



Antibiotic Stewardship in Hospitals and Primary Care: the Slovenian Experience

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Déclaration de liens d'intérêt avec les industries de santé en rapport avec le thème de la présentation (loi du 04/03/2002) :

Intervenant : Bojana Beović

Titre : Prof



L'orateur ne souhaite pas répondre



Consultant ou membre d'un conseil scientifique

OUI



NON



Conférencier ou auteur/rédacteur rémunéré d'articles ou documents: Pfizer, MSD, Alkaloid, Astellas, AstraZeneca, Sandoz



OUI



NON



Prise en charge de frais de voyage, d'hébergement ou d'inscription à des congrès ou autres manifestations

OUI



NON



Investigateur principal d'une recherche ou d'une étude clinique

OUI

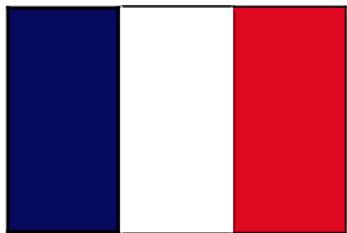


NON

A Little Bit of Geography...



**France:
63.5 Mio
Inhabitants**



**Slovenia:
2.1 Mio
Inhabitants**



Antibiotic Stewardship is...

- To choose the most effective antibiotic therapy
- To minimize adverse events
- To minimize the development of antibiotic resistance
- At minimal cost

*McGowan&Gerding, New
Horiz 1996; 4: 370-6.*



dreamstime.com

Aspects of Antibiotic Stewardship

OWNERSHIP

- Non-gouvernemental initiatives: national, international
- EU state-driven projects/programs
- National activities
- University-based initiatives
- Regional activities
- Hospital-based activities
- Industry...

ACTIVITY

- projects
- programs
- recommendations
- legislation
- structures
- campaigns
- research...

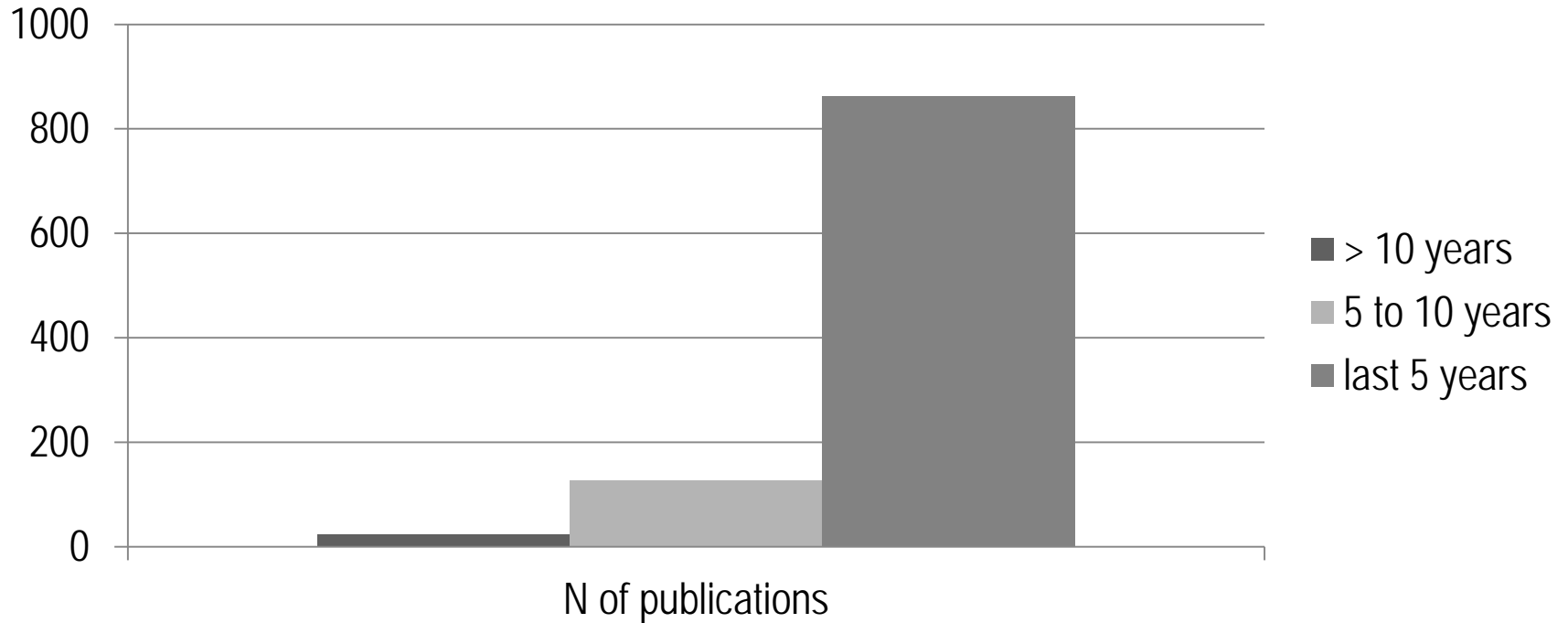
TYPE OF ACTIVITY

- restriction
- education
- structural changes...

THE TARGET GROUP

- ❖ Public
- ❖ Patients
- ❖ Physician
- ❖ Pharmacists
- ❖ Nurses
- ❖ IT...
- ❖ (management)...

„(antimicrobial) AND stewardship“ in PubMed



Do the Interventions Work?

Interventions to improve antibiotic prescribing practices for hospital inpatients (Review)

Davey P, Brown E, Fenelon L, Finch R, Gould I, Hartman G, Holmes A, Ramsay C, Taylor E, Wilcox M, Wiffen PJ



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Interventions are effective in reducing antimicrobial consumption and / or reducing antimicrobial resistance.

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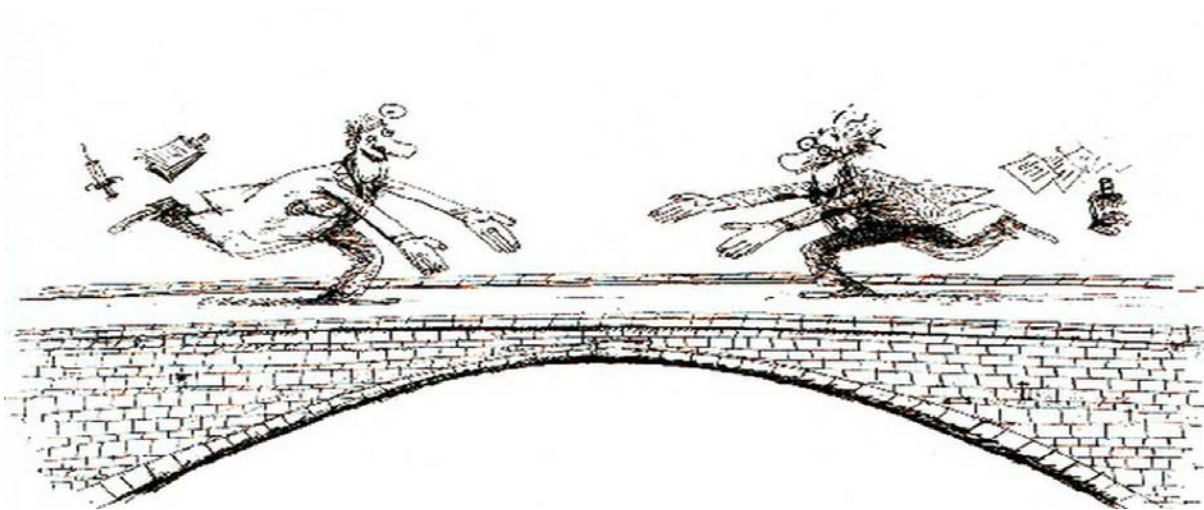
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Translational Medicine...

is a discipline that aims to improve the health of individuals and the community by "translating" findings into diagnostic tools, medicines, procedures, policies and education.



