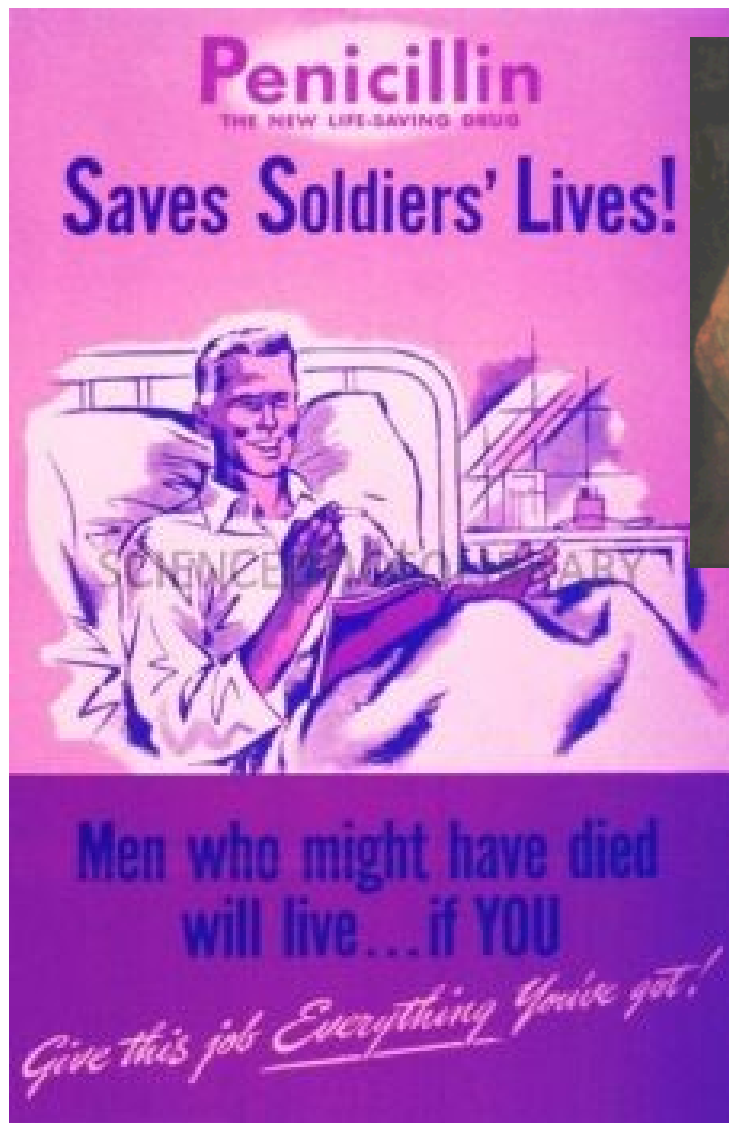


Pomen protimikrobnih zdravil in skrbi za njihovo ustrezno predpisovanje

Bojana Beović

Klinika za infekcijske bolezni in vročinska stanja

UKC Ljubljana



Pomen antibiotikov

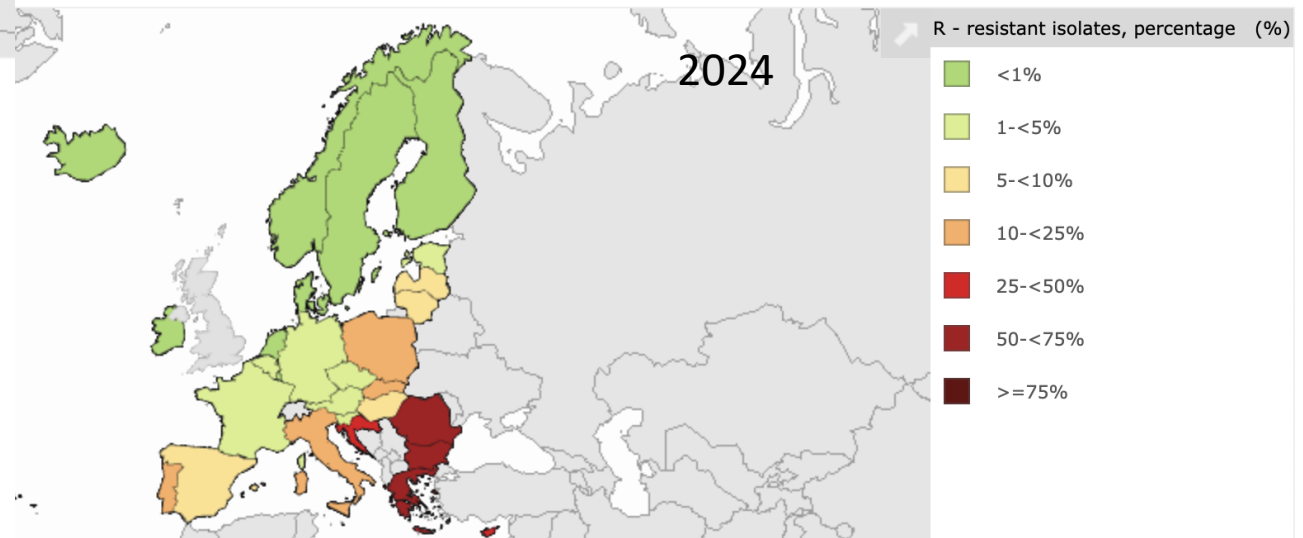
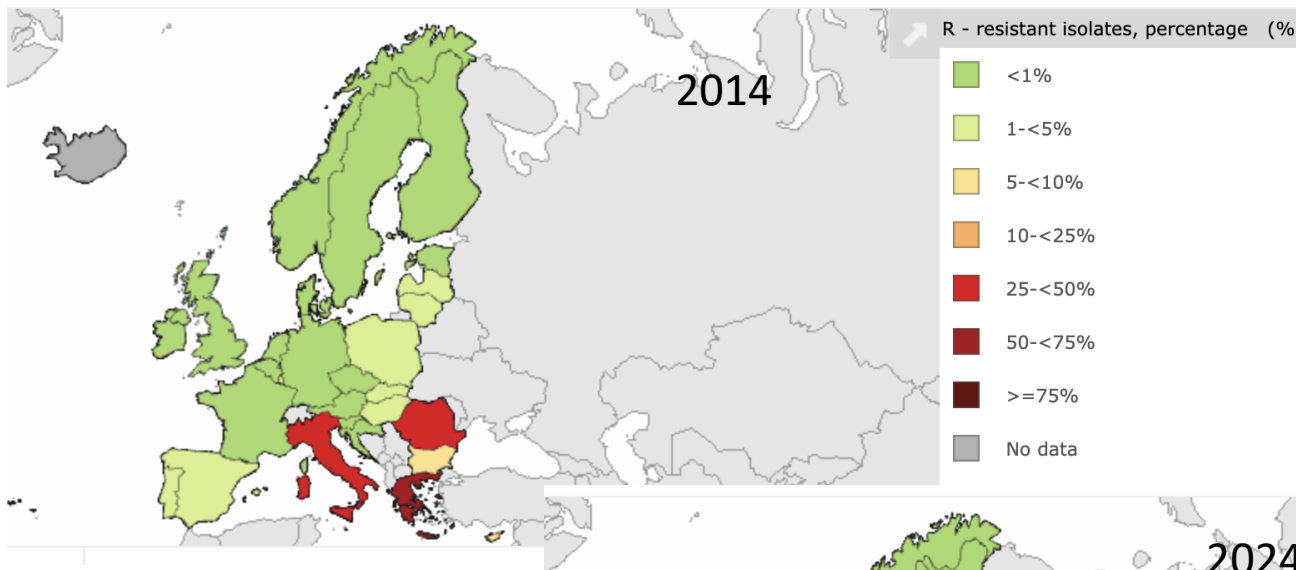
- Veliki kirurški posegi
- Transplantacije organov
- Obravnava na oddelkih za intenzivno zdravljenje
- Nevtropenični bolniki
- Drugi imunsko oslabei bolniki
