

RxNorm Extension offers broader global drug coverage than SNOMED CT, with 98% overlap at the clinical drug level

Comparing the representation of medicinal products in RxNorm Extension and SNOMED CT

Background

Real-world pharmacovigilance studies benefit from large, diverse, multinational datasets. Network studies require harmonizing drug exposure data across heterogeneous sources and markets. RxNorm Extension (RxE) was developed to extend the RxNorm framework to global markets. SNOMED CT has also developed a parallel International Medicinal Product Model. This study systematically compares their structural philosophies, coverage, and overlap.

Methods

RxNorm Extension (RxE)	SNOMED CT Drug Model
Open-world assumption Ingredient-based hierarchy → Clinical Drug Form → Clinical Drug → Branded Drug → Marketed Product	Closed-world assumption Drugs with only ingredient of interest occupy separate hierarchy branches from those with other ingredients
12 source vocabularies across 10 countries: AMIS (Germany), AMT (Australia), BDPM (France), dm+d, Genscript (UK), DPD (Canada), EDI, KDC (Korea), GGR (Belgium), GRR (Brazil), JMDC (Japan), Z-index (Netherlands)	Data from 5 national drug extensions: UK, US, Australia, Netherlands, New Zealand
Attributes: dose form, drug strength, brand name, box size, supplier/manufacturer	Attributes: ingredient, dose form, drug strength (shared with RxNorm)

Results

79,646 Clinical Drugs in RxE (+ 35,756 in RxNorm)	8,348 Clinical Drugs in SNOMED CT from 3,914 active ingredients	98% SNOMED monodrug forms present in RxNorm or RxE
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Feature	RxNorm Extension	SNOMED CT Intl.
World assumption	Open-world	Closed-world
Clinical drugs	79,646 (RxE) + 35,756 (RxNorm)	8,348
Ingredients	6,098 (1,871 non-US)	3,914 active
Market coverage	10 countries, 12 vocabularies	5 national drug extensions
Marketed product	Yes (supplier, box size)	In local extensions

Conclusion

Both RxE and SNOMED CT offer comprehensive, internationally-oriented drug vocabularies — but differ in structural philosophy and scale. With 98% overlap at the clinical drug level, the models show strong complementarity. RxE provides broader coverage for global observational research, while SNOMED CT's closed-world framework offers distinct classificational precision. Future work will explore incorporating SNOMED drugs into RxE and comparing SNOMED classes to ATC for therapeutic grouping.