

MRSA in the Nordic Countries

a brief update

Ingvild Haugan

NordicAST Workshop Gothenburg May 24th-25th 2022





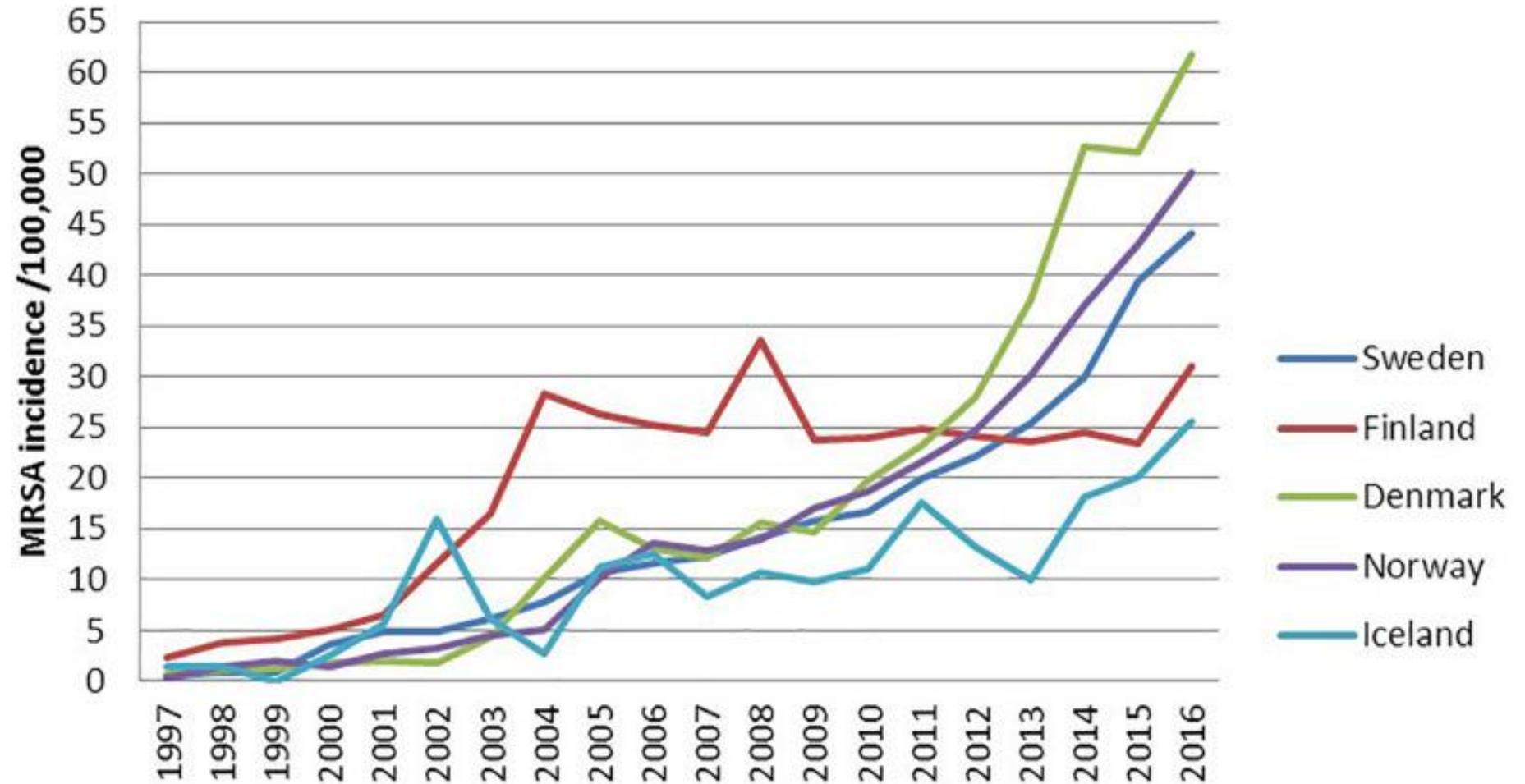
Increasing Incidences and Clonal Diversity of Methicillin-Resistant *Staphylococcus aureus* in the Nordic Countries - Results From the Nordic MRSA Surveillance

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Jaana Vuopio^{6,7}, *Anna Emilie Henius*¹, *Jens Nielsen*⁸ and *Anders R. Larsen*¹

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Increasing incidence

Incidence of notified MRSA in the Nordic Countries 1997-2016



Credit: Petersen et al 2021

Clonal diversity

- **2344** different spa types
 - (+646 non-typeable)
- **2017** «sporadic» (observed in ≤ 10 cases)
- In all countries, most spa types (54-65%) were found in only 1 year

Does clonality matter?

EMRSA-15 & EMRSA-16



ECDC



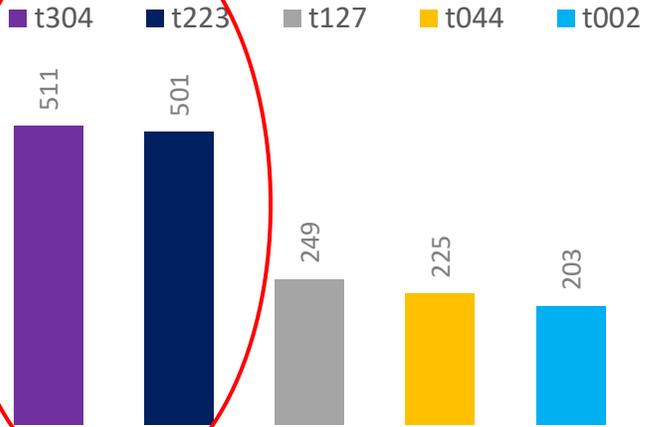
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«Hospital clones»

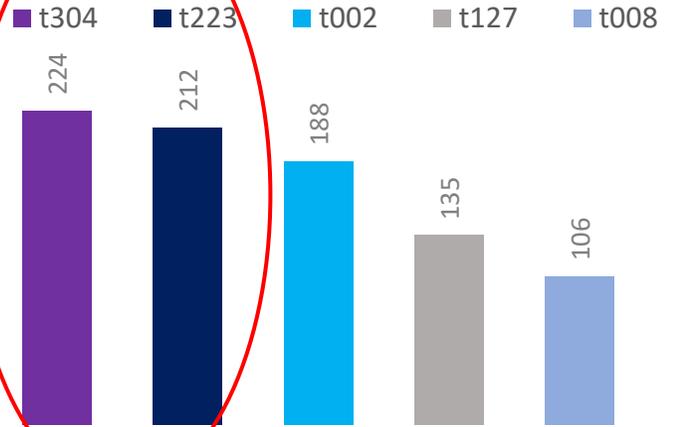


CC398

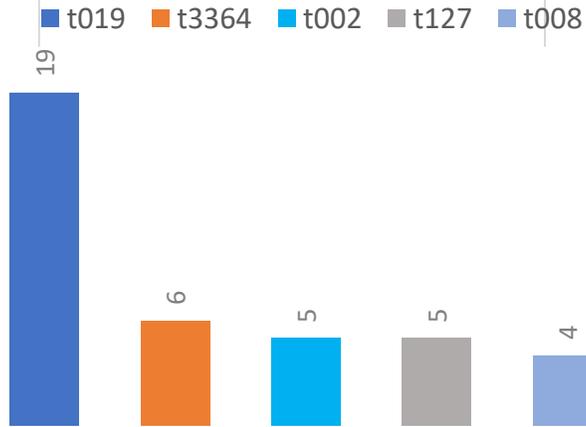
SWEDEN 2016



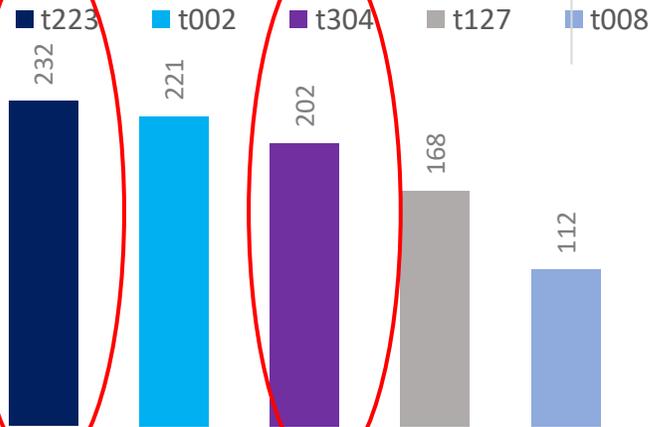
DENMARK 2016 (EXCL 034)