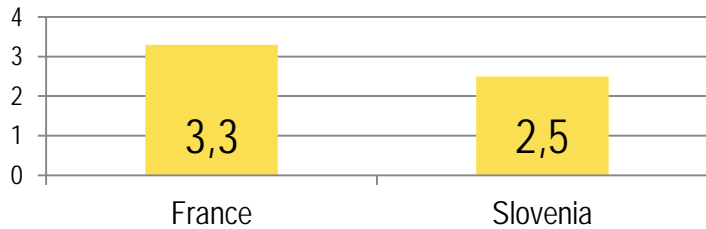
Determinants of Hospital (Outpatient?) Antibiotic use

- Sociocultural aspects
- Socioeconomic aspects
- Organisational policies
- Knowledge
- Attitudes

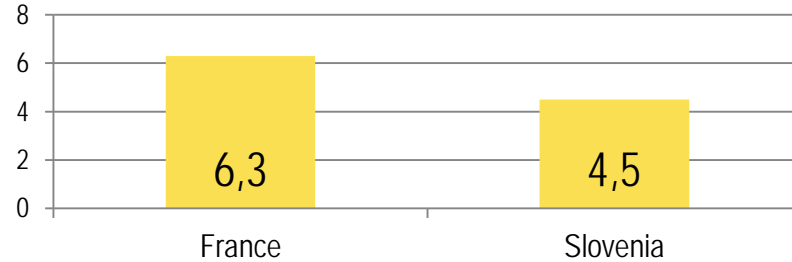
Huscher MEJL, Grol RPTM, van der Meer JW. Lancet ID, 2010; 10: 167-75.

Some Facts on Health-care System in France and in Slovenia

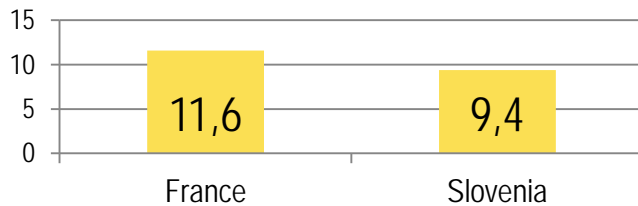
N of licensed medical doctors per 1000 Inh



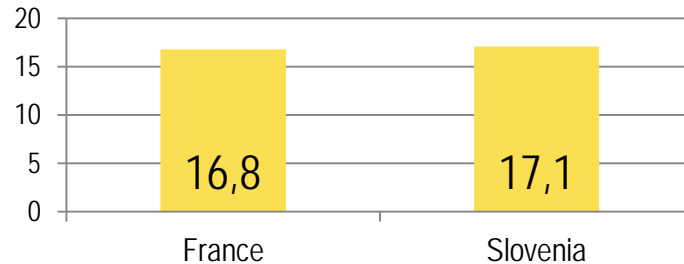
N of hospital beds per 1000 Inh



Health-care expenditure in % GDP



Hospital discharge rate per 1000 Inh



Identifying Best Practices Across Three Countries: Hospital Antimicrobial Stewardship in the United Kingdom, France, and the United States

Clinical Infectious Diseases 2014;59(S3):S170–8

Kavita K. Trivedi,¹ Catherine Dumartin,² Mark Gilchrist,³ Paul Wade,⁴ and Philip Howard⁵

- Legislation
- Infrastructure
- Local strategy
- Monitoring of outcomes

Did the Recommendations Have Any Impact?

Report on the implementation 2003 (REPORT FROM THE COMMISSION TO THE COUNCIL, 22.12.2005)

- **Almost all countries have national systems** for surveillance of antimicrobial use and antibiotic consumption
- **The majority of Member States co-ordinate actions to improve prescribing practices.**
- **Sixteen countries have measures in place** to enforce regulations for prescription-only use of systemic antimicrobial agents.
- **Most countries have nationally accepted guidelines** on appropriate use of antimicrobials for at least some conditions/syndromes
- **Twenty-two countries have a national programme for hospital hygiene** and infection control in place, only about half of the countries have legal requirements or recommendations about the number of infection control nurses per hospital bed
- **In all countries education is provided** by non-sponsored continuing education, and in almost all of them also through sponsoring by the pharmaceutical industry
- **All but six countries have performed a lay public campaign** in some format in the past five years
- **Twenty Member States, two EEA countries, and Bulgaria reported to have an intersectoral mechanism** in place and five countries are about to create it. **One Member State did not report to create such a mechanism.**

Legislation on Antibiotic Stewardship in Slovenia

- Establishment of the intersectorial mechanisms (National antibiotic committee) 2005: ID physicians, clinical microbiologists, pharmacists, veterinarians, IT, a MoH representative
- By-laws on antimicrobial consumption surveillance and responsible use of antibiotics 2011:
 - antimicrobial consumption surveillance is mandatory
 - antimicrobial stewardship programmes are mandatory in each hospital
 - audits of antimicrobial stewardship programmes by ICM (since 2013)

Official Journal of Slovenia 2011; 21: 1022-5.

Infrastructure in Slovenian Hospitals

- Mandatory AS programme
- Antimicrobial committee / drug committee or at least one dedicated person with additional training in AS (in small hospitals)

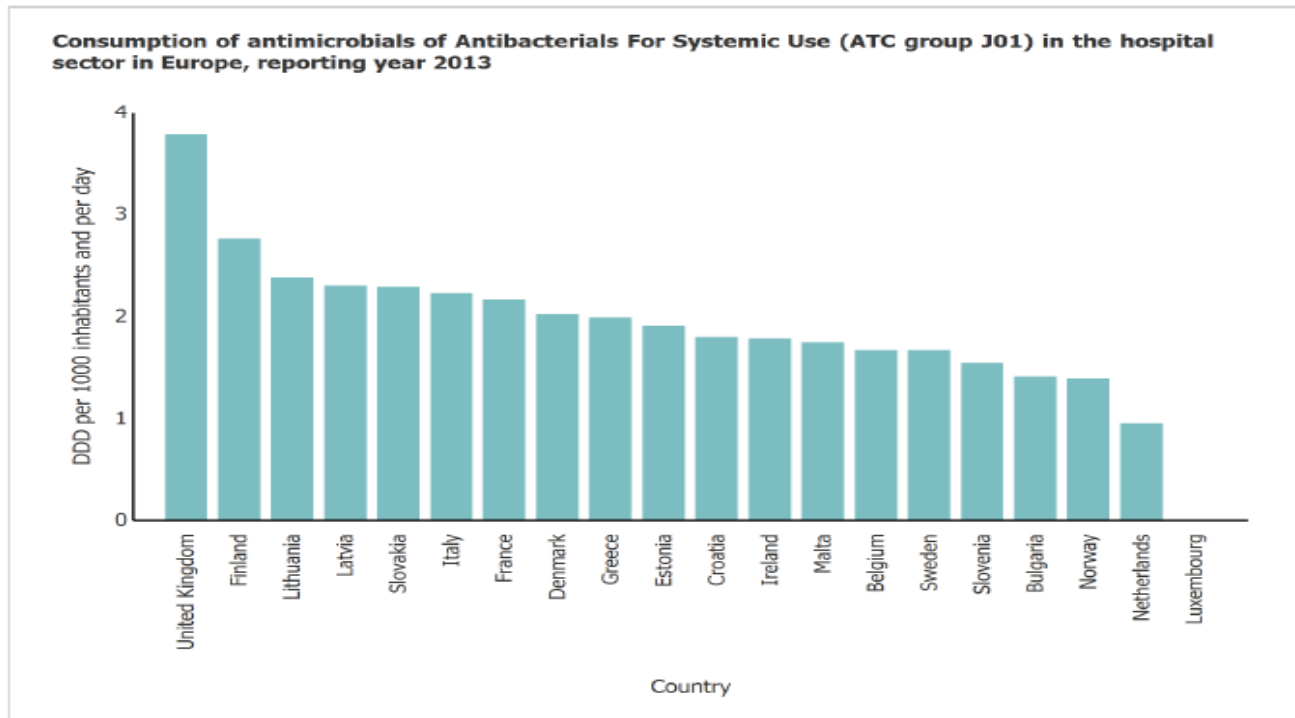
Local Strategies in Slovenian Hospitals: Audits in 10 Hospitals, Major Findings

