
Bakteriální rezistence

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Přítomnost molekulárně biologického, **geneticky kódovaného mechanismu, který snižuje** (normální) antimikrobiální **účinnost** daného antibiotika

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- **Přirozená**
- **Získaná**

Bakteriální rezistence - principy

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 - Modifikace metabol. dráhy (vankomycin a syntéza peptidoglykanu, modifikace transpeptidázy – PBP a betalaktamy)

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 - Úprava cílové molekuly (makrolidy a metylace rRNA)
- **Vytvoření cílových míst v nadbytku**

Bakteriální rezistence – šíření

- Vertikální
- Horizontální

Bakteriální rezistence – horizontální šíření

How Mobile Genetic Elements Work

Mobile Genetic Elements



Plasmids

Circles of DNA that can move between cells.



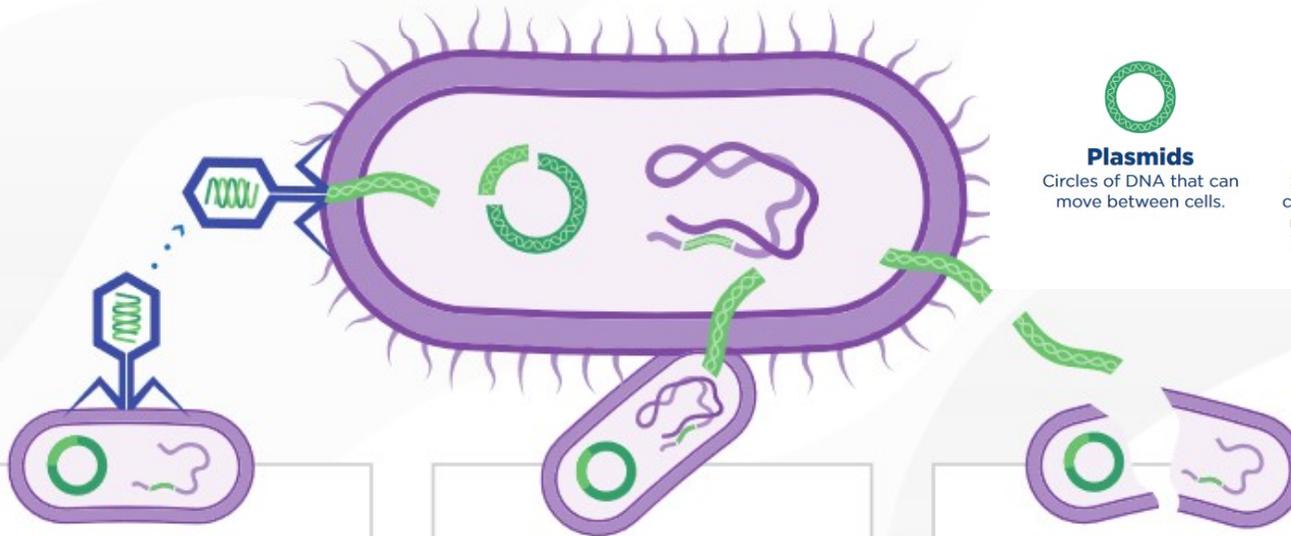
Transposons

Small pieces of DNA that can go into and change the overall DNA of a cell. These can move from chromosomes (which carry all the genes essential for germ survival) to plasmids and back.



Phages

Viruses that attack germs and can carry DNA from germ to germ.



Transduction

Resistance genes can be transferred from one germ to another via phages.

Conjugation

Resistance genes can be transferred between germs when they connect.

Transformation

Resistance genes released from nearby live or dead germs can be picked up directly by another germ.



U.S. Department of
Health and Human Services
Centers for Disease
Control and Prevention

WHO priority pathogens list for R&D of new antibiotics

Priority 1: CRITICAL

- *Acinetobacter baumannii*, carbapenem-resistant
- *Pseudomonas aeruginosa*, carbapenem-resistant
- *Enterobacteriaceae*, carbapenem-resistant, ESBL-producing

Priority 2: HIGH

- *Enterococcus faecium*, vancomycin-resistant
- *Staphylococcus aureus*, methicillin-resistant, vancomycin-intermediate and resistant
- *Helicobacter pylori*, clarithromycin-resistant
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- *Streptococcus pneumoniae*, penicillin-non-susceptible
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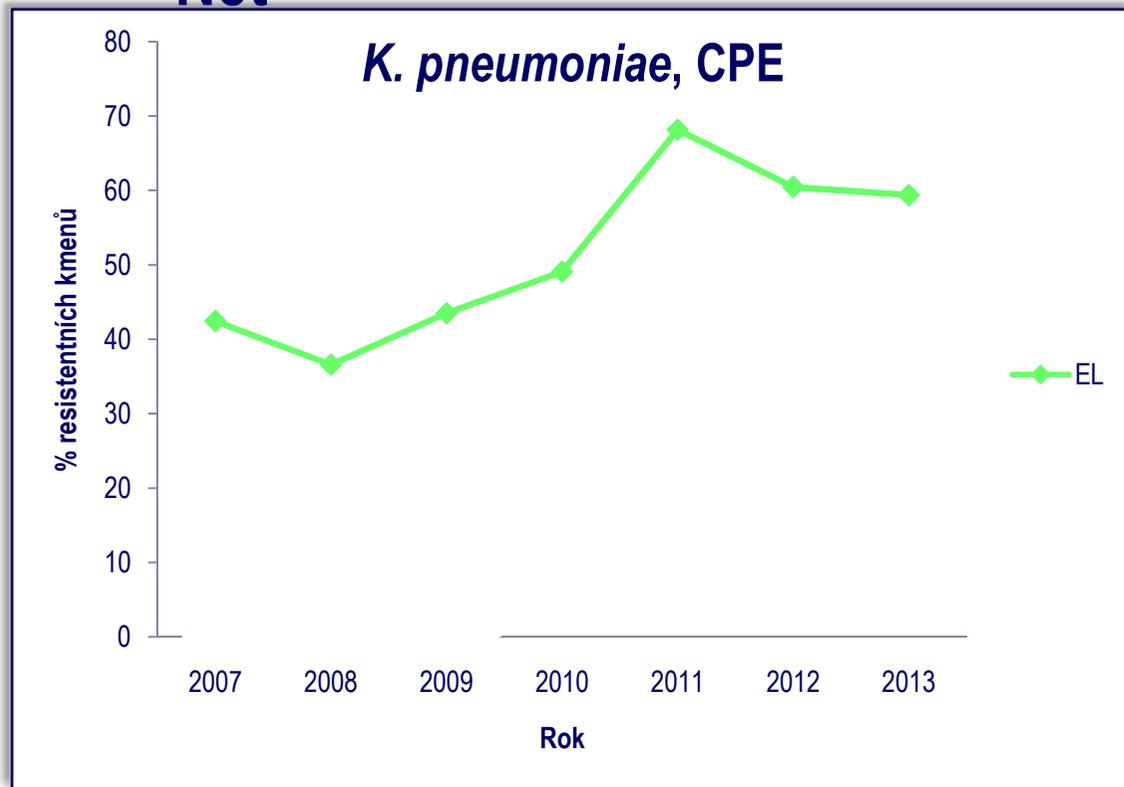
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Evropská surveillance rezistence u invazivních kmenů – EARS-Net

