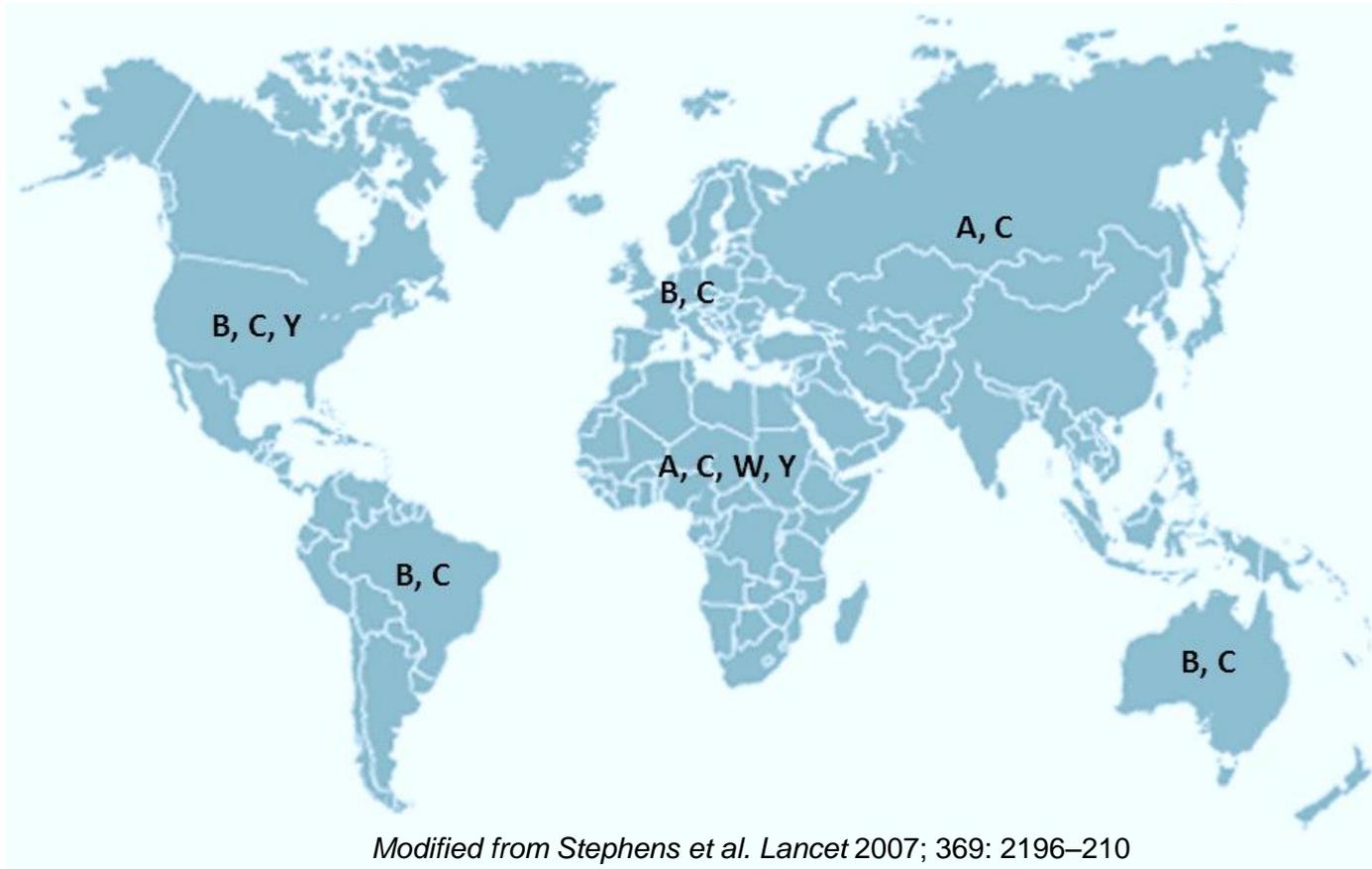


Serogroup Y

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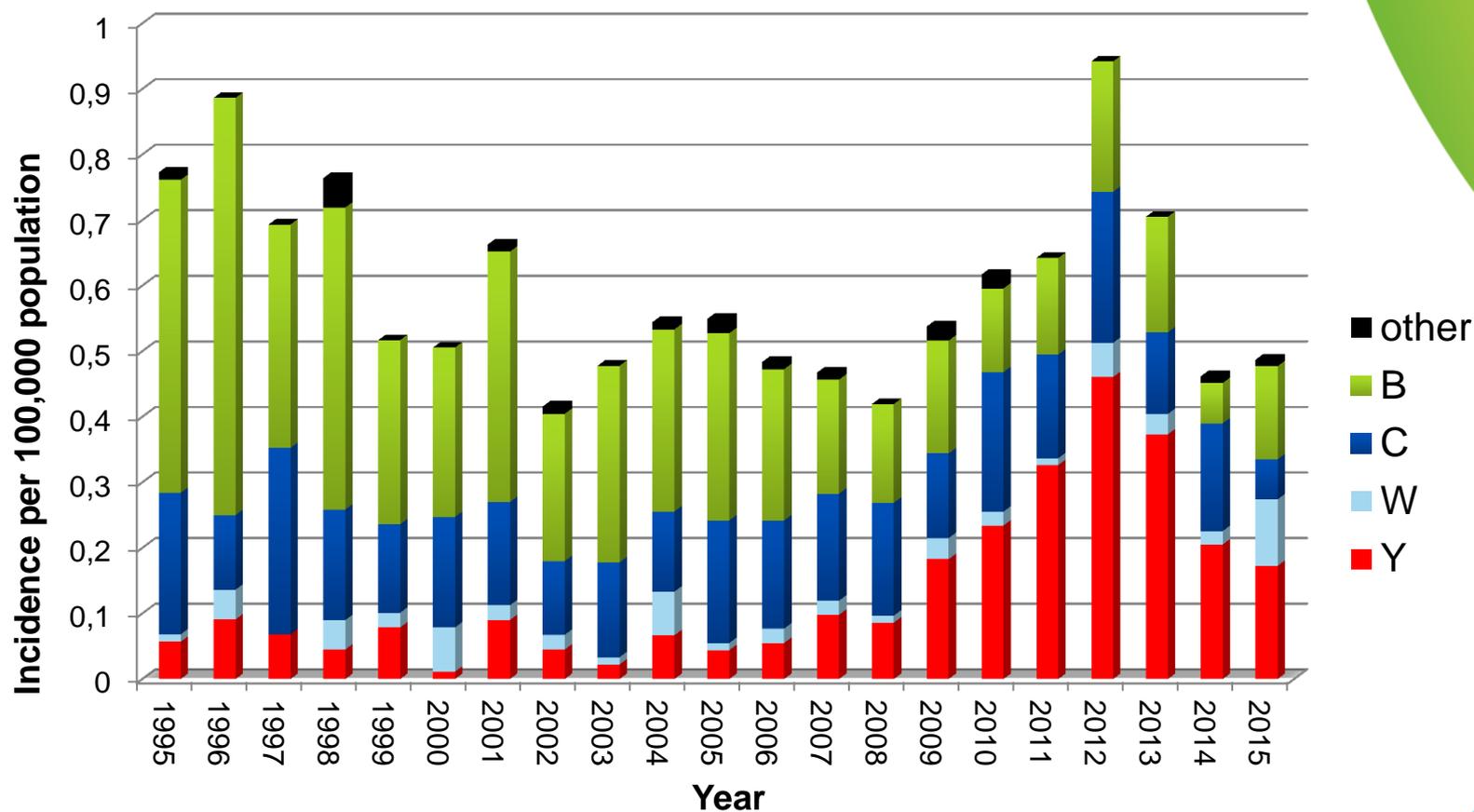
Meningococcal serogroup distribution, 2007



MenY United States

- Increase of MenY during mid-1990s
- ST-23 complex serogroup Y IMD in Maryland was associated with antigenic shift in PorA, FetA and PorB
- Strain that predominated in the early 1990s replaced by another ST-23 complex strain that emerged later in the same decade through clonal replacement
- Differences were found in predicted proteins that affect antigen profile, pilin structure and iron acquisition/uptake (Krauland et al.)