- The physicians do not receive information on antimicrobial resistance and consumption in the hospital: 4/10
- Poor adherence to guidelines: 7/10
- Indication for antibiotics not in the records: 6/10
- Poor adherence to antibiotic surgical prophylaxis guidelines: 7/8
- No de-escalation: 4/10
- Combination of antibiotics in-appropriate: 5/10
- Missing antibiotic prescribing improvement plan: 4/10
- No guidelines for prescribing „CIA“ antibiotics: 6/10
- In-appropriate duration of therapy: 7/10

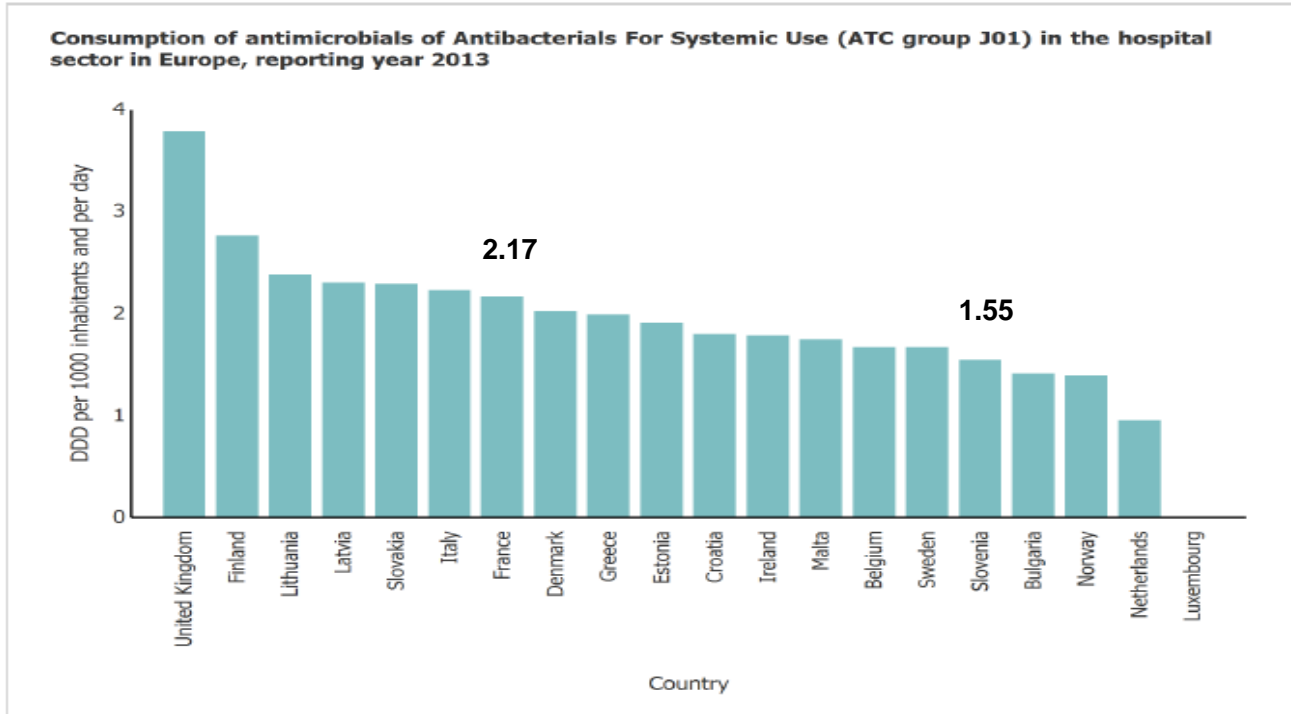
Recommendations for Antimicrobial Use in Outpatients and Inpatients in Slovenia (1998 – 2013)



Consumption of antimicrobials of Antibacterials For Systemic Use (ATC group J01) in the hospital sector in Europe, reporting year 2013



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In-hospital Antibiotic Consumption: F vs SI

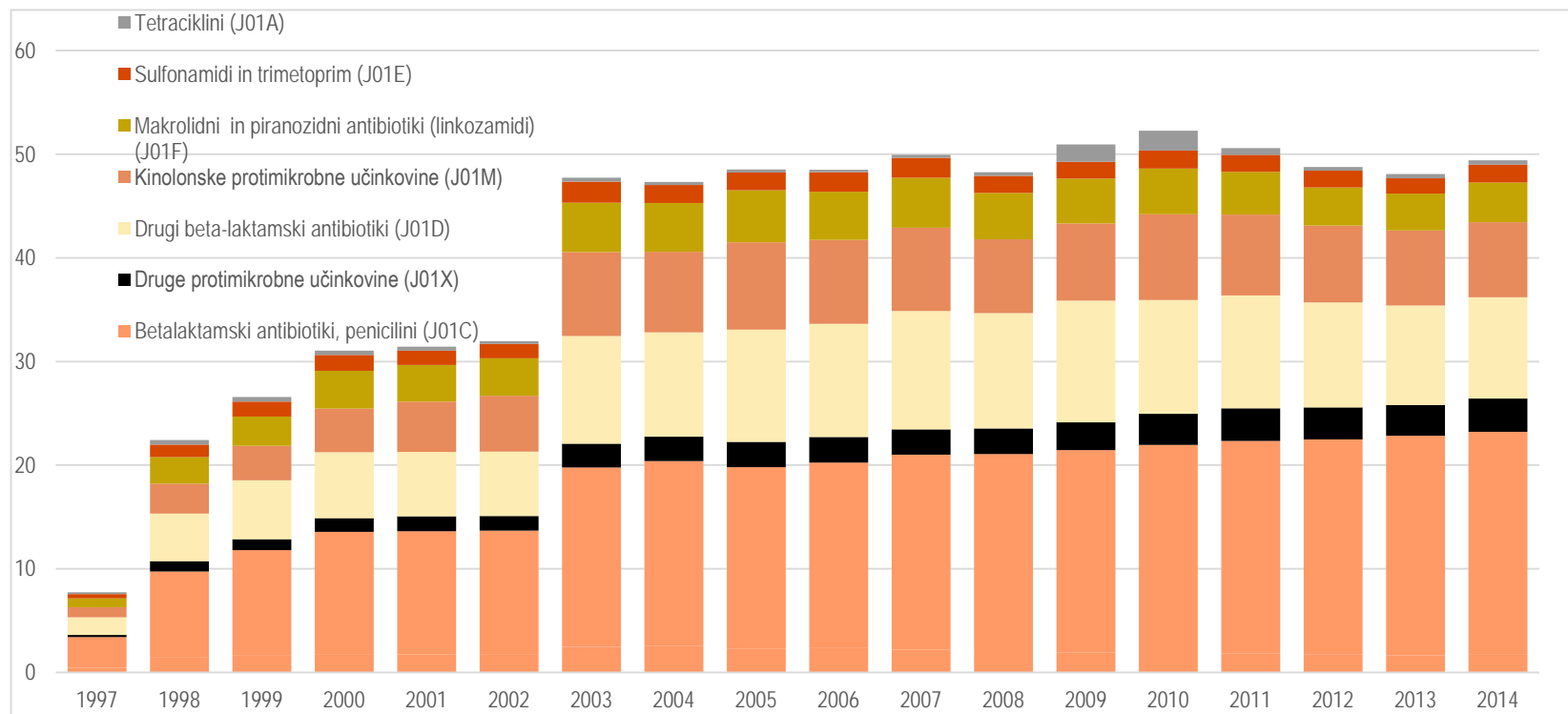
- The French hospitals (2007): 41.1 DDD/100 patient-days
- Slovenian hospitals (2007): 50 DDD/100 patient-days

Why: Less hospital beds in Slovenia?