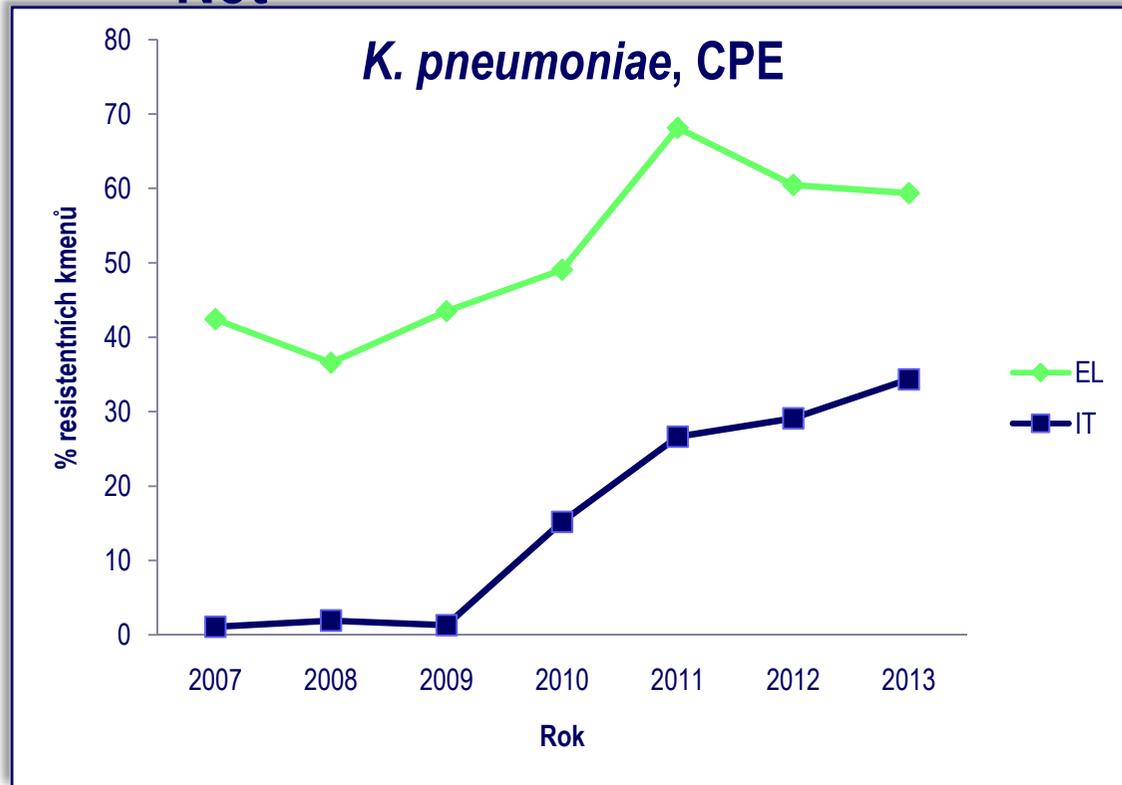


Surveillance Atlas of Infectious Diseases

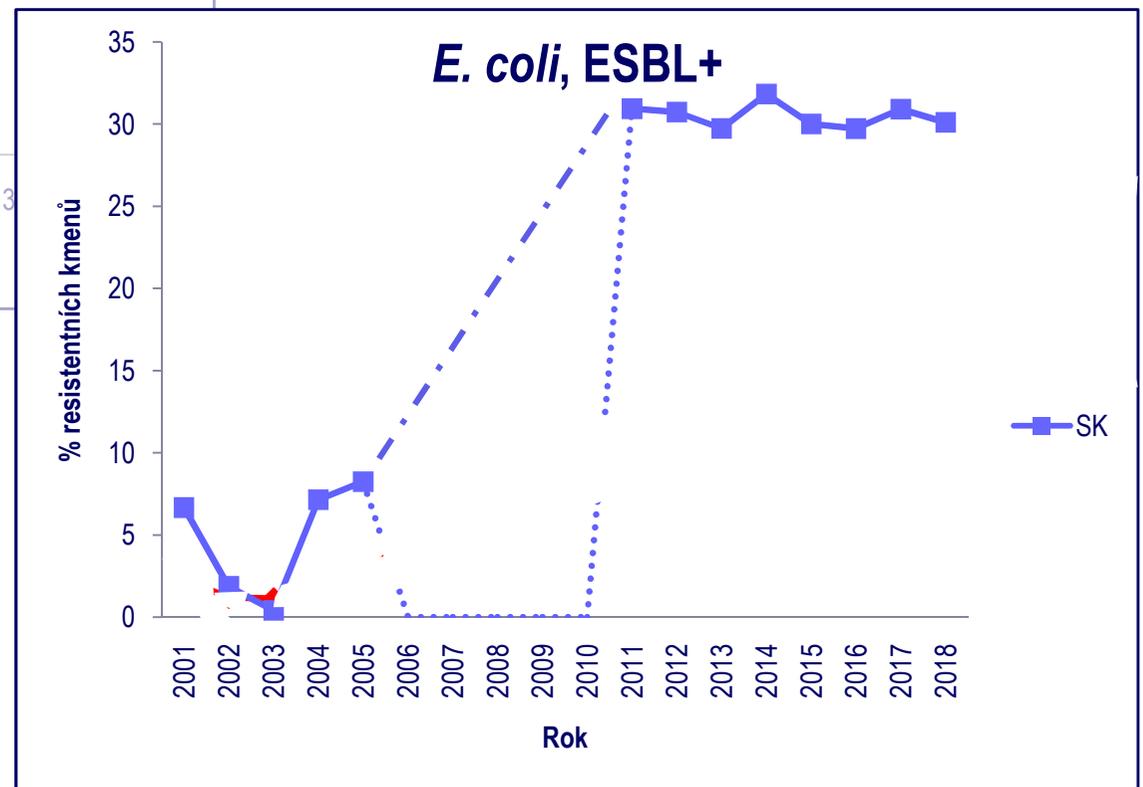
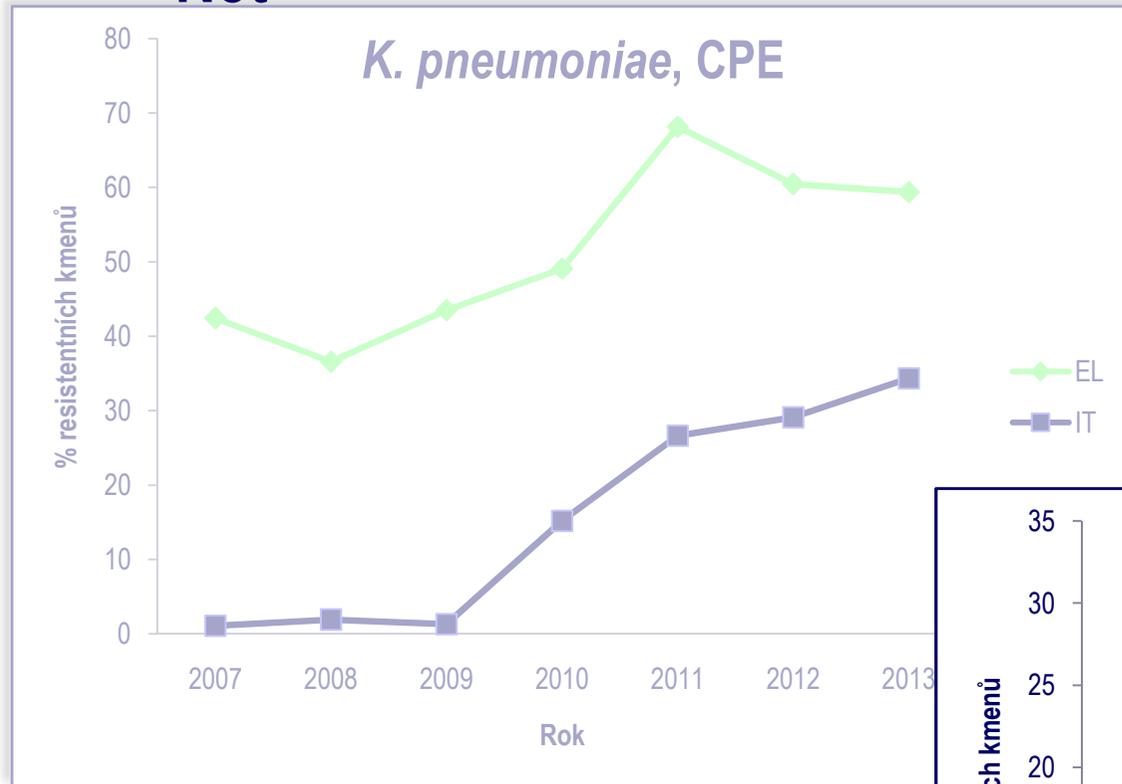
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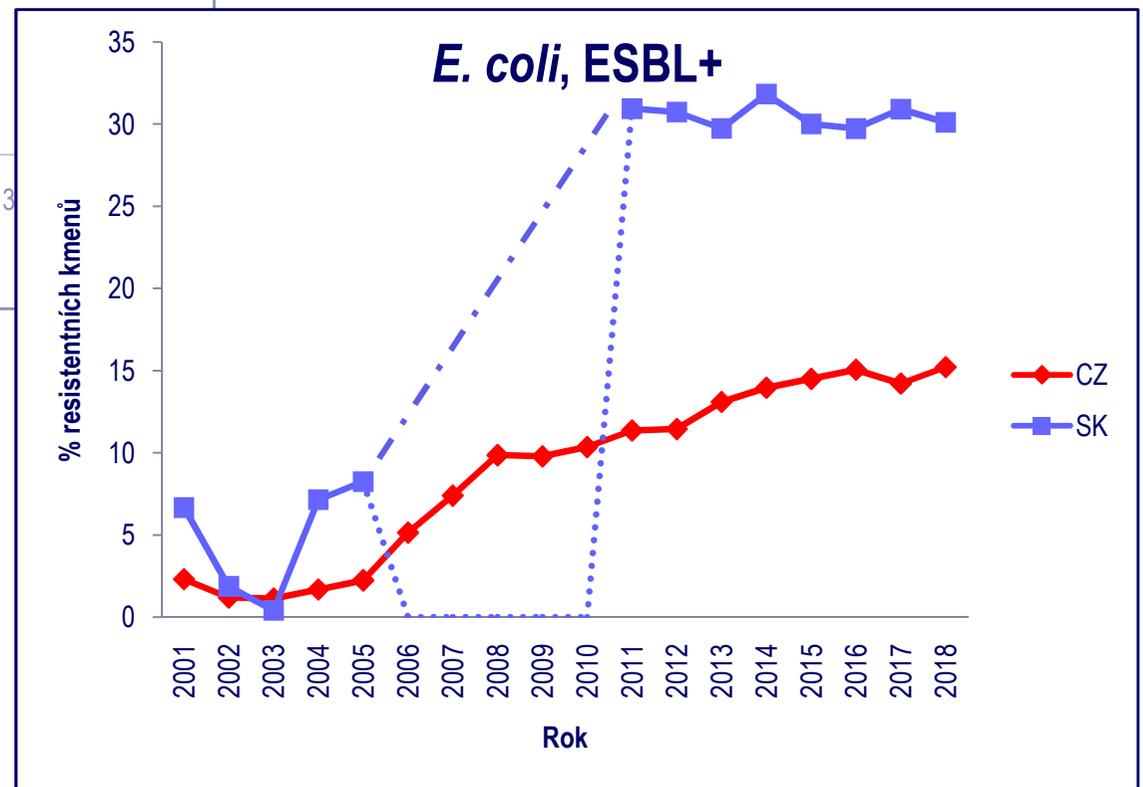
