

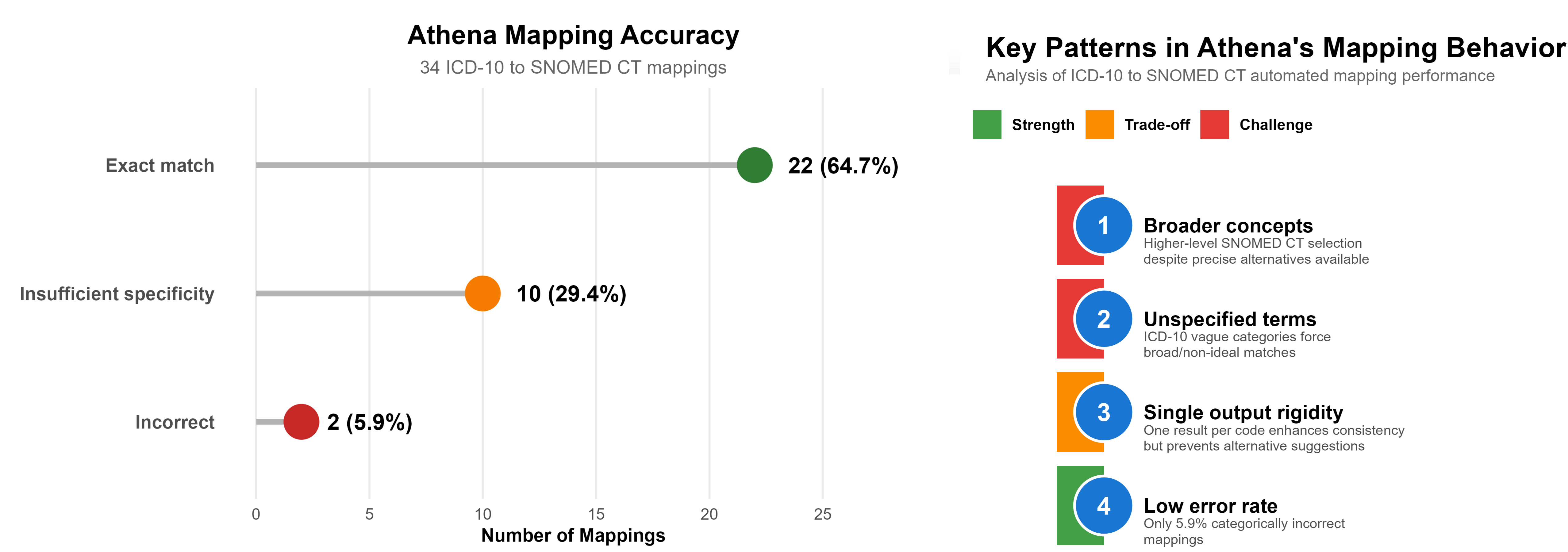
Athena automated mapping for ICD-10 → SNOMED CT loses specificity: human expert review remains essential

ICD 10 to SNOMED-CT and OMOP Mapping: Performance, Limitations, and Clinical Implications of Automated Athena Mappings

Background: Interoperability between ICD-10 and SNOMED CT is crucial for high-quality health data use, but differences in their structures make accurate mapping challenging. While Athena offers automated ICD-10-to-SNOMED CT conversions, this study evaluates how well these mappings preserve clinical specificity for muscular-dystrophy-related codes compared to manual expert mapping.

Methos: ICD-10 G71 muscular dystrophy codes were entered individually into the Athena “Non-standard → Standard (OMOP → SNOMED)” tool, which generated a single SNOMED CT concept for each code. In parallel, two researchers performed an independent manual SNOMED CT mapping using the international browser, reviewing synonyms, hierarchical relations, and clinical context, resolving uncertainties by consensus. Athena’s outputs were then blindly compared to the manual mappings and classified as exact, insufficiently specific, or incorrect, after which results were summarized in absolute numbers and percentages. Preliminary testing of LLM-based mapping was excluded due to inconsistent and unreliable performance.

Results



Conclusions: Athena provides an efficient baseline for large-scale ICD-10 to SNOMED CT conversion (OMOP), but the 64.7% exact-match rate reveals that over one-third of mappings lack clinical precision. Loss of specificity, not outright errors, is the dominant issue. A **hybrid approach**, automated mapping followed by targeted expert validation, is the most practical