Amadeo B, et al. J Antimicrob Chemother 2011; 66: 434-42.

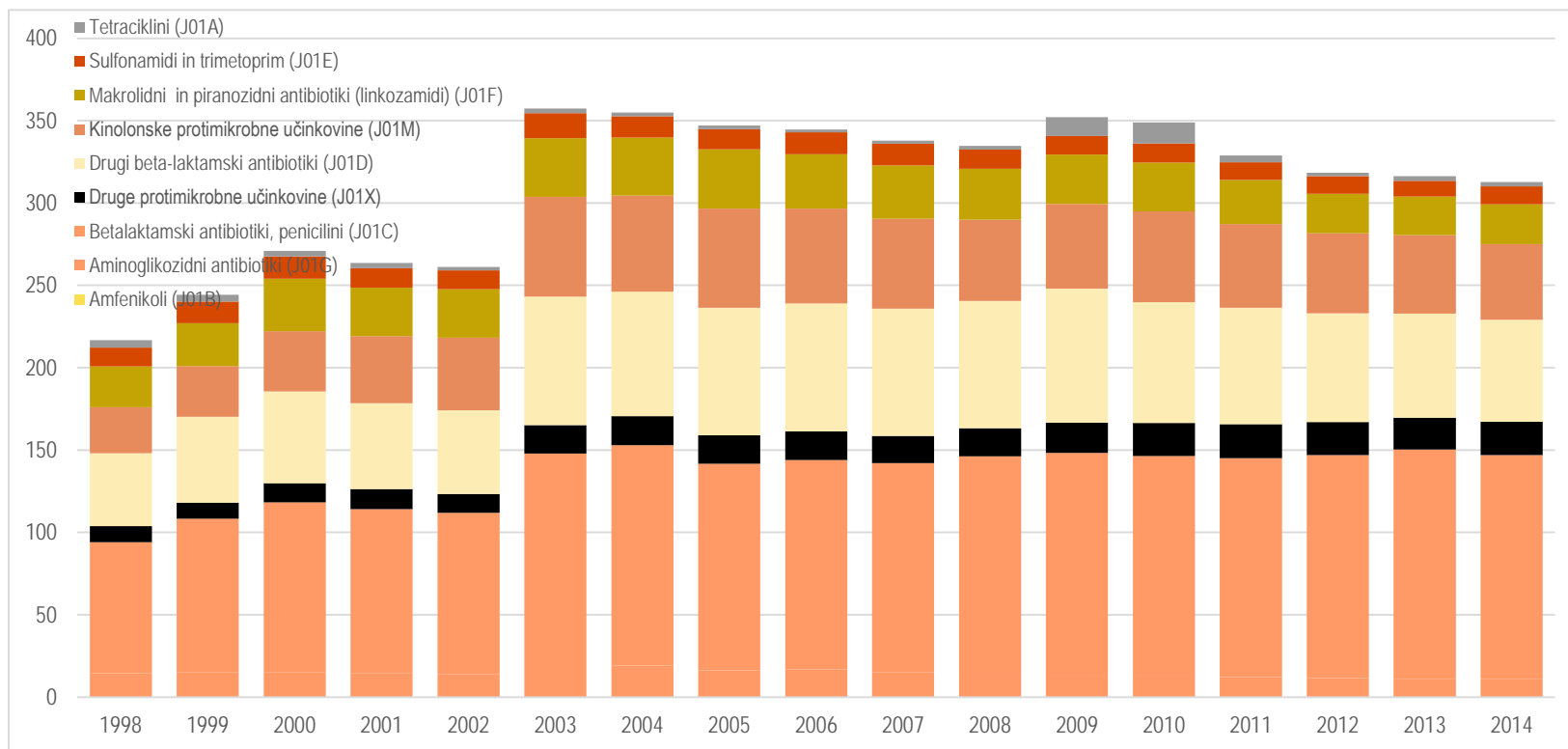
www.anbico.si

Antibiotic Consumption in General and University Hospitals in Slovenia in DDD/100 patient-days



All hospitals included from 2003 onwards

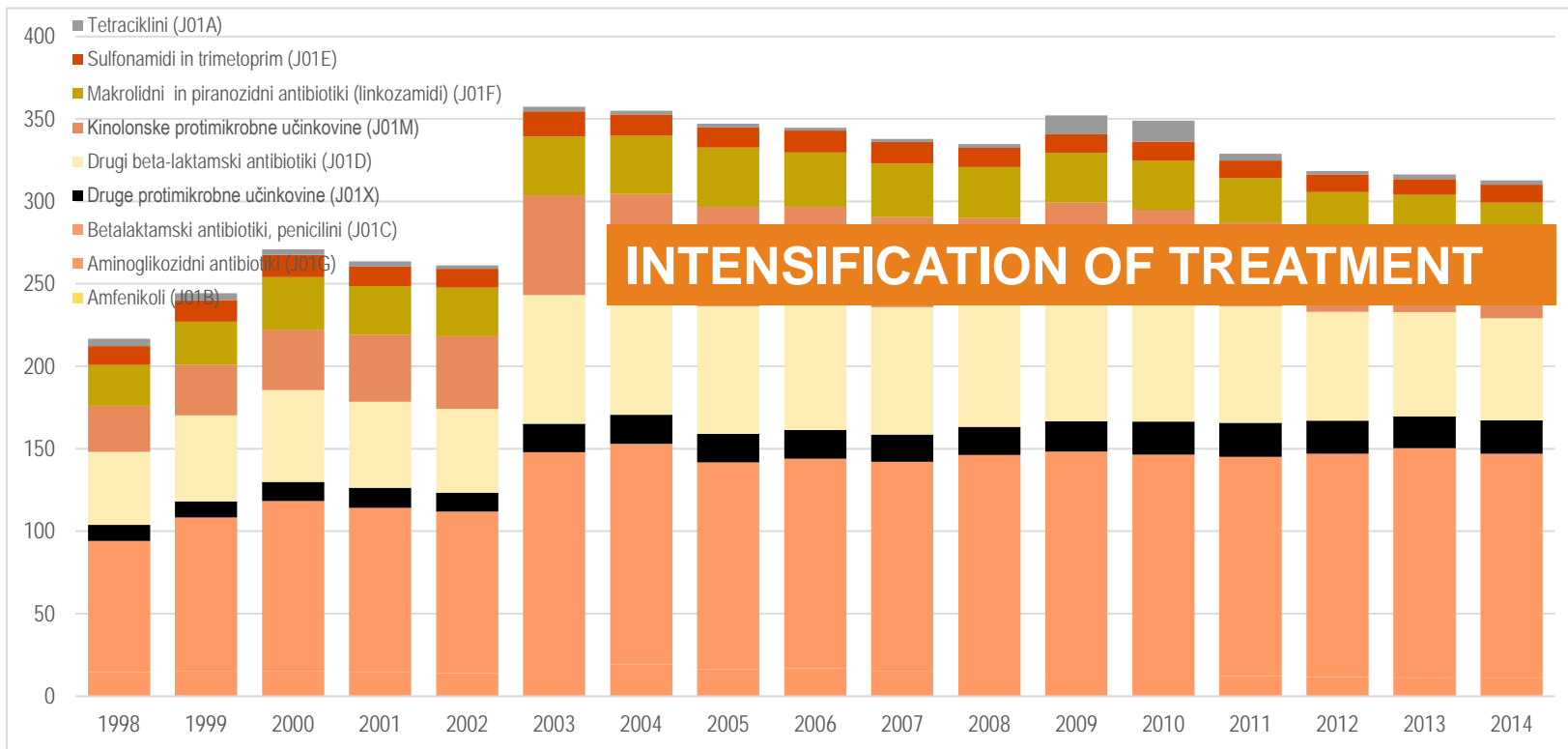
Antibiotic Consumption in General and University Hospitals in Slovenia in DDD/1000 admissions