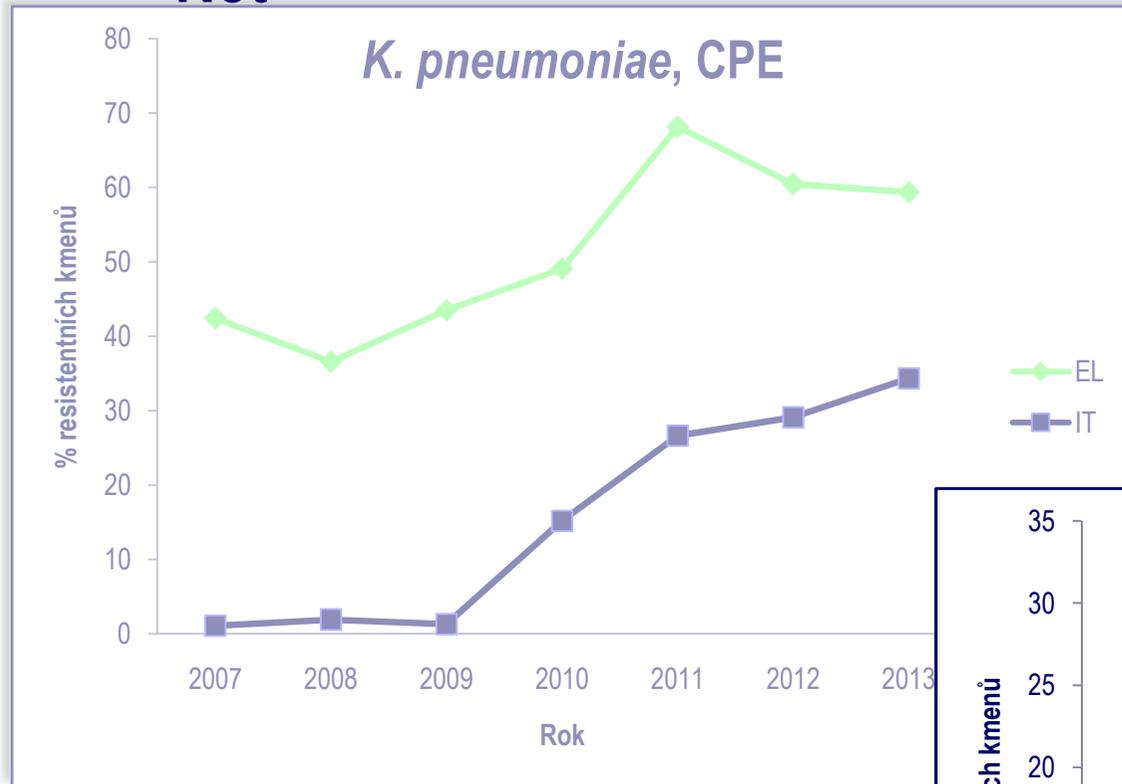
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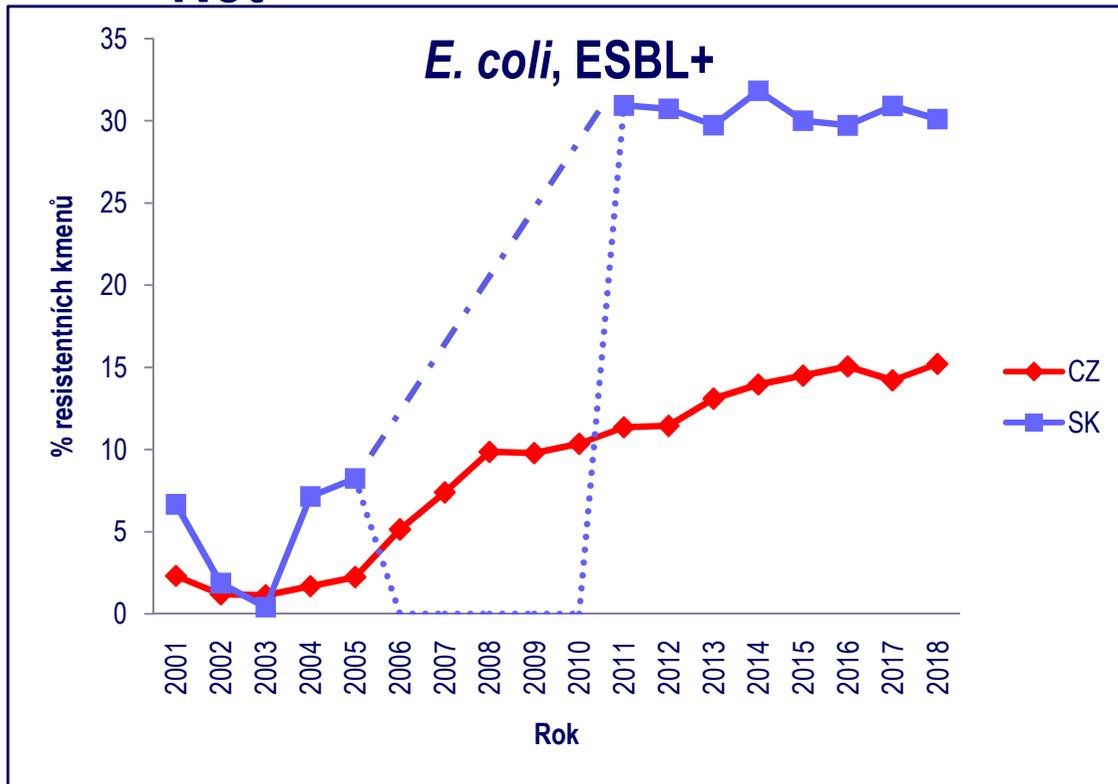
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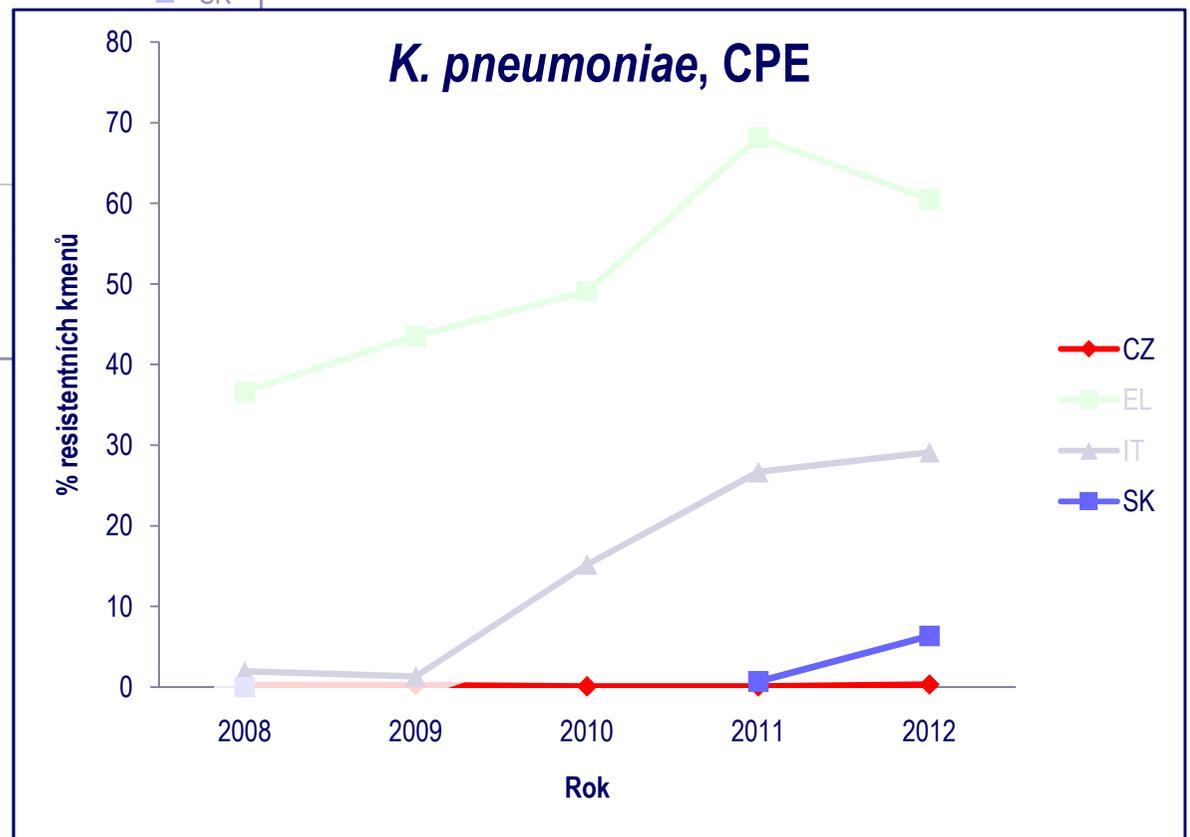