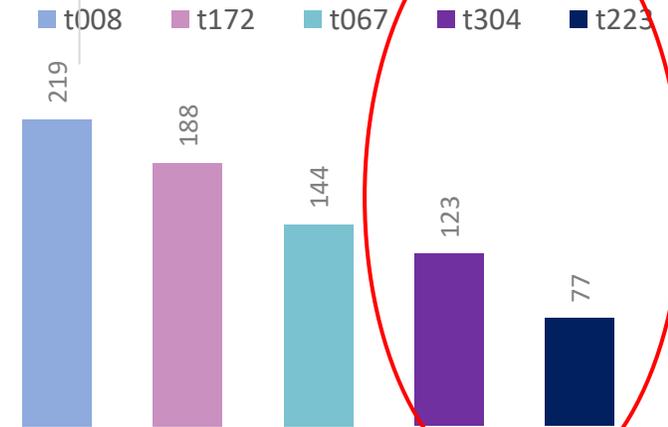
ICELAND 2016



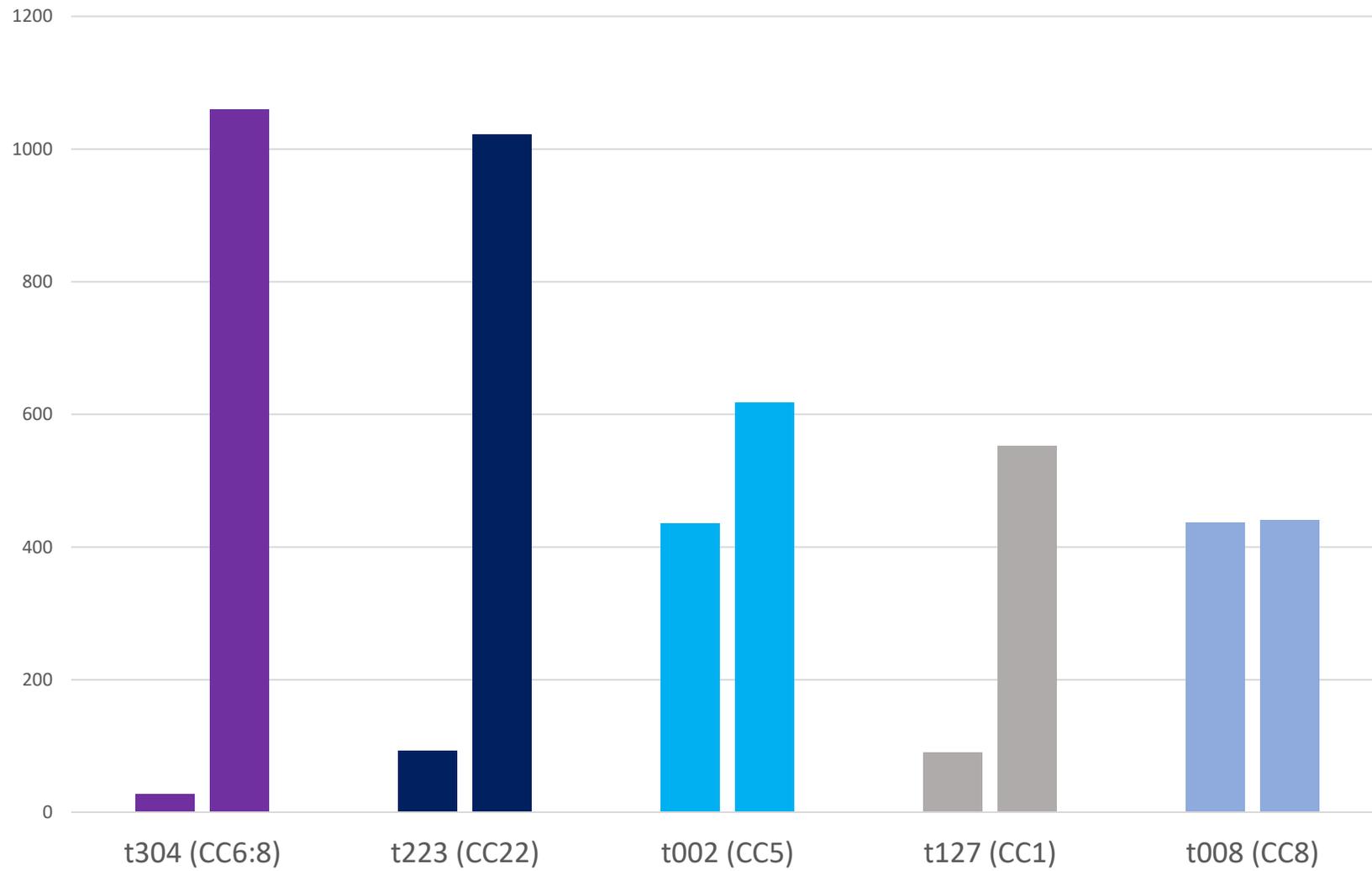
NORWAY 2016



FINLAND 2016



spa types in 2009 and 2016



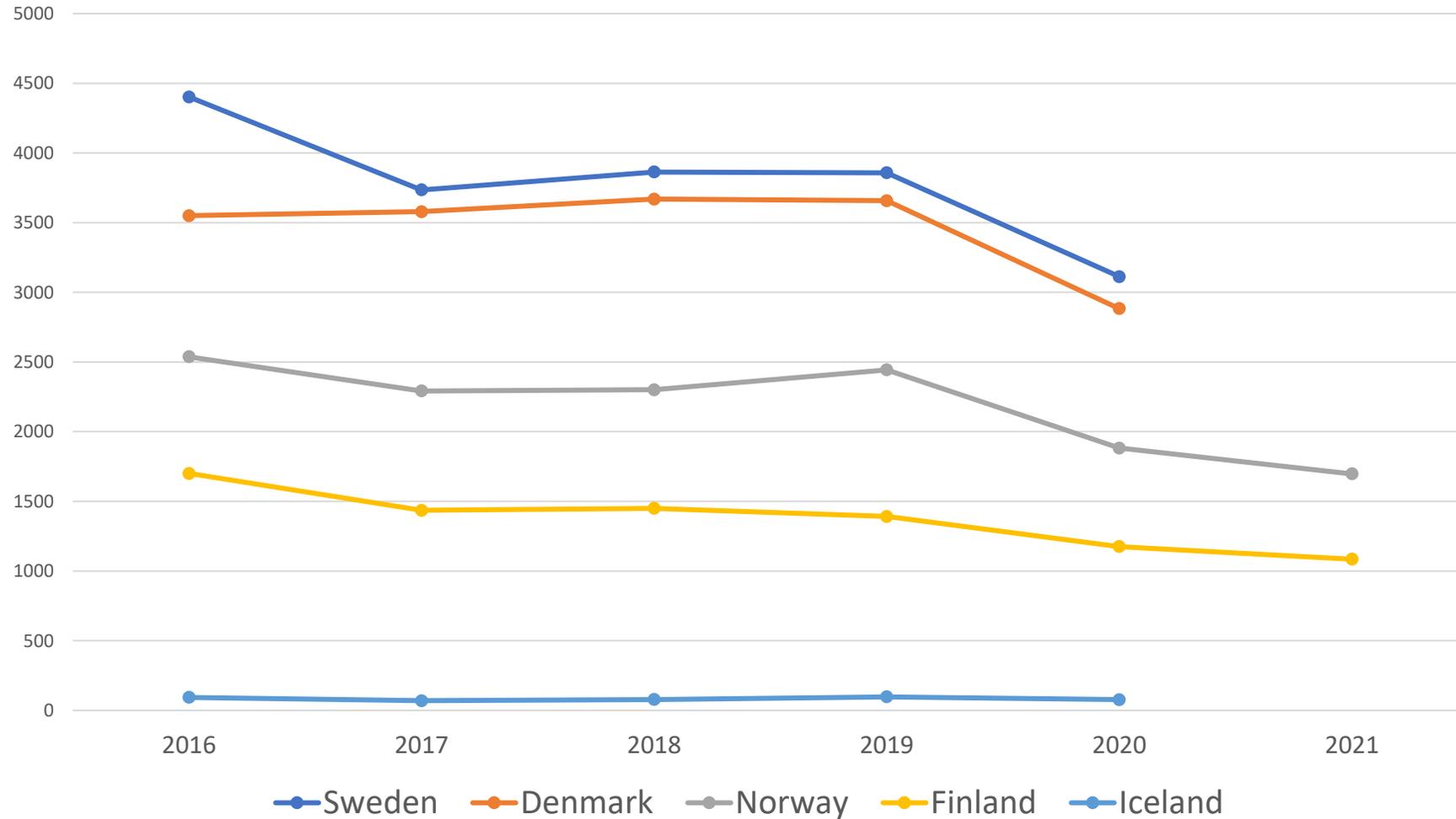
How can we know all this?

