

Explaining increases in community antimicrobial use: temporal analysis in Tayside, Scotland

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Background

In the UK, 80% of antimicrobial use is in the community and up to 50% of this is considered to be inappropriate. Despite antimicrobial stewardship efforts, reported antimicrobial use continues to rise, but there is a lack of detail behind the aggregate measures reported.

Objective

To determine whether observed increases in community antimicrobial use in World Health Organisation (WHO) defined daily doses (DDD) in Tayside are due to changes in the proportion of the population receiving any antimicrobial; the number of prescriptions received per patient; or the quantity of antimicrobial in each prescription.

Methods

The NHS Tayside health board region of Scotland has a stable population of around 400,000. We used anonymised record linkage, at the Health Informatics Centre, University of Dundee, of data on all community antimicrobial prescriptions dispensed in 2005 to 2011 and population demographic data. The analysis was mainly description of trends over time and we used t-tests to compare means of prescriptions per patient and DDD per prescription between study years.

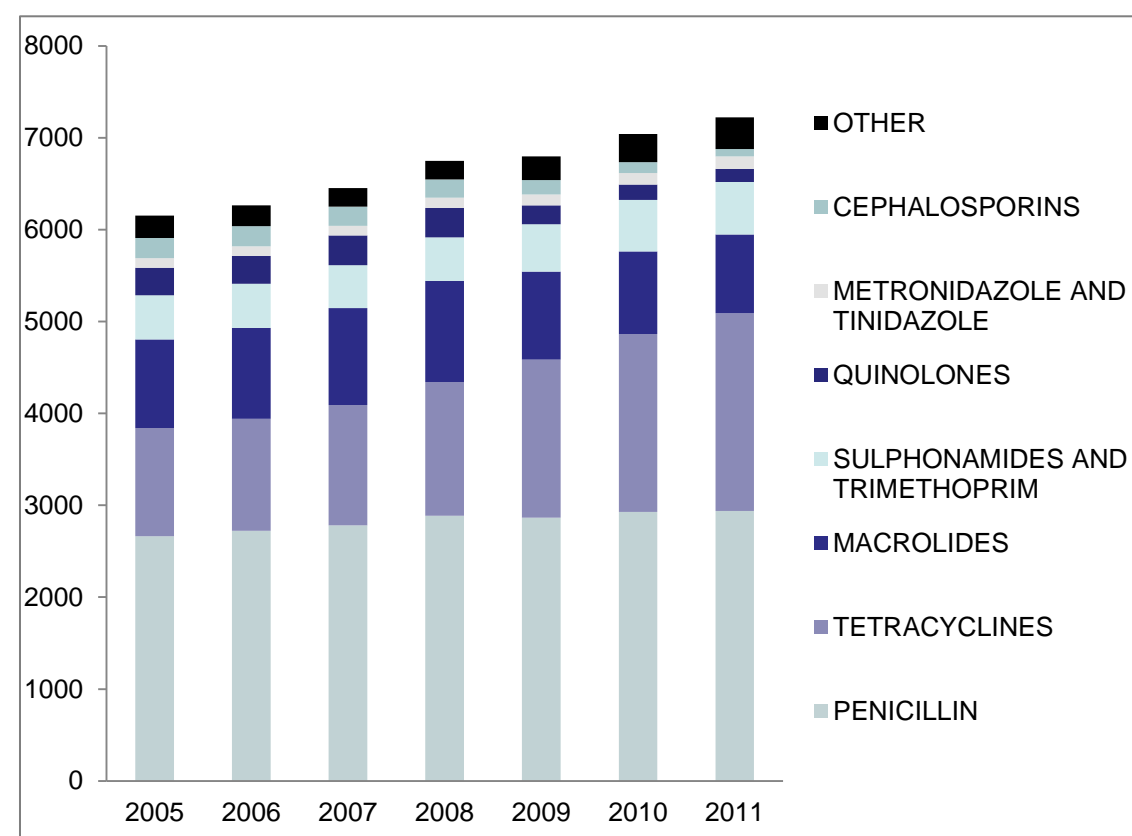


Figure 1. DDD per 1000 Tayside population per year

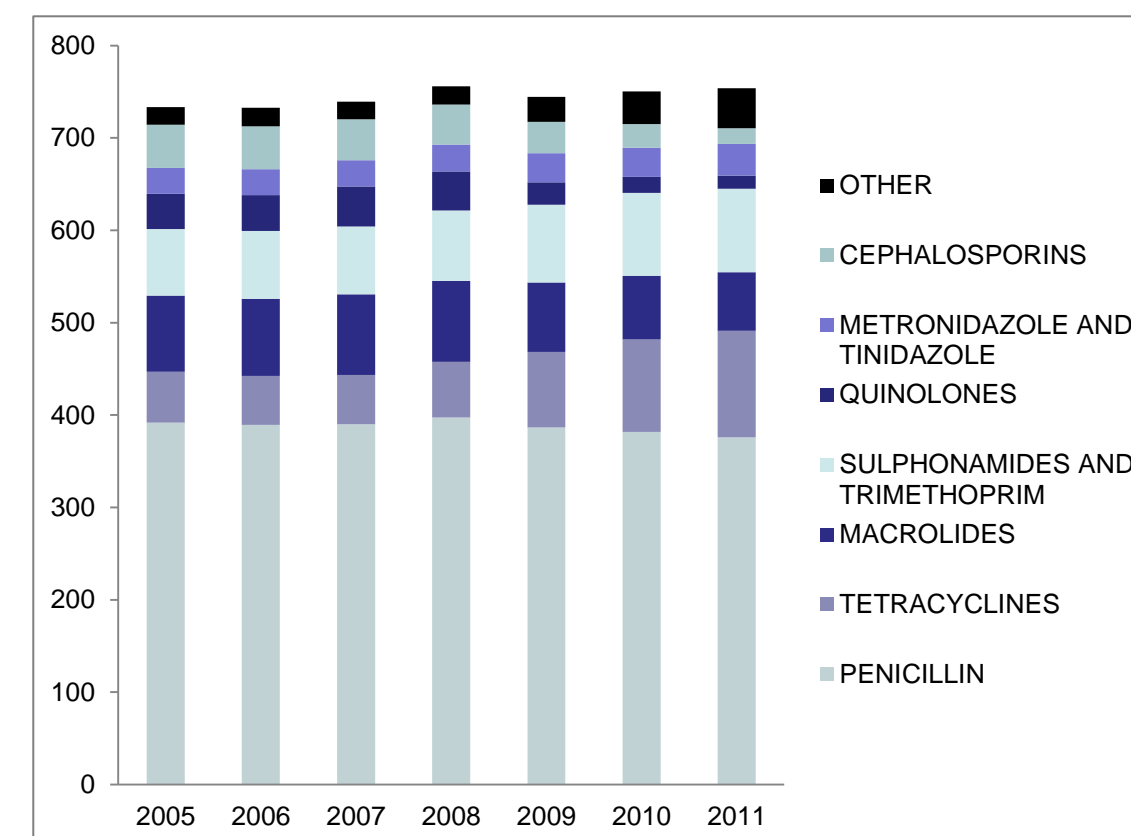


Figure 2. Prescriptions per 1000 Tayside population per year

Results