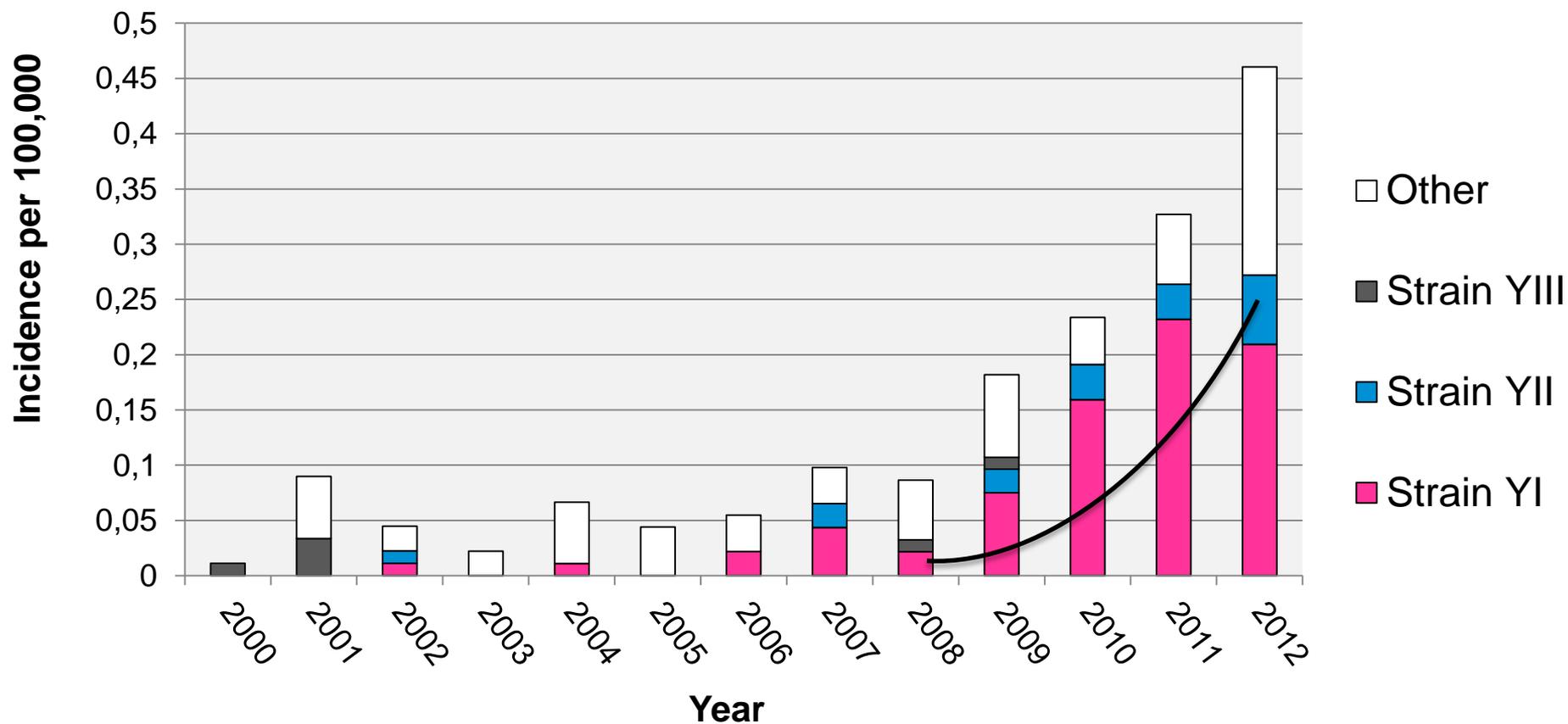
Incidence of IMD, Sweden



Age MenY

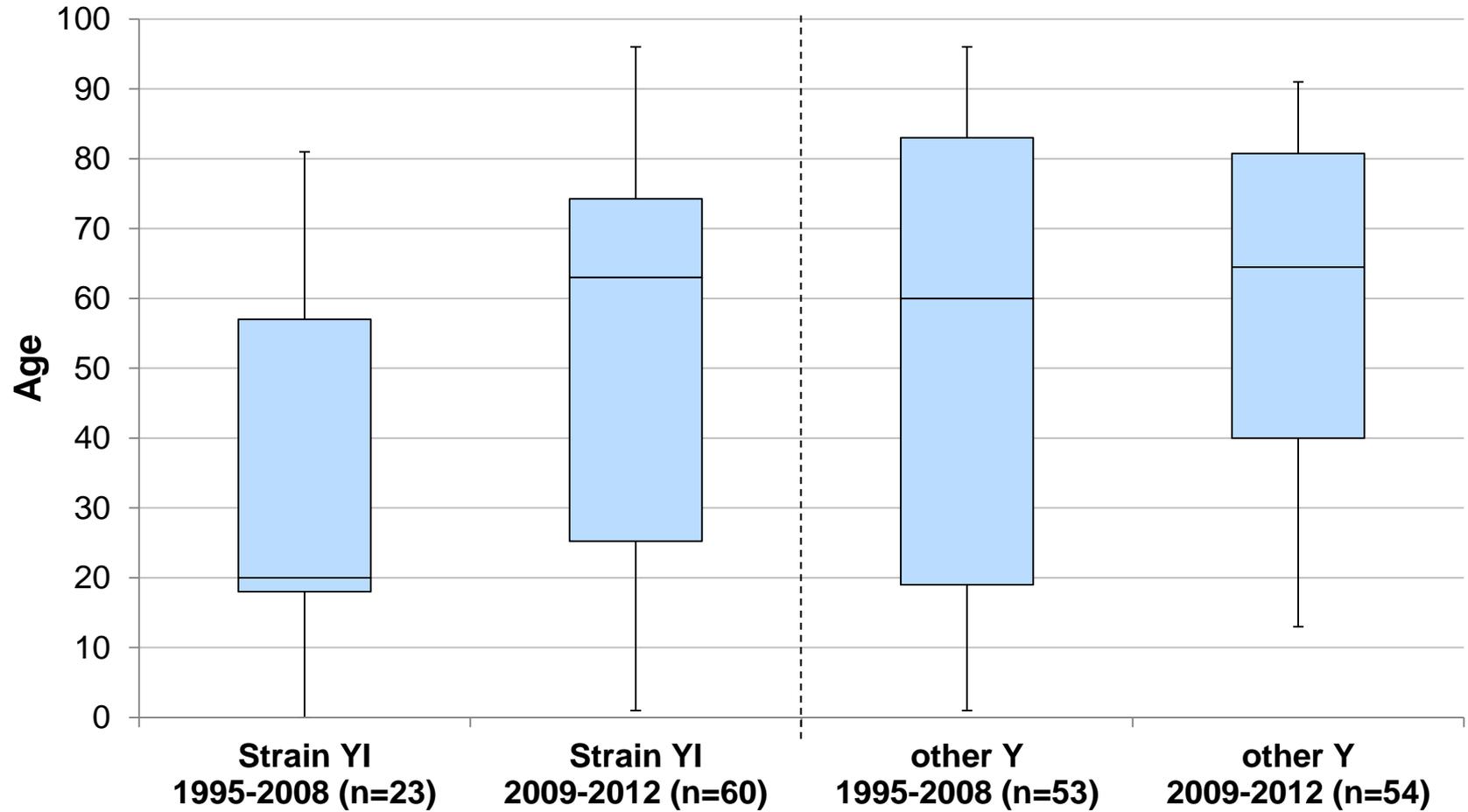


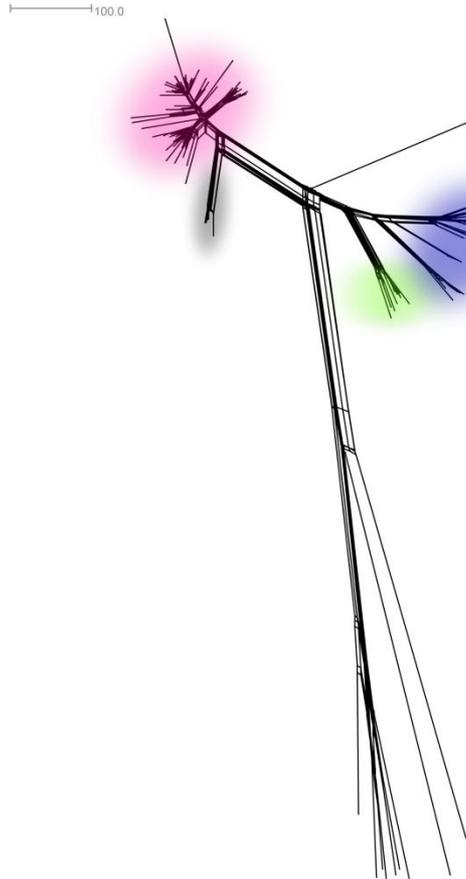
Swedish MenY strains



Strain	Prevalent in	Frequency %		PorA VR1, VR2, VR3	FetA	ST(cc)	'porB	fHbp	penA
		in Sweden	in England, Wales and Northern Ireland						
YI	Sweden	45	2.1	P1.5-2,10-1,36-2	F4-1	ST-23 (cc23)	3-36	25	22
YII	Sweden	9.7	2.1	P1.5-1,2-2,36-2	F5-8	ST-23 (cc23)	2-55	25	22
YIII	Sweden	3.8	4.2	P1.5-1,2-2,36-2	F5-8	ST-23 (cc23)	3-36	25	1
-	England, Wales and Northern Ireland	0.5	36	P1.5-1,10-1,36-2	F4-1	ST-1655 (cc23)	3-117	25	22
-	England, Wales and Northern Ireland	0.5	4.9	P1.5-1,10-4,36-2	F4-1	ST-1655 (cc23)	3-36	25	22
NM220	USA	9.7	2.1	P1.5-1,2-2,36-2	F5-8	ST-23 (cc23)	2-55	25	22
NM233	USA	0	0	P1.5-2,10-1,36-2	F4-1	ST-1621 (cc23)	3-36	25	22

Törös B, Hedberg ST, Unemo M, Jacobsson S, Hill DM, Olcén P, Fredlund H, Bratcher HB, Jolley KA, Maiden MC, Mölling P. Genome-Based Characterization of Emergent Invasive *Neisseria meningitidis* Serogroup Y Isolates in Sweden from 1995 to 2012. *J Clin Microbiol* 53: 2154-2162.





