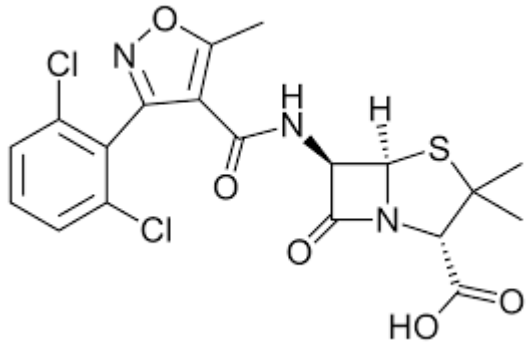
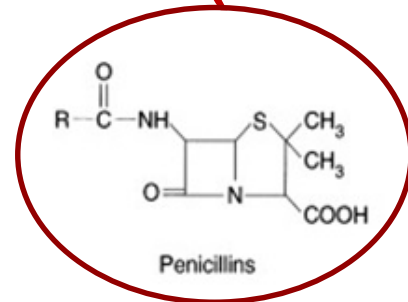


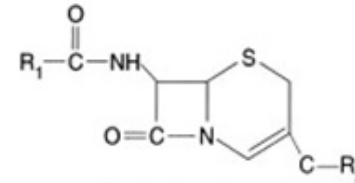
Carbapenemase Producing Organisms (CPO) In Dicillin (dicloxacillin) capsules



