

# Genetic diversity of multidrug-resistant and drug-susceptible *Mycobacterium tuberculosis* isolates in Poland

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## INTRODUCTION

Tuberculosis remains one of the greatest health threats to the human population. According to the estimates of the World Health Organization, this disease is diagnosed in 10 million people annually and is the 13th leading cause of death worldwide. Poland ranks 6th in terms of the highest incidence of tuberculosis among the countries of the European Union and the European Economic Area (Tuberculosis surveillance in Europe, ECDC; 2021).

## MATERIALS AND METHODS

The study included 89 (39 MDR and 50 DS) *M. tuberculosis* isolates collected from as many patients between 2018 and 2021 in Poland. Methods are shown in Figure 1.

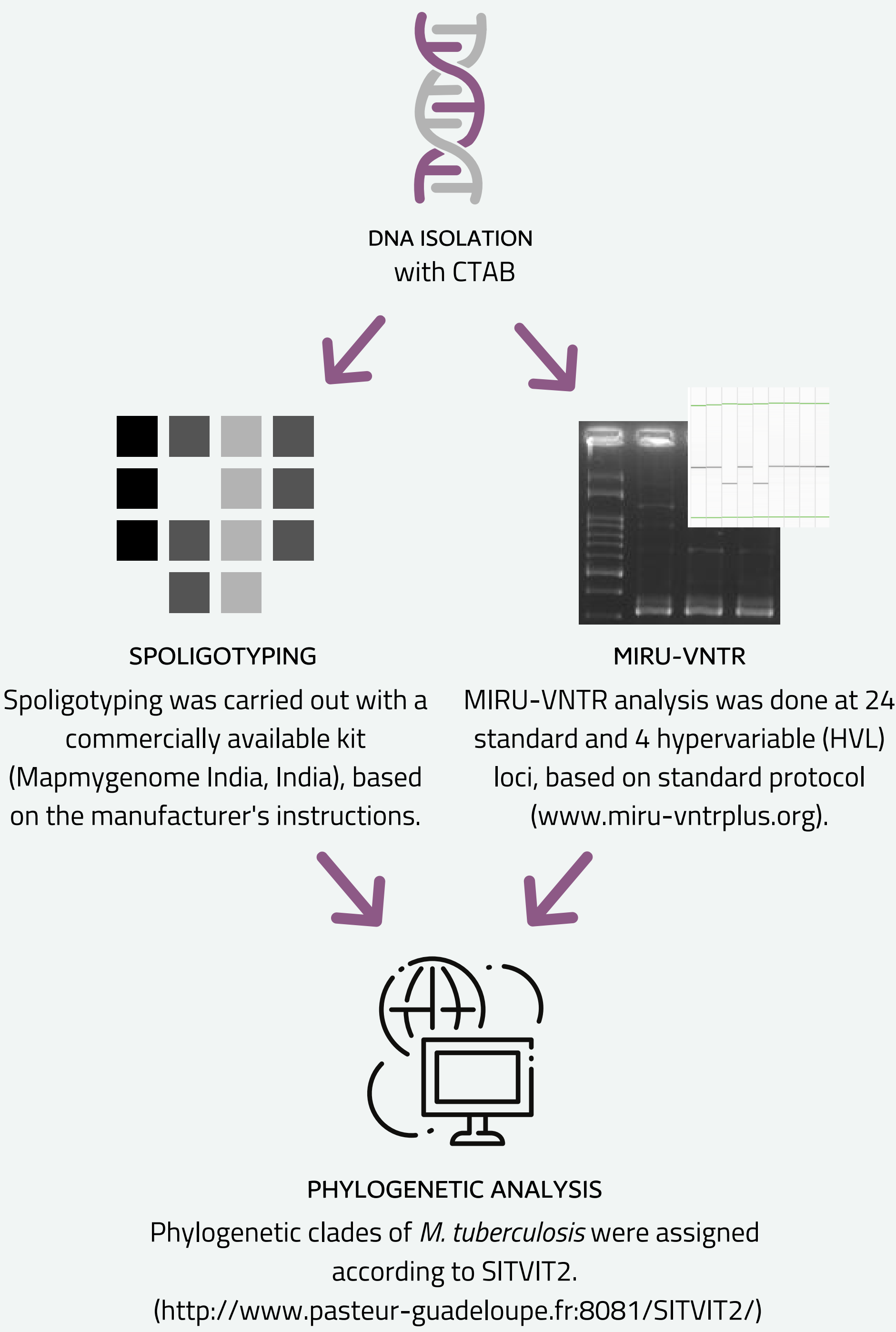


Fig. 1. Research methodology workflow.

## RESULTS

In total, 40 spoligotypes were identified, split into 10 clusters (n=59, 66.3%, 2-19 isolates per cluster) and 30 (33.7%) unique patterns. Most isolates belonged to the Beijing family (n=25; 28.1%), followed by T (n=24; 27.0%) and Haarlem (n=14; 15.7%) families. Among MDR *M. tuberculosis* isolates, nearly 60% (23/39) were of Beijing genotype (Tab. 1, Fig. 2).