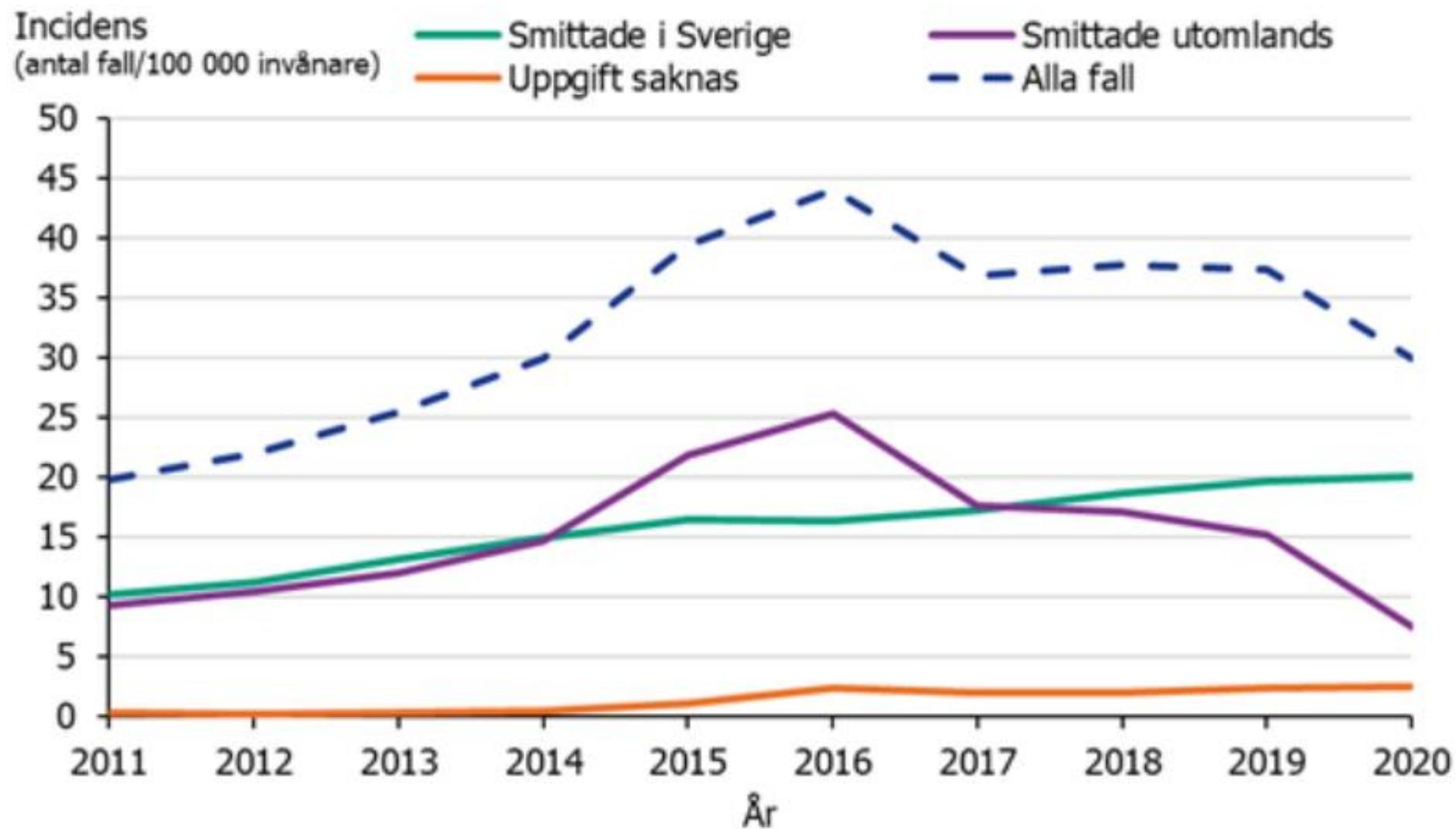
- Notifiable finding, surveillance
- Screening programs, contact tracing
- Reference laboratories
 - spa-typing, PVL
 - WGS

So what has happened in the Nordic countries since 2016?

- Incidence?
- Clonality?

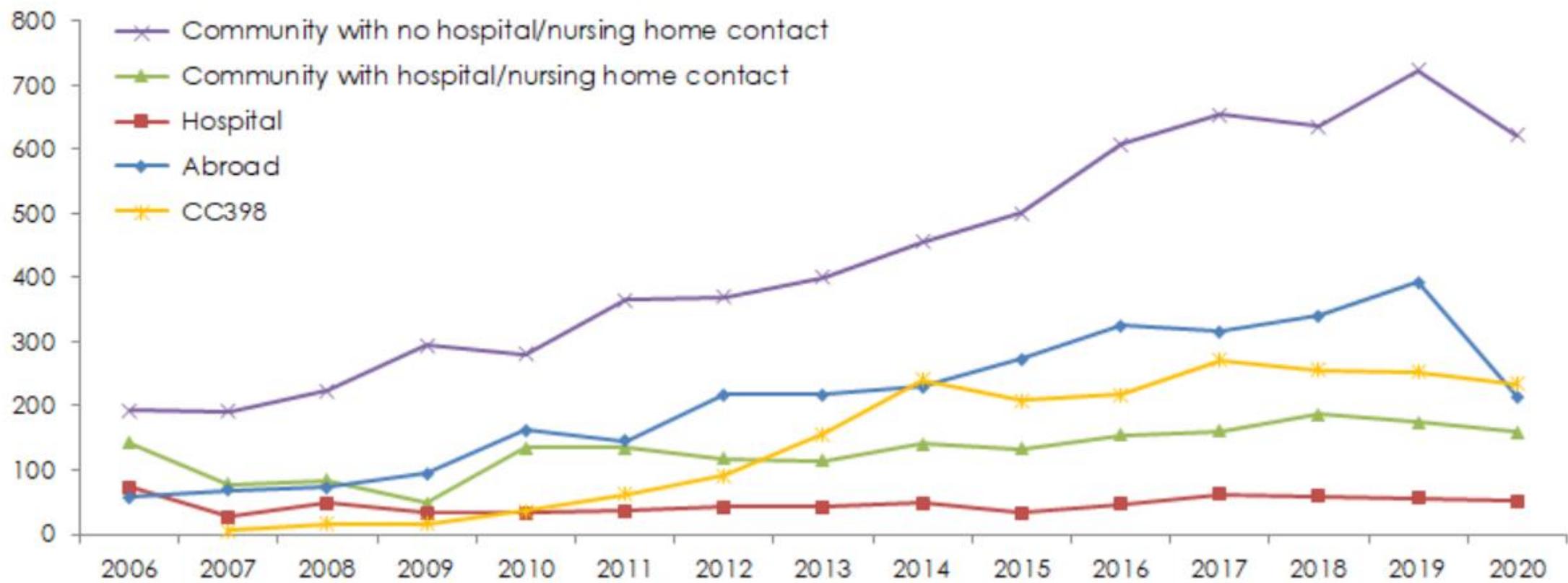
Reported MRSA cases in the Nordic Countries 2016-2021