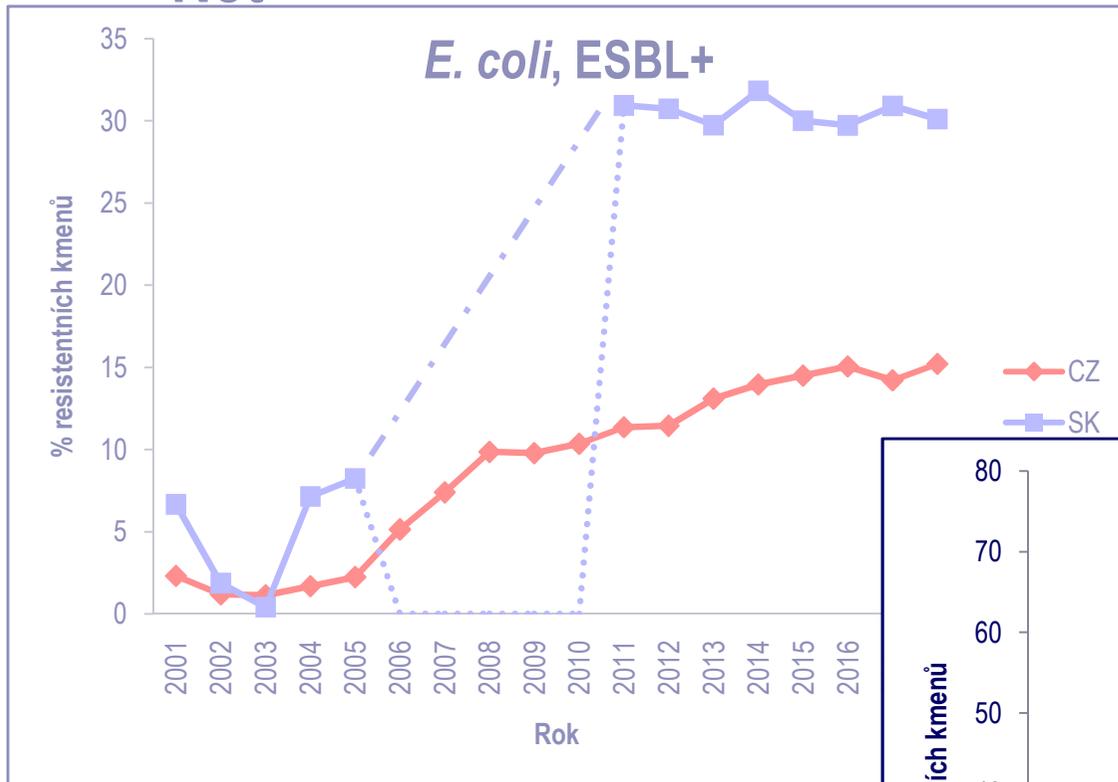
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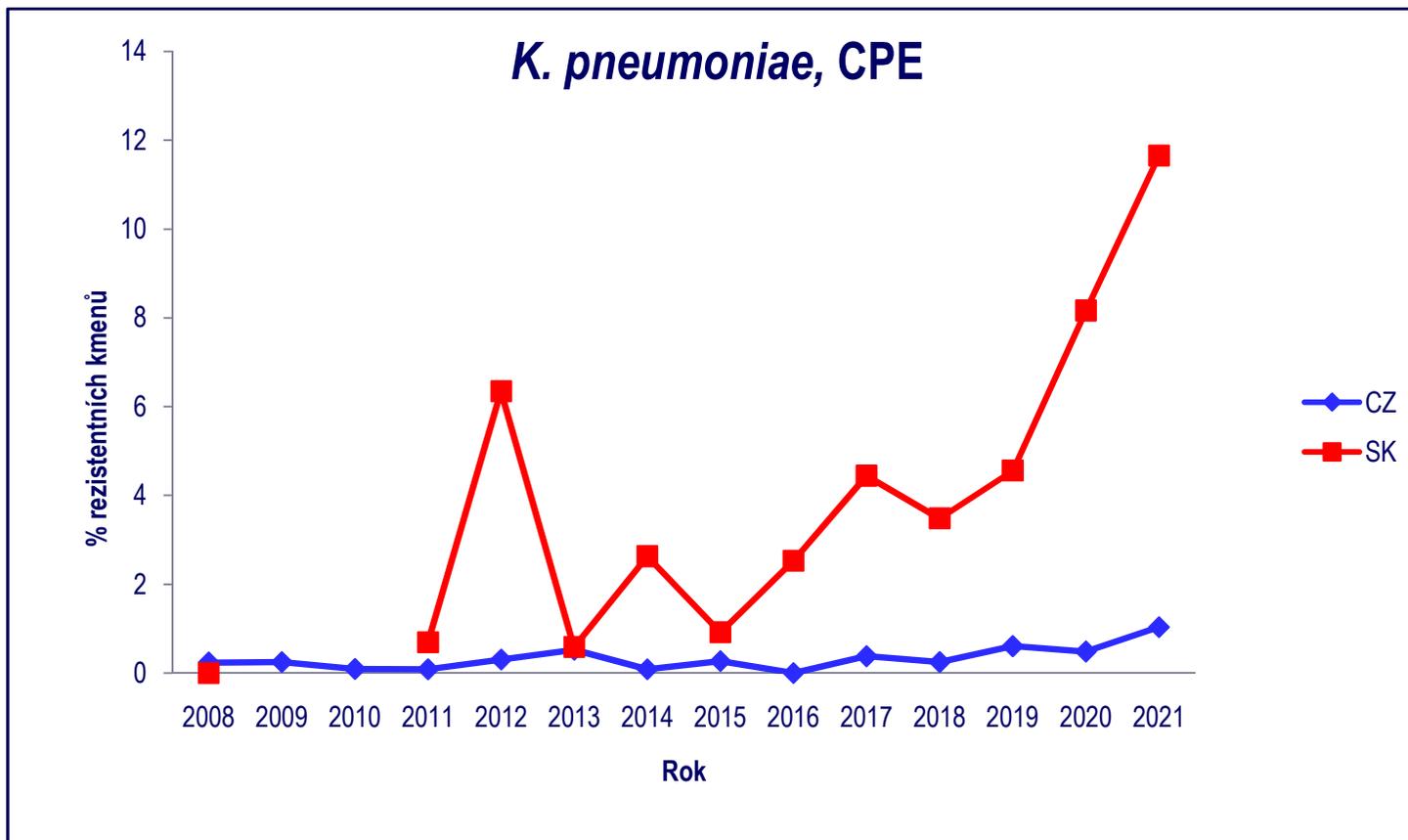
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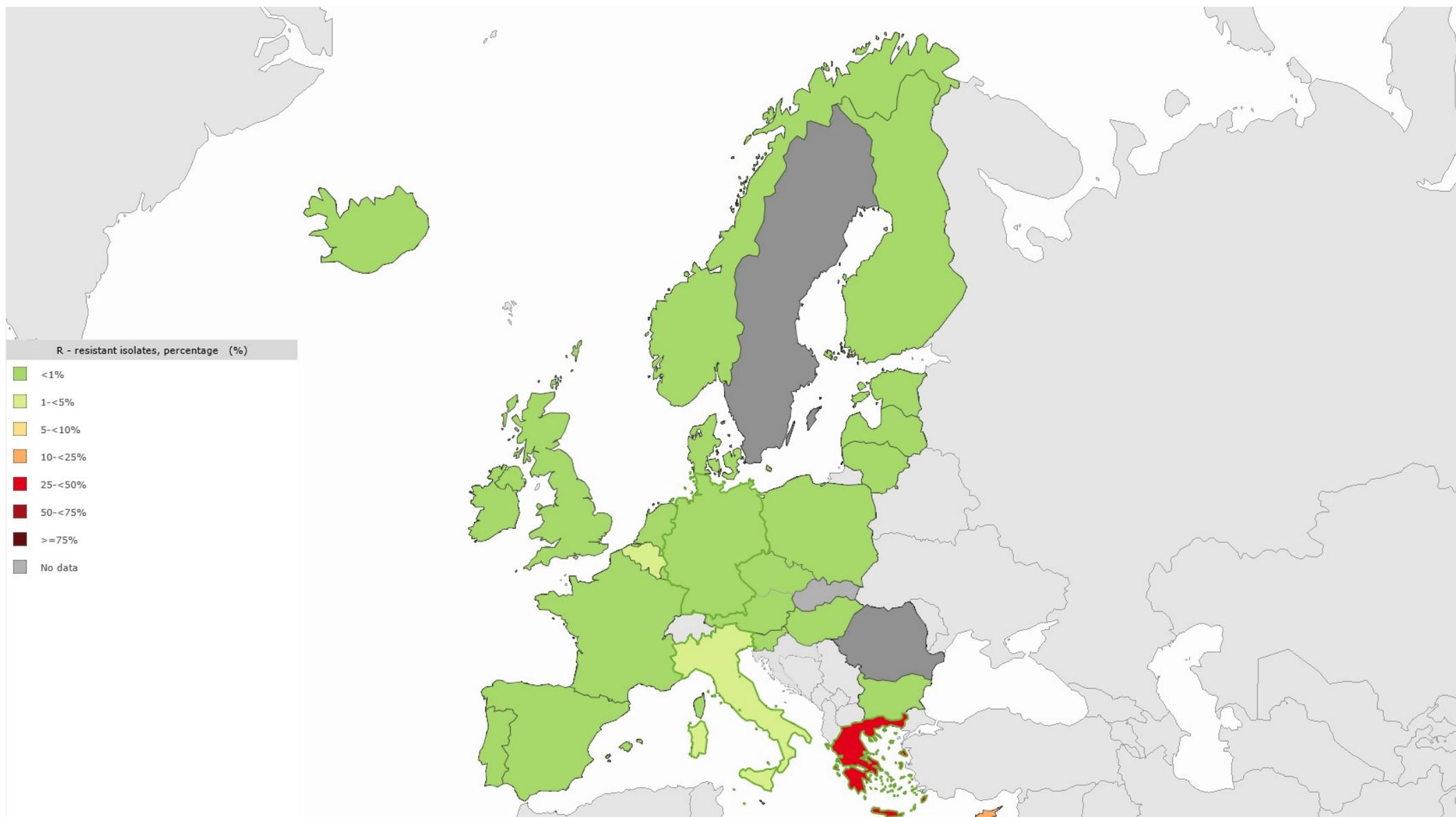


