

Outpatient Antimicrobial Consumption and Frequency of Resistance in Suwa area, Nagano, Japan

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ABSTRACT

Background:

The public health community faces the global challenge posed by antimicrobial-resistant bacteria. Therefore, trends in antimicrobial consumption should be identified to estimate selective pressure on resistance and enhance the management of antimicrobials in hospitals and communities. Although the European Union has established methods for the surveillance of antimicrobial use and resistance, other countries including the United States and Japan have no comprehensive surveillance systems in place.

Methods:

Records on outpatient antimicrobial prescriptions in Suwa area, Nagano prefecture, Japan were collected between January and December 2010 from a national health insurance electronic database. The defined daily dose (DDD) per 1,000 inhabitants per day was calculated for each antimicrobial category based on the World Health Organization's Anatomical Therapeutic Chemical (ATC)/DDD system. Records on antimicrobial-resistant bacteria were collected during the same period from area hospitals. The results were compared with European data.

Results:

The target population was 31,539 (27.1%) of the total area population. Total outpatient antimicrobial use was 9.6 DDD per 1,000 inhabitants per day. Macrolide, lincosamide, and streptogramin antibiotics (MLS) was the most frequently prescribed drug group (42%), followed by beta-lactams other than penicillins (25%) and quinolones (19%). Penicillins accounted for only 5.8% of the total number of prescribed antimicrobials. Seasonal variation in antimicrobial use was observed. The quinolone-resistance rate among *Escherichia coli* in this area was within the predicted range based on the European data; however, macrolide-resistance rates for *Streptococcus pneumoniae* exceeded these limits.

Conclusions:

Antimicrobial consumption in the study area is lower than in European countries and the pattern of use by antimicrobial category is different. The health insurance system electronic database proved a useful way to collect data on antimicrobial use in efforts to develop strategies aimed at curbing antimicrobial resistance, such as antimicrobial stewardship in Japan.

BACKGROUND

-The use and overuse of antibacterials is one of the main factors responsible for the development and spread of antibacterial resistance.

- No comprehensive surveillance system on antibacterial consumption has been established in Japan.

- Japanese public health care insurance system includes National Health Insurance (region-based health insurance), Employees' Health Insurance (occupation-based health insurance) and Long-Term Care Insurance.

METHODS

- To describe the amount of outpatient antibacterial prescriptions, reimbursement records of National Health Insurance system was collected and analyzed.

- Study area: Suwa area (Chino city, Suwa city and Hara village), Nagano prefecture, Japan

- Data source: Electronic database of National Health Insurance system

- Study periods: January to December, 2010

- The defined daily dose (DDD) per 1,000 inhabitants and per day was calculated based on the World Health Organization's Anatomical Therapeutic Chemical (ATC)/DDD system.

- Records on antibacterial-resistant bacteria during the same period were collected from two area hospitals.

- The results were compared with European data.