Sweden 1995-2012
(n=185)

Strain YI

P1.5-2,10-1; F4-1; ST-23 (cc23);
3-36; 25; 22

Strain YII

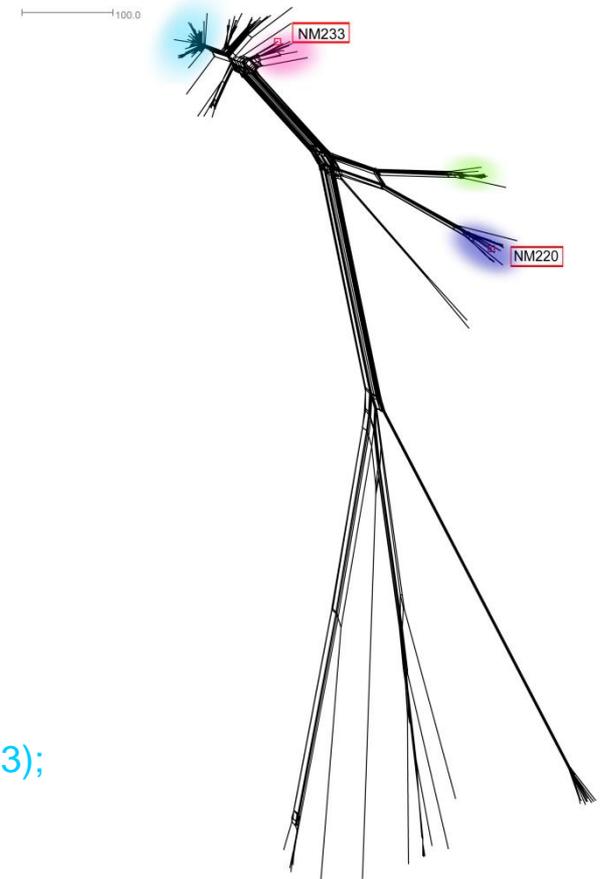
P1.5-1,2-2; F5-8; ST-23 (cc23);
2-55; 25; 22

