

# SARS – CoV-2

## Variant surveillance in the Czech Republic

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# Capacity

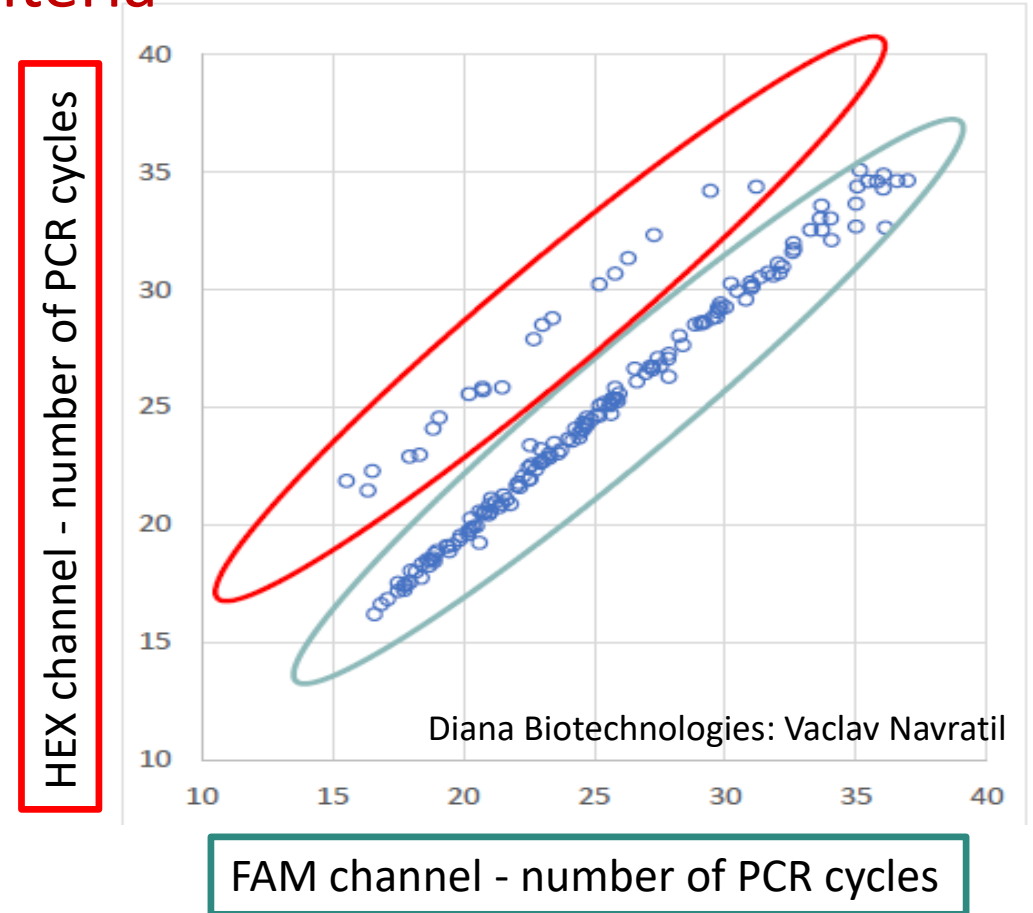
- 130 laboratories involved in SARS – CoV-2 PCR detection
- Maximal capacity 50 000 samples/day
- Four local producers of PCR kits
  - Diana Biotechnologies (EndoRNase, Spike) 20 % of the market
  - Elisabeth Pharmacon (E, Orf1ab, N)
  - Generi Biotech (E, RdRp)
  - Geneproof (E, Orf1ab, N)

Other oftenly used PCR kits /platform: Liferiver, Seegene / GeneXpert

# First detection of B.1.1.7

Based on in 1) silico analysis and 2) WGS criteria

- In silico analysis of RT-qPCR data
  - spike - A570D mismatch primer
- Resulting in the 5 Ct shift 



- Retrospective analysis - 5 laboratories – 7th December 2020

# PCR based surveillance

B.1.1.526 (South America) S: A701V, D253G, D614G, **E484K**, L5F and T95I

varianta	Pangolin lineage	417N	417T	439K	484K	501Y	570D	del 69,70
Britská	B.1.1.7	-	-	-	-/+	+	+	+
JAR	B.1.351	+	-	-	+	+	-	-
Brazilská	B.1.1.28	-	-	-	+	-	-	-
Brazilská/Manaus	P.1	-	+	-	+	+	-	-
	B.1.525	-	-	-	+	-	-	-
tzv. "česká"	B.1.258	-	-	+	-	-	-	+