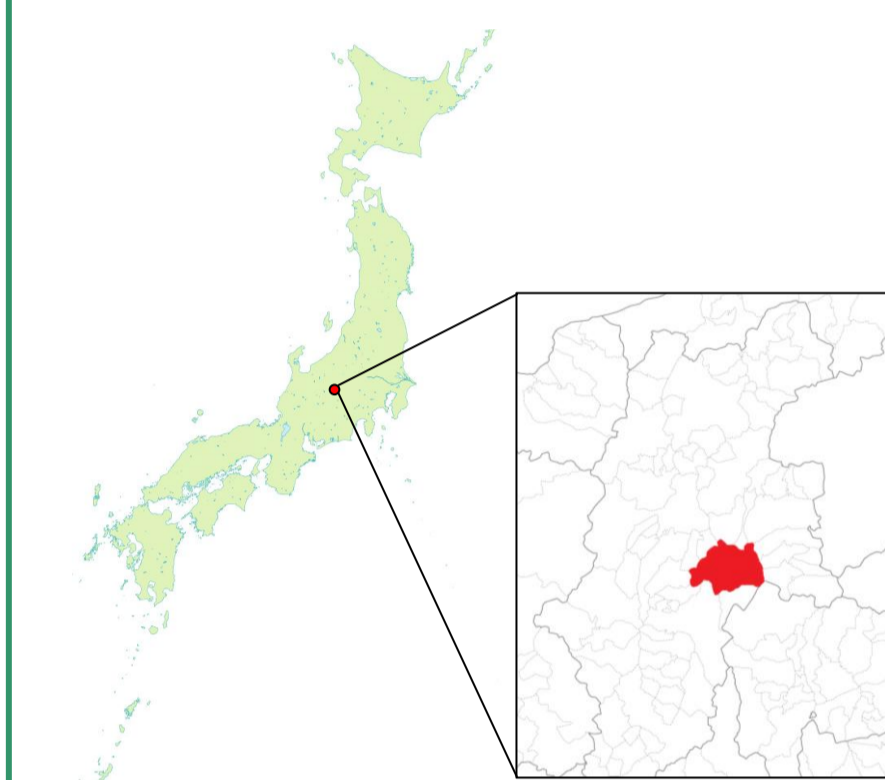
CONCLUSIONS

- Antibacterial consumption in the study area is lower than European countries and the pattern of use by antibacterial group is different.

- Electronic database of health insurance system is a useful way to survey antibacterial use in Japan.

RESULTS

Figure 1. Suwa area, Nagano, Japan



- Total population: 116,354 (2010)
- Target population: 31,539 (27.1% of total population)

