

Assessing the Utility of ICD-11 for Primary Health Care Reporting



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Authors: Karina Lyall, Alana Lane, Sharon Baker and Keith Denny, Canadian Institute for Health Information

Abstract

This poster examines how an existing health concern value set — one that is used in primary health care, and currently mapped to ICD-10-CA for aggregated reporting and to ICD-9 for patient-level physician billing (PLPB) — could be utilized to assess the feasibility of migrating from ICD-9 to ICD-11 to support physician billing in Canada.

Introduction

In Canada, ICD-9 is widely used for PLPB but has limitations in capturing comprehensive primary health care data. The Canadian Institute for Health Information (CIHI) has developed a standardized value set of health concern terms commonly used in primary care to address a national reporting gap. The Pan-Canadian Health Concern Value Set (PHCVS) is a standardized list of SNOMED CT clinical terms that are mapped to ICD-10-CA for aggregated reporting and to ICD-9 for PLPB, enhancing data interoperability. As jurisdictions in Canada consider updating physician billing systems from ICD-9, there is an opportunity to explore how the value set can be leveraged to evaluate the benefits and feasibility of adopting ICD-11 to meet PLPB requirements and to replace ICD-9.

Method

A random sample of 500 clinical terms from the PHCVS was analyzed and mapped to *ICD-11 for Mortality and Morbidity Statistics* (ICD-11 MMS, 2024 release) to determine whether there's a direct equivalency. The level of equivalency identified in ICD-11 was compared with the level of equivalency found in ICD-9 using map relation types:

- Equivalent: Both source and target have same detail/meaning
- Broader: The target is less specific than the source
- Narrower: The target is more specific than the source
- Not applicable: No applicable target code

Initially, a map relation type was assigned to establish an equivalence level between the PHCVS clinical term (source) and ICD-9 code title (target). Subsequently, the PHCVS clinical term was mapped to ICD-11. Another map relation type was assigned to demonstrate the equivalence level between the PHCVS clinical term (source) and 1 ICD-11 MMS code (target) (see Table 1).

Table 1 Example of map relation for single ICD-11 MMS code

PHCVS clinical term	ICD-11 code	Map relation type
Vitamin A deficiency	5B55.Z Vitamin A deficiency, unspecified	Equivalent

If an ICD-11 MMS target code was found and identified as broader than the PHCVS clinical term, a more in-depth review was performed to identify whether a post-coordination cluster (linking 2 or more ICD-11 codes together) could produce an equivalent map. An additional map relation type was assigned in this review (see Table 2).

Table 2 Example of map relation for ICD-11 postcoordination cluster

PHCVS clinical term	ICD-11 code	Map relation type	Postcoordination cluster	Map relation type (with cluster)
Infection caused by <i>Escherichia coli</i>	1C41 Bacterial infection of unspecified site	Broader	1C41&XN6P4 (<i>Escherichia coli</i>)	Equivalent

If an ICD-11 MMS code (or cluster) resulted in a broader map relation, a third review was performed to evaluate whether a matching Foundation entity with a unique Uniform Resource Identifier (URI) was available and has the potential to generate an equivalent clinical term map (see Table 3).

Table 3 Example of map relation for ICD-11 Foundation entity found at broader ICD-11 MMS code

PHCVS clinical term	ICD-11 code	Map relation type	Map relation type (with cluster)	Foundation entity at target code	Map relation type (with Foundation entity)
Atypical angina	BA40.Y Other specified angina pectoris	Broader	Broader (No acceptable cluster)	Atypical angina Foundation URI: http://id.who.int/icd/entity/1256379825	Equivalent

Key results

Analysis of statistical codes (ICD-11 MMS and ICD-9)

Of the sample of 500 clinical terms, 27% (n = 137) have an equivalent statistical code in ICD-11 MMS (1 target code), indicating a 5% increase in equivalent concepts compared with ICD-9 (see Figure 1).

When using the postcoordination feature in ICD-11, 53% (n = 266) of the clinical terms can be replicated in ICD-11, indicating a 31% increase in equivalence compared with ICD-9 (see Figure 2).