Strain YIII

P1.5-1,2-2; F5-8; ST-23 (cc23);
3-36; 25; 1

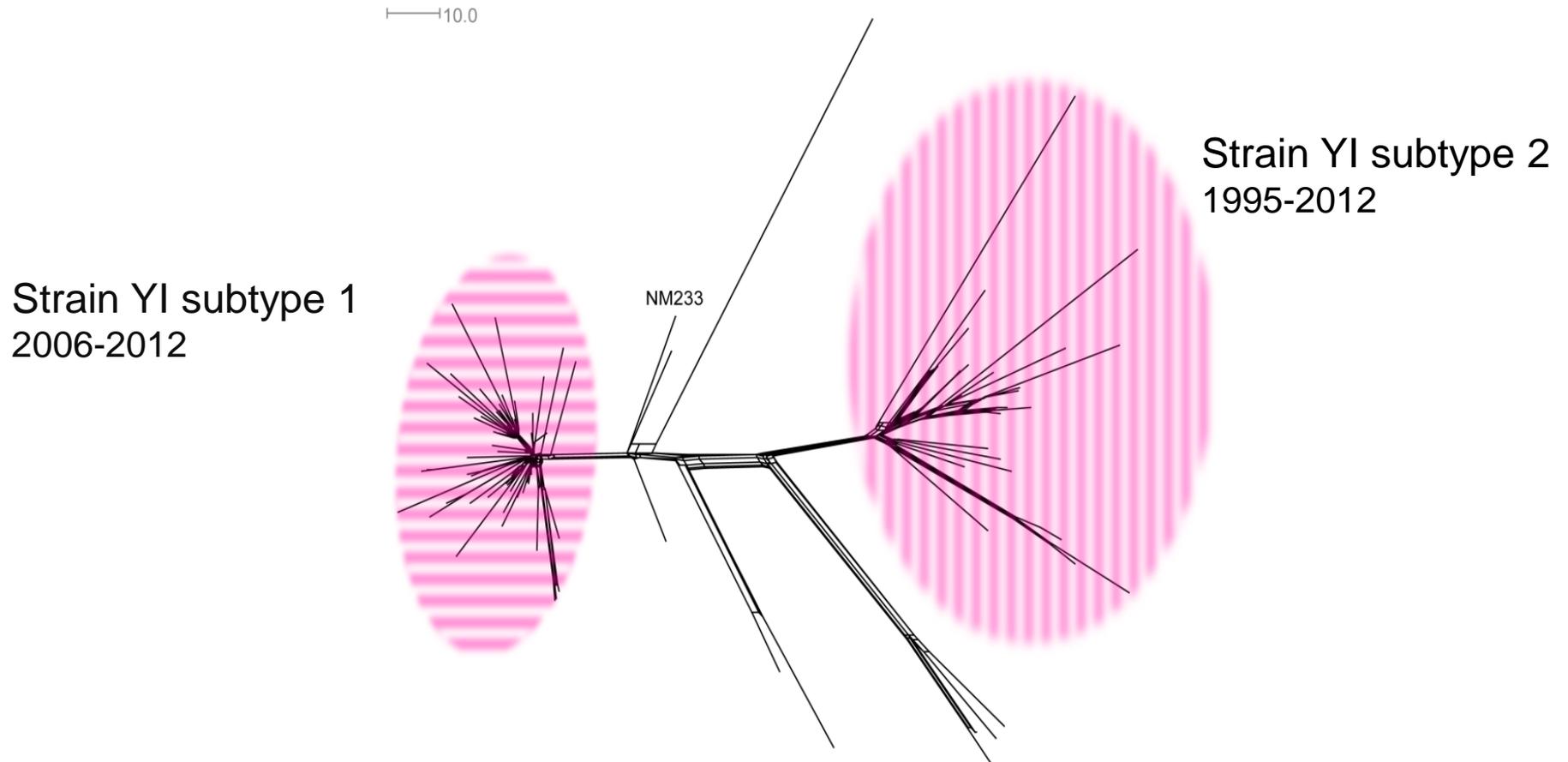
UK dominating strain

P1.5-1,10-1; F4-1; ST-1655 (cc23);
3-117; 25; 22

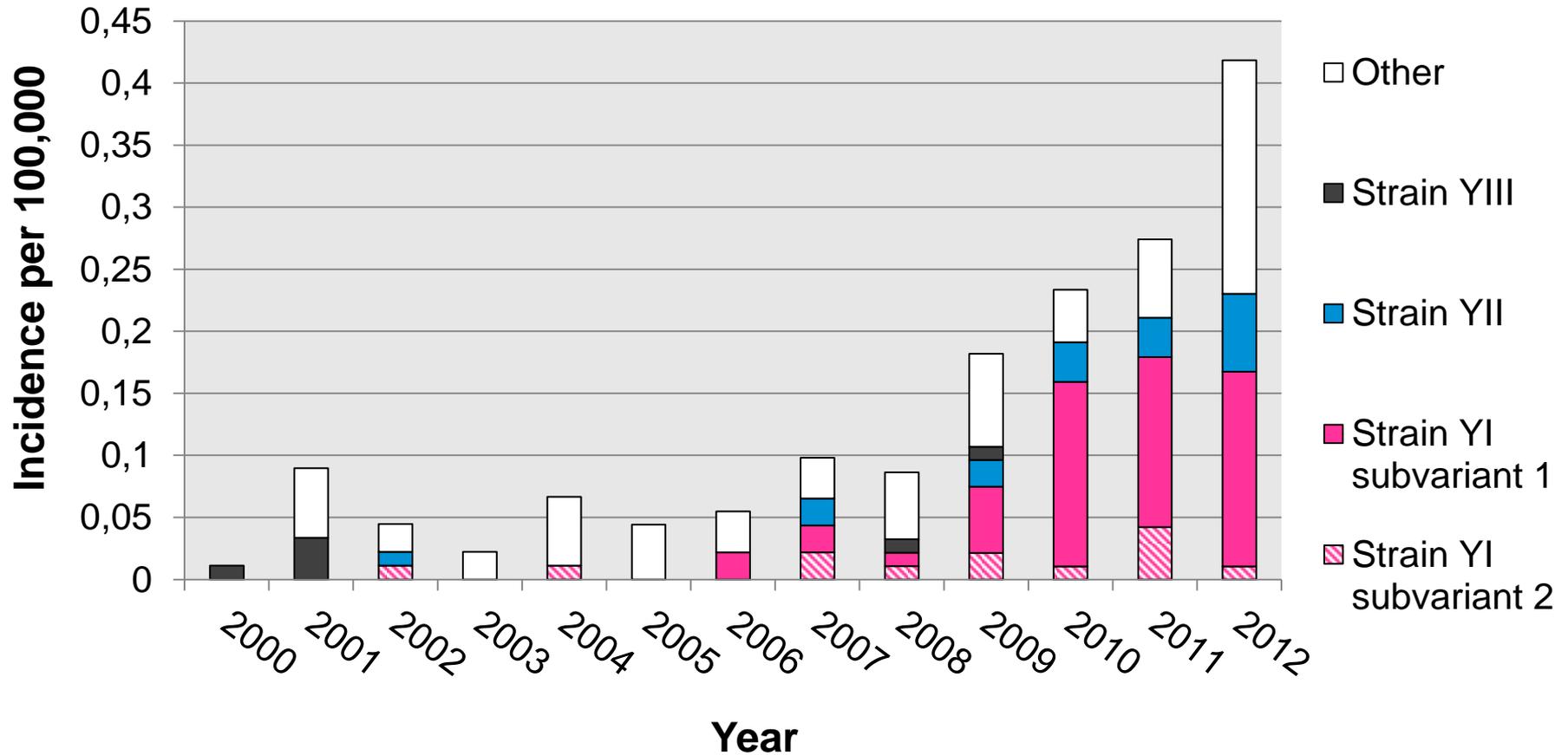


US 1999 (n=2)
England, Wales and NI
2010-12 (n=143)