All hospitals included from 2003 onwards

www.anbico.si

Antibiotic Consumption in General and University Hospitals in Slovenia in DDD/1000 admissions



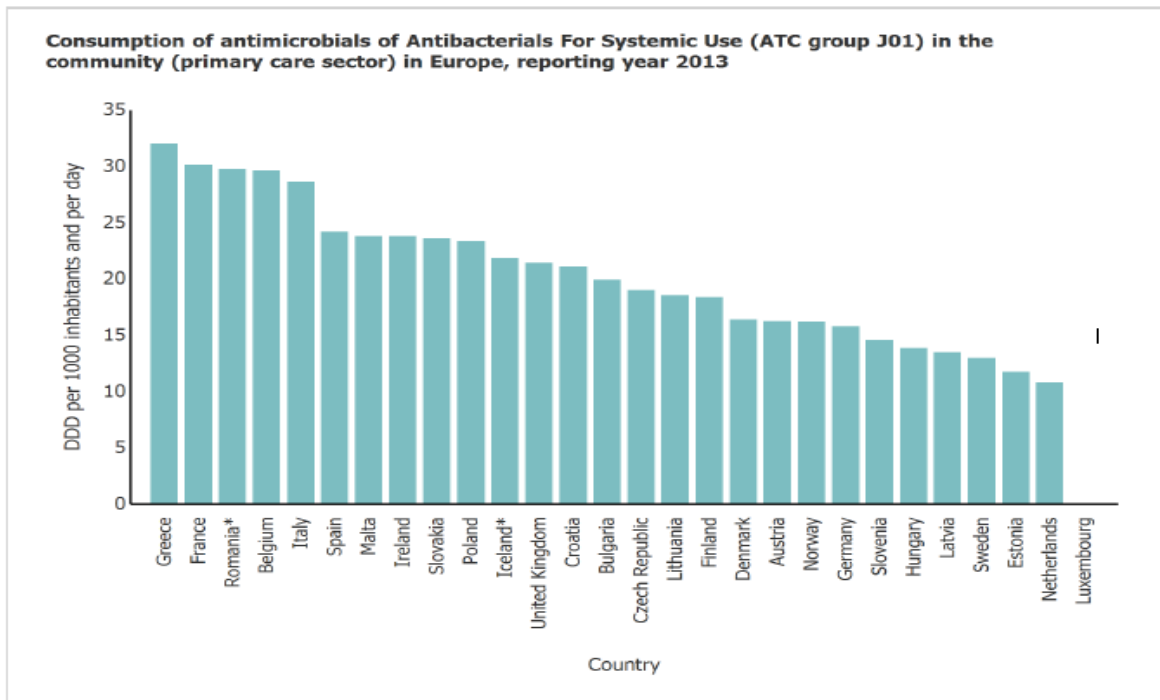
All hospitals included from 2003 on

www.anbico.si

Strategies in Ambulatory Antibiotic Use in Slovenia

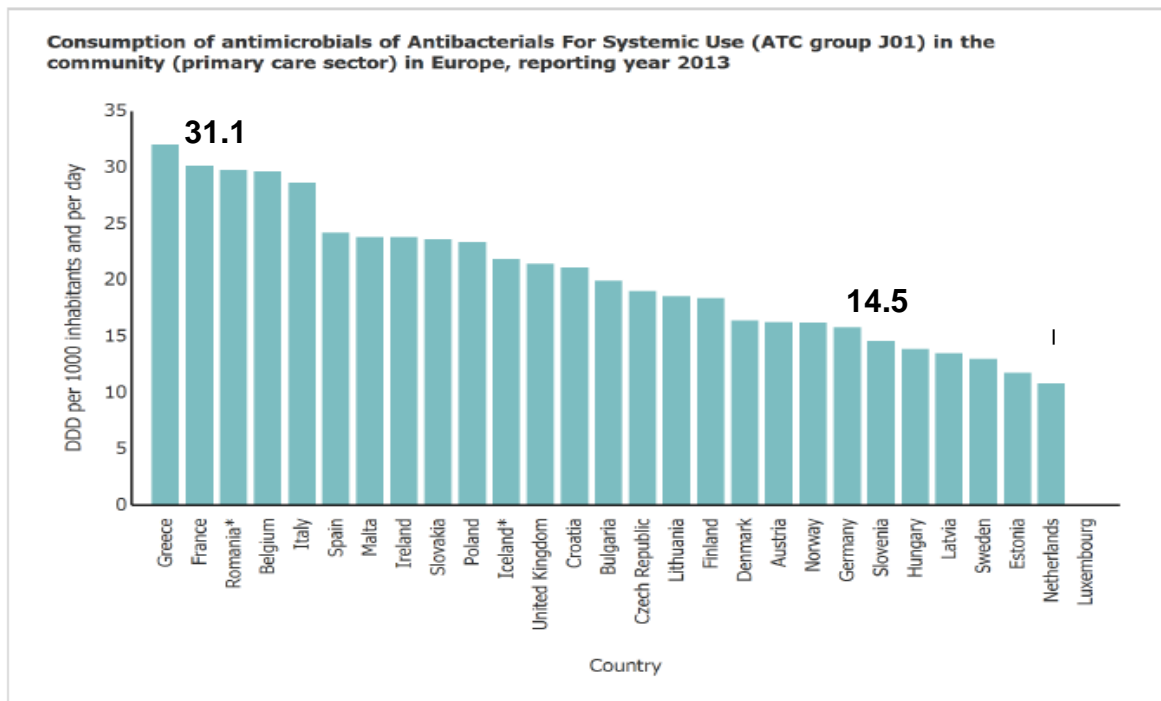
- Education of family physicians during the specialisation curriculum
- Education of family physicians provided by Slovenian Medical Association, ICM at the MoH, Health Insurance Institute)
- Restricted prescribing of some antibiotics by the Health Insurance Institute (proposed by professionals)
- Antibiotic pocket-books

Consumption of antimicrobials of Antibacterials For Systemic Use (ATC group J01) in the community (primary care sector) in Europe, reporting year 2013



* Country provided only total care data.