- Okužbe pri kroničnih bolnikih
- Okužbe pri starostnikih

**SMRTNO
NEVARNO**

Mikrobna odpornost je neizogibna posledica uporabe antibiotikov

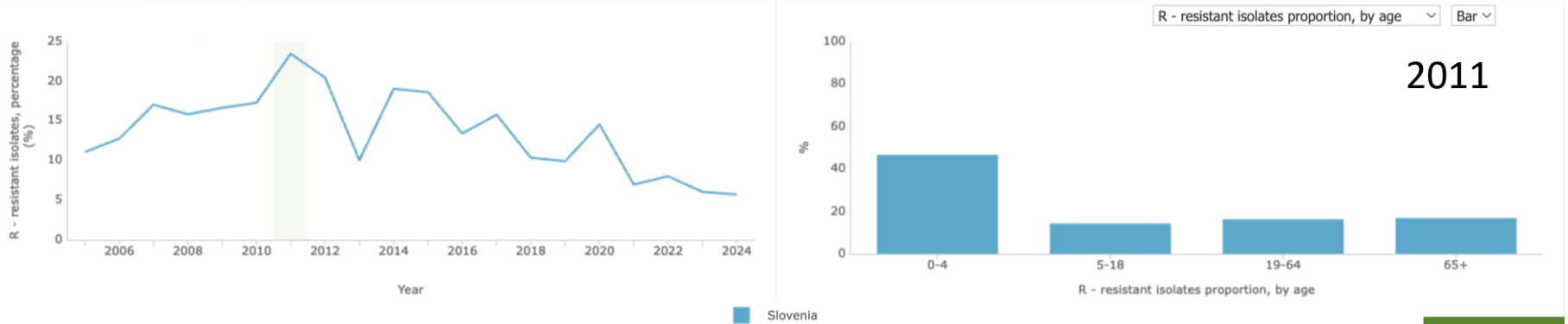
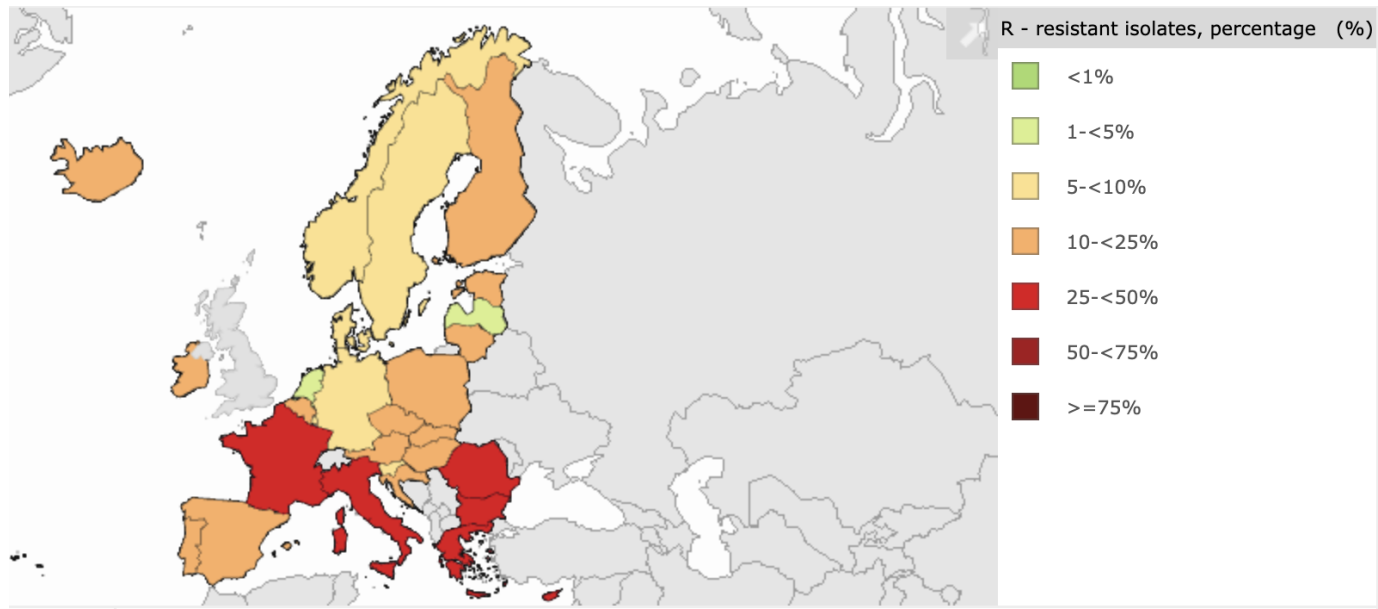
<u>First Report Of Resistance</u>	<u>Agent</u>	<u>Date of FDA Approval</u>
1940	Penicillin	1943
1947	Streptomycin	1947
1956	Tetracycline	1952
1970	Gentamicin	1967
1983 (1981)	Cefotaxime	1981
1999	Linezolid	2000