Tab. 1. Molecular families determined by the spoligotyping.

Family	Number of strains	%
Beijing	25	28,1
T	24	27,0
H	14	15,7
Not defined	14	15,7
LAM	7	7,9
Ural	2	2,2
EAI3-IND	1	1,1
CAS1-Delhi	1	1,1
X	1	1,1

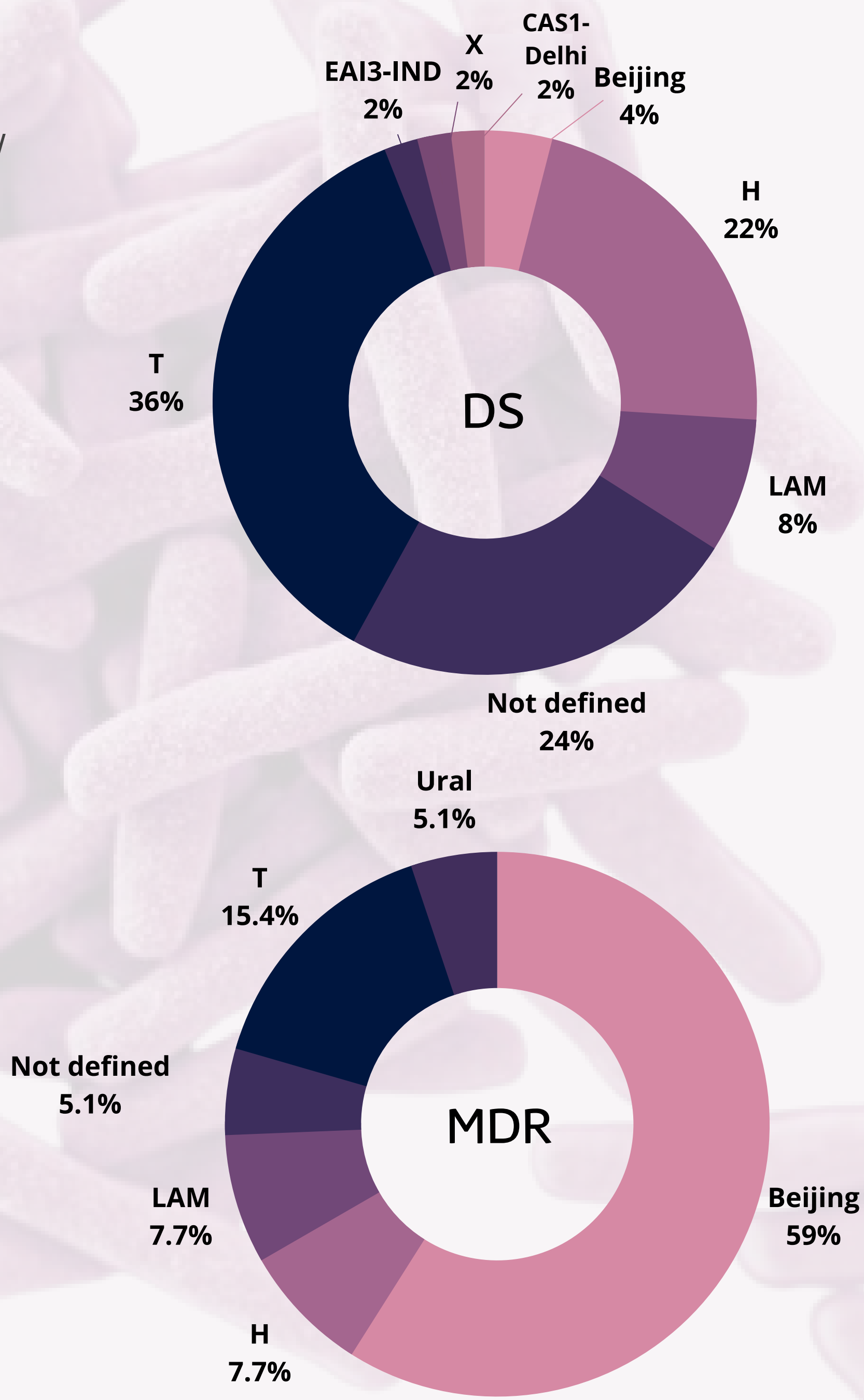


Fig. 2. Prevalence of *M. tuberculosis* molecular families among MDR-resistant and drug-susceptible (DS) strains.

A combined spoligotyping and MIRU-VNTR analysis resolved 3 clusters (n=10, 11.2%, 2-6 isolates per cluster) and 79 (88.8%) unique patterns. Upon MIRU-VNTR no clustered isolates were observed (Fig. 3).