The 19B with N501Y is now assigned lineage A.27

19B with N501T, assigned as A.28

In France, we are currently Following up such a variant - also has 452R

B.1.525 also linked to import from Nigeria in cases in Norway

Hi Helena, As mentioned in a previous e-mail, we are happy to support the sequencing effort at your end. let me know if we

# PCR based surveillance

- Single step PCR for the detection of nt substitutions of concern
  - Single multiplex PCR (SARS – CoV-2 + IC + nt substitution)
- Two step PCR for the detection of nt substitutions of concern
  1. SARS – CoV-2 detection + IC
  2. PCR for the detection of nt within the cohort of positive samples

All positive	Part of positive pool
Same day	Once per week

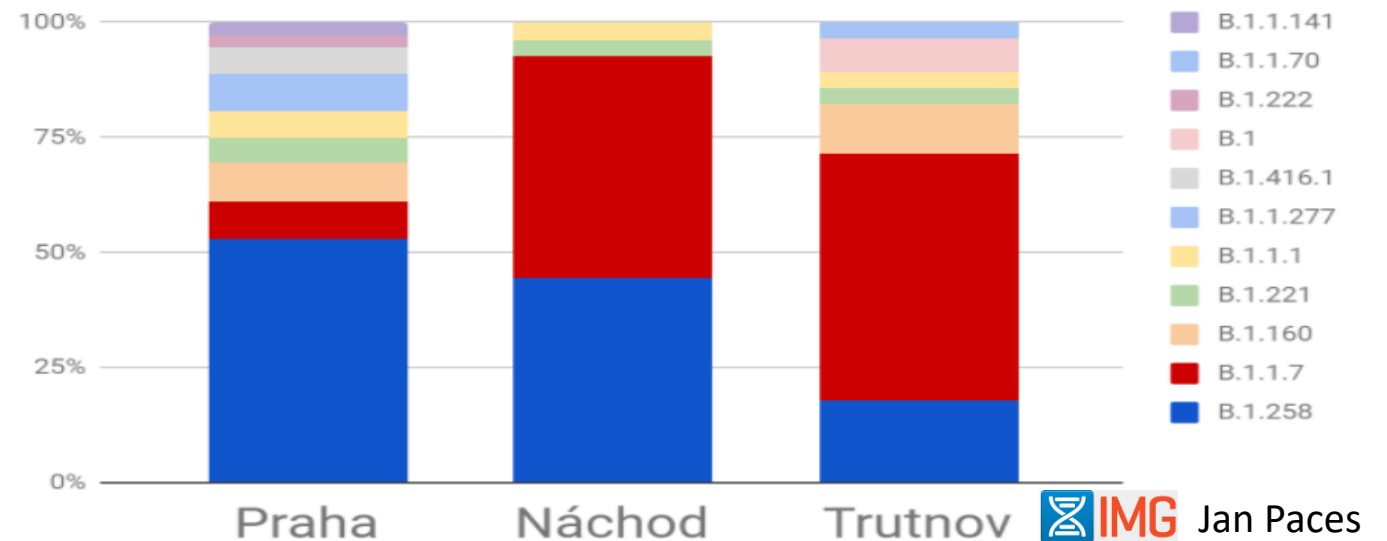
# WGS surveillance

NRL & SVU: - Oxford Nanopore Minlon, Artic protocol, 1500 pb

- The only one group has been continuously sequencing from the index case (1. 3 . 2020)

Czech Academy of Science (Swift Protocol, NextSeq)