Proti karbapenemom odporna *Klebsiella pneumoniae*

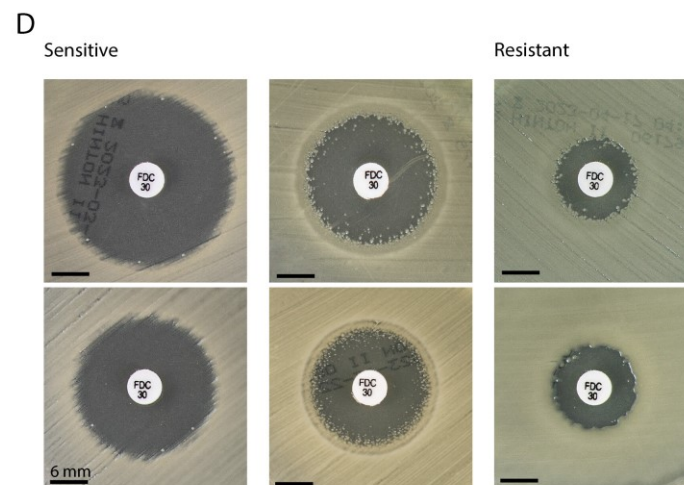
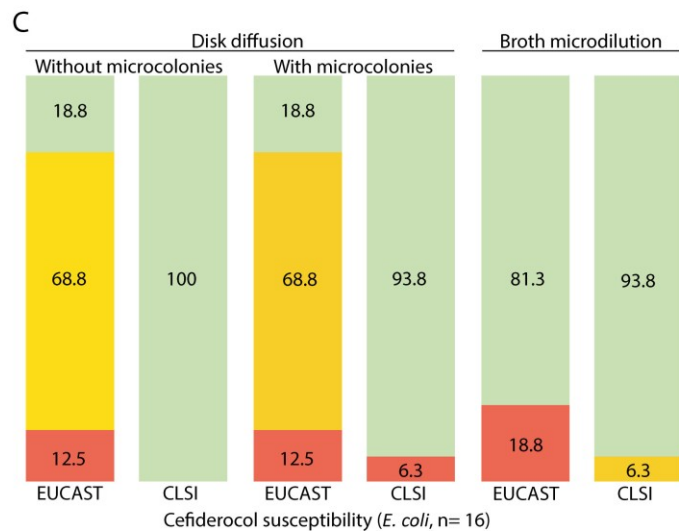
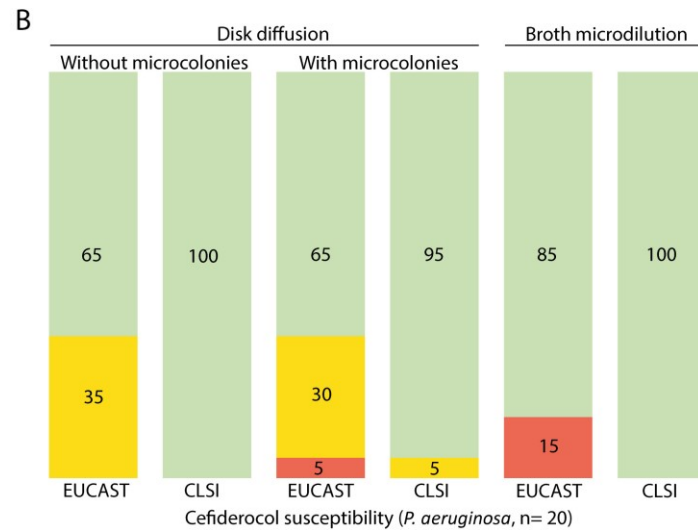
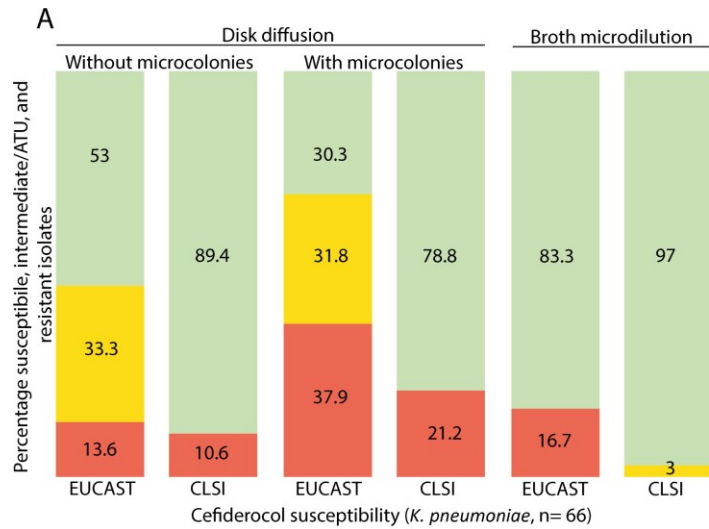