Källa: Folkhälsomyndigheten

Figure 2. Number of clinical MRSA infections by epidemiological classification, 2006-2020



Iceland 2021

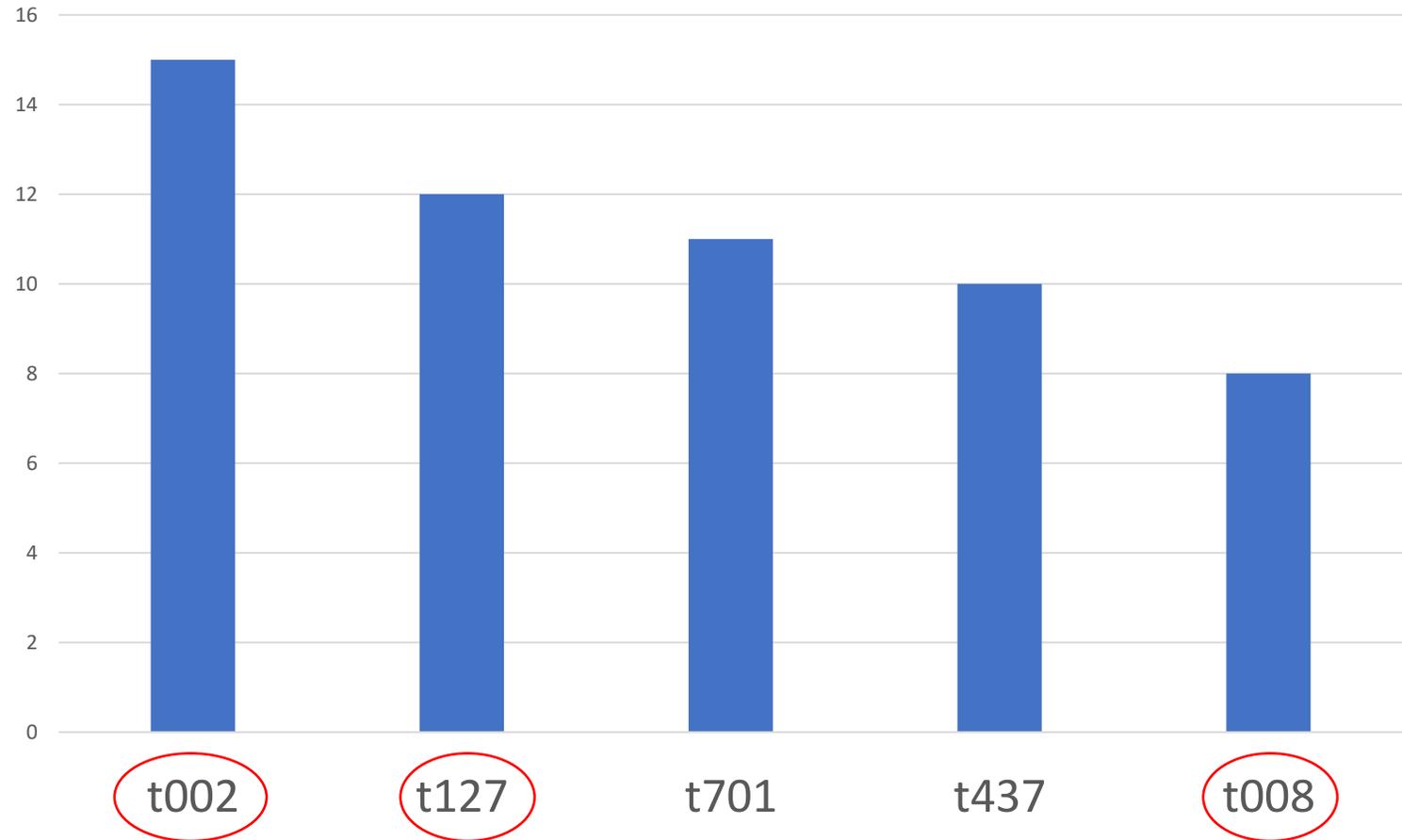
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Denmark 2020 (excl CC398)

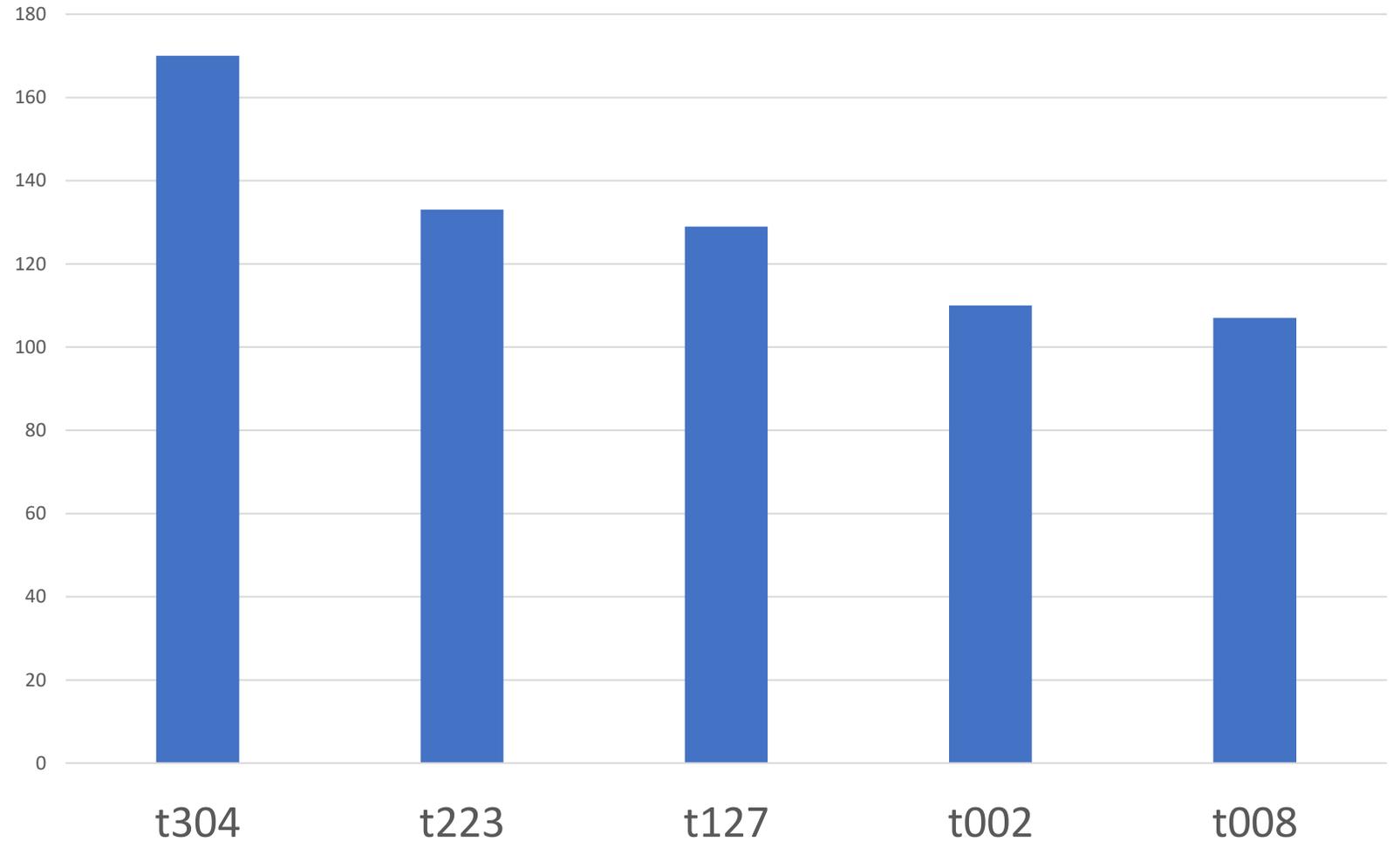
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Sweden 2020