Figure 2. Outpatient antibacterial use in Suwa area, Nagano, Japan, 2010

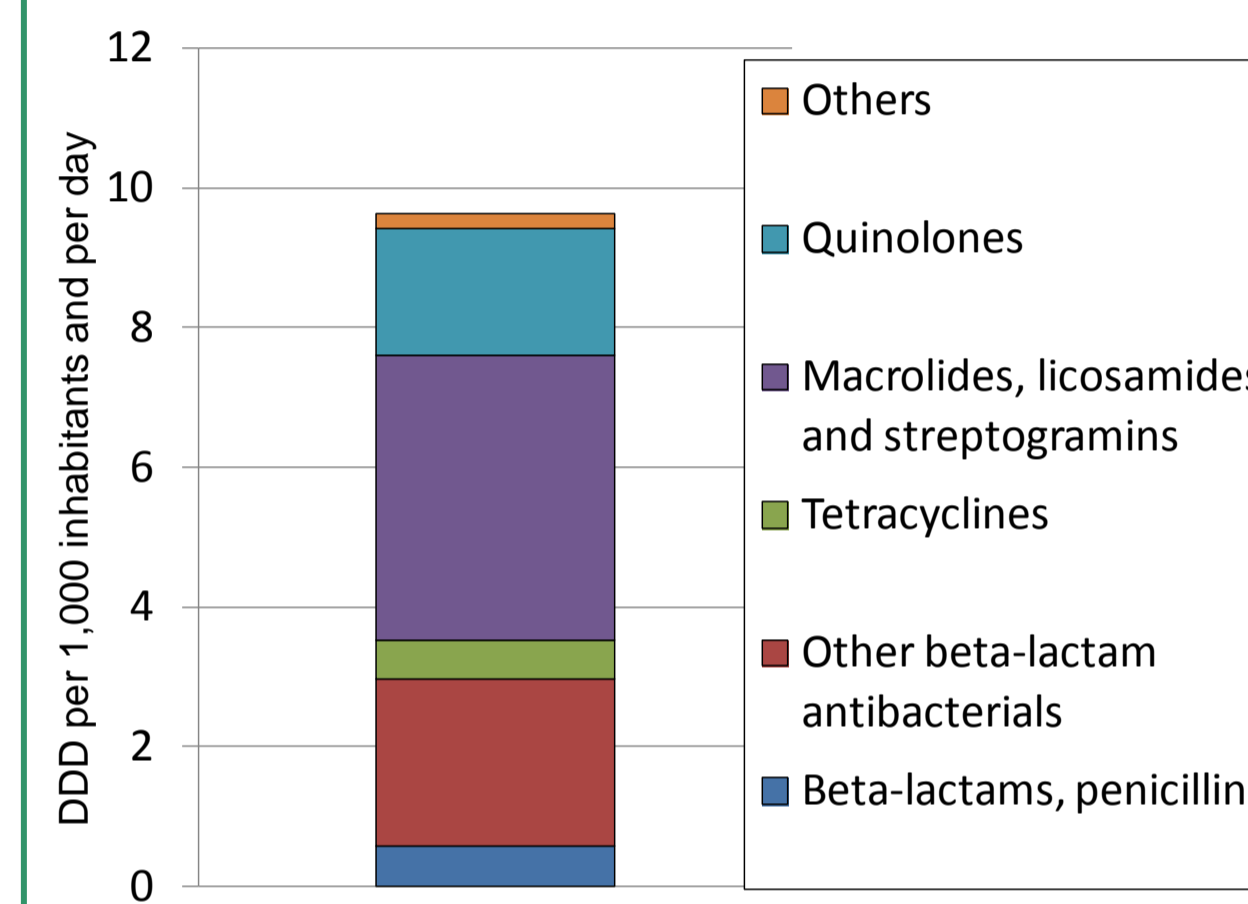


Figure 3. Outpatient antibacterial use in 26 European countries and Suwa area, Japan, 2010