Klebsiella pneumoniae CPE, 2009 – 2021



Surveillance Atlas of Infectious Diseases

Antimicrobial resistance [↗](#) | *Klebsiella pneumoniae* [↗](#) | Carbapenems [↗](#) | R - resistant isolates, percentage [↗](#) | 2009 [↗](#)



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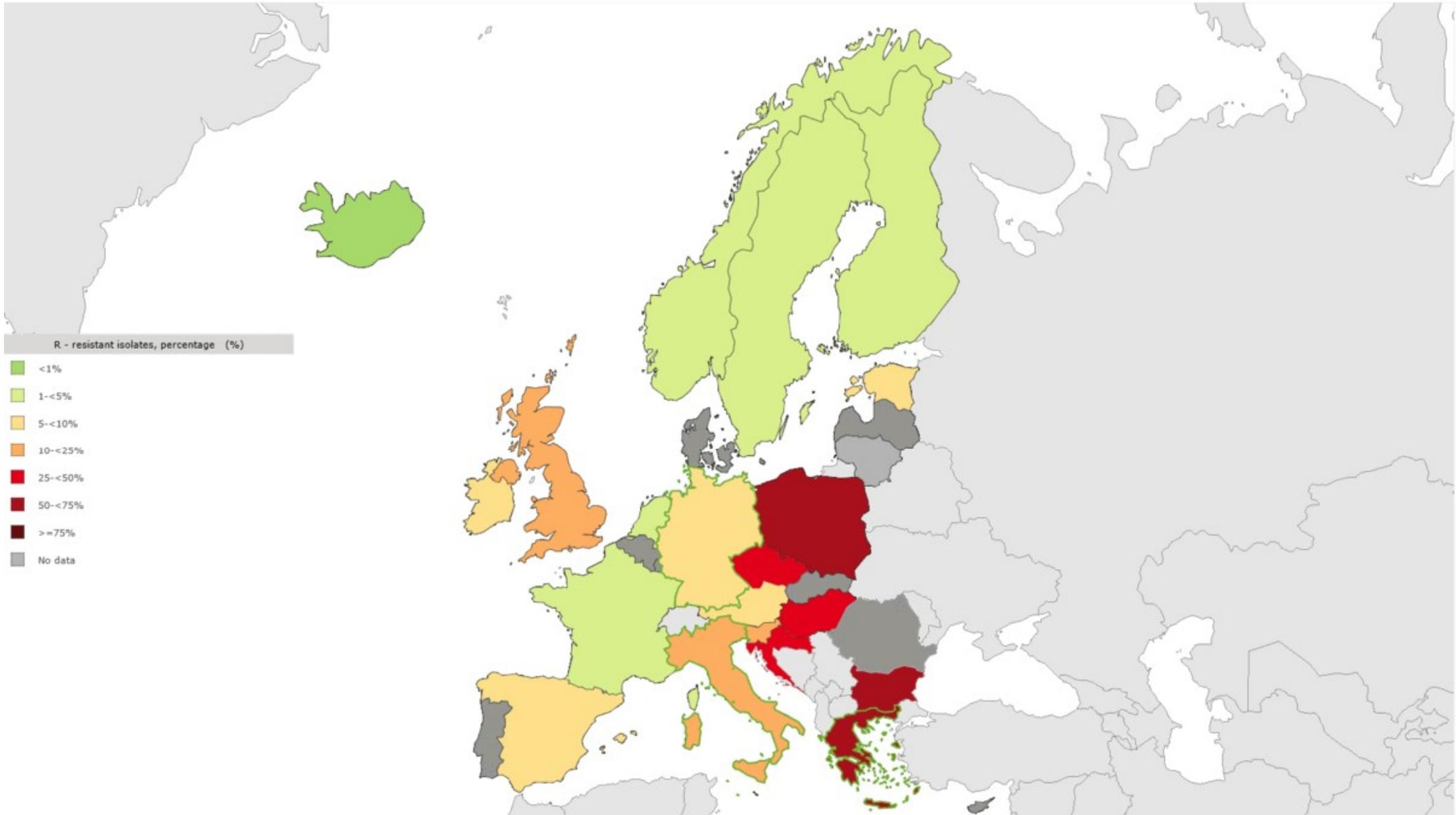