Figure 1 Comparison of PHCVS equivalency level in ICD-11 (1 target code) versus ICD-9

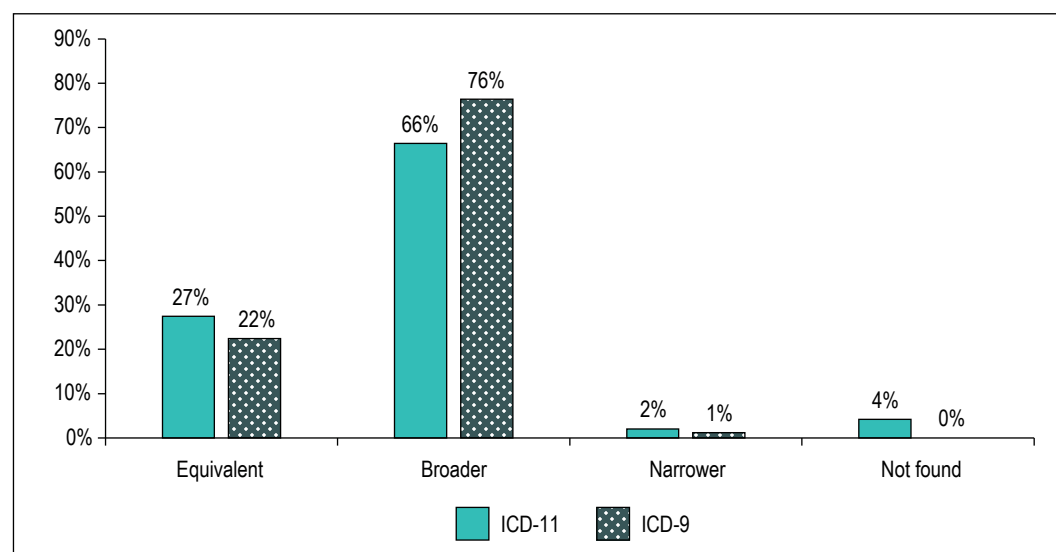
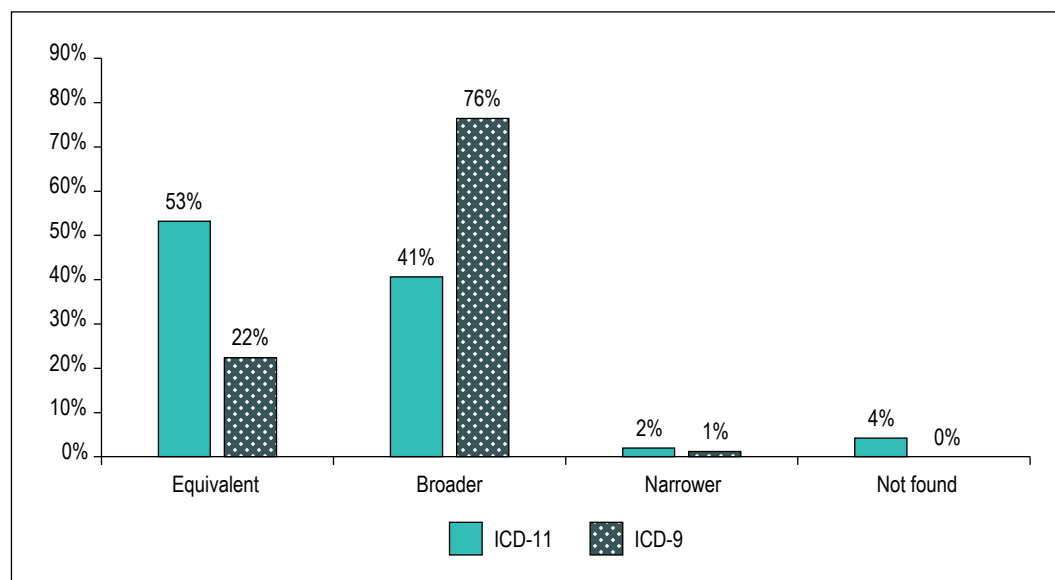


Figure 2 Comparison of PHCVS equivalency level in ICD-11 (1 target or code cluster) versus ICD-9