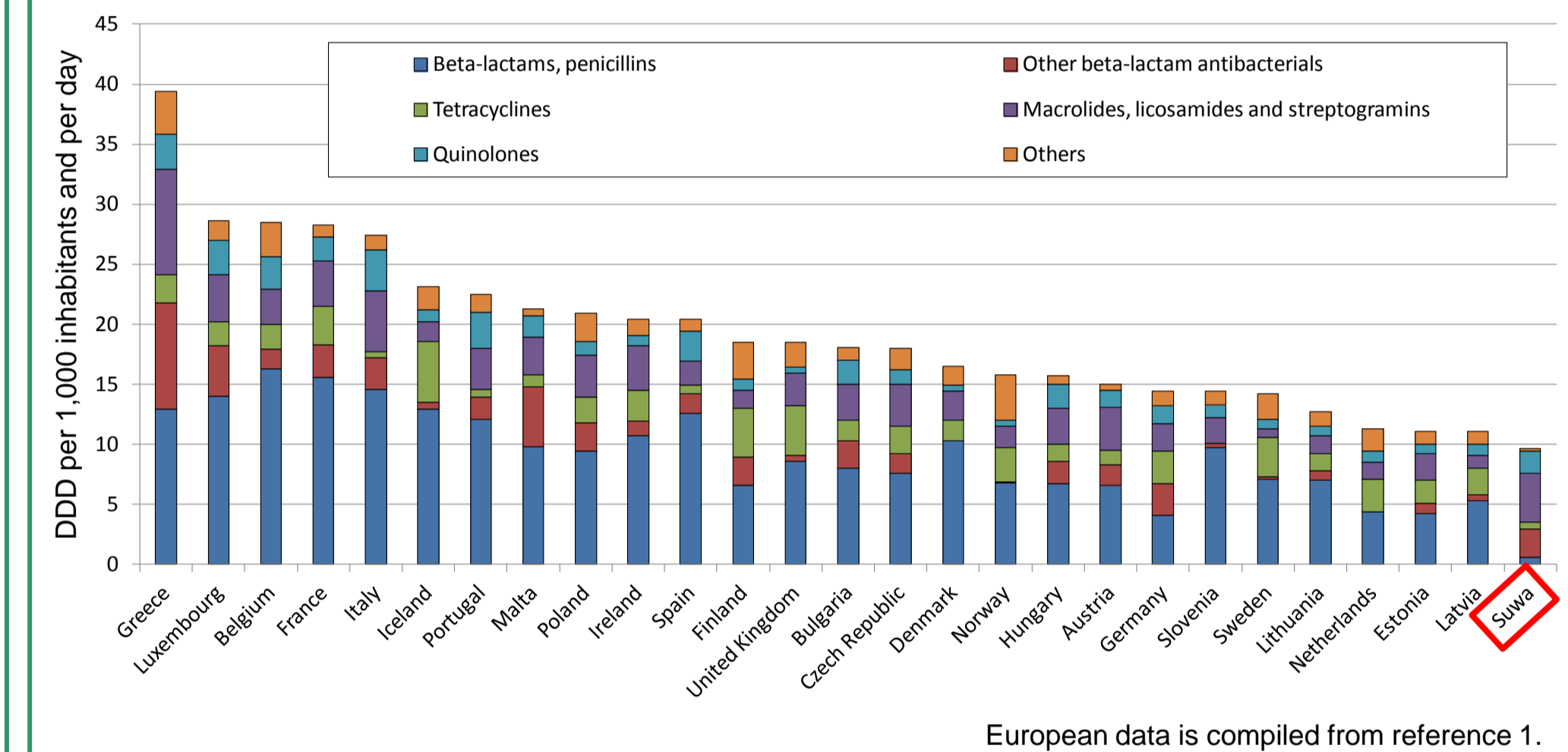


Figure 4. Seasonal variation of outpatient antibacterial use, Suwa area, Nagano, Japan, 2010

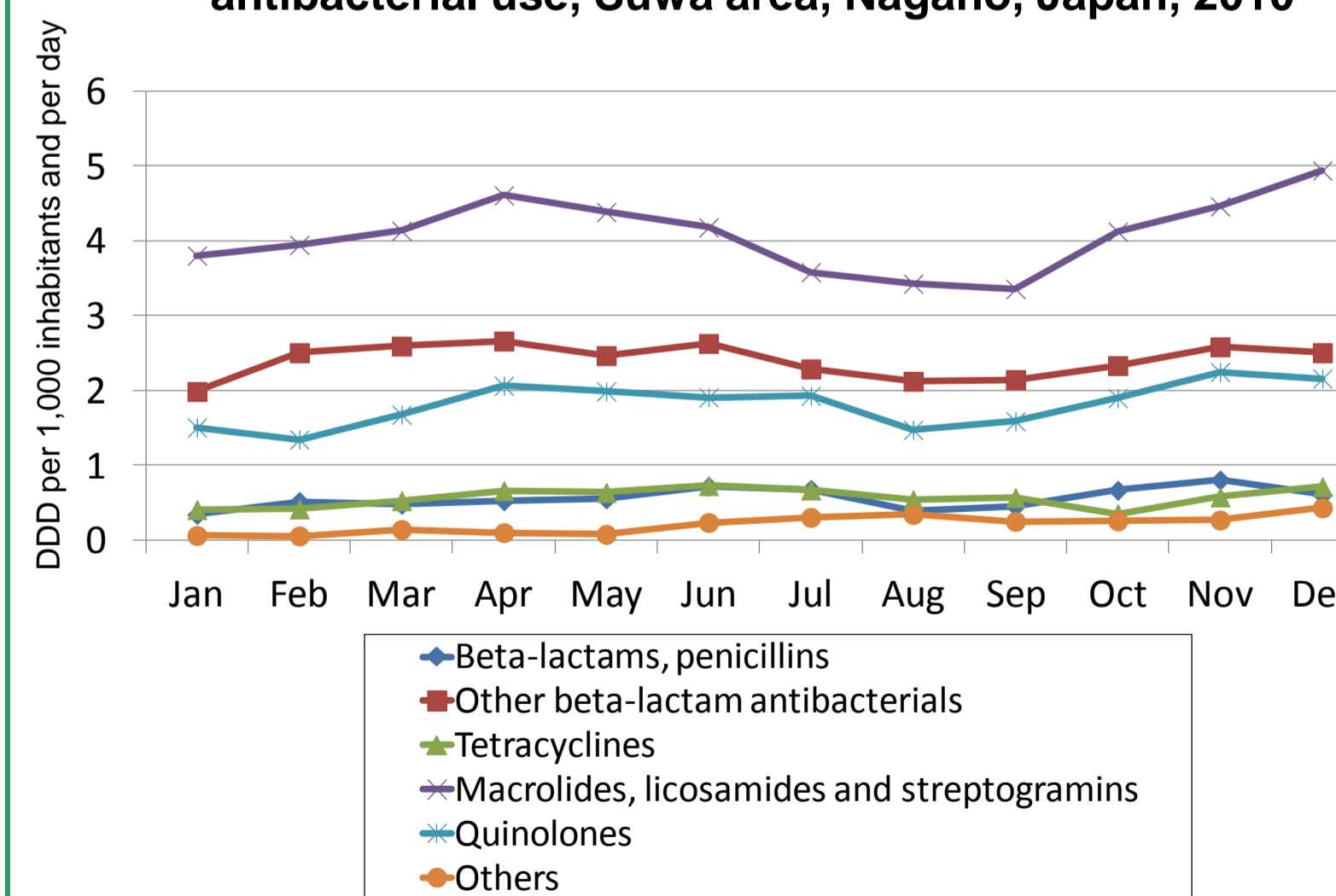


Figure 5. Quinolone use and quinolone-resistant *E. coli* in 26 European countries and Suwa area, 2010