- Early January 2021, the first round of 91 samples from the 3 localities



- PHE- ECDC sequencing support, the first 9 of samples sent 12.2. 2020

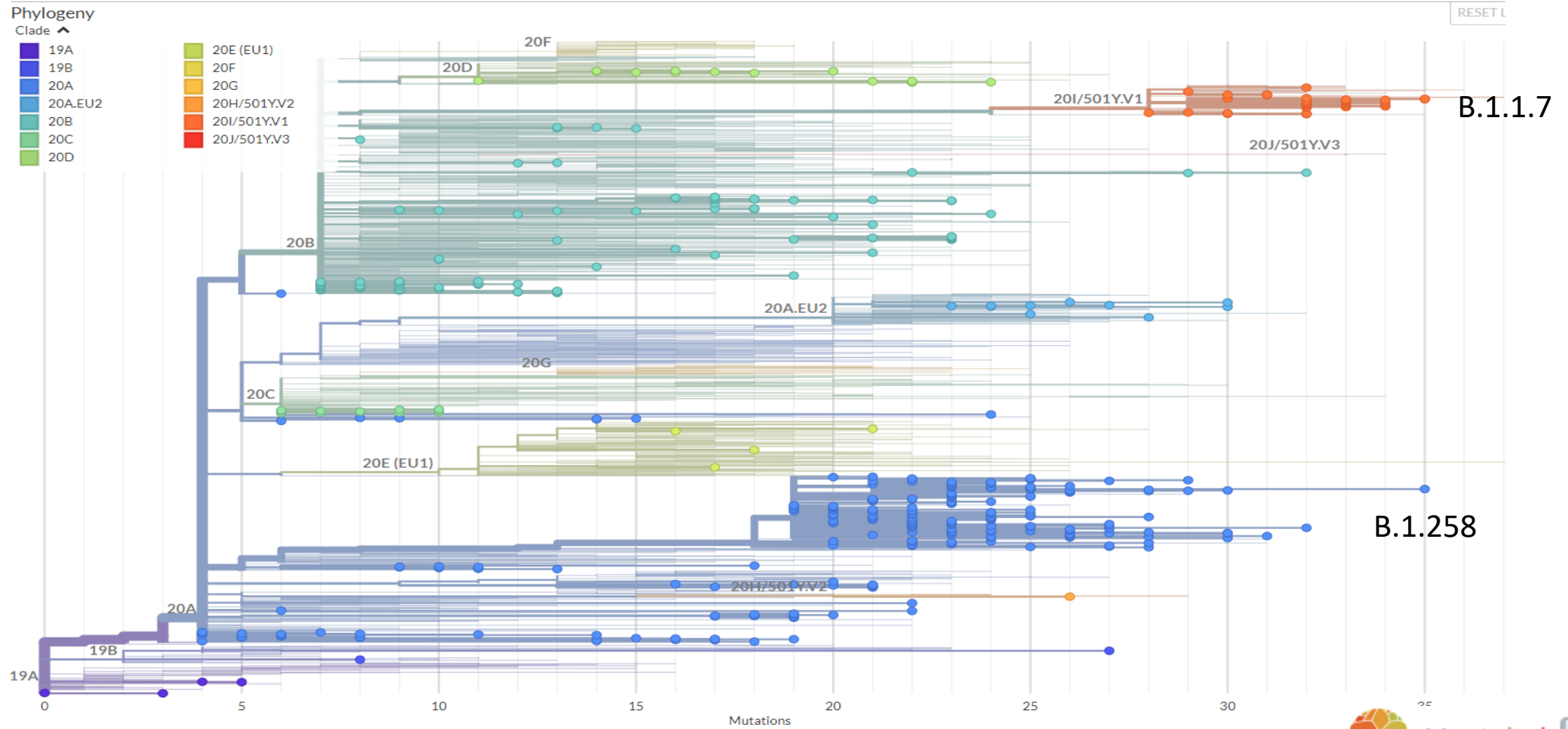
# Samples intended for the WGS –

## WGS criteria

- Increased R in local outbreaks
- Accumulation of low Ct values in the local outbreaks (Ct < 16)
- Increasing proportion of inapparent cases with Ct < 26
- Atypical clinical manifestation / atypical positive clinical material (liquor)
- Hospitalised severe cases under 50 YoA without comorbidities
- Hospitalised under 16 YoA
- Airport arrivals
- Positive cases after vaccination Ct < 30