Consistent with published reports, primary care antimicrobial use in DDD per 1000 population in Tayside, Scotland has increased each year between 2000 and 2011 (Figure 1). The trend in prescriptions per 1000 population is less dramatic but there was still an increase from 733 to 753 over the study period (Figure 2). The choice of antimicrobial class has clearly changed over time.

Both the mean DDD in each prescription and the mean number of prescriptions received by each patient with any prescription have increased (Table), with the rise in DDD per prescription being most dramatic.

	2005	2006	2007	2008	2009	2010	2011
Total DDD	300,125	306,661	311,602	321,358	323,573	328,282	332,276
Total prescriptions	145,879	147,799	147,386	151,476	150,522	152,790	151,778
Mean DDD per prescription	8.39	8.55	8.73	8.92	9.13	9.38	9.58
Difference from 2005 mean DDD*	Ref year	0.16	0.34	0.53	0.74	0.99	1.19
Mean prescriptions per patient	2.06	2.07	2.11	2.12	2.15	2.15	2.19
Difference from 2005 mean prescriptions*	Ref year	0.02	0.06	0.06	0.09	0.09	0.13

* $p < 0.001$ for all mean differences from 2005, except prescriptions in 2006 ($p = 0.015$)

Conclusions

The main factor behind increasing DDD in Tayside seems to be rising DDD per prescription, influenced by drug choice and course duration. While some of this may represent changes in accordance with changing guidelines, antimicrobial use by any measure is not decreasing - the biggest and urgent challenge for antimicrobial stewardship.