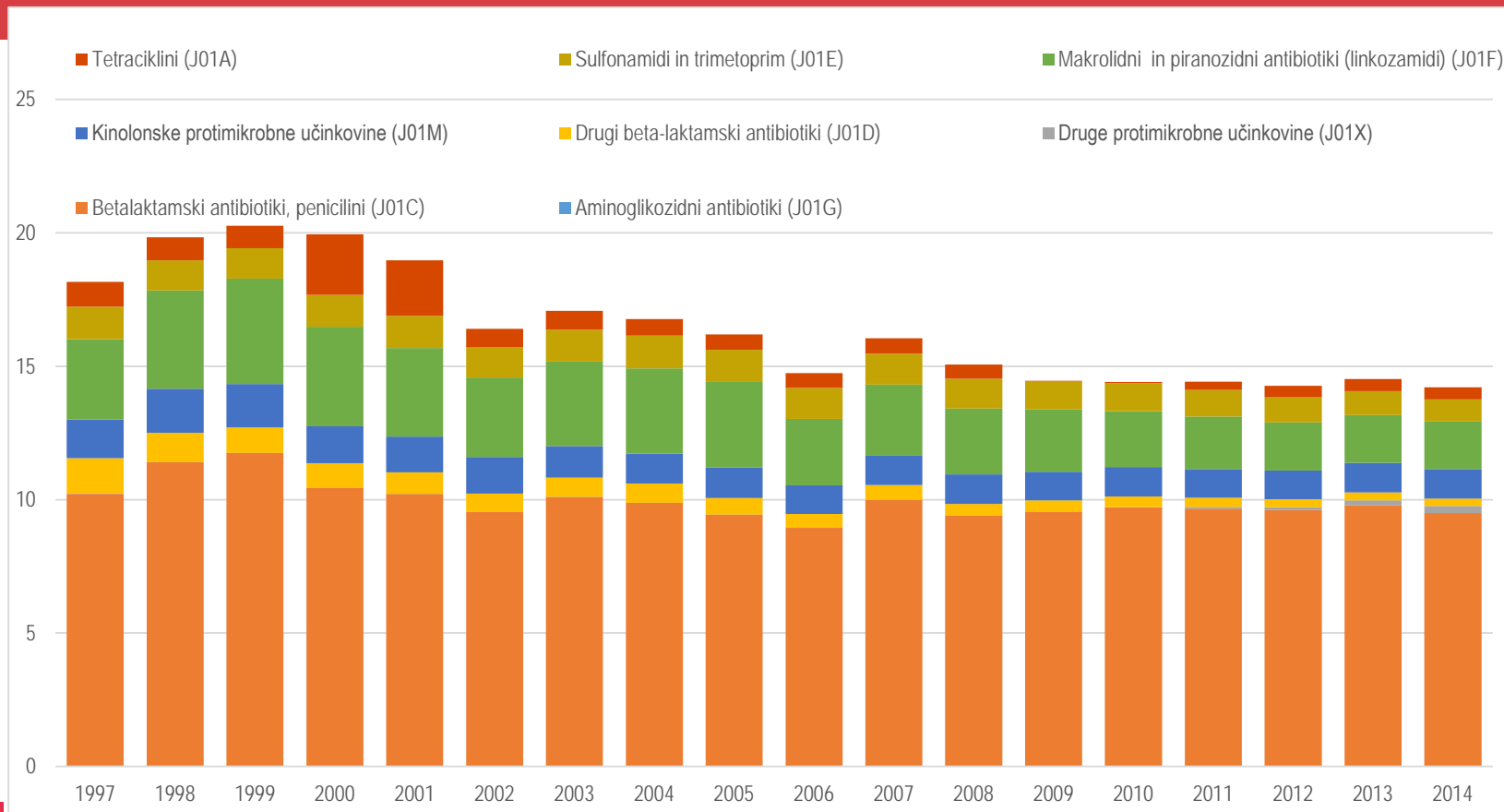
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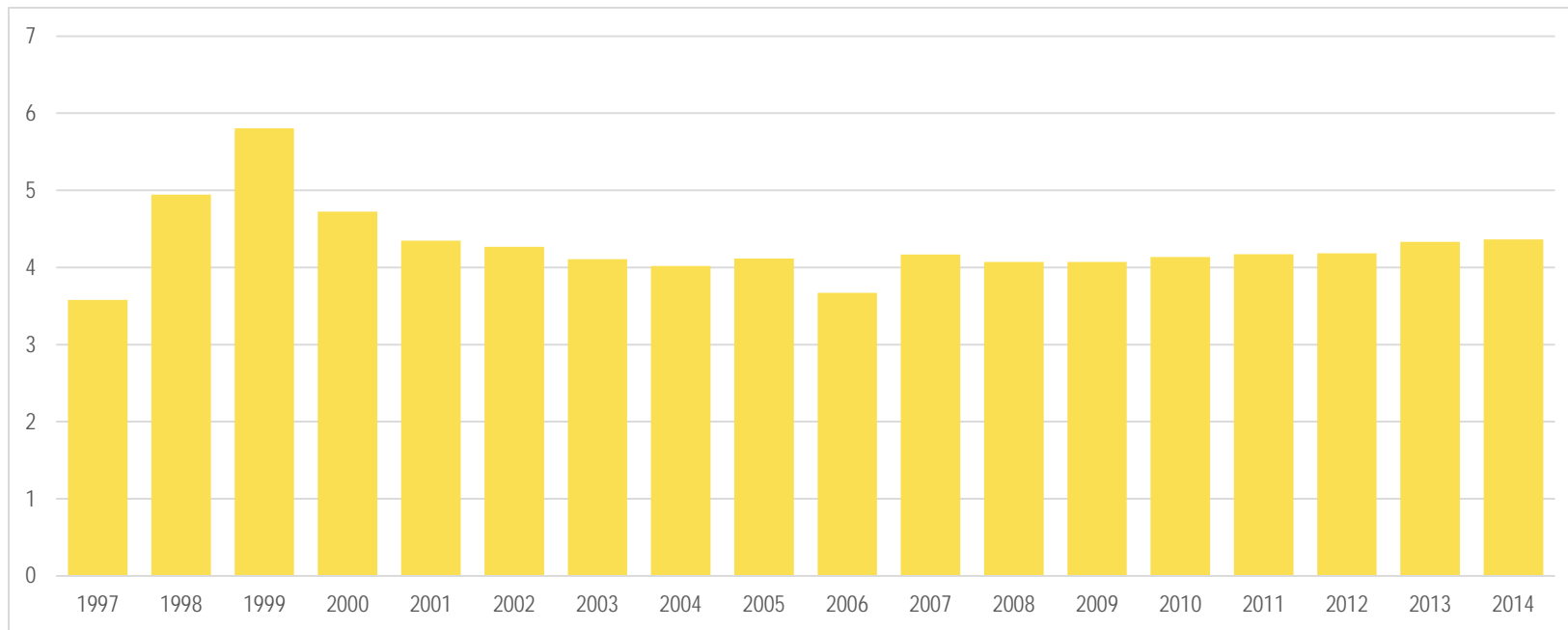
* Country provided only total care data.

<http://ecdc.europa.eu/en/activities/surveillance/ESAC-Net/Pages/index.aspx>

Ambulatory Antibiotic Consumption in Slovenia in DDD/1000 Inh/day (DID)