# Phylogeny tree SARS –CoV-2 Czechia

423 of consensus fasta – NRL and State Veterinary Institute

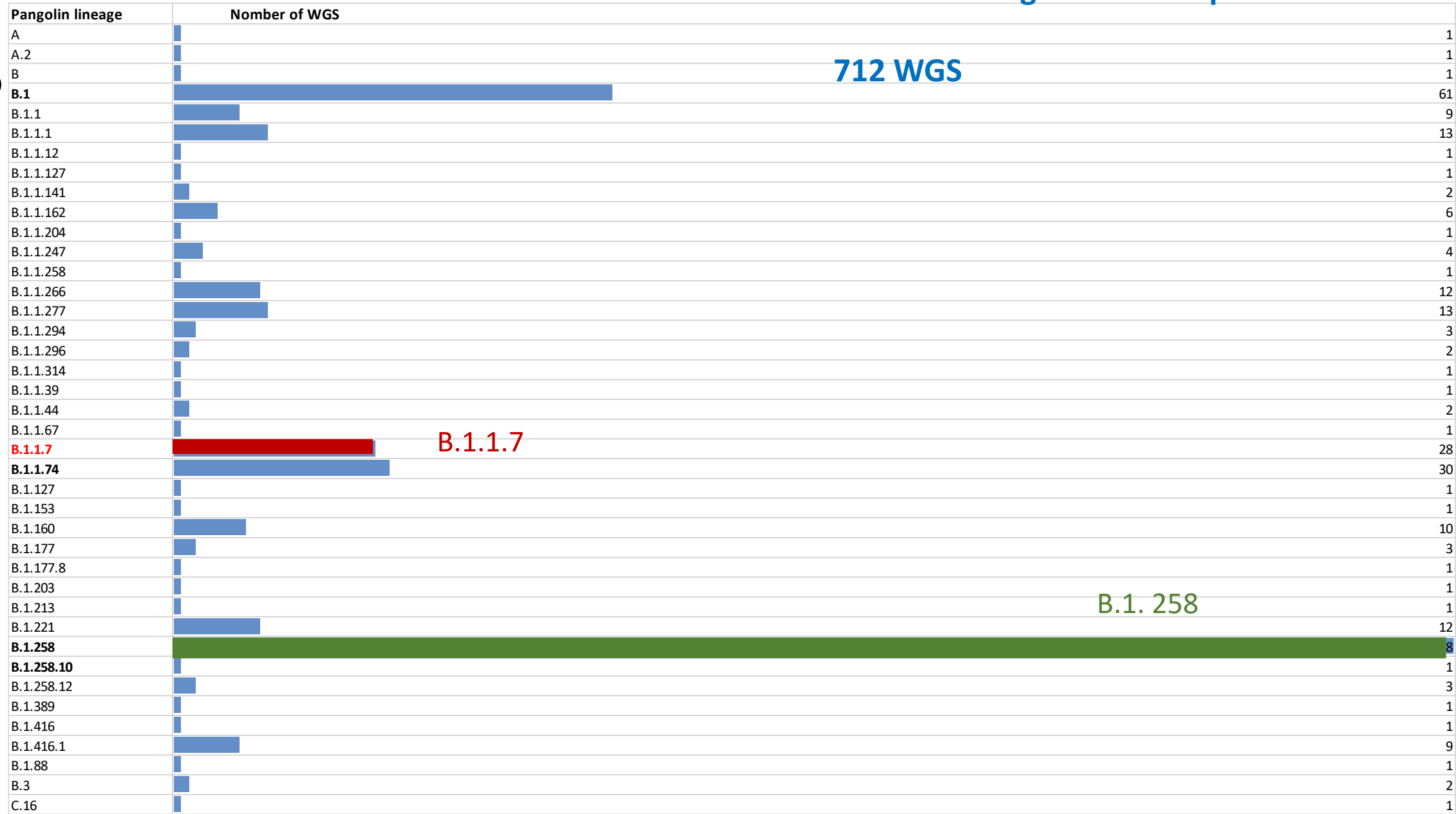




# Czechia: in total 651 WGS in GISAID + 61 waiting for the complete metadata

WGS