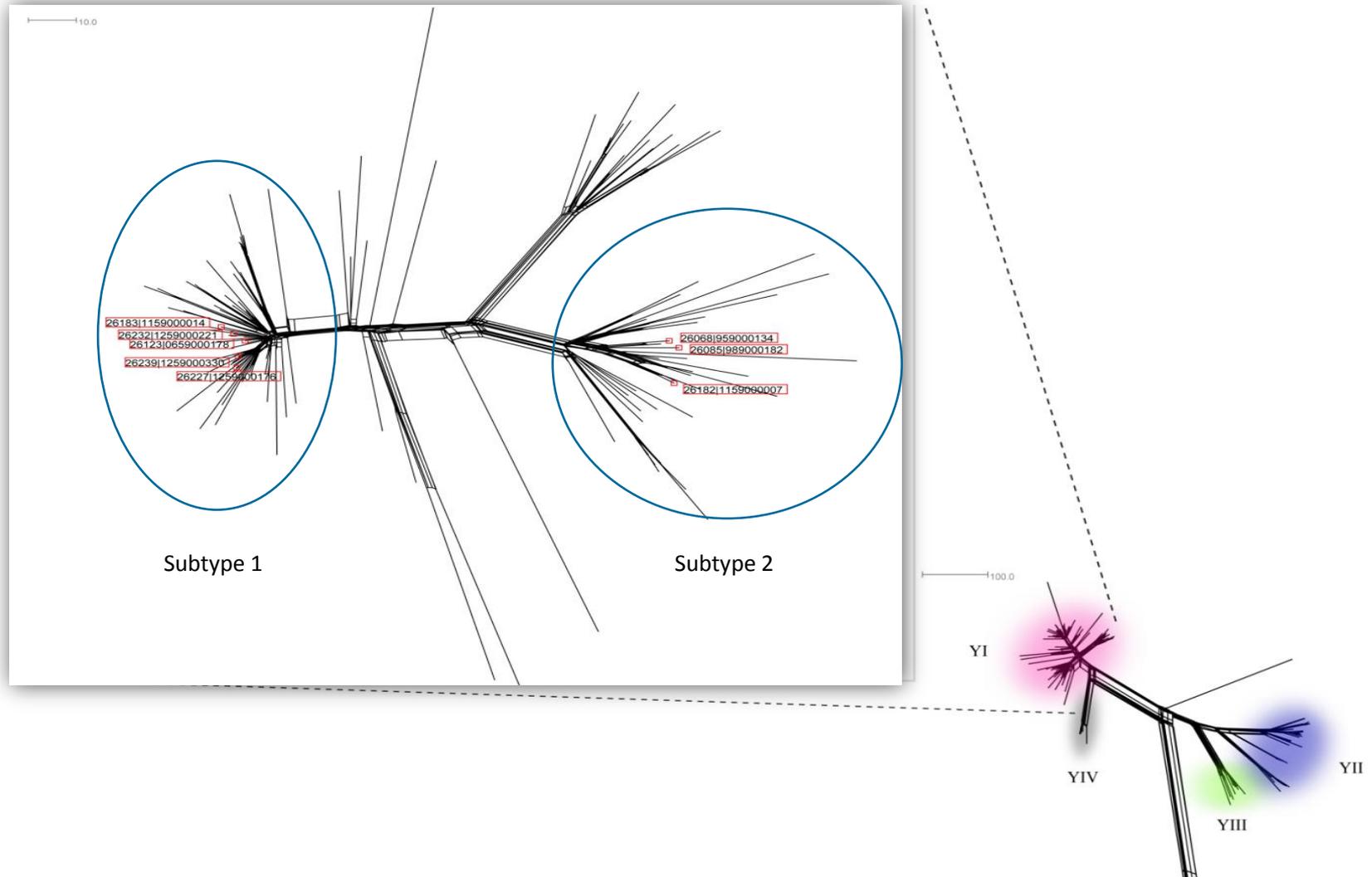
Törös B, Hedberg ST, Unemo M, Jacobsson S, Hill DM, Olcén P, Fredlund H, Bratcher HB, Jolley KA, Maiden MC, Mölling P. Genome-Based Characterization of Emergent Invasive *Neisseria meningitidis* Serogroup Y Isolates in Sweden from 1995 to 2012. *J Clin Microbiol* 53: 2154-2162.