<https://ecdc.europa.eu/en/publications-data/antimicrobial-resistance-surveillance-europe>

Proti makrolidom odporni pnevmokoki 2024



Antimicrobial susceptibility to last-resort antibiotics in carbapenemase-producing bacteria from Ukrainian patients | Microbiology Spectrum



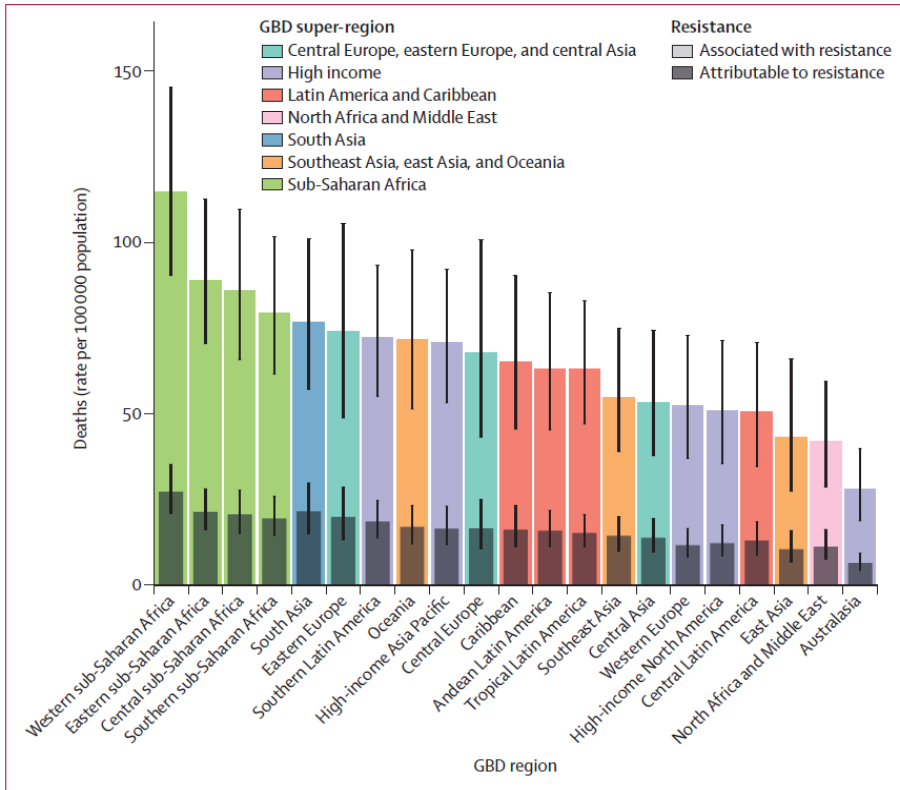


Figure 2: All-age rate of deaths attributable to and associated with bacterial antimicrobial resistance by GBD region, 2019

Global burden of bacterial antimicrobial resistance in 2019: a systematic analysis

Antimicrobial Resistance Collaborators*

Lancet 2022; 399: 629–55

4.95 milijonov (3.62–6.57) smrti povezanih z AMR
1.27 milijonov (0.911–1.71) smrti neposredno pripisanih AMR

Global burden of bacterial antimicrobial resistance in 2019: a systematic analysis