423 WGS – NRL and State veterinary Institute



712 WGS

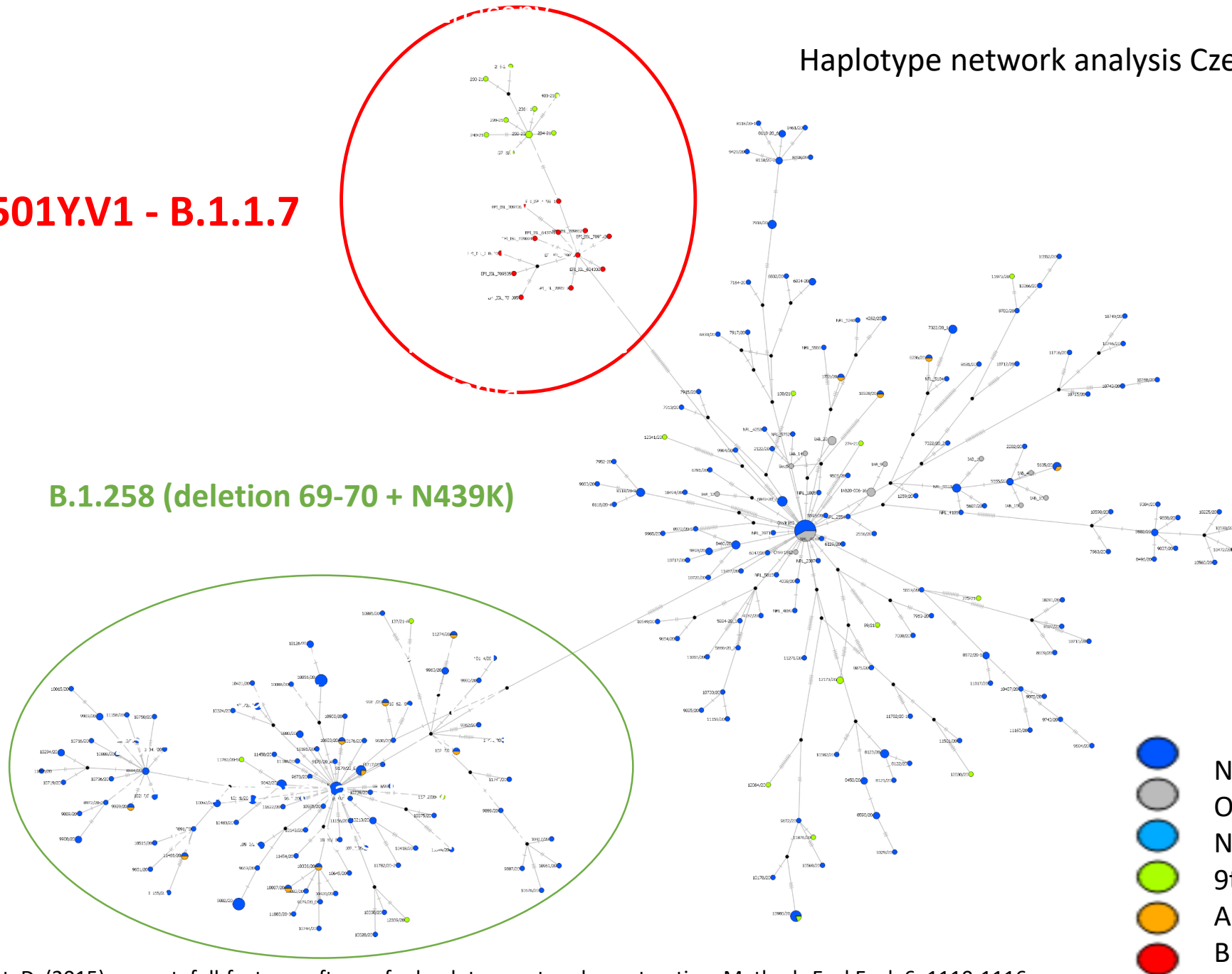
B.1.1.7

B.1. 258

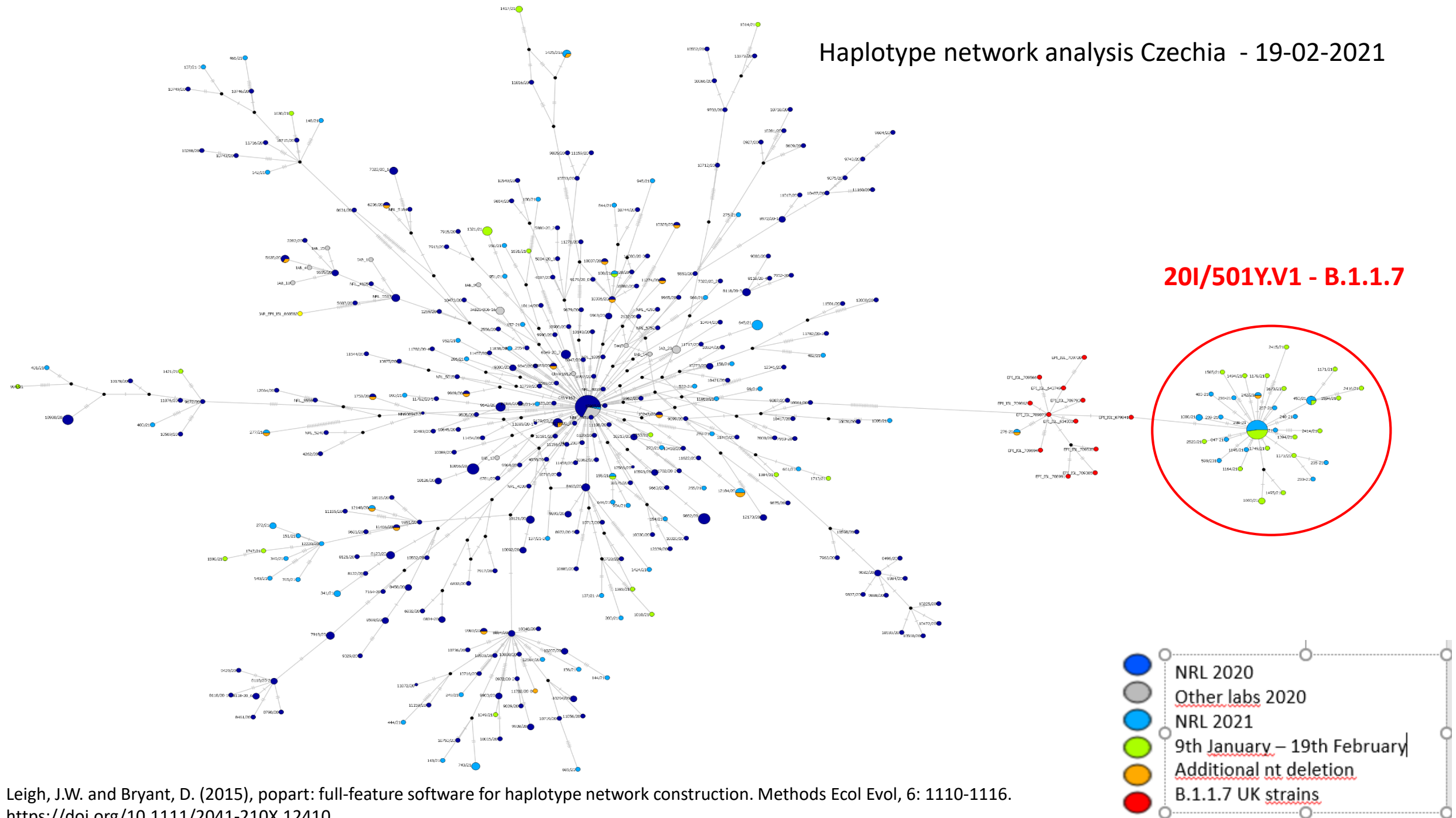
# Haplotype network analysis Czechia - 19-01-2021