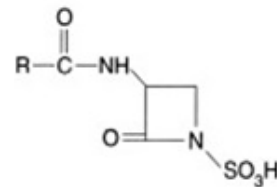
Dicloxacillin



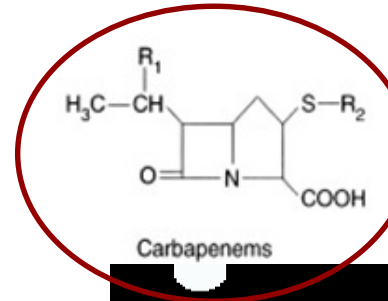
Penicillins



Cephalosporins



Monobactams



Carbapenems

Henrik Has
Senior scie
Statens Serum Institut





The national surveillance of CPO in Denmark

GÆLDENDE

BEK nr 1091 af 30/08/2018

ldreministeriet

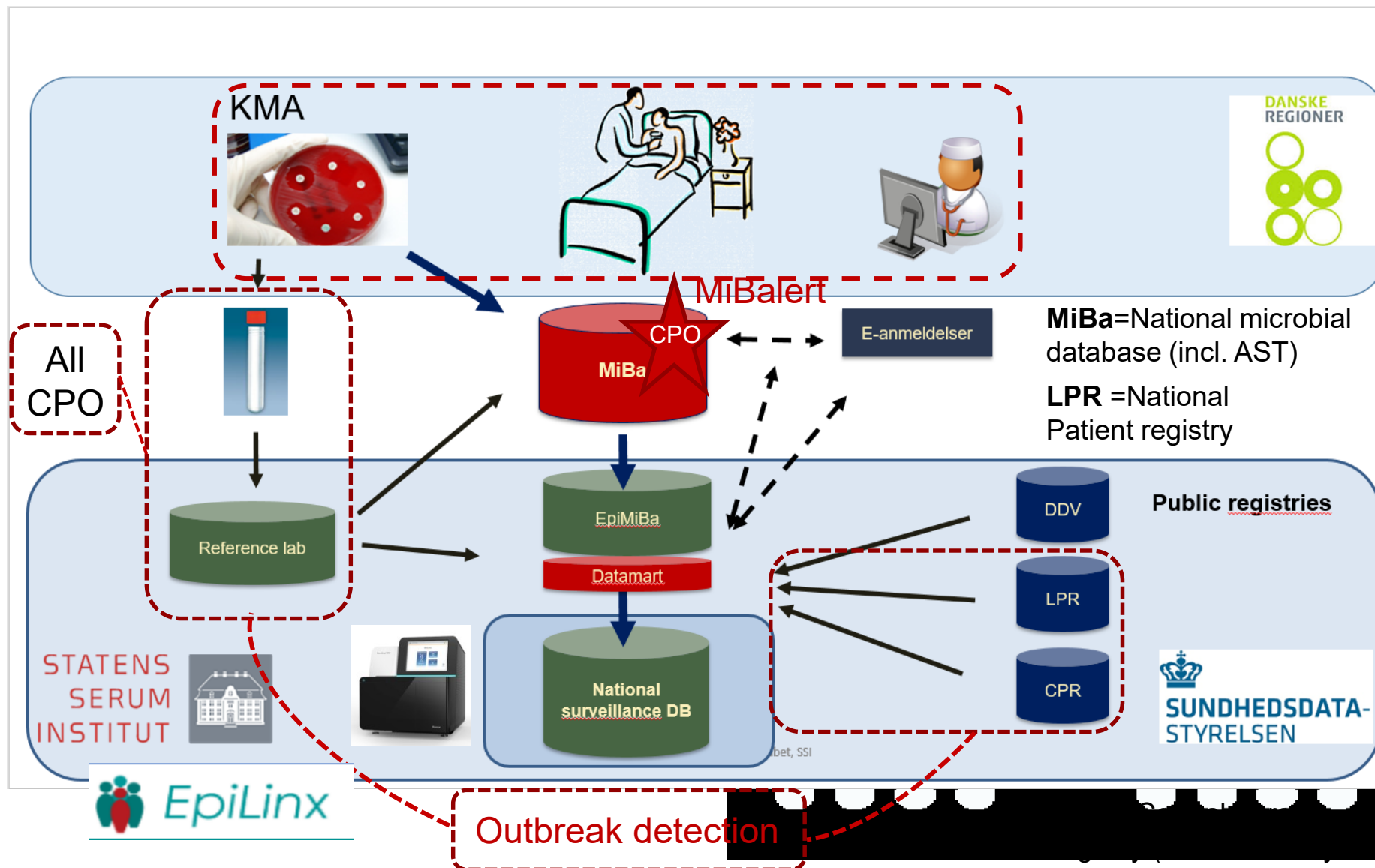
ysninger >

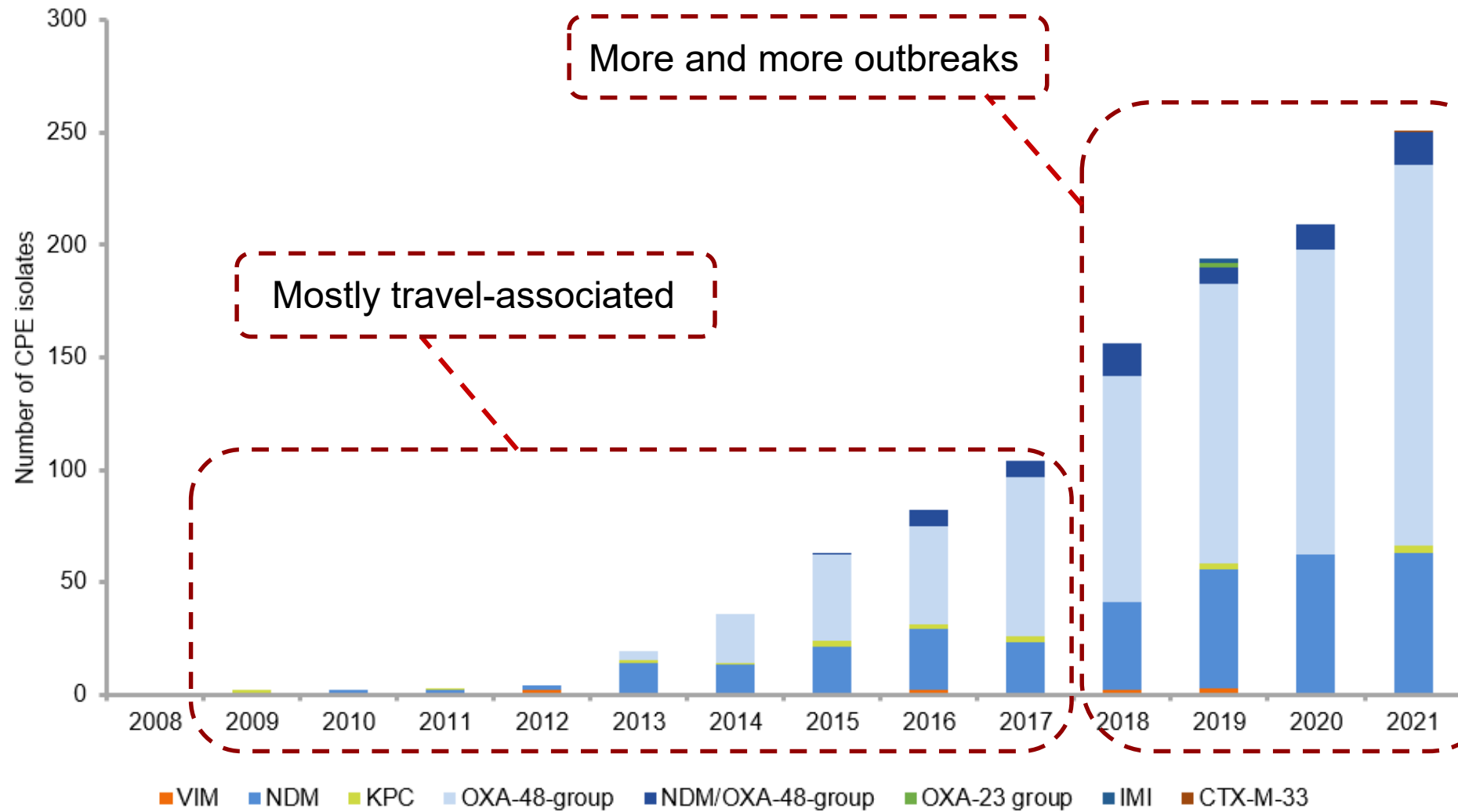
**Notifiable in Danish legislation
since September 2018**