Antimicrobial Resistance Collaborators*

Lancet 2022; 399: 629-55

1,27 milijona smrti, pripisljivih mikrobnosti odpornosti

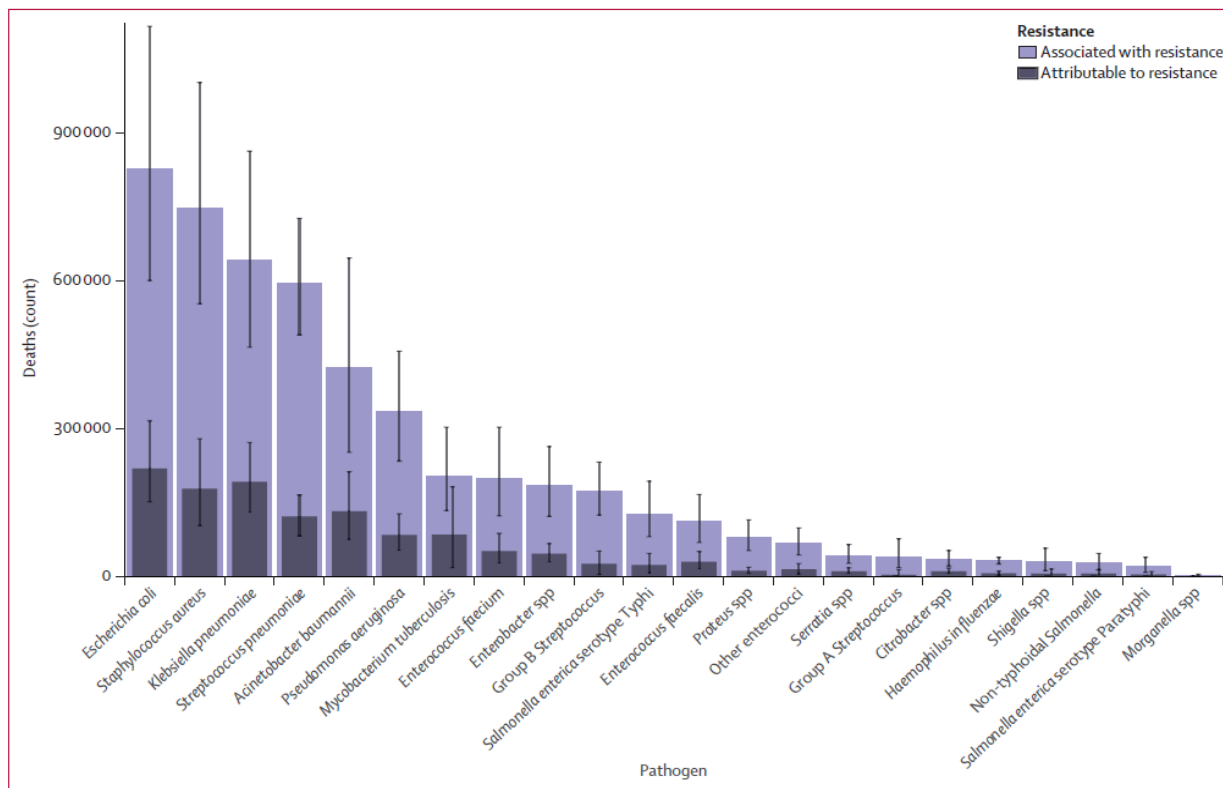


Figure 4: Global deaths (counts) attributable to and associated with bacterial antimicrobial resistance by pathogen, 2019. Estimates were aggregated across drugs, accounting for the co-occurrence of resistance to multiple drugs. Error bars show 95% uncertainty intervals.

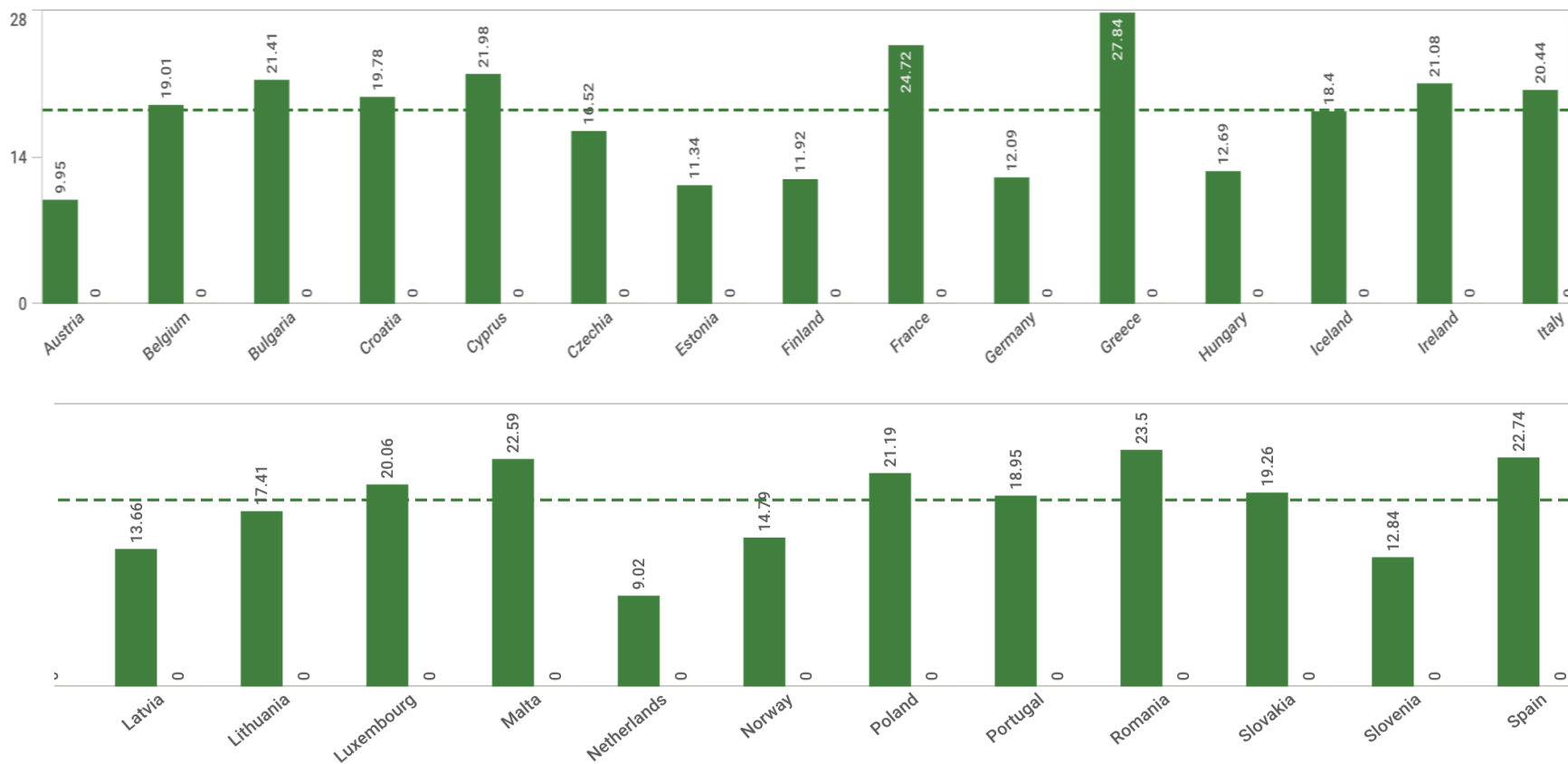
Table 2. Total number of blood isolates of the selected antibiotic-resistant bacteria as reported to EARS-Net, and estimated number of bloodstream infections, number of infections, number of attributable deaths and number of disability-adjusted life years (DALYs), EU/EEA, 2016-2020