**20I/501Y.V1 - B.1.1.7**

**B.1.258 (deletion 69-70 + N439K)**

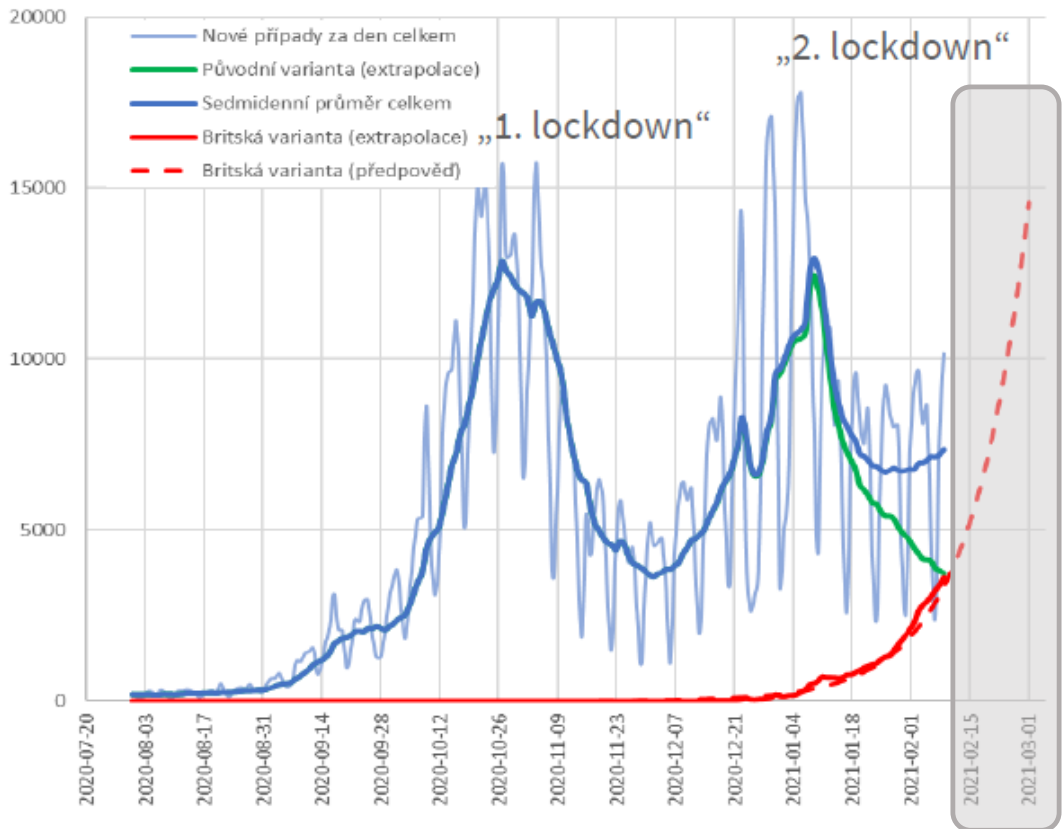


# Haplotype network analysis Czechia - 19-02-2021



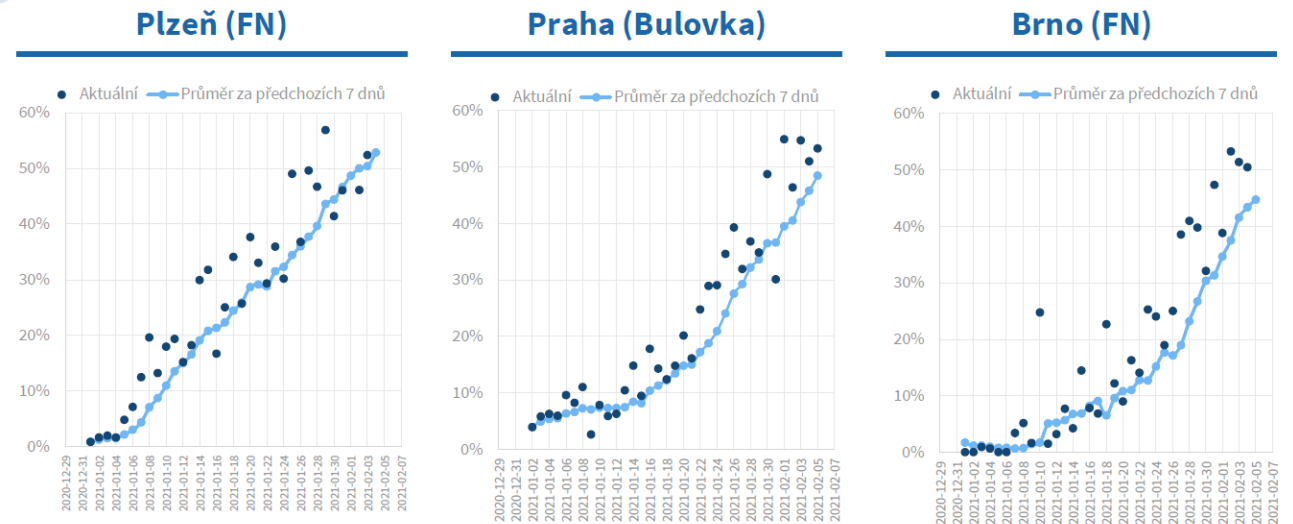
# PCR surveillance

Number of positive cases 20-7-20 till 10-02-21