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E. faecium, VRE, 2000 – 2021



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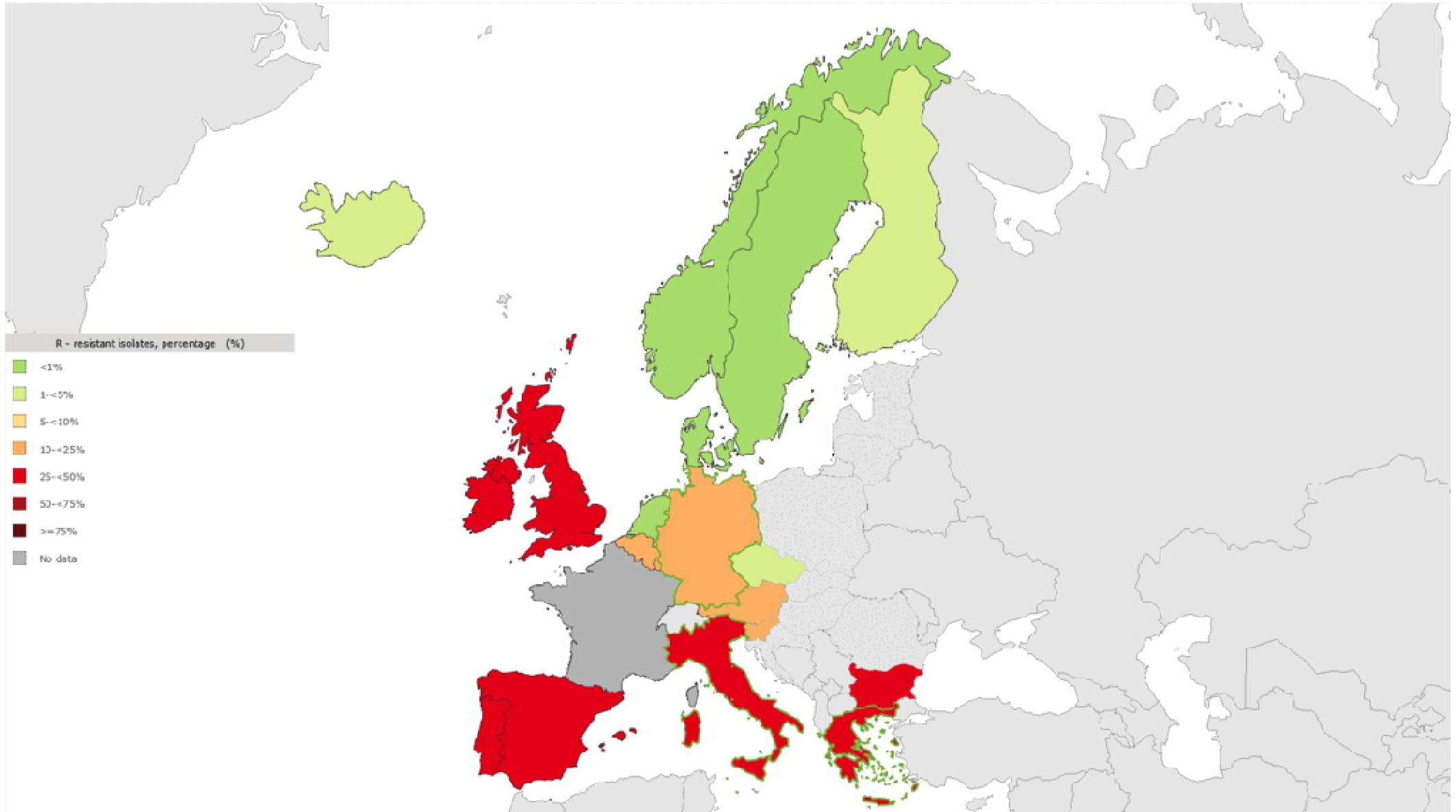