	2016	2017	2018	2019	2020
Number of blood isolates as reported to EARS-Net*	39 729	44 306	53 557	54 450	51 798
Estimated number of bloodstream infections after correction for population coverage	107 404	109 556	127 896	134 277	122 070
Estimated median number of infections, all types (95% UI)	685 433 (589 451 - 792 873)	701 816 (603 052 - 811 925)	822 075 (706 070 - 951 816)	865 767 (742 802 - 1 003 591)	801 517 (684 955 - 932 213)
Estimated median number of attributable deaths (95% UI)	30 730 (26 935 - 34 836)	31 178 (27 388 - 35 296)	36 605 (32 227 - 41 352)	38 710 (34 053 - 43 748)	35 813 (31 395 - 40 584)
Estimated median number of DALYs (95% UI)	909 488 (813 858 - 1 013 060)	918 117 (820 200 - 1 024 443)	1 046 858 (940 859 - 1 161 268)	1 101 288 (988 703 - 1 222 498)	1 014 799 (908 022 - 1 129 999)

European Centre for Disease Prevention and Control. Assessing the health burden of infections with antibiotic-resistant bacteria in the EU/EEA, 2016-2020. Stockholm: ECDC; 2022.

Poraba antibiotikov na recept v EU

(DDD/1000 prebivalcev na dan)

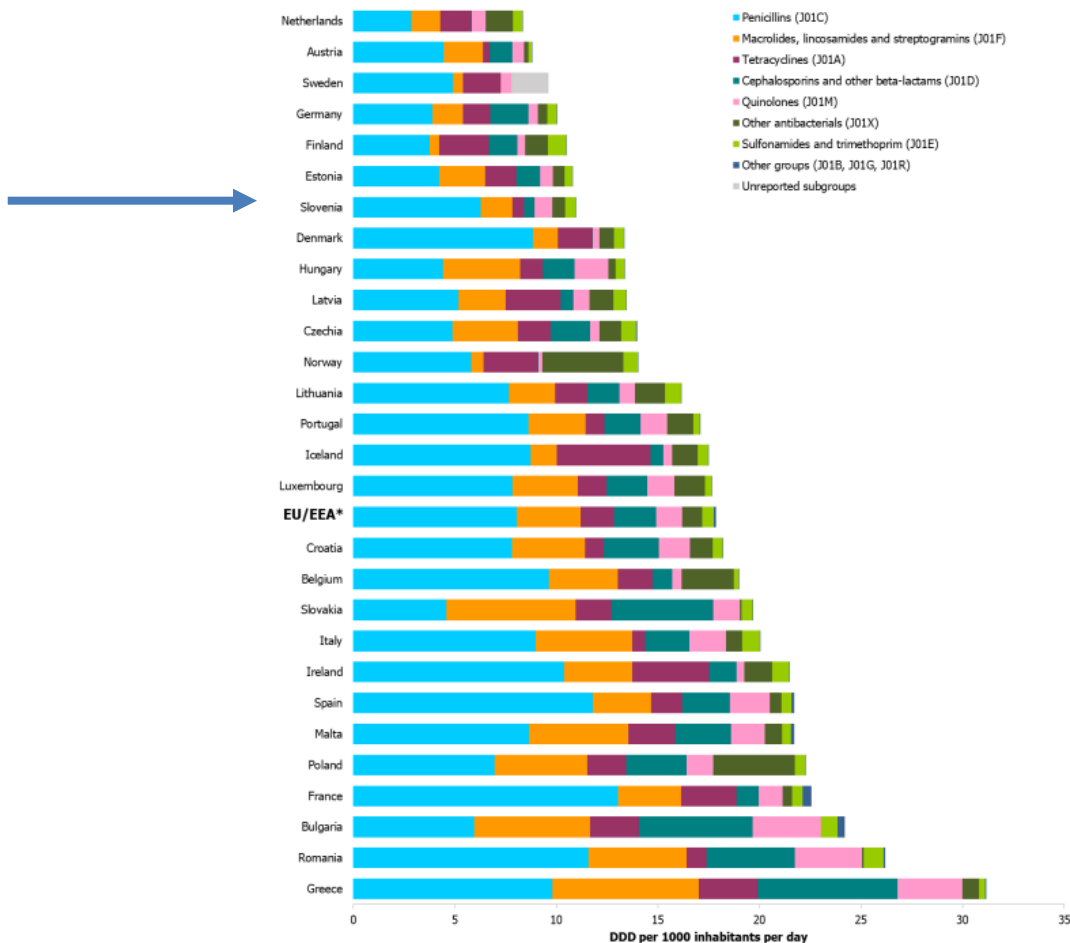


https://qap.ecdc.europa.eu/public/extensions/AMC2_Dashboard/AMC2_Dashboard.html#geo-distribution-tab