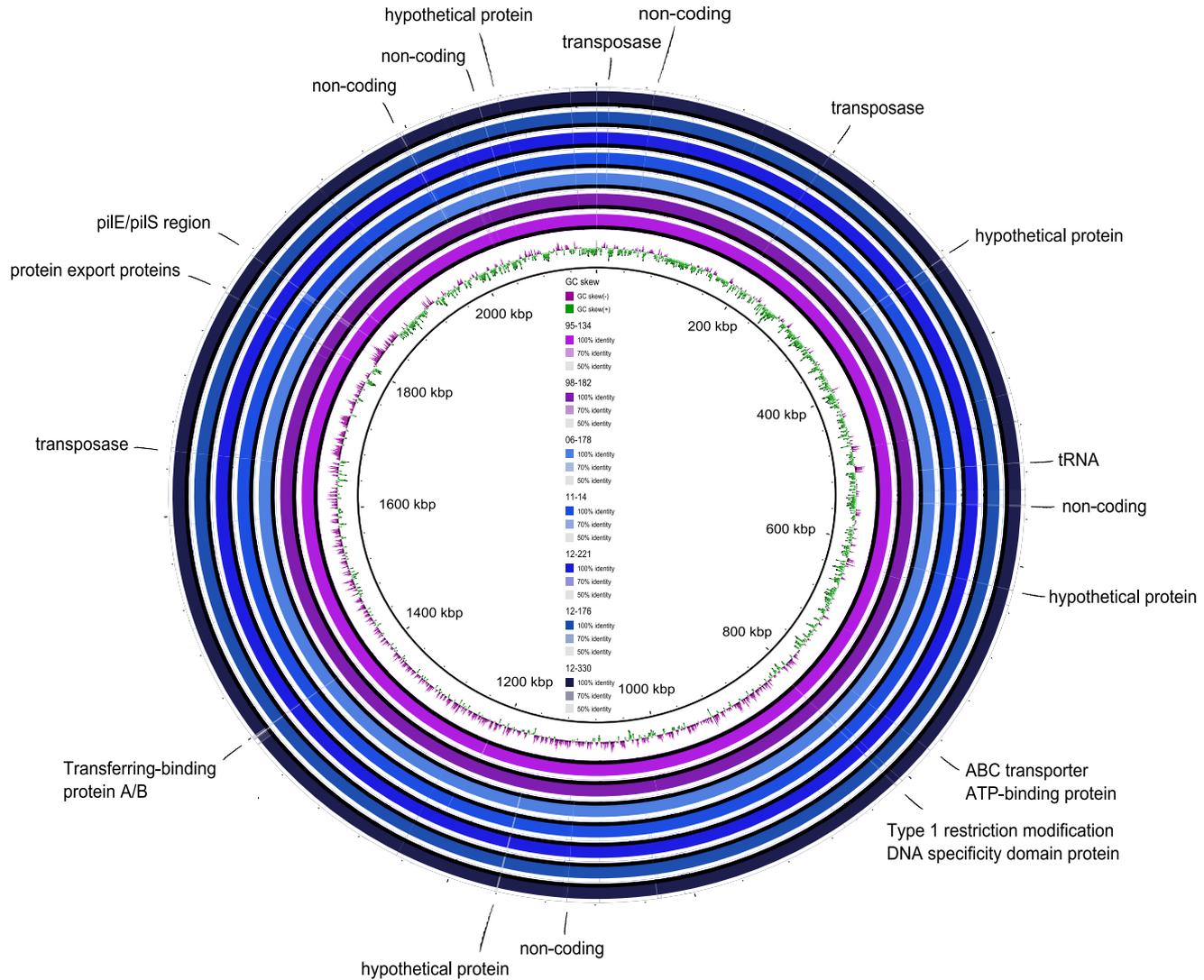


Törös B, Hedberg ST, Unemo M, Jacobsson S, Hill DM, Olcén P, Fredlund H, Bratcher HB, Jolley KA, Maiden MC, Mölling P. Genome-Based Characterization of Emergent Invasive *Neisseria meningitidis* Serogroup Y Isolates in Sweden from 1995 to 2012. *J Clin Microbiol* 53: 2154-2162.



PacBio sequencing





Conclusions

- Different predominant strains dominate different geographical regions
- Strain Y1 consists of two subvariants
- The main differences between the subtypes are not in presence/absence of genes but in allelic differences
- Strain Y1 is possibly more transmissible but less virulent?

Thank you

Martin Maiden et al.



Muhamed-Kheir Taha et al.