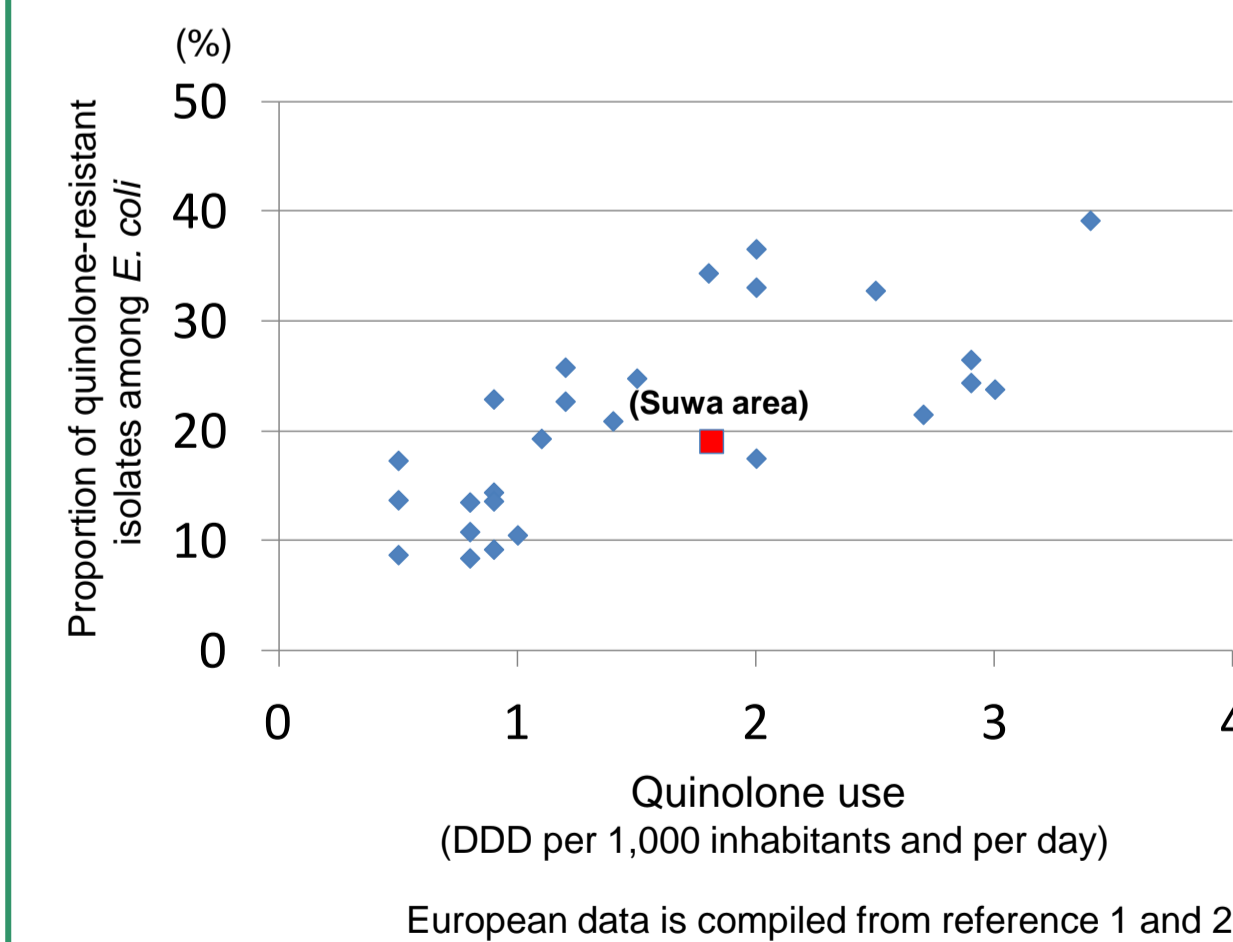
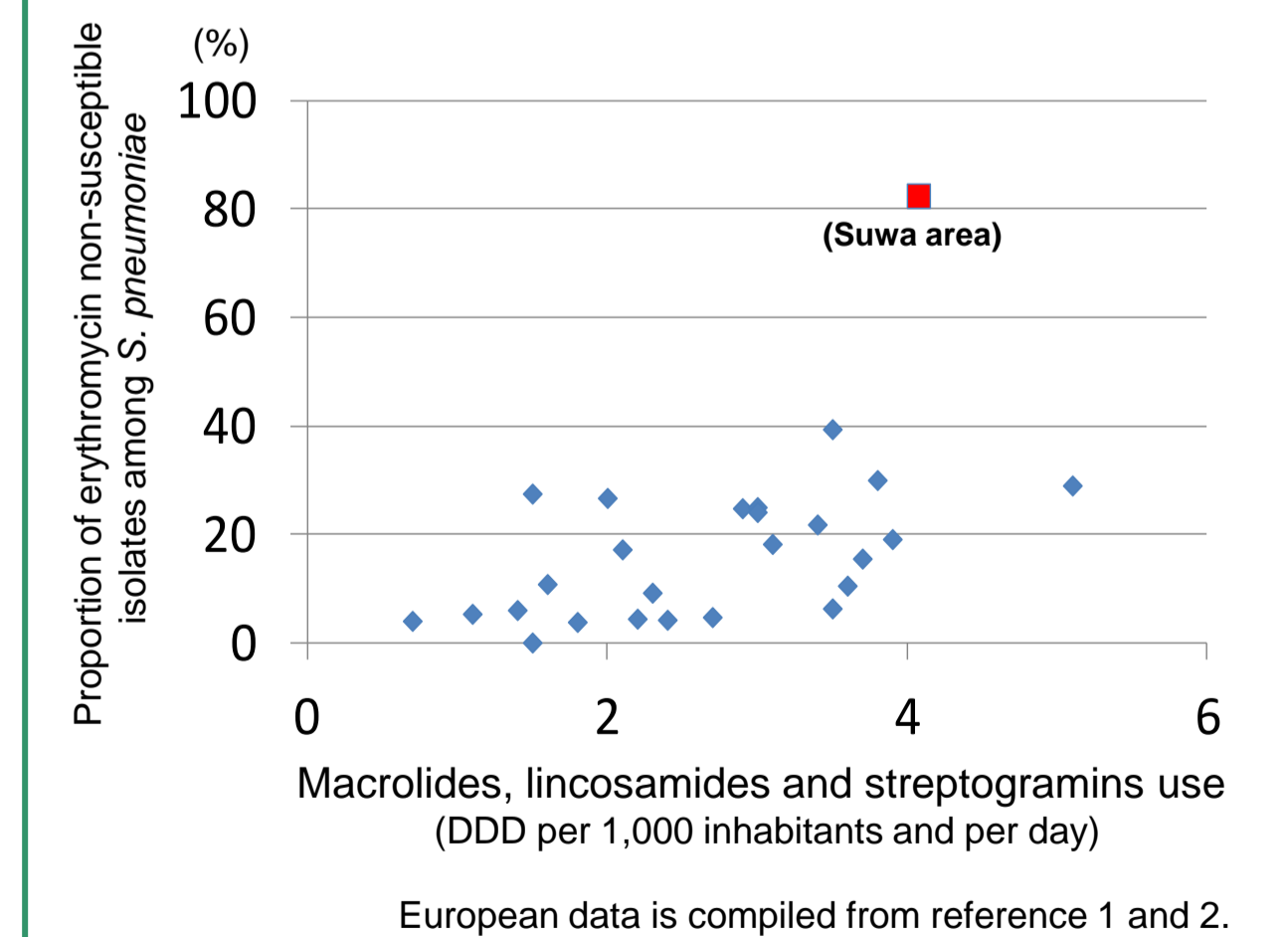


Figure 6. MLS use and macrolide non-susceptible *S. pneumoniae* in 25 European countries and Suwa area, 2010



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