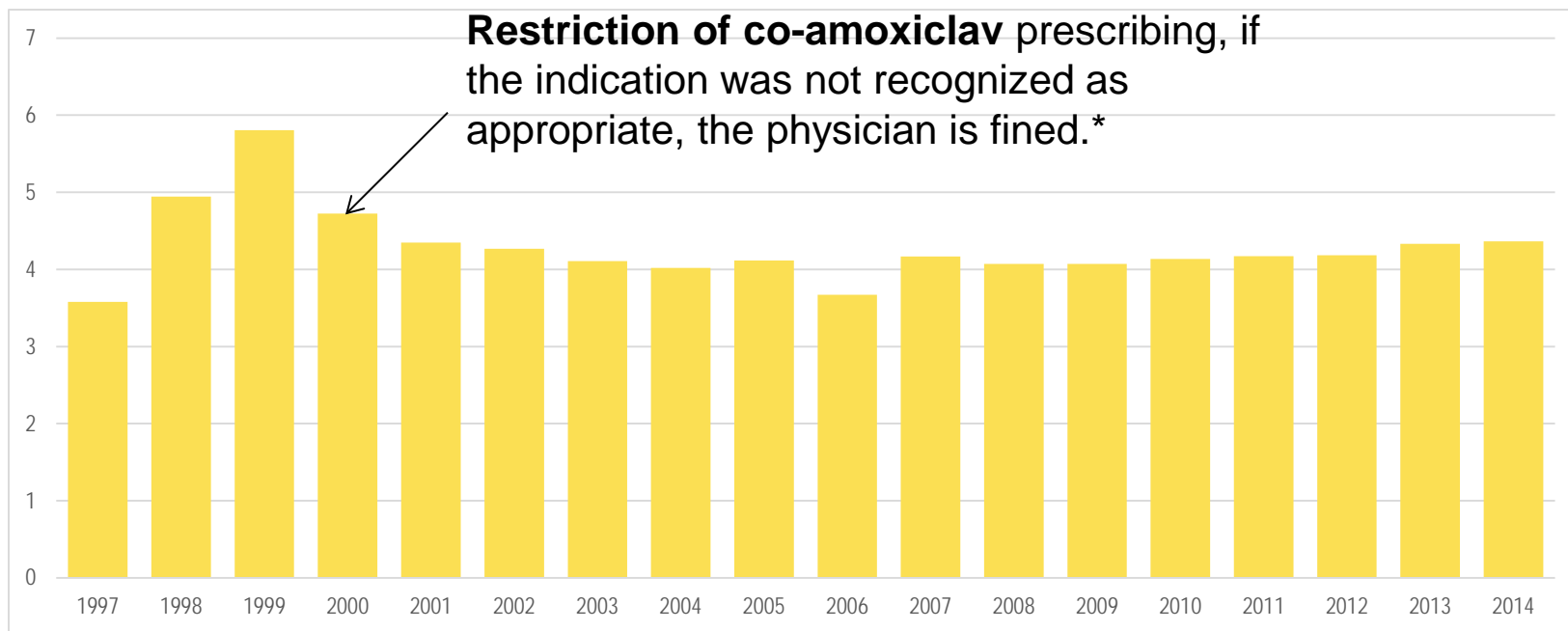


Ambulatory Consumption of Co-amoxiclav in Slovenia in DID



www.anbico.si

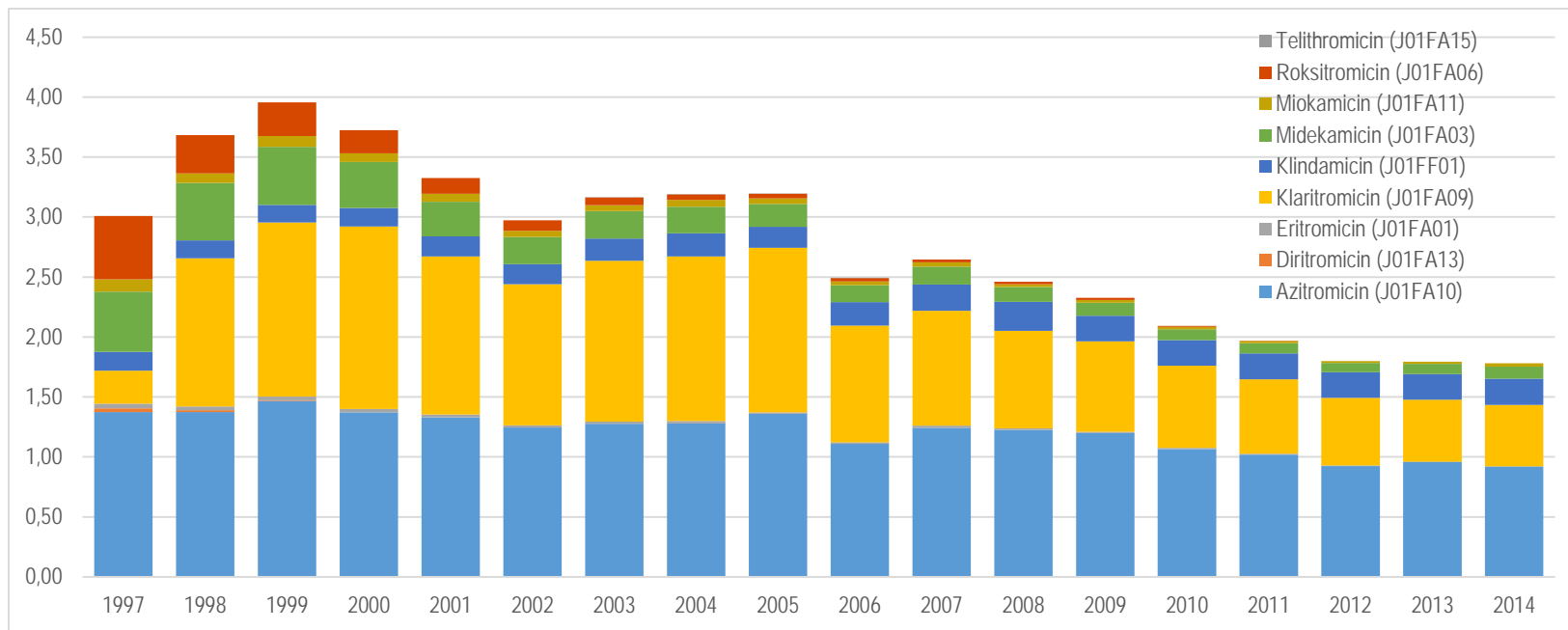
Ambulatory Consumption of Co-amoxiclav in Slovenia in DID



*Level and trend change $p < 0.001$

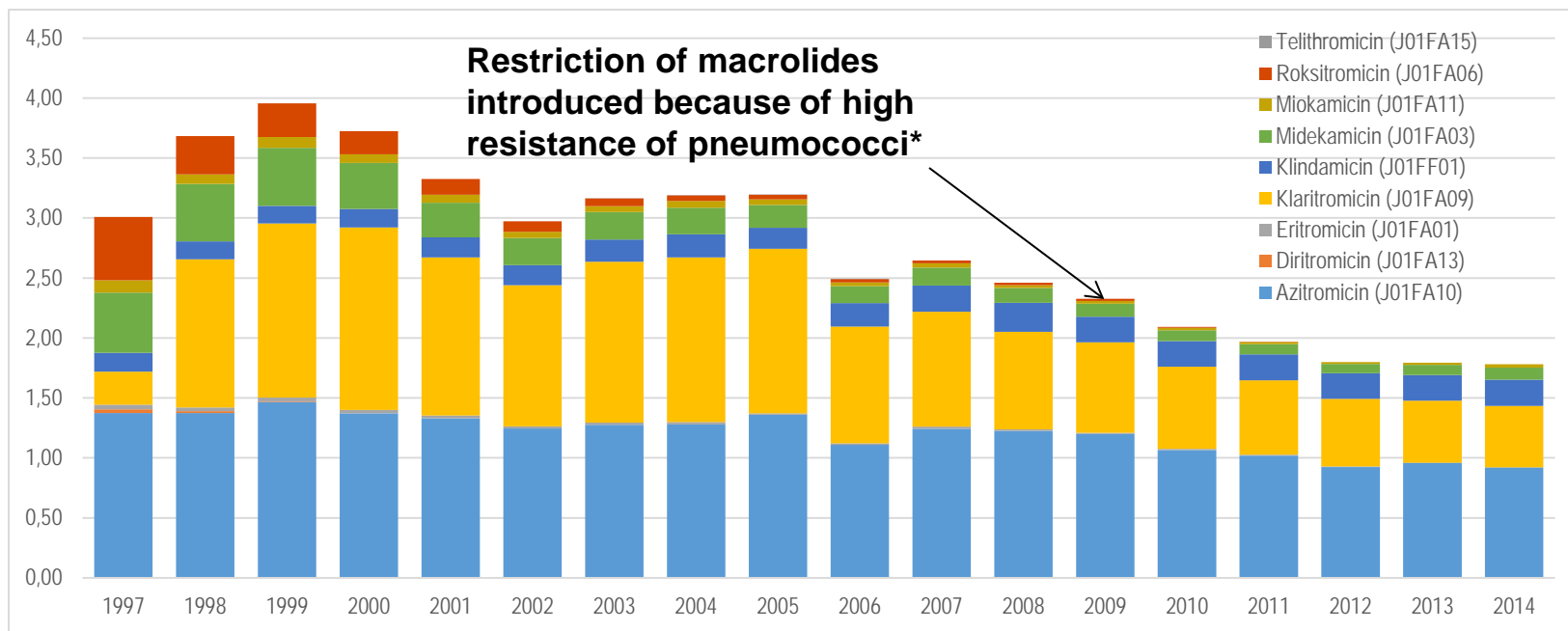
www.anbico.si
Čižman M, et al. *J Glob Antimicrob Resist* 2015

