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Comment on: Measurement units for antibiotic consumption in outpatients

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Sir,

We are grateful for the interest of Čižman[1] in our work[2] on appropriate measurement units for outpatient antibiotic consumption. Based on data for Slovenia and referring to the correlation between antibiotic consumption and resistance, he argues that for an international benchmarking of antibiotic use in outpatients, the number of defined daily doses (DDDs) per 1000 inhabitants per day (DID) is a better measurement unit than the number of packages per 1000 inhabitants per day (PID), and that if substantial changes in the number of DDDs per package occur over time, additional measurement units should be used, such as PID and the number of prescriptions per 1000 inhabitants per year, to identify trends in national prescribing. The latter statement is completely in line with our recommendation to use a similar combination of measurement units or to exercise caution when interpreting trends based only on DDDs when such changes occur or are unknown.[2]

This recommendation was first based on the observation in Belgium that outpatient antibiotic consumption in terms of DID had not decreased since the start of the national public antibiotic awareness campaign, whereas we observed a substantial decrease in PID due to the less frequent treatment of fewer individuals. These contrasting trends coincided with a decrease in the proportion of pneumococci resistant to penicillins, tetracyclines and macrolides and are explained by a substantial increase in the number of DDDs per package for the most commonly used antibiotics.[3] In Slovenia, the latter is not the case based on the data provided by Čižman.[1] Meanwhile, we have shown that the number of DDDs per package increased for most commonly used antibiotics in Europe (31 countries), resulting in contrasting trends depending on whether DID or PID is used as the measurement unit and corroborating our recommendation to adopt PID to monitor outpatient antibiotic use in Europe.[4] Based on that study, Figure 1 shows the estimated linear trends in the number of DDDs per package for total outpatient antibiotic consumption in Europe, Belgium and Slovenia. These data explain why consumption trends expressed in DID or PID are contrasting for Belgium and Europe, and similar for Slovenia.

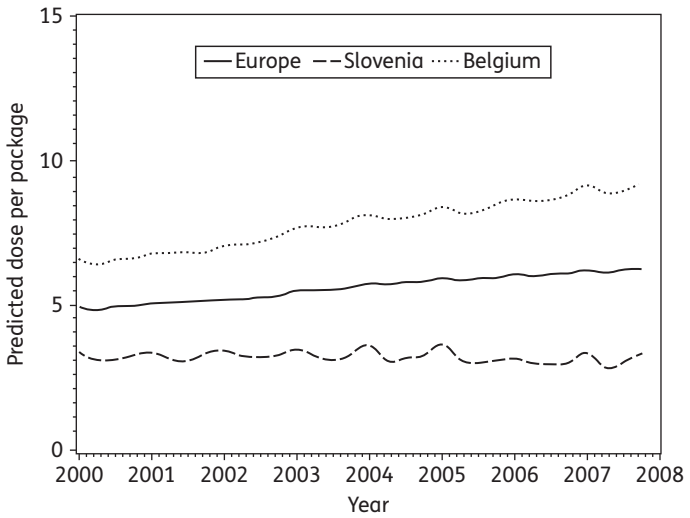

Figure 1. Trends in the number of DDDs per package for total outpatient antibiotic consumption.[4]

We are currently investigating whether the description of outpatient antibiotic consumption in DID and PID can be improved by including change points in the model,[5] e.g. to assess the impact of the European Antibiotic Awareness Day,[6,7] and what measurement unit correlates best with antimicrobial resistance in Europe. Expressing the consumption in PID and including a change point provided the best fitting model when assessing the correlation between macrolide, lincosamide, streptogramin B and tetracycline consumption and the prevalence of macrolide-resistant *Streptococcus pyogenes* in Belgium.[8]

Transparency declarations

None to declare.

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