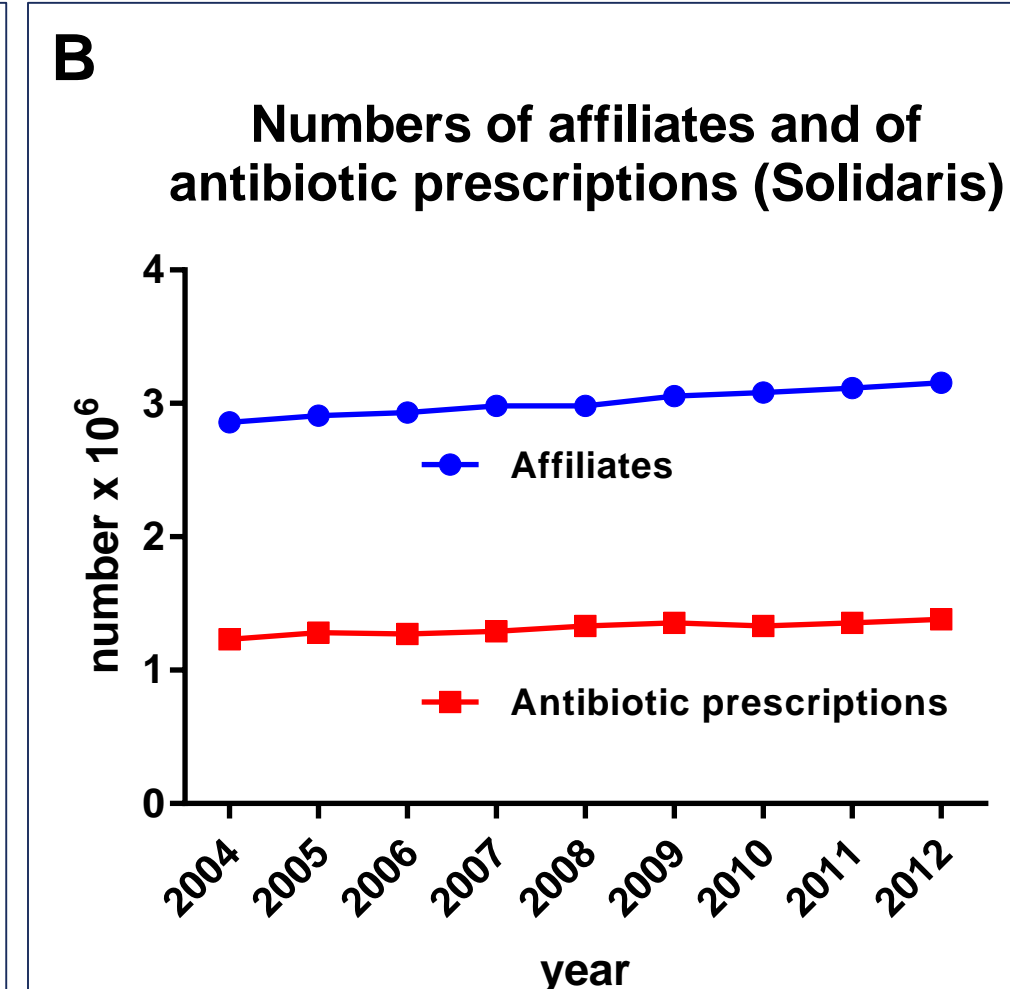
Our objectives were

- to cross DDDs data with prescription number data, to detect real changes in prescription habits;
- to measure the impact of fluoroquinolones on total antibiotic pressure and cost, and correlation of with major patients' comorbidities and prescriber's profile.