...mælde af Carbapenemase-
...organismer (CPO) påvist hos personer

I medfør af § 26 i lov om foranstaltninger mod smitsomme sygdomme, jf. lovbekendtgørelse nr. 814 af 27. august 2009,







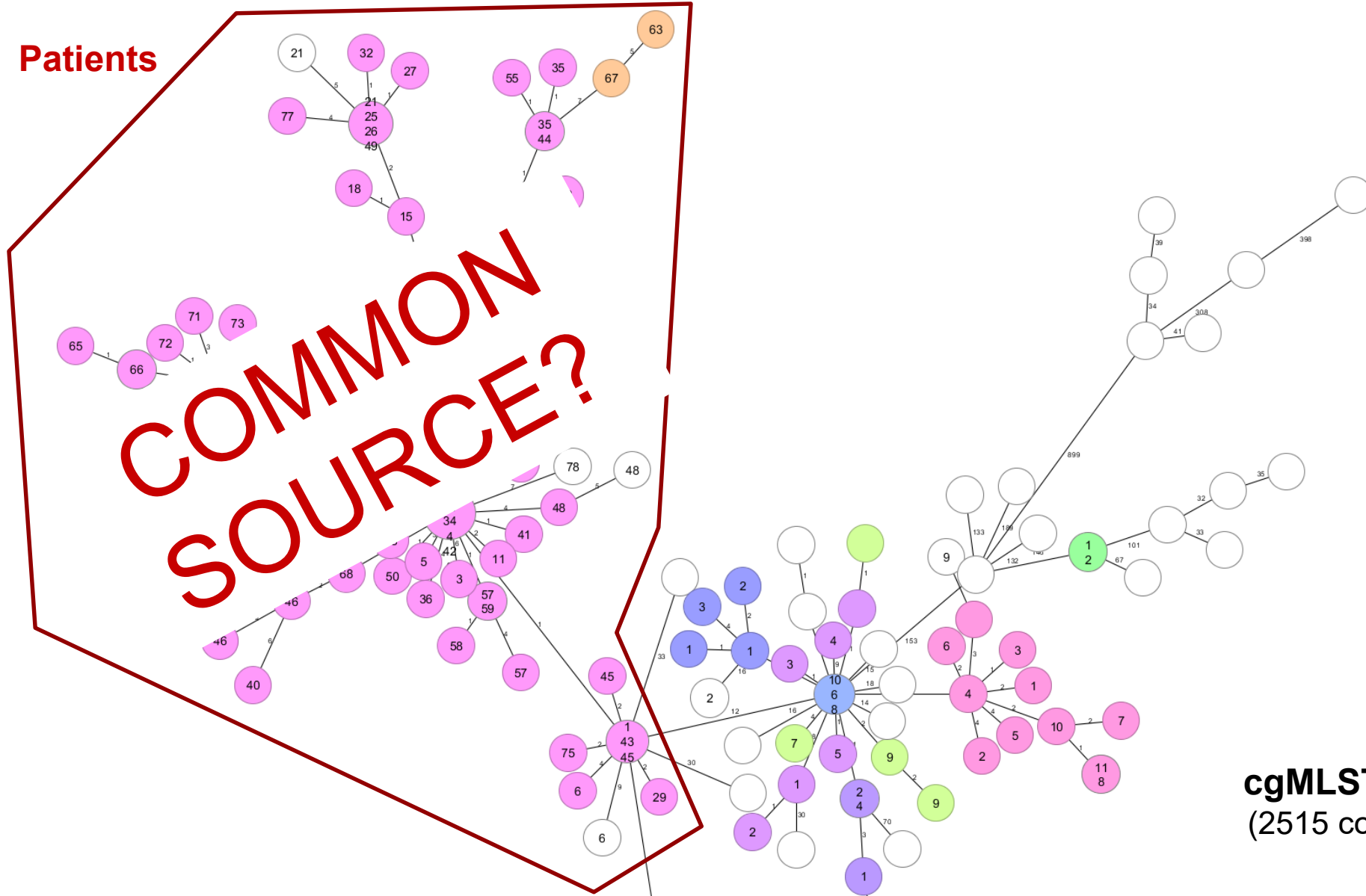
All isolates are submitted to WGS (Illumina) to detect genomic (clonal) clusters across departments, hospitals and regions.

cgMLST



CPO IN DENMARK – E. COLI ST410

Patients



cgMLST
(2515 core genes)

