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Comment on: Hospital consumption of antibiotics in 15 European countries: results of the ESAC Retrospective Data Collection (1997–2002)

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Sir,

The assessment of antimicrobial use and the determination of need for control measures have become important priorities of public health research and policy. Recently, retrospective data on antimicrobial drug consumption were presented by the European Surveillance of Antimicrobial Consumption (ESAC) project, established in 2001 with support of the European Commission. The ESAC database for outpatient antibiotic use is large and comprehensive but more limited for hospital antibiotic consumption. For the year 2002, ‘fairly complete’ national consumption data of systemic antibiotics for hospital care from quite different sources (manufacturers, wholesalers and pharmacies) were available for only 15 countries, namely Belgium, Croatia, Denmark, Estonia, Greece, Finland, France, Hungary, Luxembourg, Malta, Norway, Poland, Slovakia, Slovenia and Sweden. Validity was considered a problem for the datasets from Finland (obviously including parts of outpatient consumption), Poland (coverage of 60% only) and Greece (other reasons).

How can coverage and quality of the desperately needed antibiotic use database for hospital care be improved? What is the recommendation to public health authorities and researchers of those (often very large) countries which were unable to deliver ‘fairly complete’ datasets? Are the hospital sample data reported from the Netherlands (covering 58% of all hospitals), for example, not valid, reliable and sufficiently complete? Is it worthwhile to collect national consumption data from ~2000 hospitals in a large country like Germany, with its complex, decentralized health system? Is it not more acceptable (and perhaps desirable) to provide sample data from pharmacies than sales data from manufacturers/wholesalers? What is the critical sample size? How do hospital samples need to be stratified? Are regional data from large countries such as Italy, Spain, the UK and Germany relevant to reduce the white spots on the map?

Data from a convenience sample of hospitals (40 regional acute-care general hospitals and 2 university hospitals) located in south-western Germany, for example, are available for the years 2000–2002. The hospitals, located in Baden-Württemberg, a federal state with a 10.6 million population—a population size similar to that of Belgium, Greece, Portugal or Sweden—had a distribution of hospital size similar to that of all general hospitals in that state. This sample data and corresponding hospital statistics can easily be used to estimate state-wide hospital antibiotic consumption and to compare it with state-wide outpatient antibiotic consumption. We performed such an analysis for the year 2002.

For this purpose, use density estimates [in DDD/1000 inhabitants and day (DID)] in south-western Germany (the federal state of Baden-Württemberg) and comparison with different European countries based on national estimates reported by ESAC.

Figure 1. Antibiotic consumption [in DDD per 1000 inhabitants and day (DID)] in south-western Germany (the federal state of Baden-Württemberg) and comparison with different European countries based on national estimates reported by ESAC.
homes) antibiotic use estimates for the same region and year, this represents 14% (13.2–14.2%) of the total antibiotic consumption—a slightly higher percentage than reported by ESAC for most other European countries included in their survey. When we repeated these measurements for selected drug classes, we estimated that 21% of fluoroquinolone DDDs were prescribed in the hospital; the corresponding proportion for co-trimoxazole was 7%, for macrolides/clindamycin it was 5%, and for tetracyclines it was 1%.

Hospital antibiotic consumption of ~2 DID for this part of Germany is well within the order of magnitude reported in the ESAC work (Figure 1). If one accepts that Finland (probably due to healthcentre inclusion) and France (for unknown reason) are outliers in the ESAC database, there is still some variation in hospital antibiotic use in the DID data format between many European countries and regions. Interestingly, this variation is much less evident in a comparison of hospital antibiotic use density estimates in the DDD/100 data format from France, Denmark, the Netherlands and different regions of Germany. There may be fewer white spots than anticipated on the European map of hospital antibiotic consumption. It is certainly possible (albeit cumbersome, we agree) to reduce them further, but a careful definition of acceptable data sources, quality, type and format is required. In large countries that are not yet on the map, the provision of reliable data may be feasible from stratified hospital samples, and this may be the only acceptable way for cost-effective data acquisition and analysis.

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Transparency declarations

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Hospital consumption of antibiotics in 15 European countries: results of the ESAC Retrospective Data Collection (1997–2002)—author response

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Sir,

I thank Kern et al. for their comments regarding our article and congratulate our German colleagues for their successful attempt to collect comprehensive data from south-western Germany. We fully acknowledge the advantages of data collected from individual hospitals within national antibiotic programmes. These data are often complemented by a denominator (number of bed days or admissions) and can be expressed in e.g. DDD per 100 bed days. As nicely demonstrated in the paper by Kern et al., regional data based on individual hospitals allow stratification of antibiotic use according to the hospital type, size or location.

In our article we reported on hospital antibiotic consumption for the year 2002, and at that time valid national estimates were available for only 15 of the 34 countries participating in the European Surveillance of Antimicrobial Consumption (ESAC) project, granted by DG SANCO of the European Commission. Indeed, for the remaining countries, the data delivered on hospital antibiotic use to ESAC were mostly based on a sample of hospitals. Since 2002 we have made a lot of progress, and data collected from individual hospitals within national antibiotic programmes have been compiled in the Netherlands, Lithuania, Austria, Ireland and (as nicely illustrated by Kern et al.) Germany. In addition, Iceland is able to extract their hospital use data from total sales data since 2004, and Russia and Israel have been delivering their national data since 2003. Thus, sound national data are now available from 23 countries. Other countries were able to deliver data from a limited sample of hospitals or conducted ad hoc one-off studies. As a result, there are now only a few white spots left on the European map (see Figure 1). Finally, in 2006 we launched an ESAC ‘Hospital care’ subproject, led by Professor Peter Davey of the University of Dundee, Scotland, to develop an accurate methodology for comparative studies on hospital antibiotic use. Indeed, there are no studies assessing the different numerators and denominators which should be used to monitor hospital antibiotic use, rendering comparison and benchmarking of hospital antibiotic use cumbersome. In this