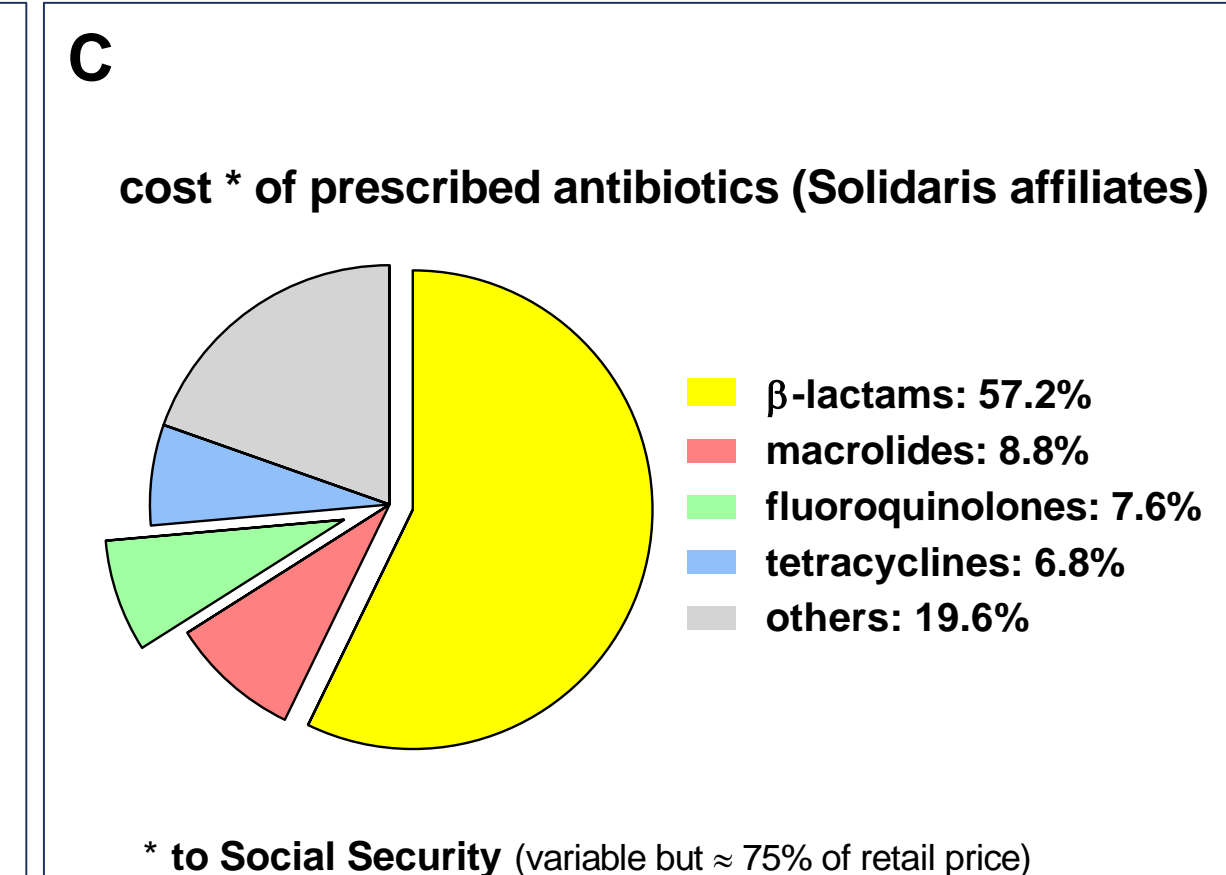
Main observations (campaigns were ran each year)



There was an almost constant increase in antibiotics DDDs per 1,000 inhabitants and per year, which was similar to what had been observed at the national level, ruling out a gross selection bias in the more limited population analysed for prescription numbers (see B).



There was essentially no change in the number of antibiotic prescriptions per year, with the slight increase almost exactly matching that of the number of Solidaris affiliates (the number of DDDs per 1,000 affiliates and per year was similar to national values [see A]).



For the whole period (see A), fluoroquinolones DDDs remained stable (~5.5 % of total) accounting for 7.6% of all antibiotics Social Security costs (~ macrolides or tetracyclines). They were more prescribed for patients > 65 y. and by active and large prescribers without correlation with COPD or diabetes (drugs data).

References

- [1] Cars *et al.* Lancet. 2001;357:1851-3 - PMID [11410197](#)
[2] Bauraind *et al.* JAMA. 2004;292:2468-70 - PMID [15562124](#)
[3] Tulkens PM. ASM Microbe 2016, Boston, Mass.: oral presentation (session 014 – June 17, 2016) - available at <http://tinyurl.com/mgfd346>
[4] Coenen *et al.* J Antimicrob Chemother 2014;69:529–534 - PMID [24084641](#)

Acknowledgements / Conflicts of Interest

We thank the *Mutualités socialistes* (Solidaris) for access to their data base. This work was made without support of any kind. PMT was a member of the Belgian Antibiotic Policy Coordination Committee (BAPCOC) and co-author of ref. 2 above.

Methods

We searched the 2004-2012 database of one major Belgian health social organization (*Mutualités socialistes* [Solidaris]; channeling drug reimbursement to ~ 40% of the Belgian population), with access to both DDDs and number of prescriptions of antibiotics for systemic use (ATC group J01; separate analysis of beta-lactams [J01C] and fluoroquinolones [J01MA]) in the community. Data were cross-checked with the profile of the prescriber (active/inactive; large/parsimonious) and for two patient's main common co-morbidities (diabetes and COPD [drug consumption]). Only aggregated data were used to respect prescriber's and patient's anonymity. DDDs data were also compared with national DDDs data (publicly available on <http://tinyurl.com/hwu74sf> [in French] in and ref [3]).

Messages and Conclusion

- Contrary to a previous report covering the 2002-2009 period [4], the present study fails to demonstrate an association between the performance of yearly public antibiotic campaigns in Belgium and the number of antibiotic prescriptions in the community over the 2004-2012 period and in the population analysed;
- Fluoroquinolones, often considered as major players in antibiotic resistance, represent only a modest proportion of all antibiotics prescribed and of Social Security costs in the population analysed;
- Whatever the metric used (DDD or number prescriptions), Belgium remains a high antibiotic consuming country, especially if compared to the Netherlands, calling for a better design and an improved targeting of the public actions aiming at reducing antibiotic overconsumption in the community.