Ambulantna poraba v EU

(DDD/1000 preb/dan)

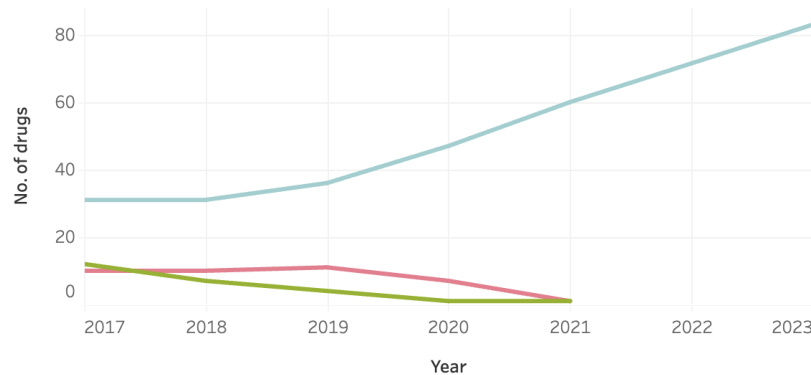
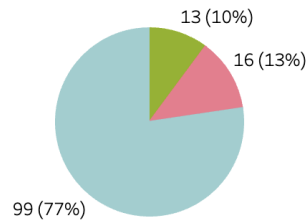
Figure 3. Community consumption of antibacterials for systemic use (ATC group J01) at ATC level 3 subgroup, EU/EEA countries, 2022 (expressed as DDD per 1 000 inhabitants per day)



Antibiotiki v razvoju

B. Number of approved and discontinued antibacterial agents

Approved Discontinued Pipeline

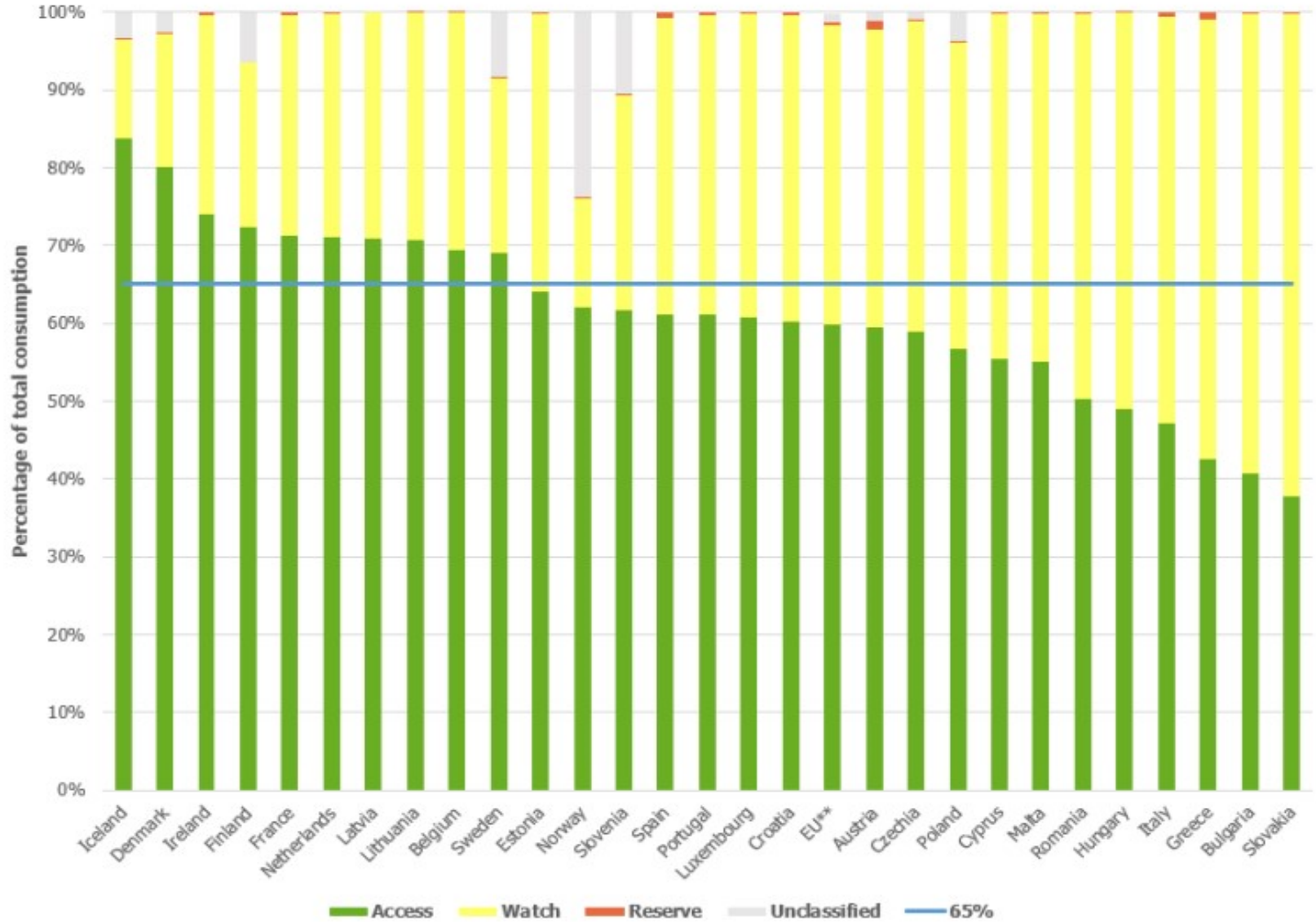


Vzroki za počasen razvoj novih antibiotikov:

- Neuspešno iskanje novih molekul
- Drag razvoj
- Počasna povrnitev investicije

<https://www.who.int/observatories/global-observatory-on-health-research-and-development/monitoring/who-antibacterial-preclinical-pipeline-review>, Bruessow H. Microbial Biotechnology. 2024;17:e14510.

Figure 1. Total consumption of antibacterials* according to WHO AWaRe classification, percentage by class EU/EEA countries, 2022



„Navzkrižje interesov“: ohraniti učinkovitost antibiotikov vs ozdraviti bolnika?



Diagnoza in zdravljenje okužb je bolj zapletena kot številna druga stanja. Uvedba antibiotikov pogosto poteka empirično z minimalnimi informacijami o patogenu.



Neupoštevanje pričakovanj programa nadzorovane rabe antibiotikov ni vedno enako slabemu zdravljenju bolnika.



Zdravimo vedno bolj bolne bolnike, katerih terapevtske in klinične potrebe zahtevajo predpis antibiotika, subspecialisti, ki jih zdravijo, pa o tem nimajo potrebnega znanja



Izziv ostaja uskladiti dolgoročne cilje nadzorovane rabe antibiotikov s kratkoročnimi cilji zdravnikov (zdraviti posameznega bolnika).

Ključni dejavniki, ki pripomorejo k napačni rabi antibiotikov

Lipsky B, et al. *J Antimicrob Chemother.* 2016;71(11):3026–35.



Diagnostična negotovost

Is there a bacterial infection in this wound?



Neznanje

When to treat with antibiotics



Strah

Of failing to treat properly, or of having a bad outcome



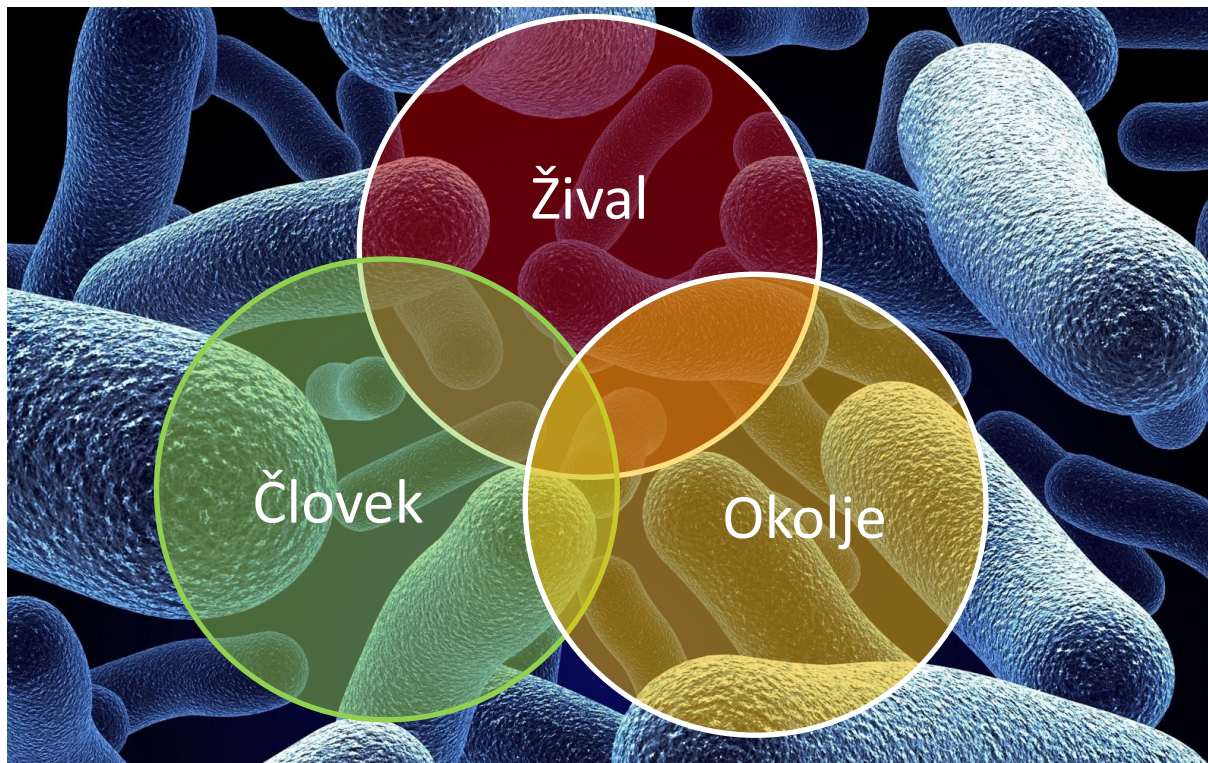
Zahteve bolnikov

For unnecessary antibiotic therapy

Bakterije so naše najbližje okolje



Načelo "eno zdravje"



Mikrobna odpornost in povezanost človeka, živali in okolja