t304

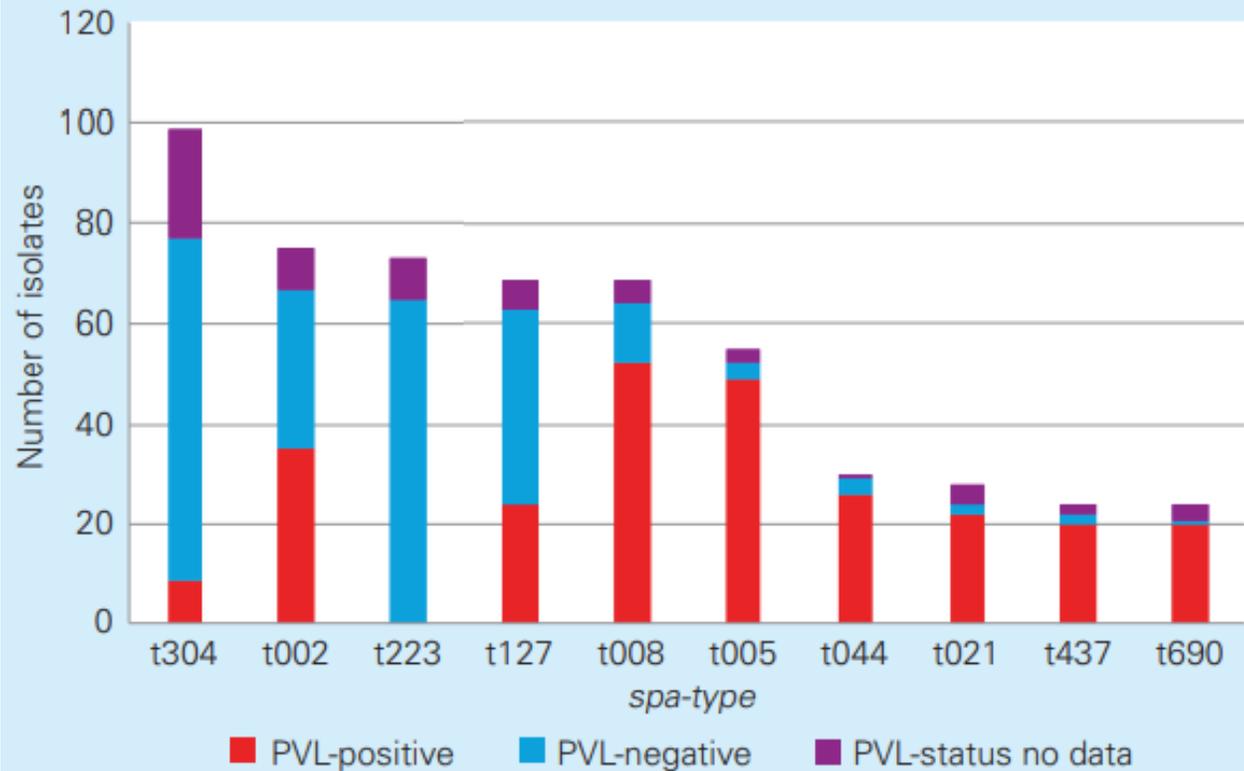
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Figure 3.18. The ten most common *spa*-types (with PVL status) among cases with MRSA with clinical infections, 2020.



Source: The Public Health Agency of Sweden

Norway 2021

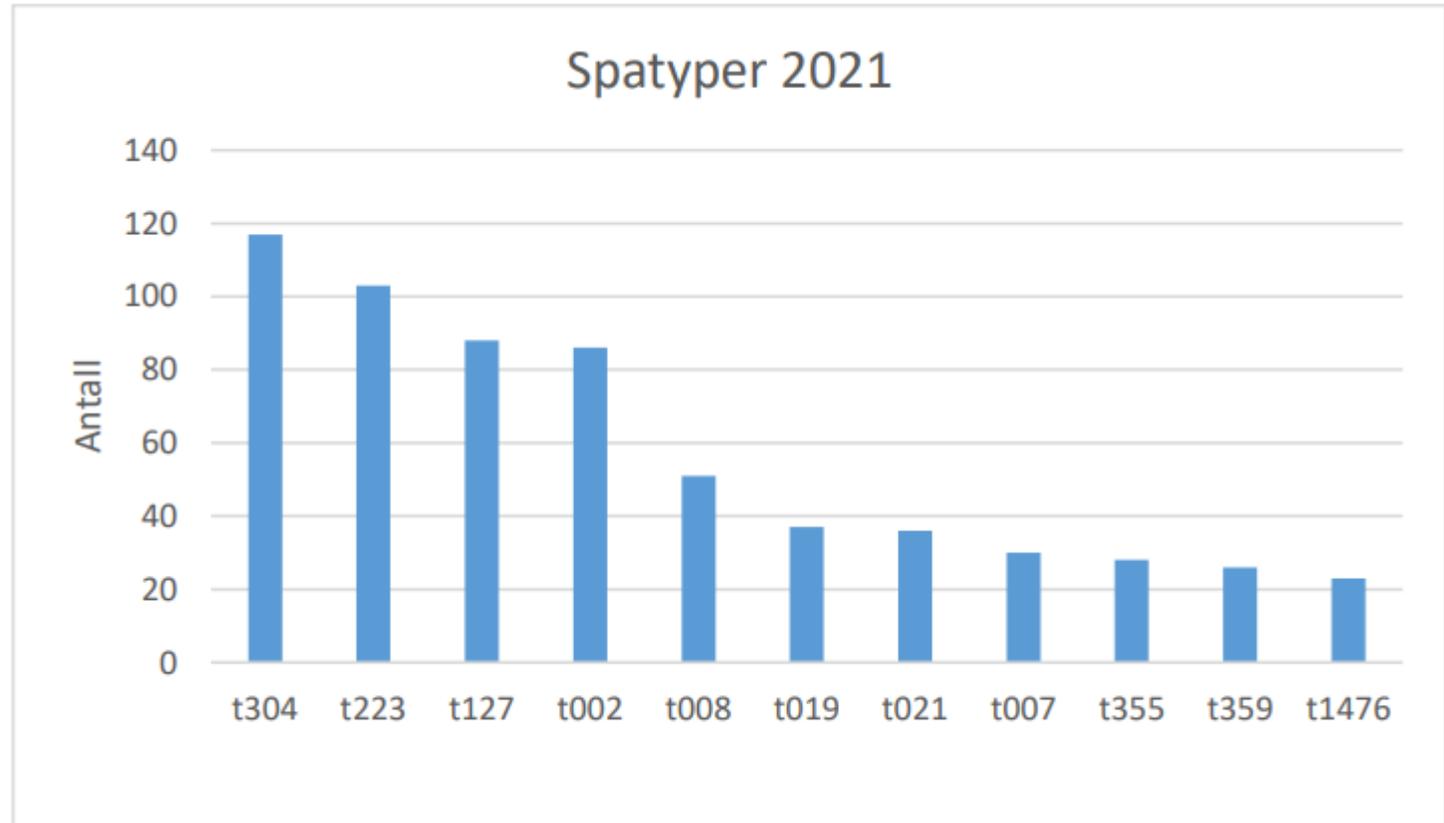
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Finland 2020