Ambulatory Consumption of Macrolides in Slovenia in DID



www.anbico.si

Ambulatory Consumption of Macrolides in Slovenia in DID

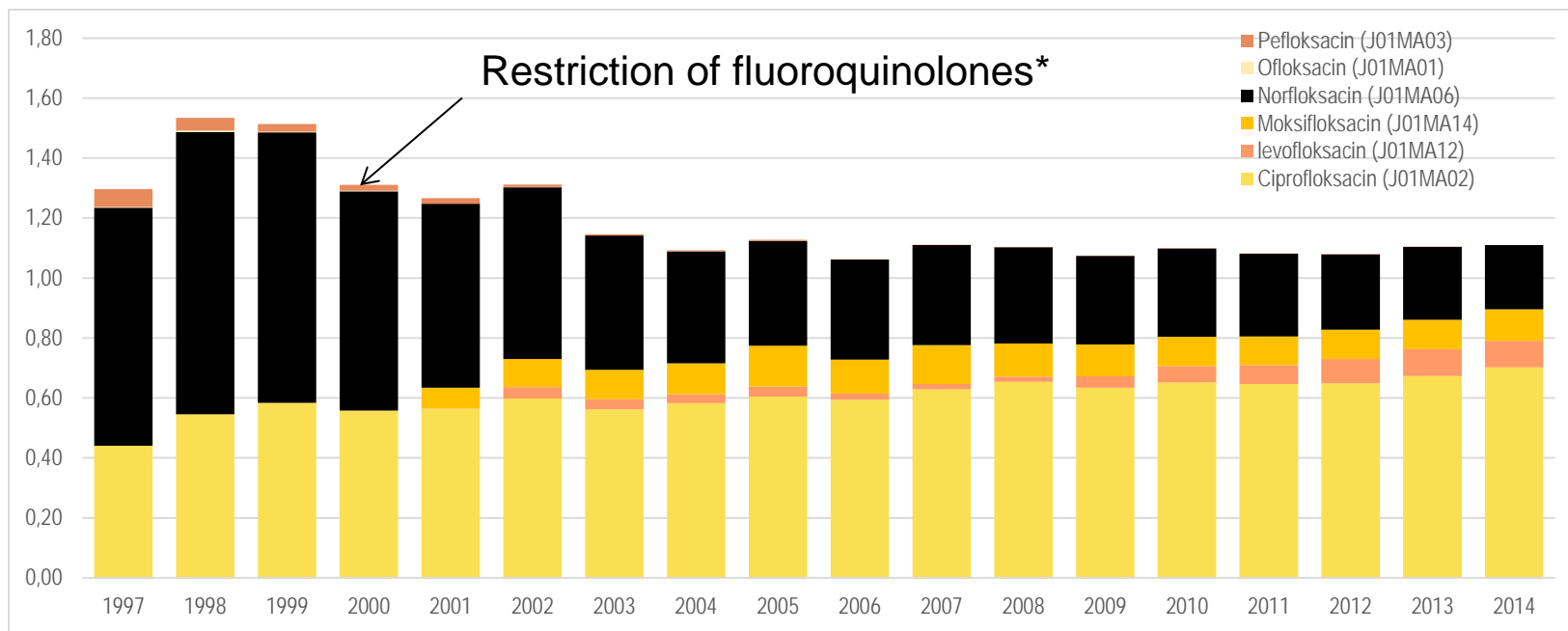


*decrease after intervention was not significant

www.anbico.si

Čižman M, et al. *J Glob Antimicrob Resist* 2015

Ambulatory Consumption of Fluoroquinolones in Slovenia in DID

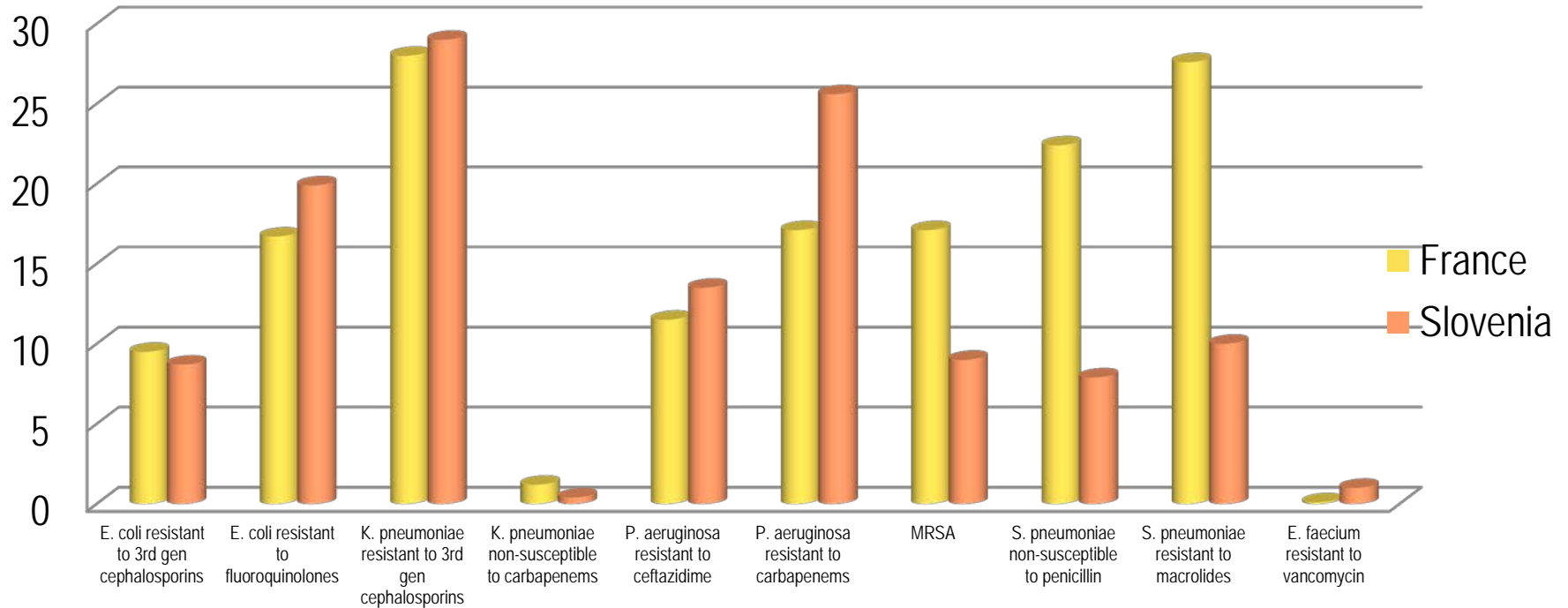


*level and trend change <0.001

www.anbico.si
Čižman M, et al. *J Glob Antimicrob Resist* 2015

Antibiotic Resistance: France vs Slovenia (2013)

% resistance, sterile samples



Conclusions: Can Slovenia Serve as an Example

- Good control of antibiotic prescribing in the community, less success in the hospital sector
- Relatively high resistance rates (poor health-care resources, fewer hospital beds, less effective infection control?)
- Country-wide antibiotic stewardship activities easier to perform in small countries