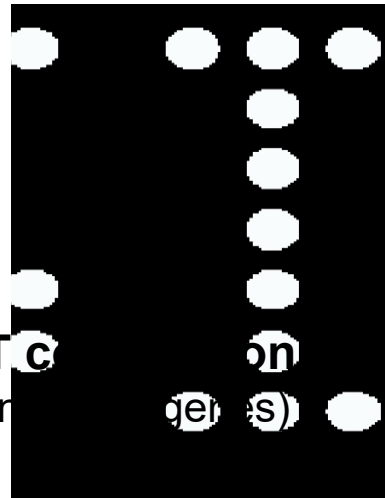
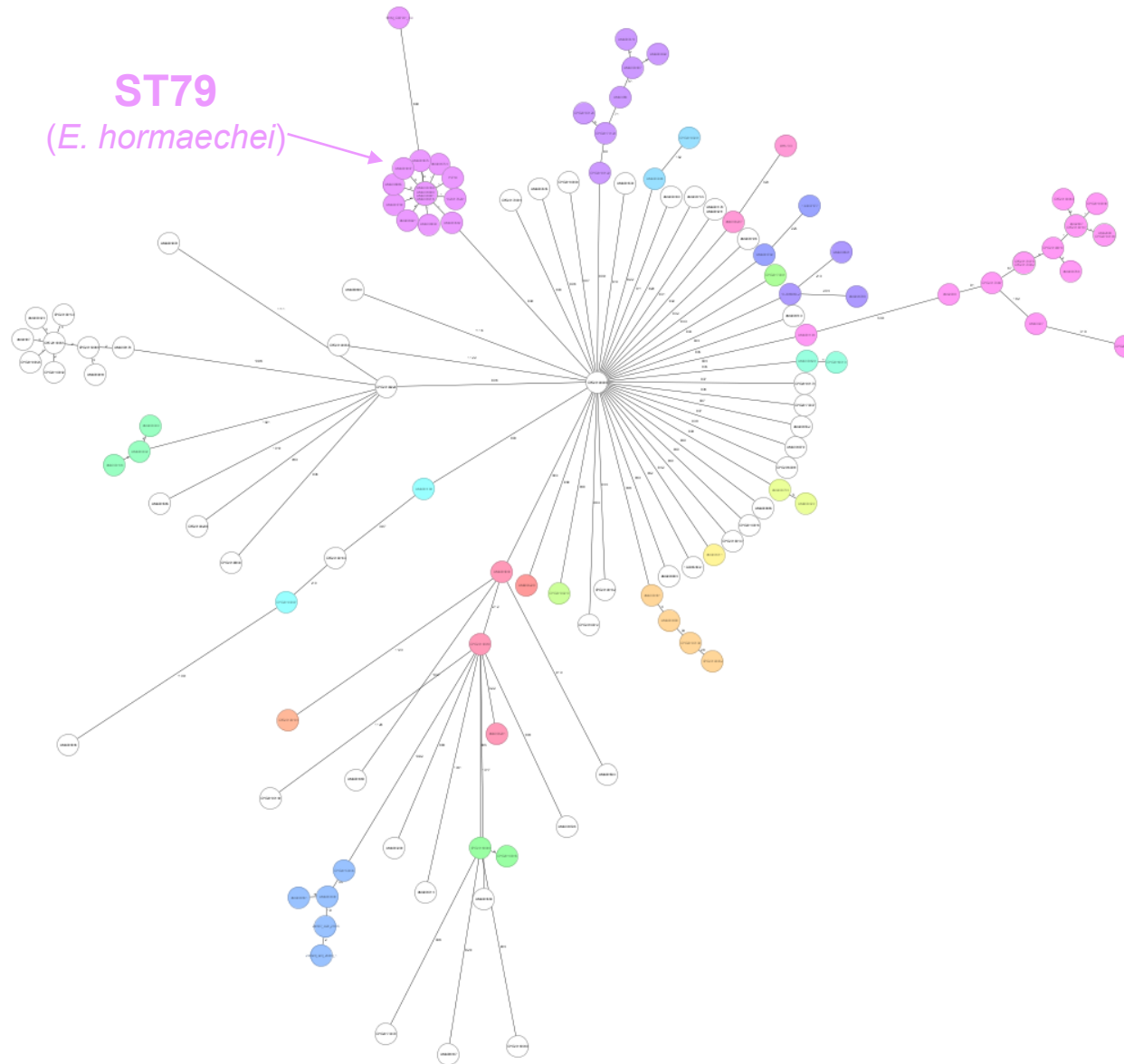


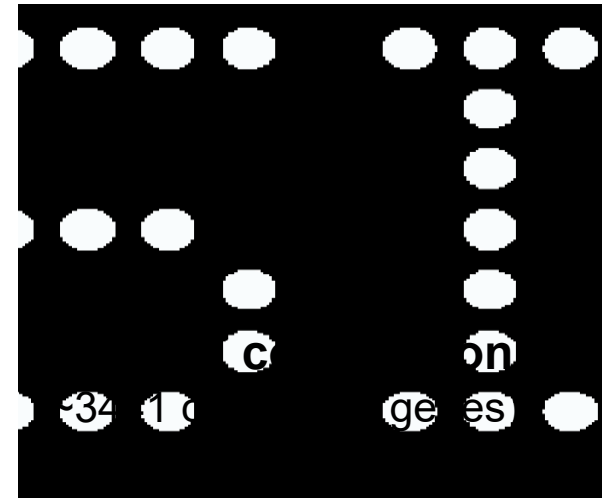
Table 8.11 Outbreaks of carbapenemase-producing Enterobacterales (CPE) and carbapenemase-producing organisms (CPO) during 2021, n=15, Denmark DANMAP 2021

Outbreak ID	Year	Patients total	Patients 2021	Carbapenemase	Type of Outbreak	Species (clonal spread)	Regions	Status
Outbreaks of carbapenemase-producing Enterobacterales (CPE)								
41	2012-2021	73	21	NDM-1	Clonal/plasmid	ST18 <i>C. freundii</i>	Capital Region/Central Denmark Region/North Denmark Region/Southern Denmark Region	Verified
48	2013-2021	30	7	OXA-436/OXA-48	Clonal/plasmid	ST90 <i>E. cloacae</i> / ST22 <i>C. freundii</i>	Capital Region/Southern Denmark Region/Zeland Region	Verified
21	2015-2021	72	12	NDM-5/OXA-181	Clonal	ST410 <i>E. coli</i>	Capital Region/Central Denmark Region/Zeland Region	Verified
22	2015-2021	10	4	OXA-181	Clonal	ST440 <i>E. coli</i>	Capital Region/Central Denmark Region	Possible
42	2015-2021	12	3	OXA-48	Clonal	ST65 <i>C. freundii</i>	Capital Region/North Denmark Region/Zeland Region	Verified
33	2016-2021	25	2	OXA-232	Clonal	ST231 <i>K. pneumoniae</i>	Central Denmark Region	Verified
1061	2020-2021	6	3	OXA-181	Clonal	ST22 <i>C. freundii</i>	Central Denmark Region	Possible
1068	2020-2021	9	7	OXA-48	Clonal	ST18 <i>C. freundii</i>	Capital Region	Verified
1052*	2020-2021	3	2	NDM-1	Clonal	ST18 <i>C. freundii</i>	Central Denmark Region	Possible
1070*	2017-2021	6	3	OXA-48	Clonal	<i>C. farmeri</i>	Zeland Region	Verified
1075*	2021	2	2	NDM-1/OXA-48	Clonal	ST23 <i>K. pneumoniae</i>	Capital Region	Verified
1076*	2021	2	2	OXA-48	Clonal	ST233 <i>K. aerogenes</i>	Zeland Region	Verified
Outbreaks of carbapenemase-producing organisms (CPO)								
1058	2020-2021	13	2	OXA-23	Clonal	ST195 <i>A. baumannii</i>	Capital Region	Verified
1067	2020-2021	6	4	OXA-23	Clonal	ST195, ST1816 <i>A. baumannii</i>	South Denmark Region	Verified
1074*	2021	3	3	OXA-72	Clonal	ST1757 <i>A. baumannii</i>	Capital Region	Verified