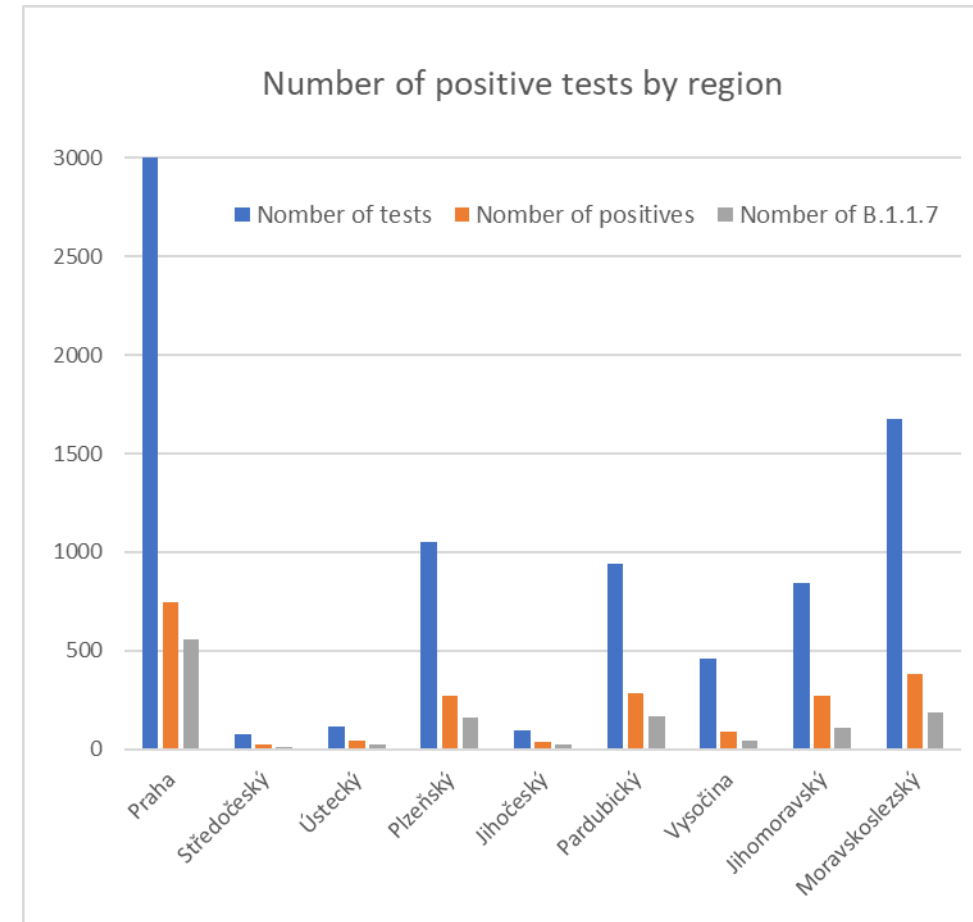
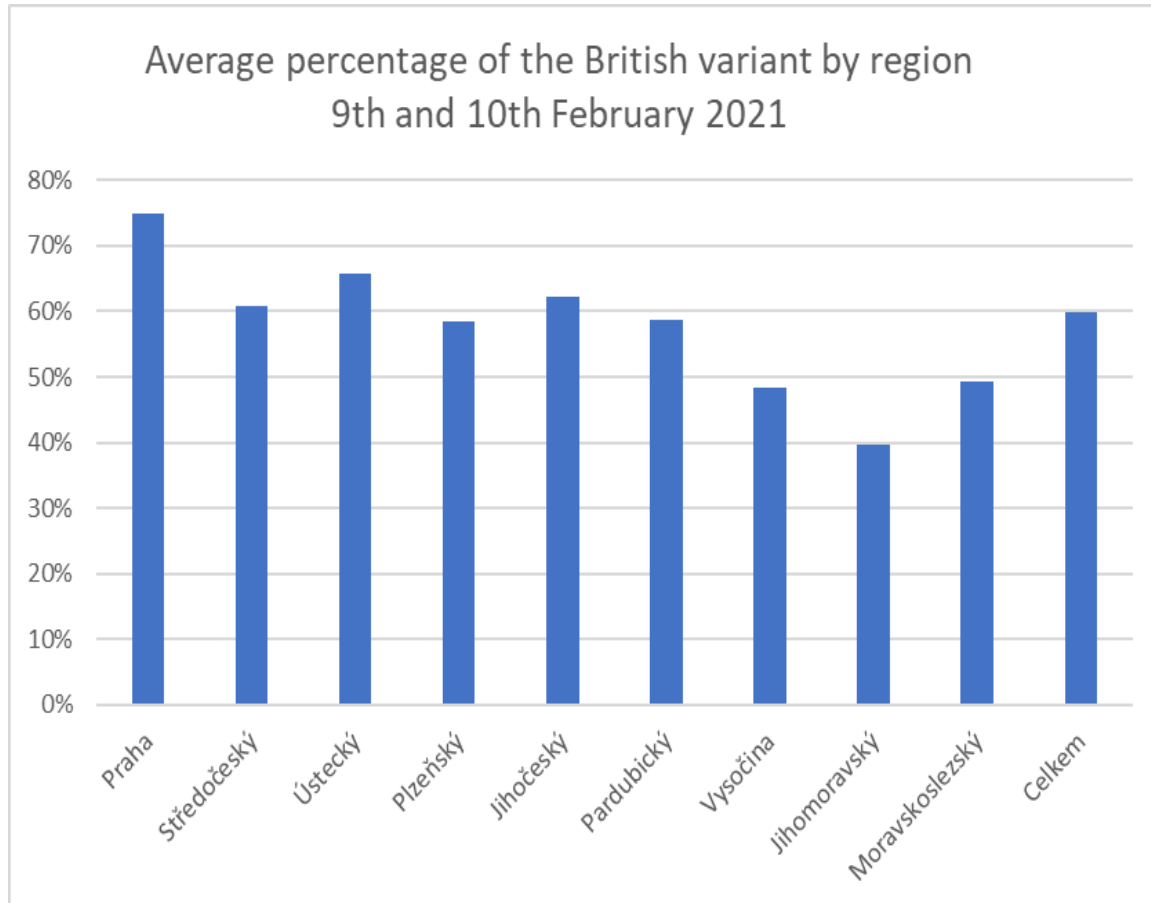
PCR surveillance – 20% of PCR capacity

Proportion of the detected B.1.1.7 by RT-q-PCR  
Results of 3 laboratories, period 29-12-20 till 7-2-21



Approximation by 1. 3 .2021

PCR surveillance (20 % of tests done on regular basis in the Czechia):  
The proportion of the "British variant" has been growing rapidly since the beginning of January





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