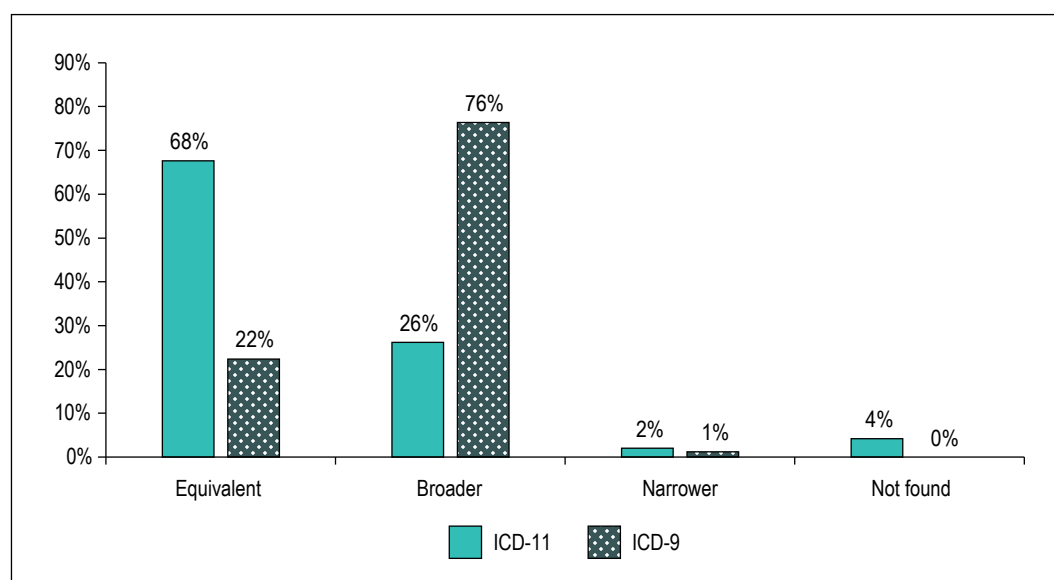


Analysis of Foundation entities available in ICD-11

Of the remaining clinical terms that were less specific in ICD-11 (either 1 target code or postcoordination cluster), a further 15% (n = 72) of terms were identified as Foundation entities with a unique URI (non-codeable). If these Foundation entities were elevated to the MMS to become codeable entities, the level of equivalence for ICD-11 codes could potentially increase to 68% (n = 338), producing a 46% increase in equivalency compared with ICD-9 (see Figure 3).

When reviewing Foundation entities with URIs alone (i.e., with or without an MMS code, and not using postcoordination), there's a potential 49% (n = 147) equivalence in PHCVS clinical terms, whereas ICD-9 shows only 22% equivalence in comparison.

Figure 3 Comparison of PHCVS equivalency level in ICD-11 (MMS statistical codes and Foundation entities with URIs) versus ICD-9



Conclusions

As we continue to evaluate the utility of ICD-11 for physician billing, preliminary results show that ICD-11 offers significant advantages using postcoordination and Foundation entities (with URIs), compared with ICD-9. However, the practicality of using URIs for data capture is still to be determined. Clinical concepts that map to broader ICD-11 Foundation entities show potential for practical application, but further analysis is required. We intend to continue this analysis to determine the level of equivalency for all PHCVS clinical terms in ICD-11. This analysis will guide whether enhancements within ICD-11 are necessary to fulfill these health care information requirements in Canada.

Appendix: Text alternatives for figures

Text alternative for Figure 1: Comparison of PHCVS equivalency level in ICD-11 (1 target code) versus ICD-9

Map relation type	ICD-11	ICD-9
Equivalent	27%	22%
Broader	66%	76%
Narrower	2%	1%
Not found	4%	0%

Text alternative for Figure 2: Comparison of PHCVS equivalency level in ICD-11 (1 target or code cluster) versus ICD-9

Map relation type	ICD-11	ICD-9
Equivalent	53%	22%
Broader	41%	76%
Narrower	2%	1%
Not found	4%	0%

Text alternative for Figure 3: Comparison of PHCVS equivalency level in ICD-11 (MMS statistical codes and Foundation entities with URIs) versus ICD-9

Map relation type	ICD-11	ICD-9
Equivalent	68%	22%
Broader	26%	76%
Narrower	2%	1%
Not found	4%	0%