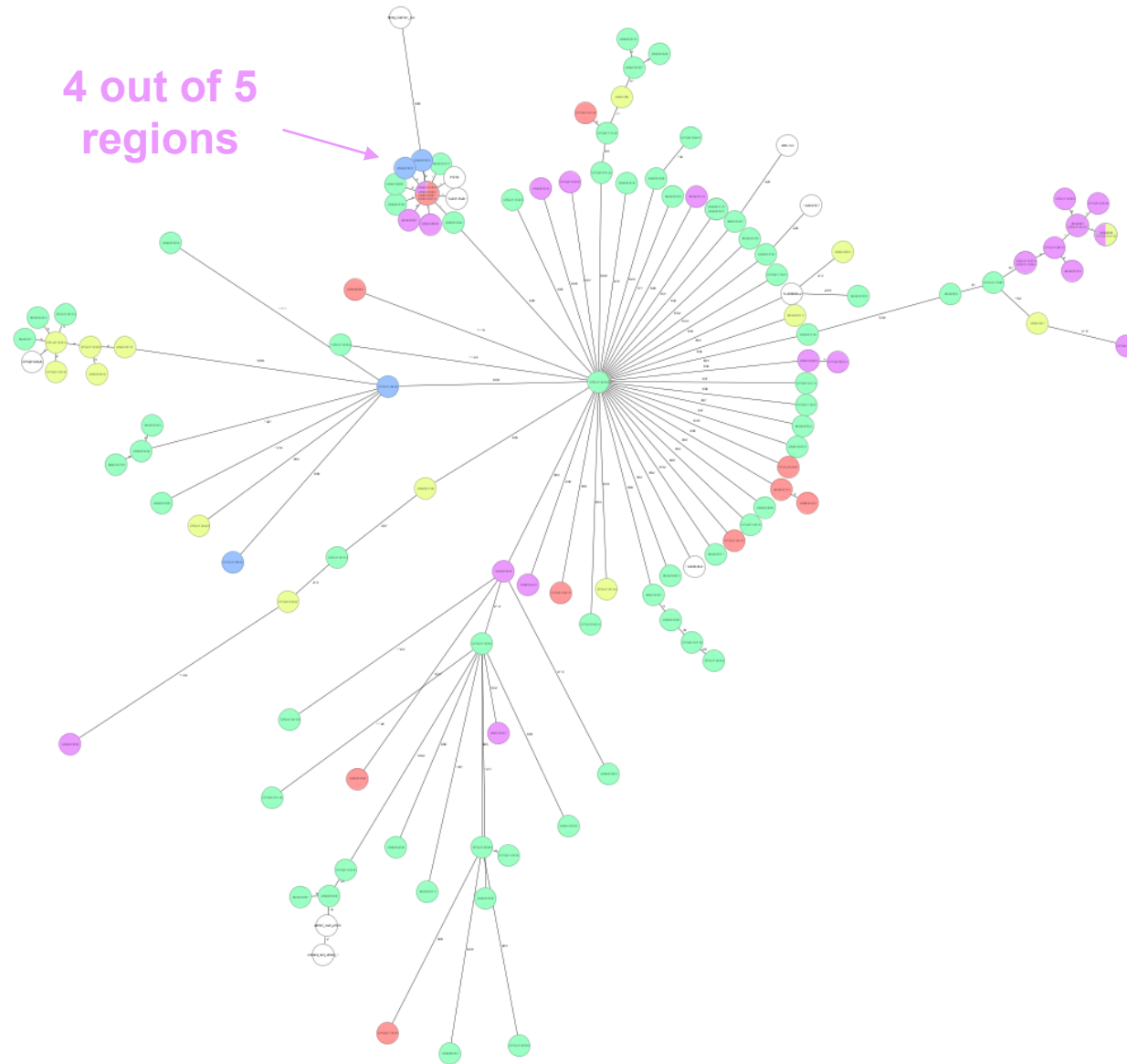
ENTEROBACTER CLOACAE COMPLEX



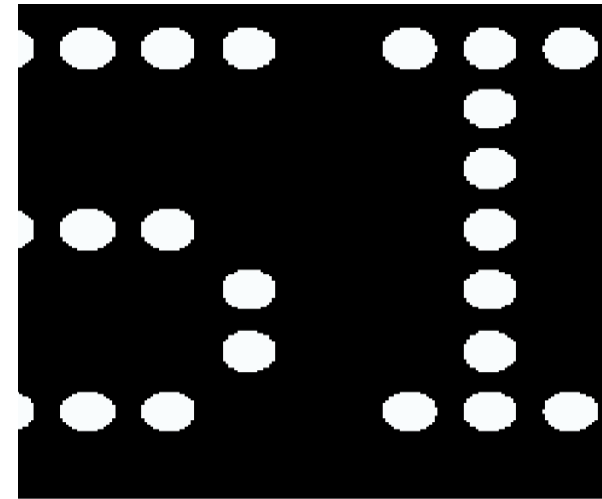
Color's indicate
Sequence Type



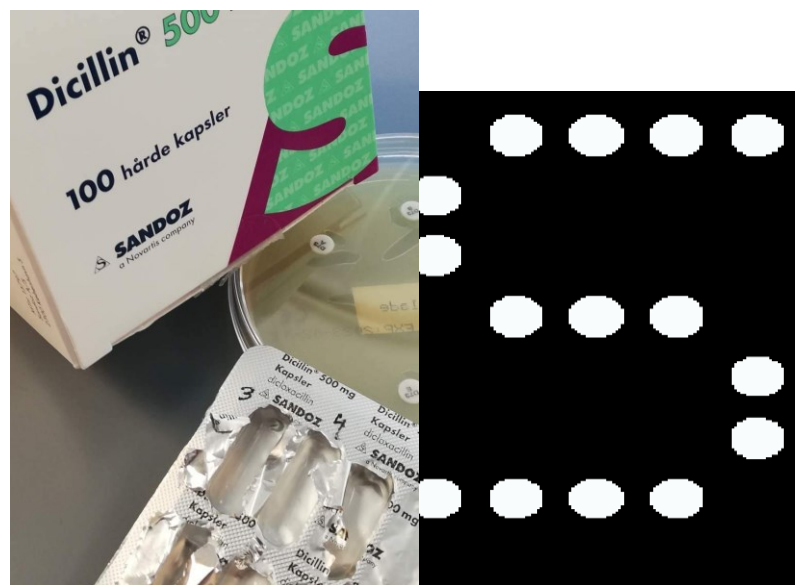
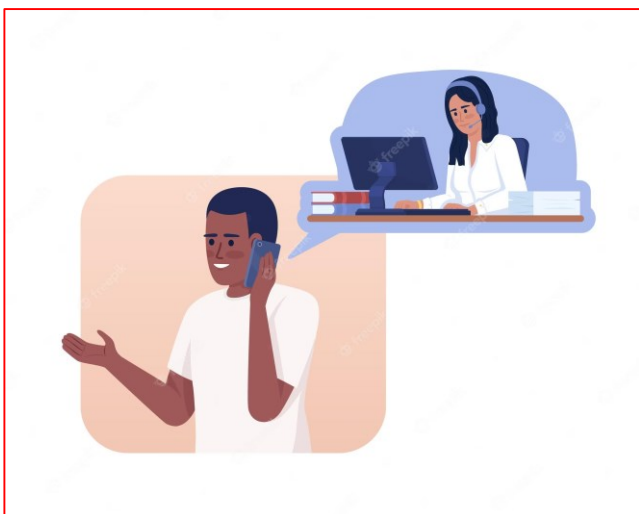
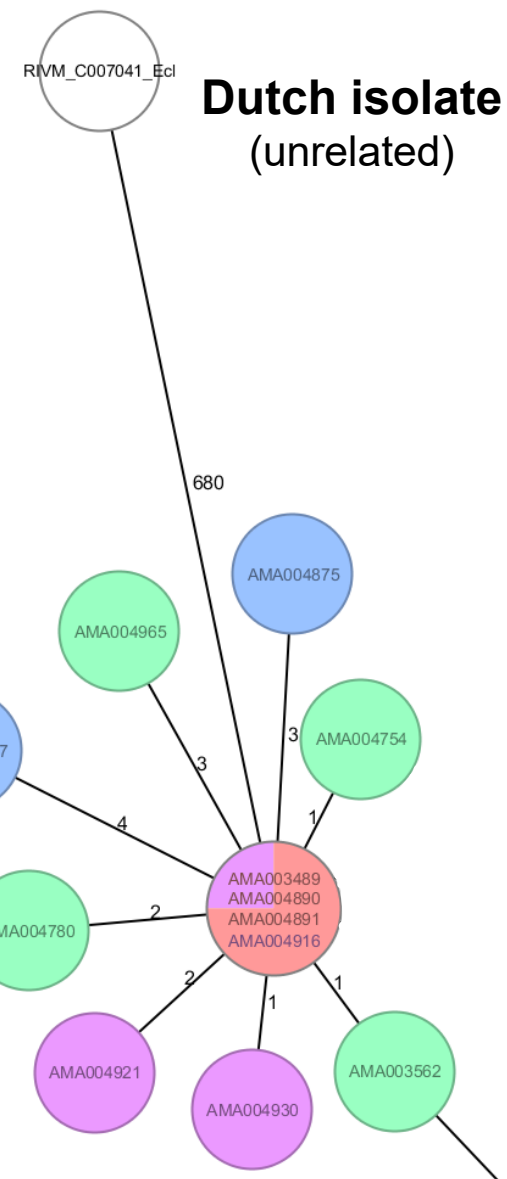
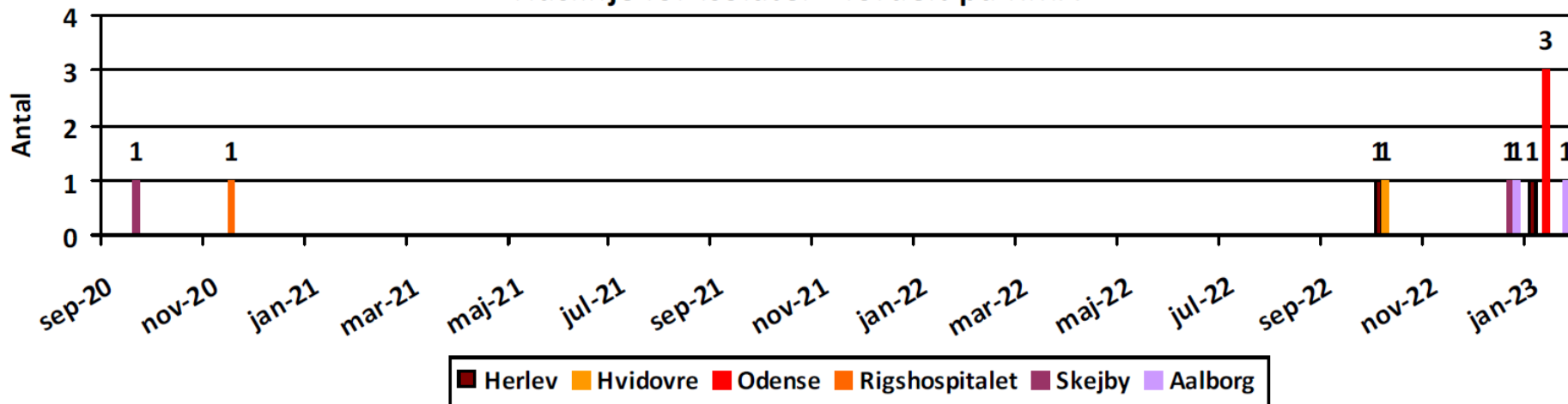
ENTEROBACTER CLOACAE COMPLEX

