

Global subtyping of *Mycobacterium kansasii* clinical isolates

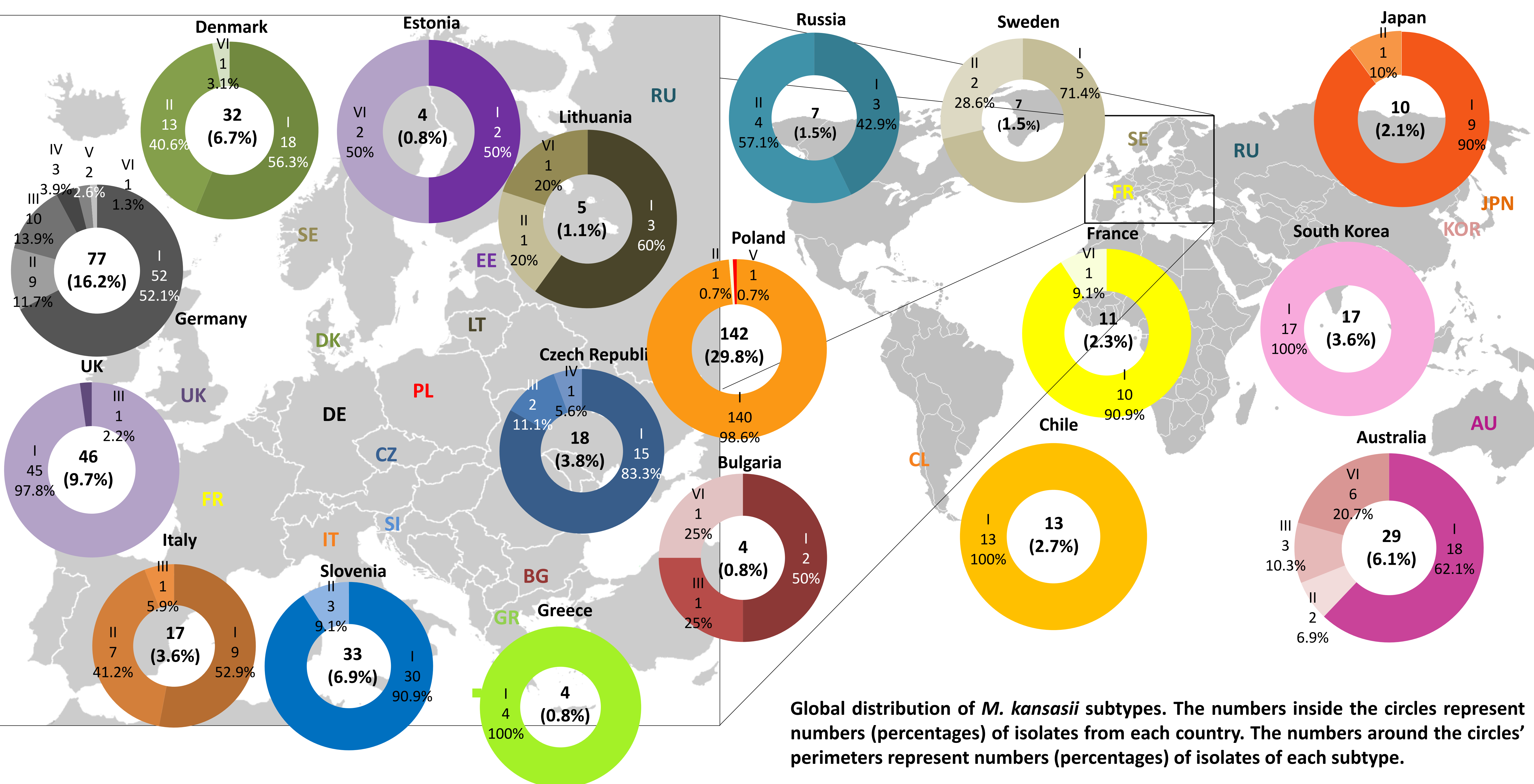
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INTRODUCTION: *Mycobacterium kansasii* is a slow growing non-tuberculous mycobacterium (NTM) which causes pulmonary and extrapulmonary infections. Although the incidence of *M. kansasii* shows significant geographical variability, it is, on average, the sixth most frequent NTM isolated from clinical samples throughout the world. To date, seven (I-VII) subtypes of this species have been identified by PCR restriction-enzyme analysis (PCR-REA) of the *hsp65* (65-kDa heat shock protein), *rpoB* (β -subunit of RNA polymerase) and *tuf* genes. Most of the disease-related strains belong to subtype I and II, while the other subtypes (III-VII) are considered nonpathogenic. The aim of this study was to investigate the global distribution of *M. kansasii* subtypes from clinical samples.

MATERIALS AND METHODS: A total of 491 isolates of *M. kansasii* recovered from as many patients were used in this study. The isolates were collected from 18 countries (across 4 continents) between 2000 and 2017. Genomic DNA was extracted using GenoLyse kit (Roche, Basel, Switzerland). Subtyping was done according to isolates' PCR-REA patterns obtained in two PCR-REA assays, involving *hsp65* and *tuf* genes. Briefly, PCR-amplified DNA fragments were digested with respective restriction enzymes, separated by electrophoresis in 4% agarose gels, and visualized by staining with ethidium bromide and exposure to UV light. Patients were classified as having (or not) an NTM disease, following the criteria of the American Thoracic Society (ATS).

RESULTS: Among 476 isolates, the most frequent were subtypes I (n=395; 82.98%) and II (n=43; 9%). There were 18 (3.7%), 4 (0.8%), 3 (0.6%) and 13 (2.7%) isolates of subtype III, IV, V, and VI, respectively. The largest number of *M. kansasii* subtype I isolates was observed for Poland (n=140; 98.6%). *M. kansasii* subtype II was the most frequent in Italy (n=7; 41.2%). Isolates from patients meeting the ATS case definition criteria belonged to subtype I (90.4%), II (8.4%), III (0.6%) and IV (0.6%).



Global distribution of *M. kansasii* subtypes. The numbers inside the circles represent numbers (percentages) of isolates from each country. The numbers around the circles' perimeters represent numbers (percentages) of isolates of each subtype.

CONCLUSIONS: Subtypes I and II predominated among *M. kansasii* isolates worldwide. However, important variation in the global distribution of *M. kansasii* subtypes was noted. Furthermore, not only *M. kansasii* subtype I and II, but also subtypes III and IV were associated with the NTM disease.

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