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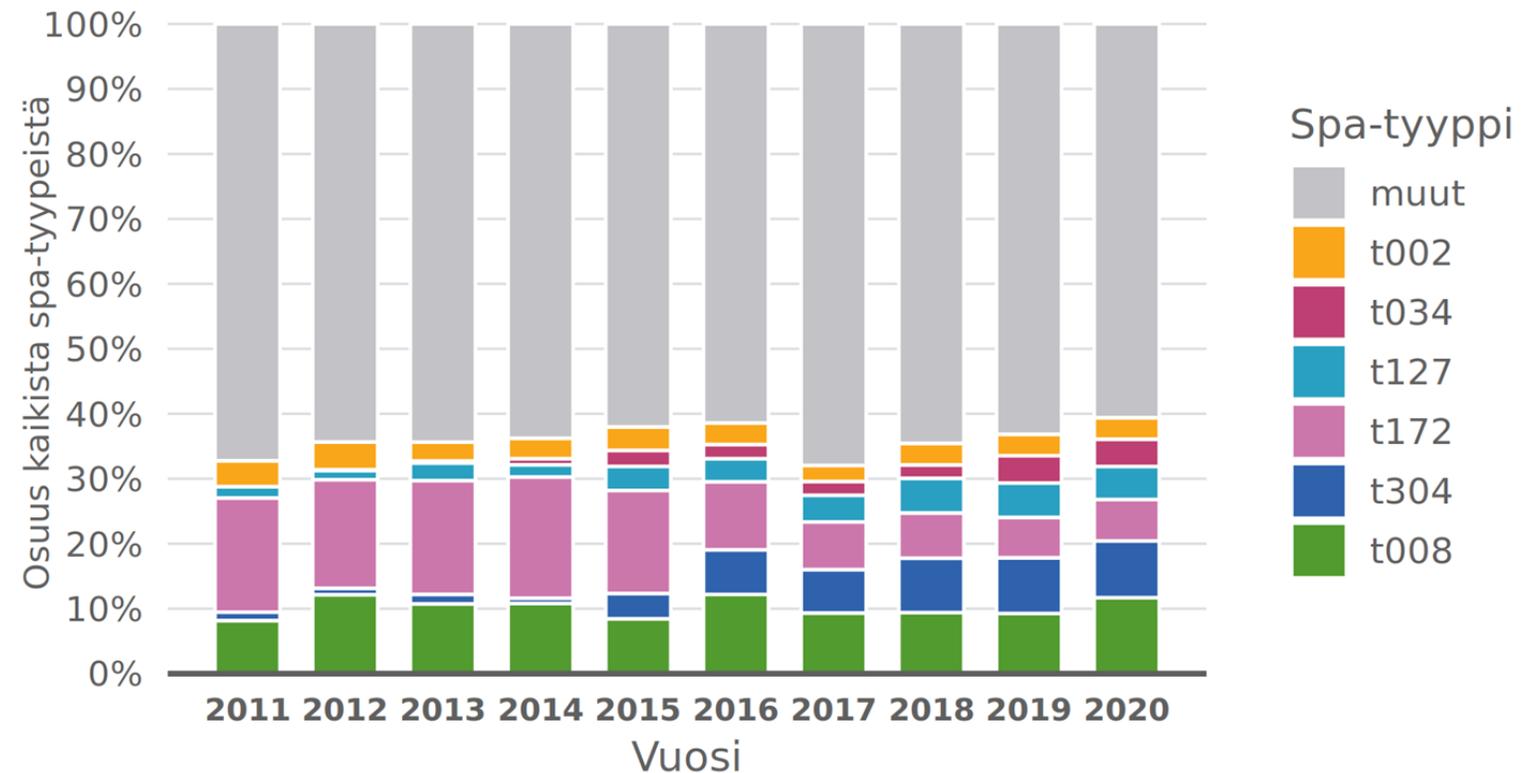
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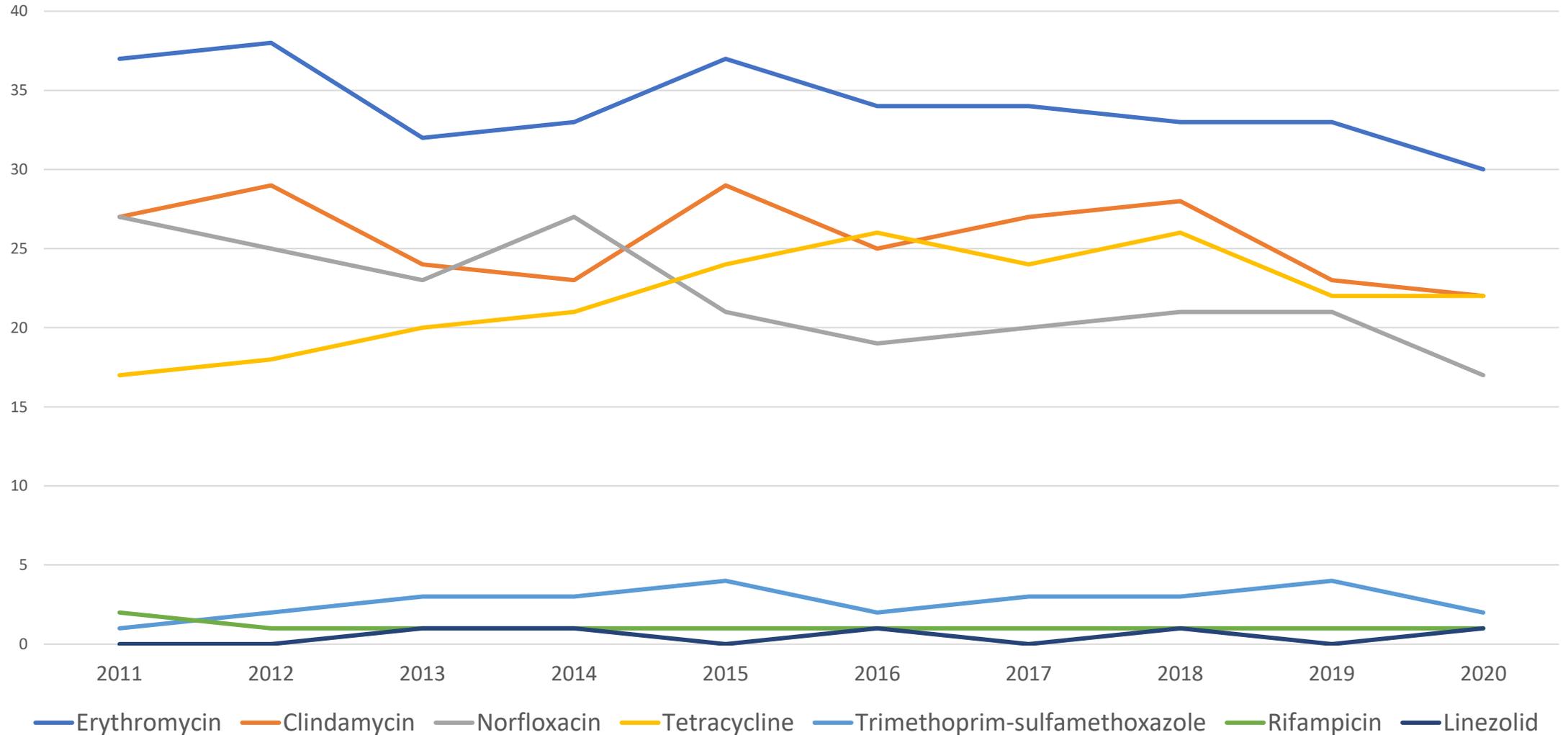
MRSA:n spa-tyyppien jakautuminen vuosina