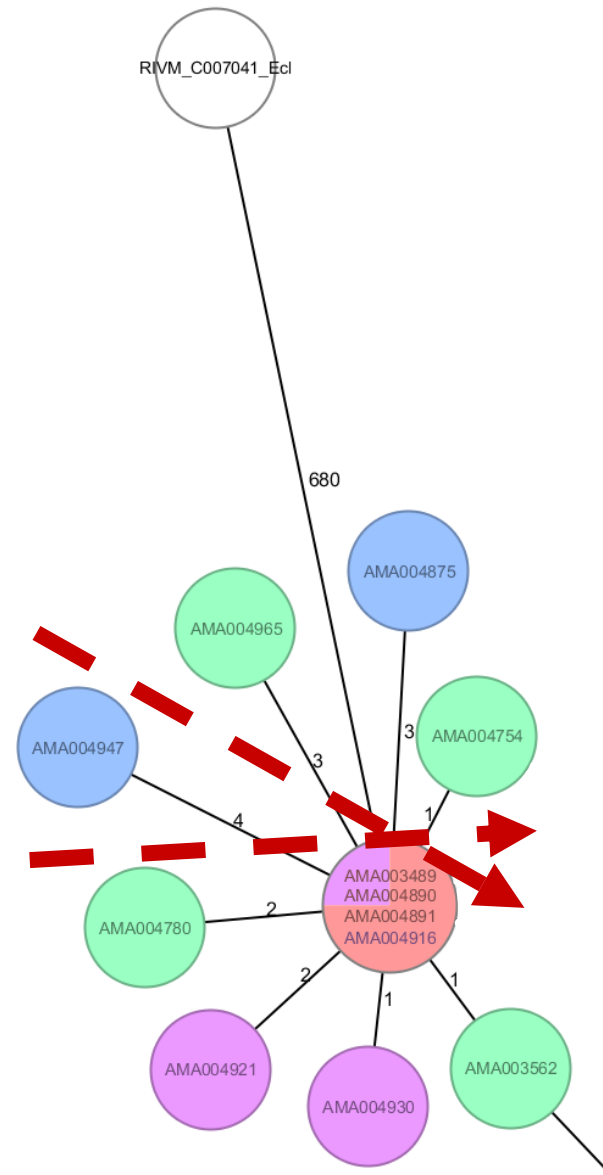
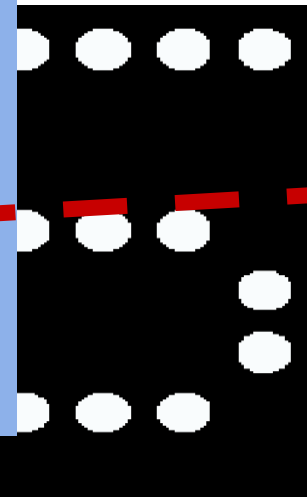
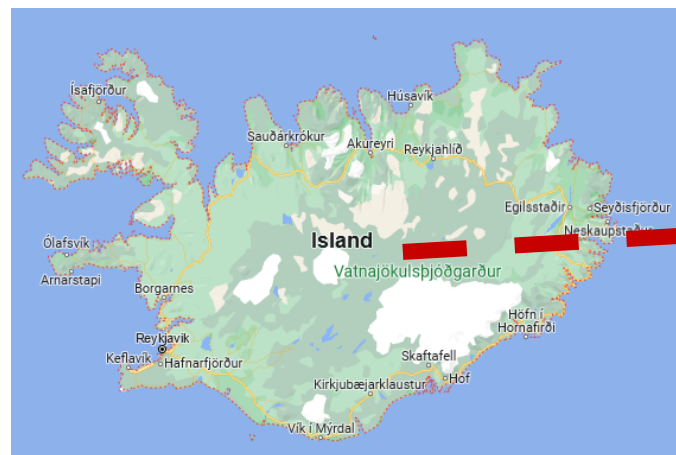
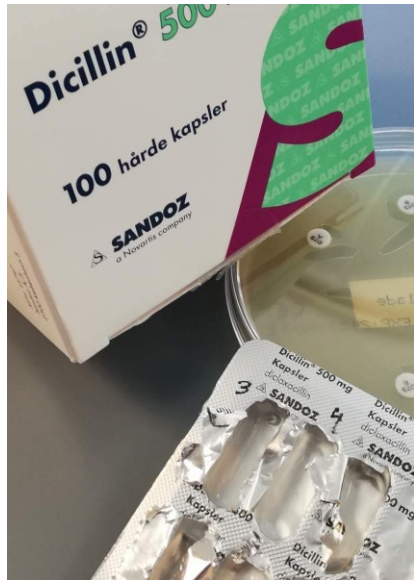


