Real-World Mental Health Assessment Instruments and Instrument Components: A Coverage Analysis using LOINC and SNOMED-CT

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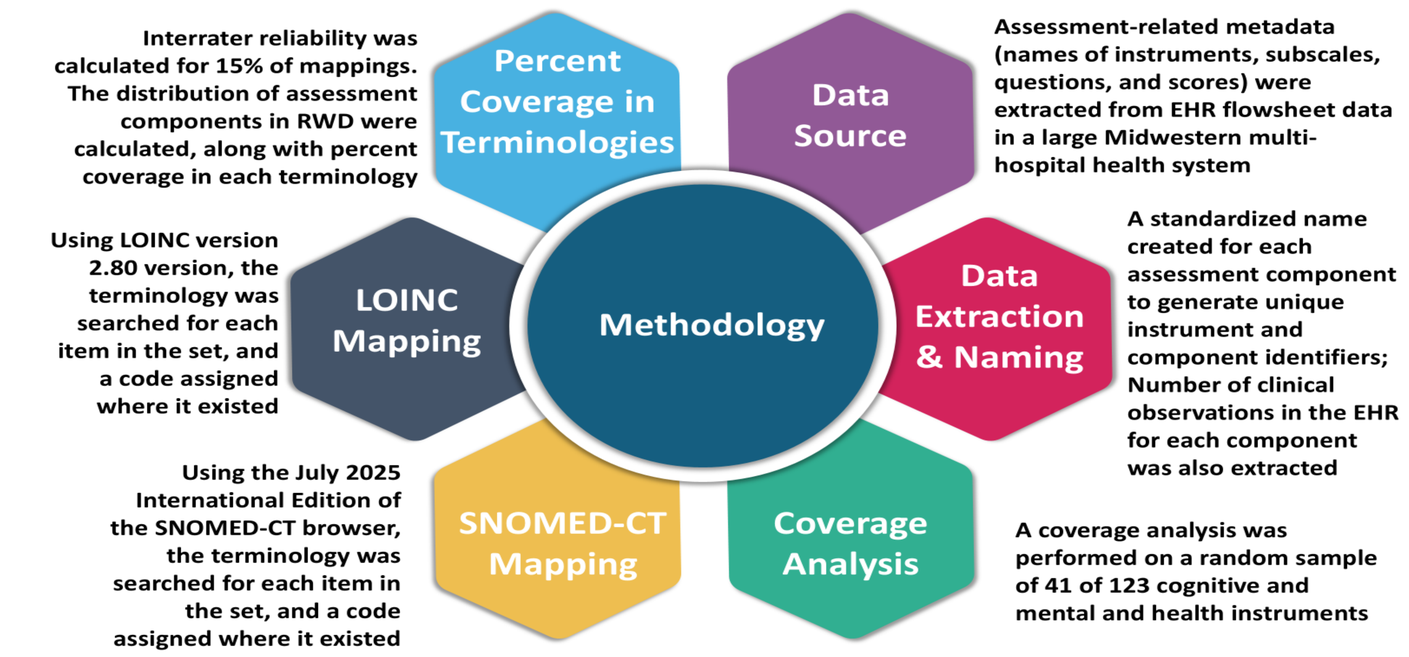
BACKGROUND

- Vast amounts of assessment data exist in electronic health records (EHRs).
- To effectively use these data in clinical and knowledge discovery workflows, they must be robustly represented with unique identifiers in standardized clinical terminology.
- We sought to characterize the types and prevalence of standardized cognitive and mental health assessment instruments used in a healthcare delivery system using real world data (RWD).
- We evaluate their coverage using two widely adopted clinical terminologies, Standardized Nomenclature of Medicine – Clinical Terms (SNOMED-CT) and Logical Object Identifiers Names and Codes (LOINC).

METHODS



RESULTS

Table 1: Table 1: Count and Observations by Component

Component	Count	%	Observations	%
Question	515	87.1%	38,377,572	76.8%
Instrument Metric	39	6.6%	5,279,038	10.6%
Subscale Metric	17	2.9%	3,109,014	6.2%
Interpretation	16	2.7%	1,570,971	3.1%
Custom Question	4	0.7%	1,626,343	3.3%
TOTAL	**591**	**100%**	**49,962,938**	**100%**

- A total of 123 unique assessment instruments were identified.
- A total of 591 discrete instrument components were identified.
- Instrument components found in RWD included instruments, subscales, questions, answer lists, and both instrument and subscale metrics (e.g., total score, t-score, z-score).
- Nearly 50M assessment-related clinical observations (Table 1) were found.

Table 2: Coverage by Component and Terminology

	Instrument Metrics	Subscale Metrics	Question
Observations	5,279,038	3,109,014	38,377,572
LOINC	49.0%	38.0%	74.1%
SNOMED-CT	50.9%	0.0%	0.0%

- A concept existed in at least one of the two terminologies for 62.1% of RWD instrument components (SNOMED-CT=32.0%, LOINC=68.9%, both=4.6%).
- Interrater reliability of mapping with two authors (EN, PR) was strong (k=0.85).
- Concept coverage by component and terminology is depicted in Table 2.

DISCUSSION + CONCLUSION

Significant gaps exist in clinical terminology for assessment data in RWD. Coverage of instrument metrics was lower than expected, as RWD often includes many summary metrics beyond raw scores (e.g., mean scores, z-scores, t-scores). There is a need to improve content in SNOMED-CT and LOINC to ensure unique identifiers for commonly used assessments are available for encoding, analyzing, and transmitting these data.

ACKNOWLEDGEMENTS + REFERENCES + CONTACT INFORMATION

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References

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2. LOINC Steering Committee, “Users’ Guide – Standardized Assessment Measures (Section 10).” https://loinc.org/kb/users-guide/standardized-assessment-measures/

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