kuusi yleisintä vuonna 2020 vs muut



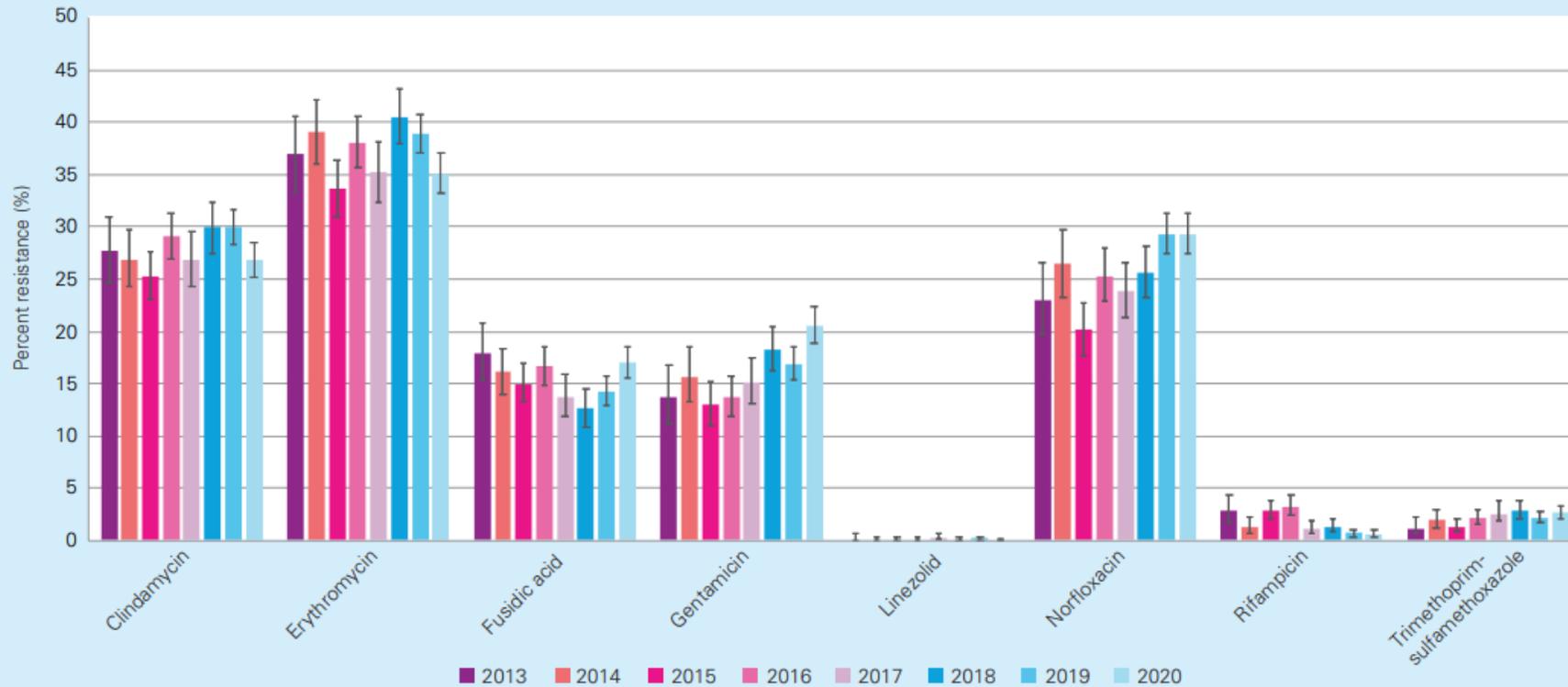
Lähde: Tartuntatautirekisteri, THL 2021

AMR in non-CC398 Denmark



AMR in MRSA - Sweden

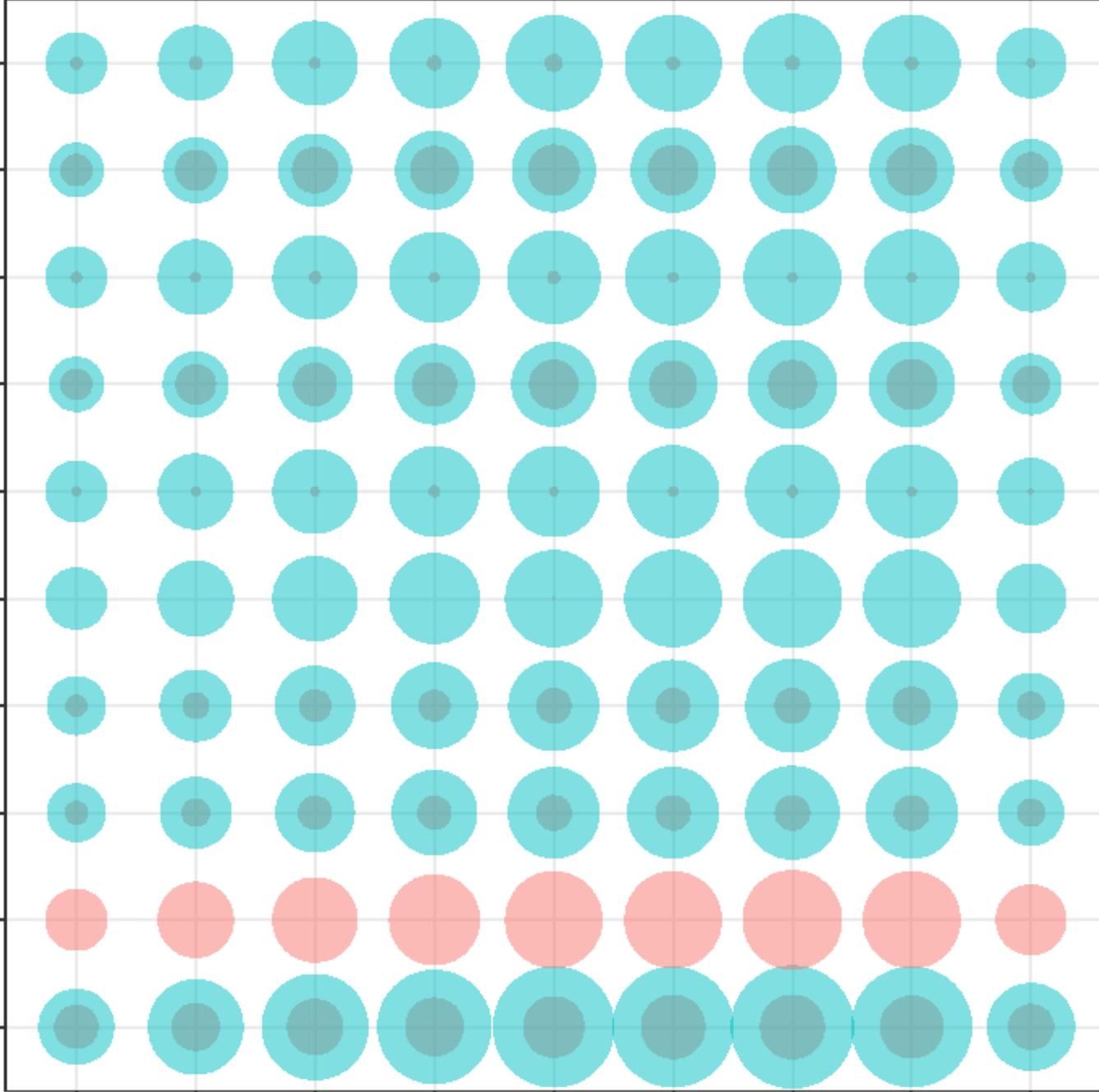
Figure 3.19. Antibiotic resistance in clinical MRSA isolates 2013-2020. The numbers of AST isolates for all years and antibiotics ranges from 576 to 2 702. The exact numbers are given in the attached file.



Source: The Public Health Agency of Sweden

Antibiotika_komb

Trimetoprim.sulfametoksazol
Tetrasyklin
Rifampicin
Ciprofloksacin/Norfloksacin
Mupirocin
Linezolid
Gentamicin
Fusidin
Cefoksitin
Erytromycin/Klindamycin