Color's indicate
Danish Region



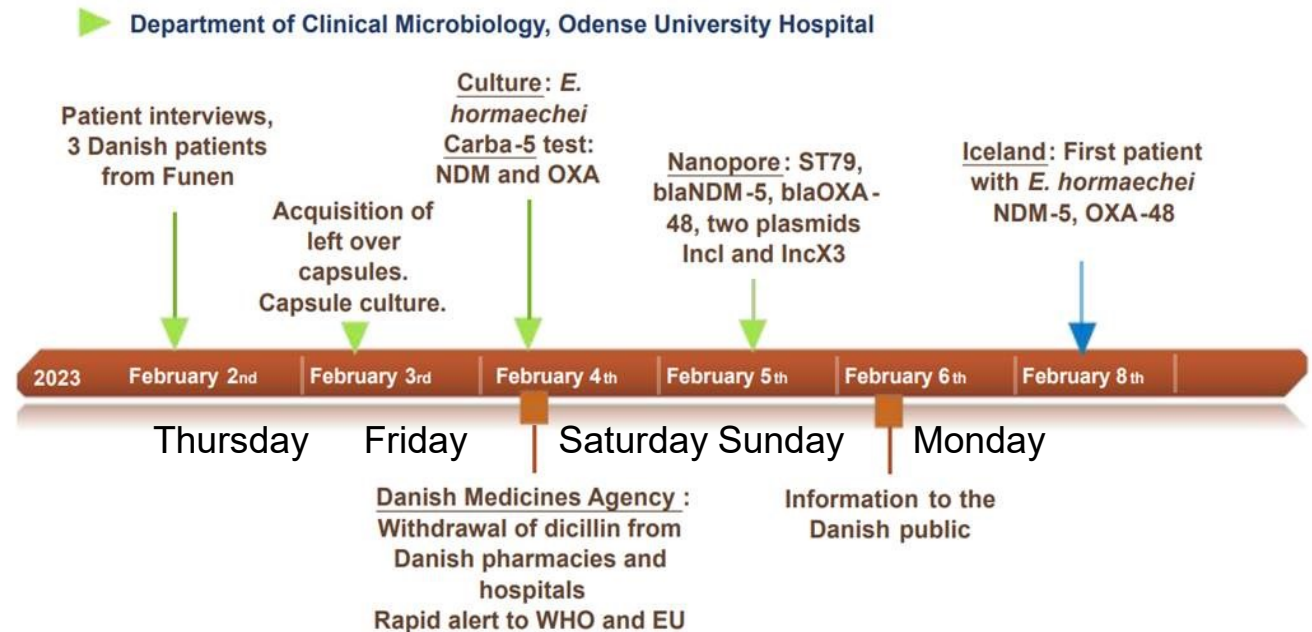
Tidslinje for isolater - fordelt på KMA





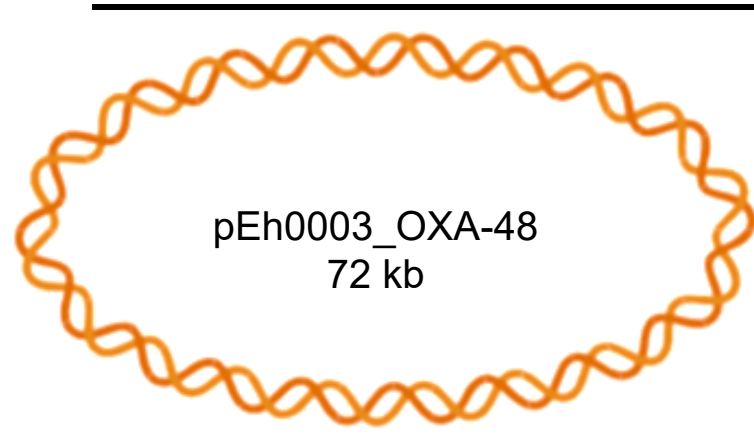
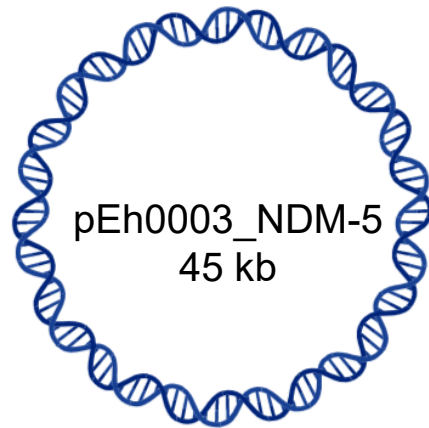
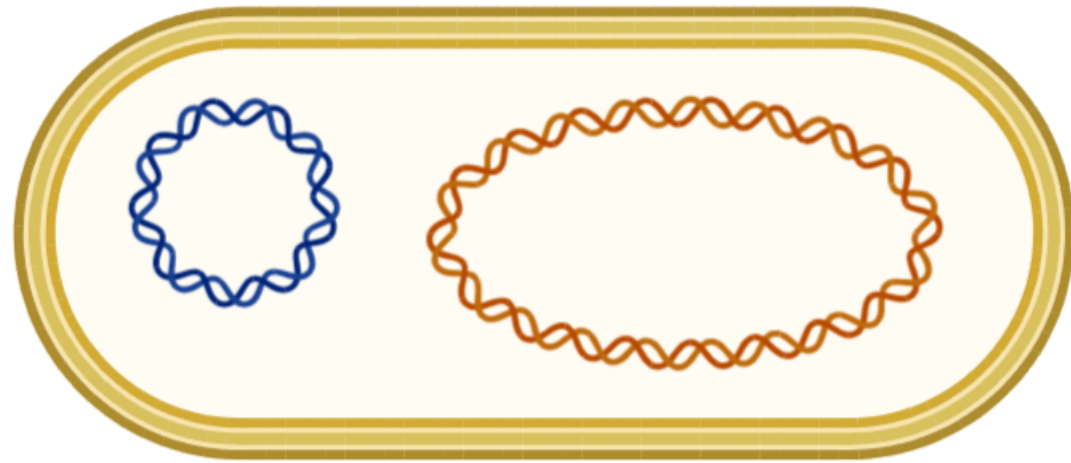
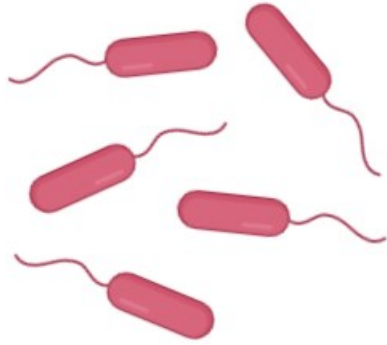
DICILLIN STORY - TIMELINE

- January 11. Patient 1 (OUH*)
- January 16. Patient 2 (OUH)
- January 19. Patient 3 (OUH)
- January 23. SSI informs OUH about cluster
- January 24. OUH starts local investigations
- January 24. SSI makes inquiries to other NHIs
- January 31. OUH starts interviews with patients