S. aureus, MRSA, 2000 – 2021



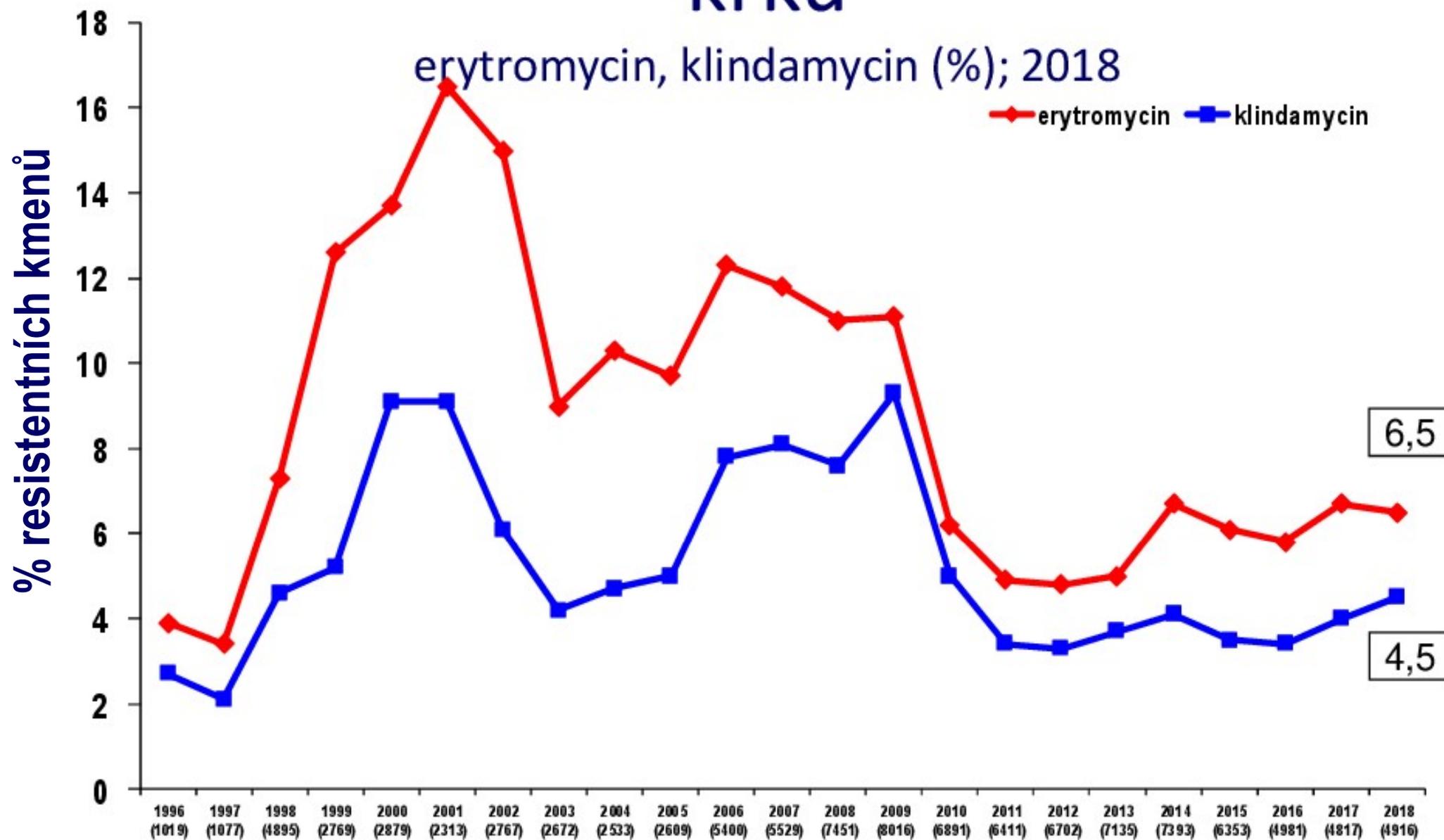
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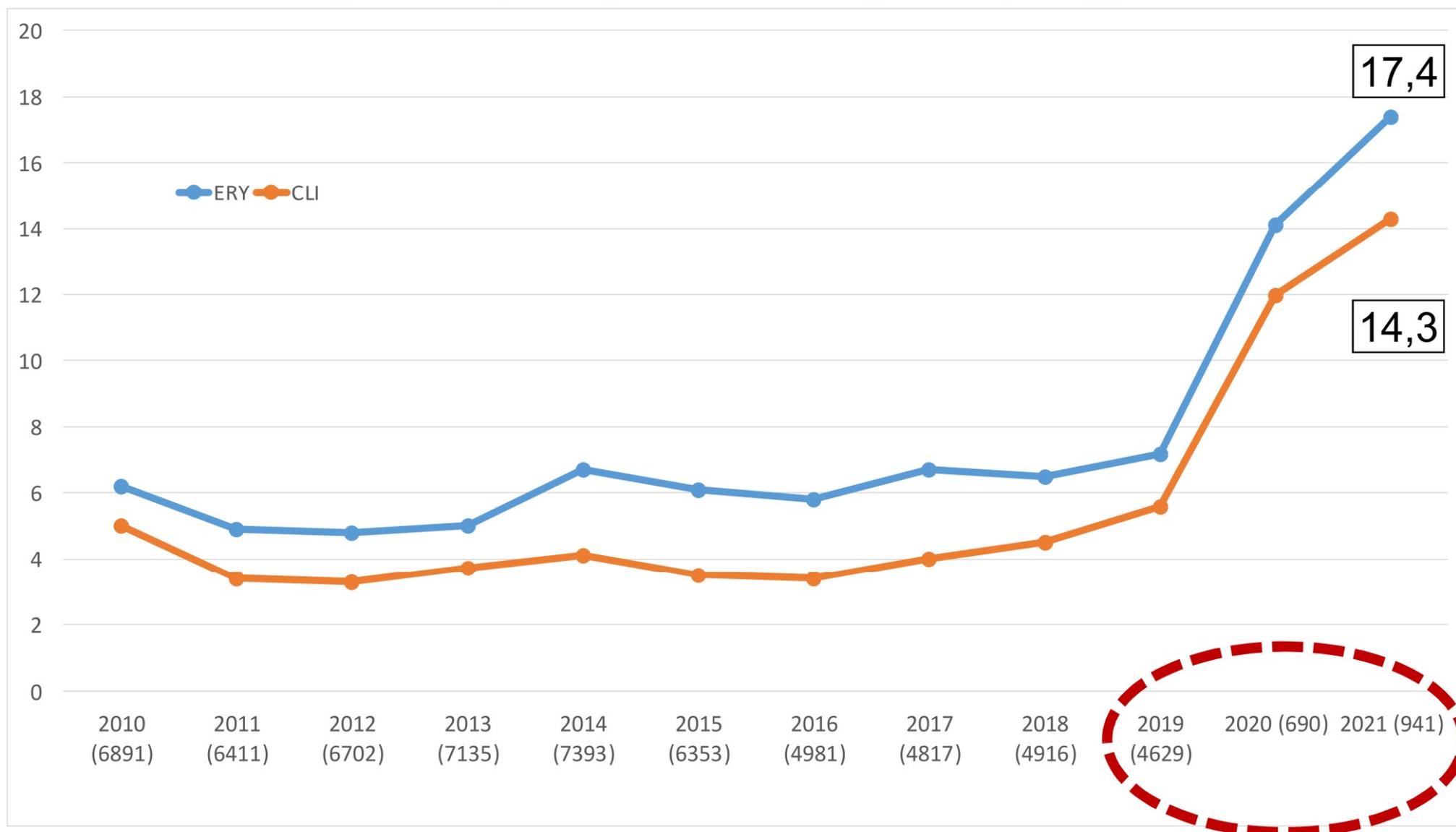