2012 2013 2014 2015 2016 2017 2018 2019 2020

År

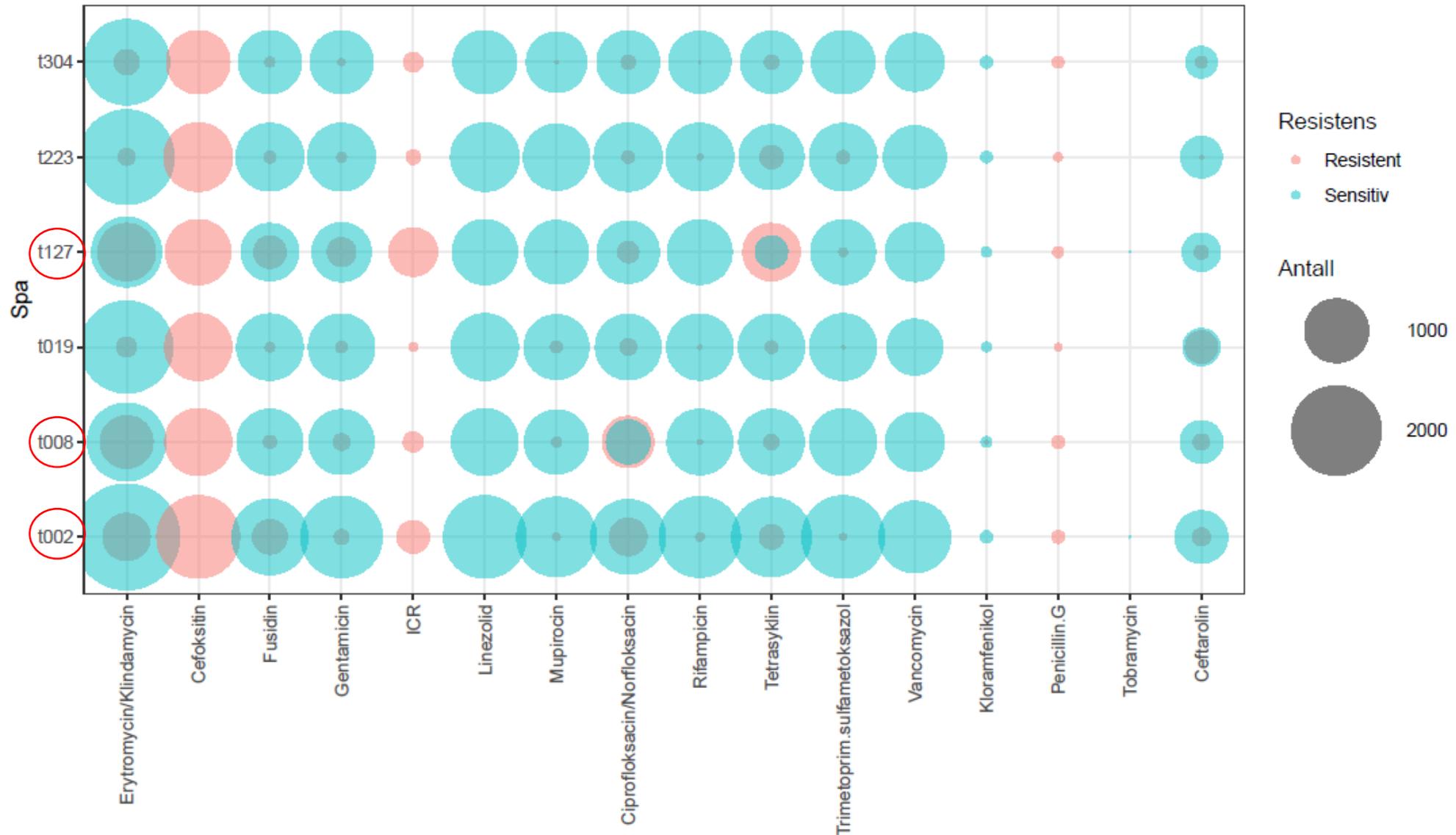
Resistens

- Resistent
- Sensitiv

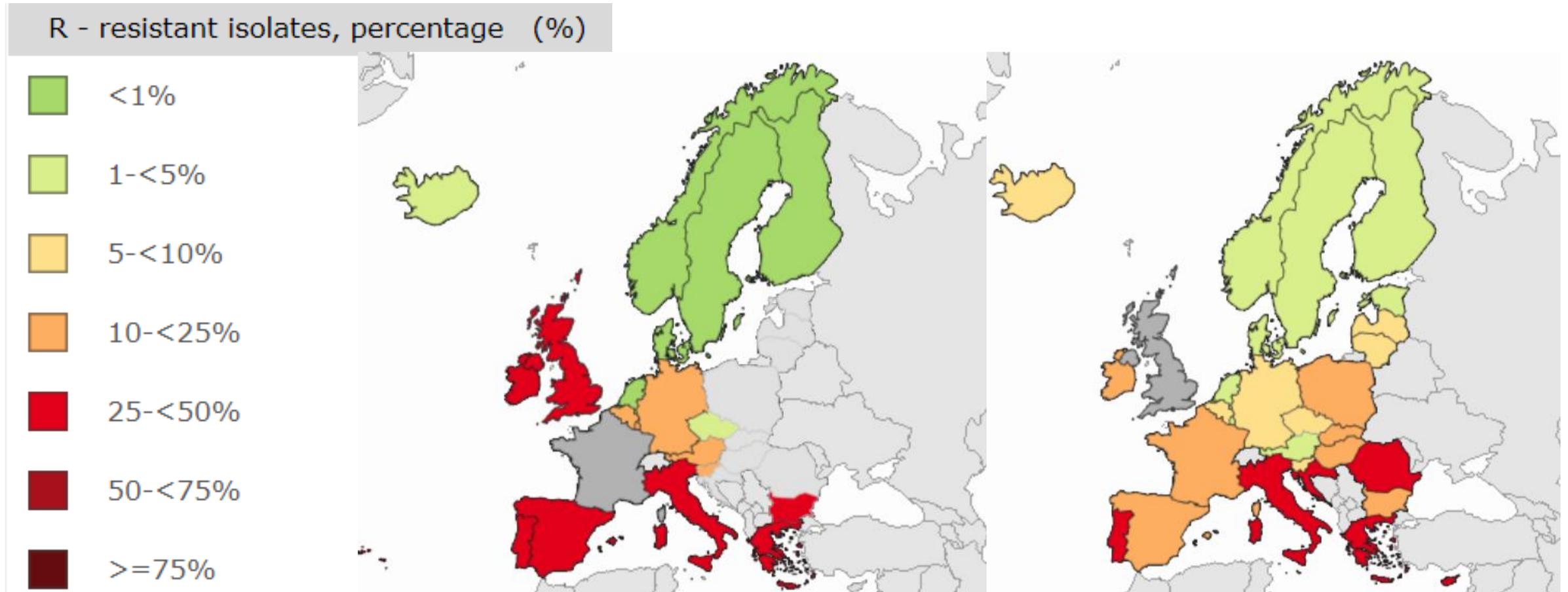
Antall

- 1000
- 2000
- 3000
- 4000

AMR in common MRSA spa types



Proportion of MRSA among Staphylococcus aureus blood stream infections 2000 - 2020





Thanks to...

- Anders Rhod Larsen (DK)
- Laura Lindholm (FI)
- Barbro Mätikalo (S)
- Stefan Börjesson (S)
- Kristján Orrí Helgason (IS)
- Gunnstein Ægir Haraldsson (IS)
- Hege Enger (NO)
- Kirsti Sandnes Sæbø (NO)
- Lene Christin Olsen (NO)



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- Australian Group on Antimicrobial Resistance (AGAR) Australian *Staphylococcus aureus* Sepsis Outcome Programme (ASSOP) Annual Report 2019 Geoffrey W Coombs, Denise A Daley, Shakeel Mowlaboccus and Stanley Pang, on behalf of the Australian Group on Antimicrobial Resistance
- Isaac See, Yi Mu, Valerie Albrecht, Maria Karlsson, Ghinwa Dumyati, Dwight J Hardy, Mackenzie Koeck, Ruth Lynfield, Joelle Nadle, Susan M Ray, William Schaffner, Alexander J Kallen, Trends in Incidence of Methicillin-resistant *Staphylococcus aureus* Bloodstream Infections Differ by Strain Type and Healthcare Exposure, United States, 2005–2013, *Clinical Infectious Diseases*, Volume 70, Issue 1, 1 January 2020, Pages 19–25, <https://doi.org/10.1093/cid/ciz158>

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- [MRSA - disease prevalence report 2020 \(ssi.dk\)](#)
- [Meticillinresistent gula stafylokocker \(MRSA\) – sjukdomsstatistik — Folkhälsomyndigheten \(folkhalsomyndigheten.se\)](#)
- [Swedres-Svarm reports – SVA](#)
- [Tartuntatautien esiintyvyyys Suomessa -raportit – THL](#)
- [Bakteerien mikrobilääkeresistenssi Suomessa : Finres 2020 \(julkari.fi\)](#)
- <https://www.landlaeknir.is/utgefid-efni/skjal/item47569/>
- <https://stolav.no/Laboratoriemedisin/Avdeling%20for%20medisinsk%20mikrobiologi/MRSA/%c3%85RSRAPPORT%20FOR%20NASJONALT%20REFERANSELABORATORIUM%20FOR%20MRSA%202021.pdf>