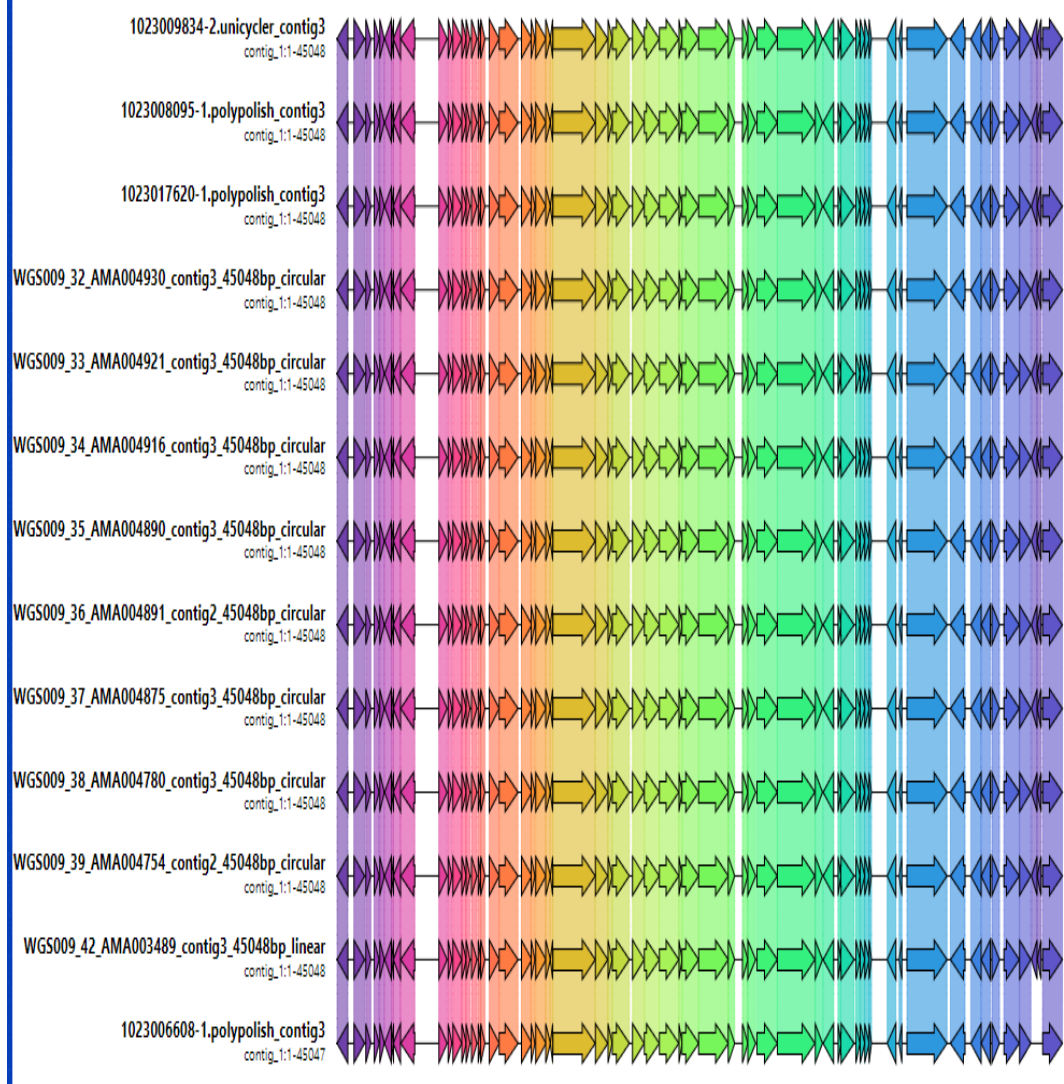


*OUH = Odense University Hospital

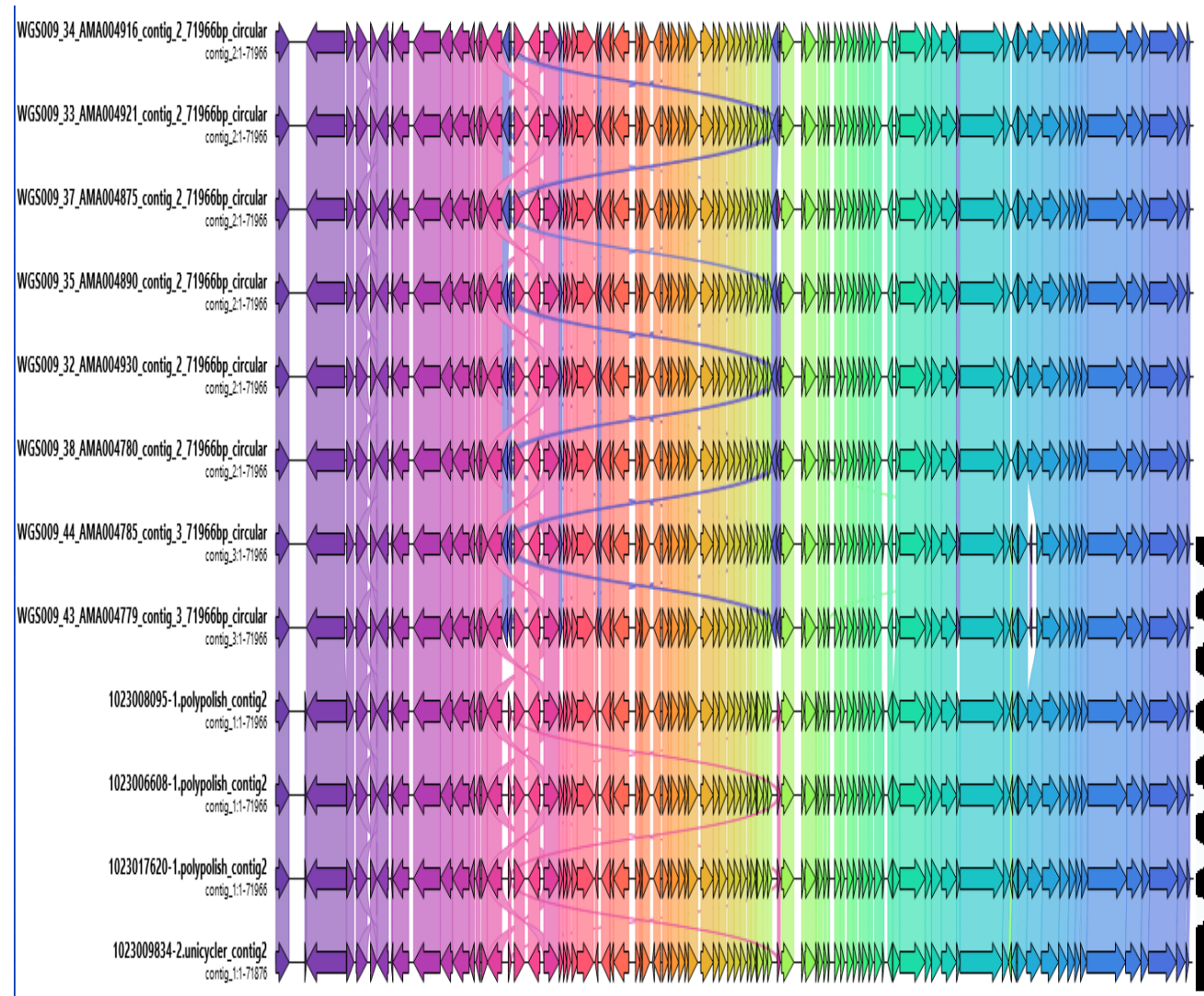
PLASMID SEQUENCING



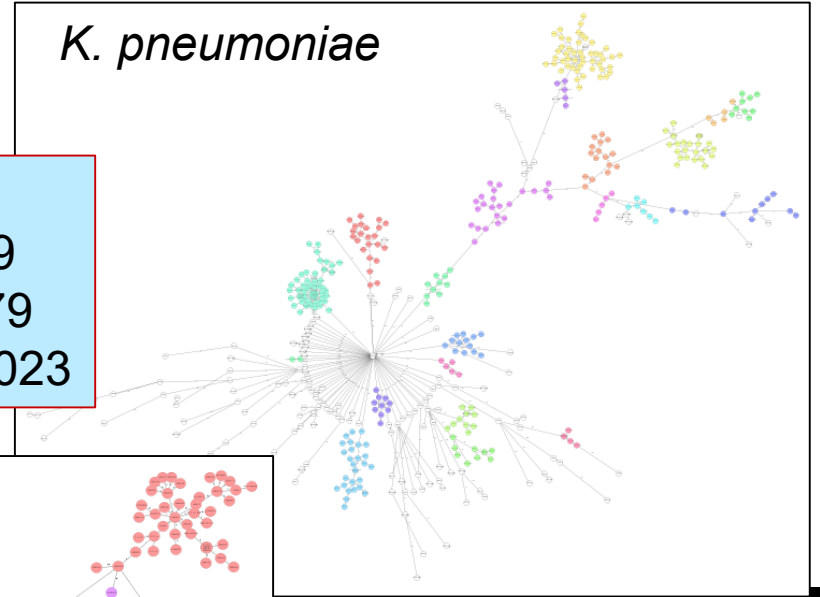
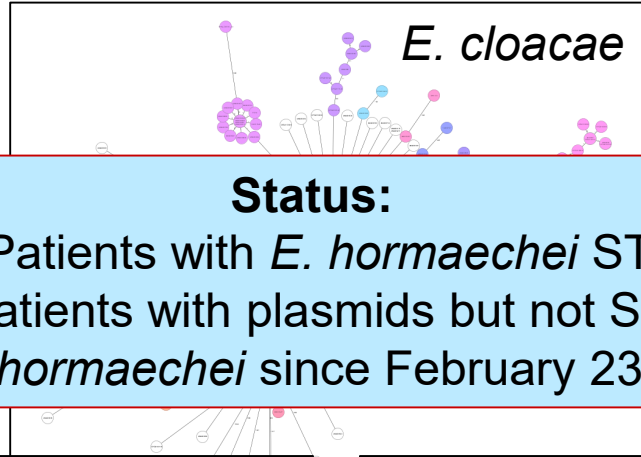
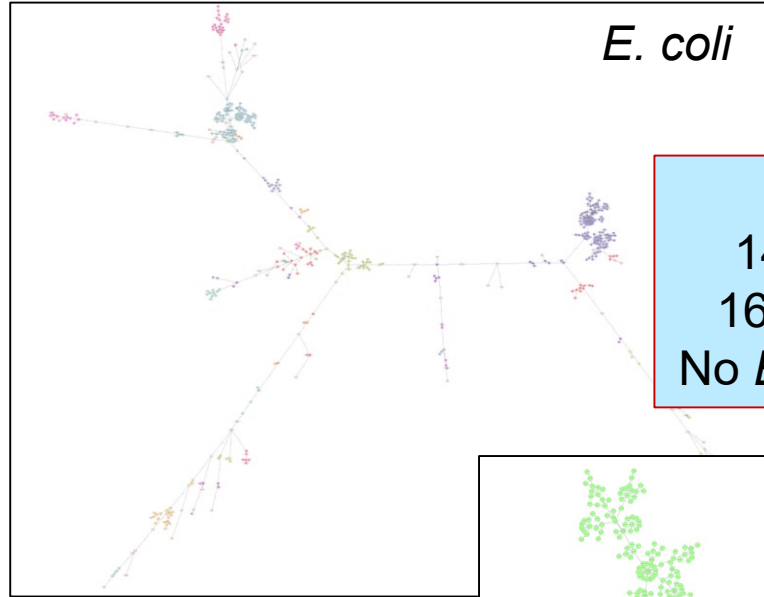
pEh0003_NDM-5



pEh0003_OXA-48



HORIZONTAL TRANSMISSION TO OTHER SPECIES??



Status:
14 Patients with *E. hormaechei* ST79
16 patients with plasmids but not ST79
No *E. hormaechei* since February 23.2023