Streptococcus pyogenes - výtěry z krku

erytromycin, klindamycin (%); 2018

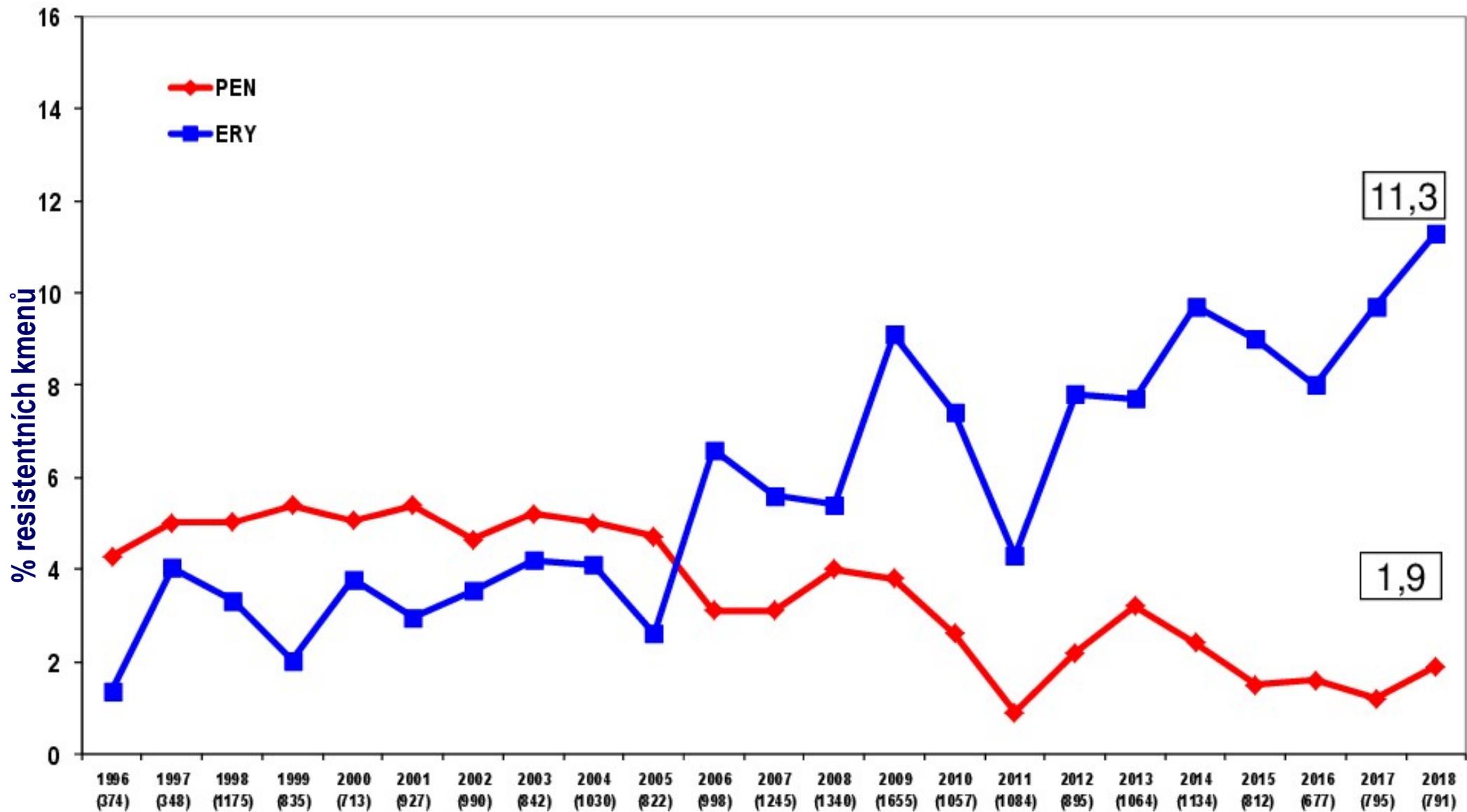


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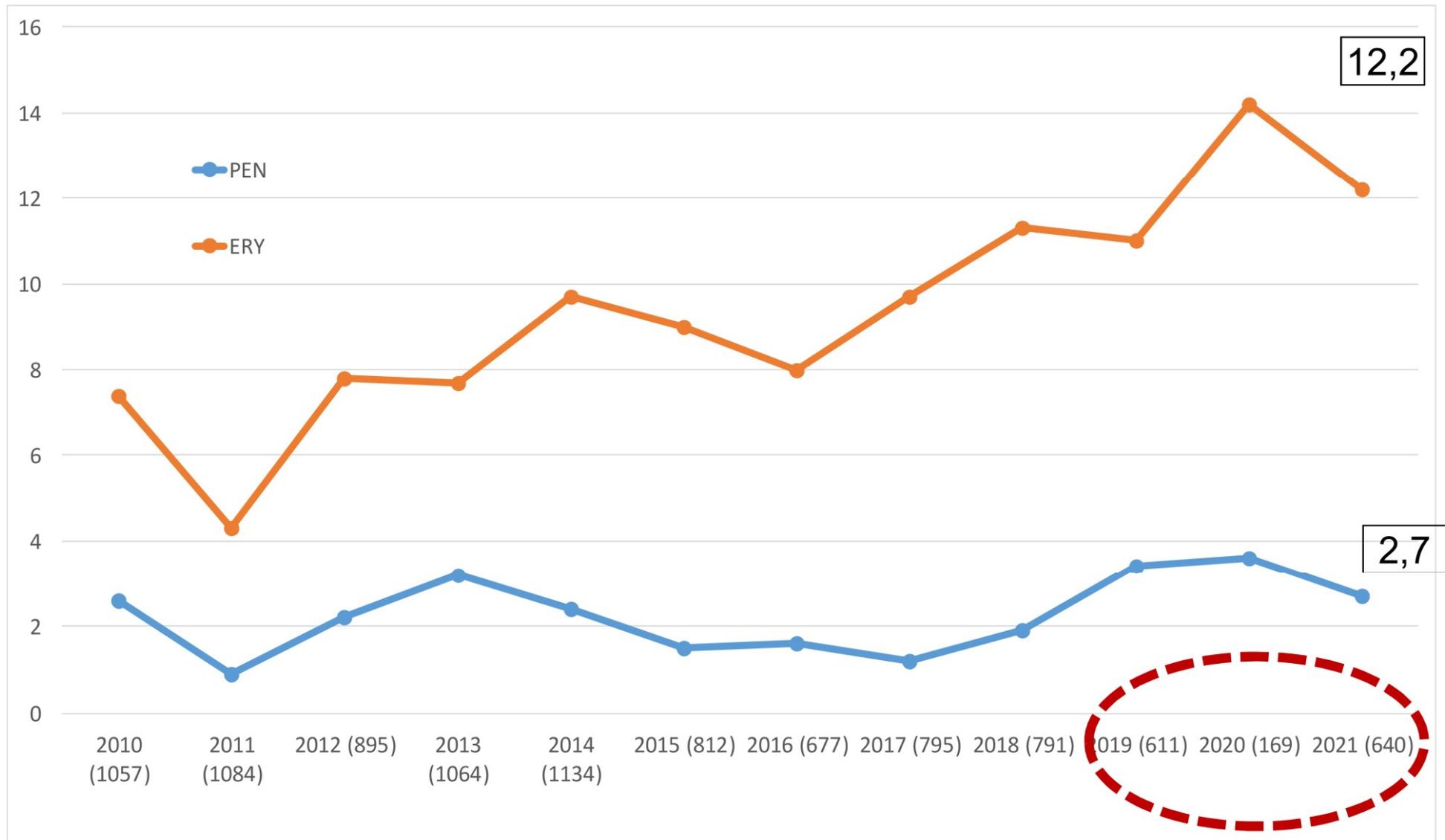


Streptococcus pneumoniae - HCD+DCD

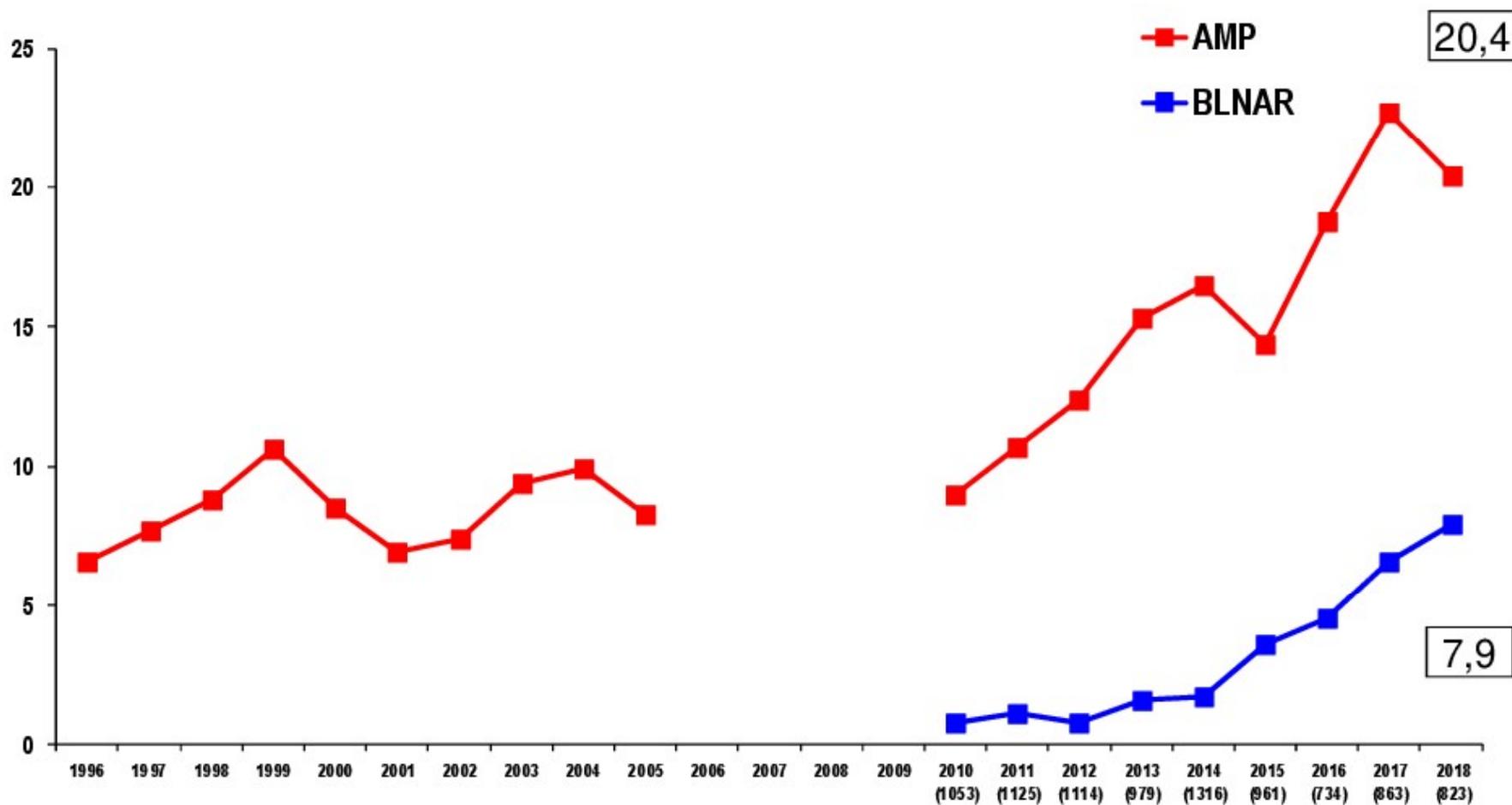
penicilin, erytromycin (%); 2018



Streptococcus pneumoniae - HCD+DCD penicilin, erytromycin (%); 2021



Haemophilus influenzae, HCD+DCD 2018



Data: PSMR NRL pro antibiotika, SZÚ

Haemophilus influenzae, HCD+DCD

2021