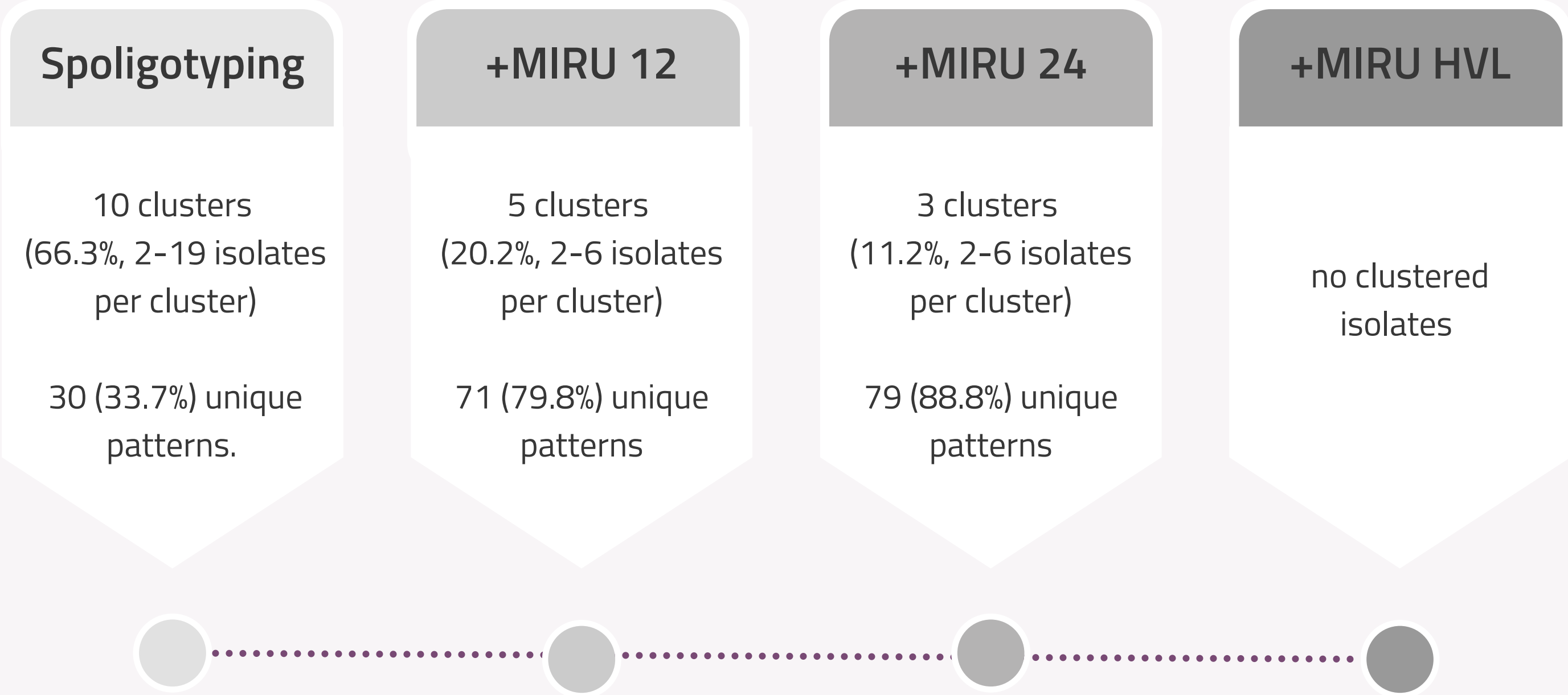
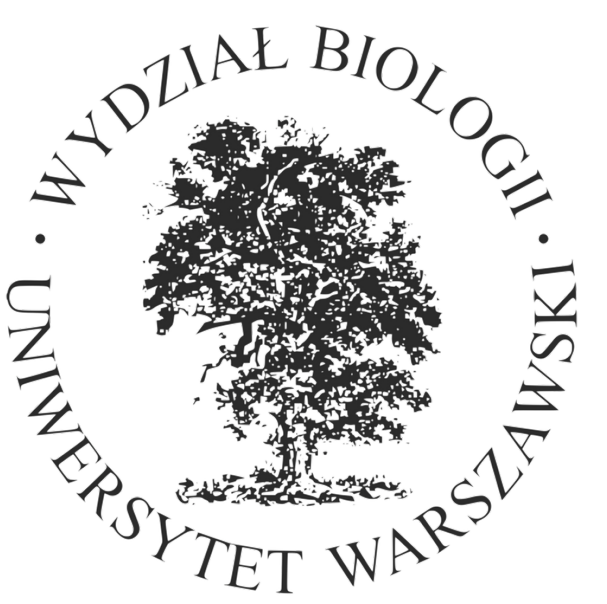


Fig. 3. Discriminatory power of the applied methods.

## CONCLUSIONS

- 1) Almost 70% of Polish *M. tuberculosis* isolates belonged to 3 molecular families, i.e. Beijing, T, and Haarlem.
- 2) The Beijing family was the most prevalent (60%) among MDR-TB cases.
- 3) The incidence of TB in Poland seems to be attributable to reactivation of latent infection rather than recent transmission.



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