

# Canadian Stability Analysis: Comparison of Selected Set of v2018 ICD-10-CA Codes and ICD-11



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## Abstract

The World Health Organization (WHO) launched the development of ICD-11 in 2007, with the World Health Assembly formally adopting ICD-11 in May 2019. The Canadian Institute for Health Information (CIHI) is assessing the clinical, business and statistical implications of implementing ICD-11 for morbidity in Canada. The work focuses on its fitness for use and the impact of transitioning from ICD-10-CA to ICD-11 for Canada-specific codes and selected CIHI indicator codes.

## Background

The *International Statistical Classification of Diseases and Related Health Problems* (ICD) is the foundation for identifying health trends and statistics worldwide. It contains thousands of unique codes for diseases, injuries and causes of death. Using ICD enables the capture of information from health encounters for research, policy and decision-making. Some WHO member states are currently using the base version of ICD-10 while others have created their own clinical modifications. The national standard used in Canada for reporting morbidity statistics is ICD-10-CA. CIHI developed ICD-10-CA in collaboration with an expert panel of physicians and external field reviewers to satisfy Canadian data needs.

## Approach

All Canadian enhancements to ICD-10-CA (3,903 codes) and selected ICD-10-CA codes used in Canadian health indicator reporting (2,722 codes) were assessed for comparability with ICD-11 content. Using the ICD-11 Mortality and Morbidity Statistics coding tool, classification specialists mapped ICD-10-CA code titles to ICD-11 codes (stem and extension) and assigned outcome types (Table 1).

The outcome types included the following:

- An exact (or conceptual) match at ICD-11 stem code level (equivalent);
- An ICD-11 code less specific than an ICD-10-CA code at the stem code level;
- An ICD-11 code more specific than an ICD-10-CA code at the stem code level; and
- No match in ICD-11 (at the single stem code level).

When an ICD-10-CA code was an exact or conceptual match to the target ICD-11 code, the result was recorded as an outcome type 1 — Exact match at ICD-11 stem code level (equivalent). If the ICD-10-CA code could not be identified in ICD-11, the outcome type was recorded as 4 — No match in ICD-11 (no map possible at single stem code level). If the comparison was not an exact match but the ICD-11 code was more specific, the outcome type was recorded as 3 — Greater specificity in ICD-11 at stem code level.

If the outcome type was not an exact match in ICD-11 and was less specific than the ICD-10-CA code title, the results were recorded as an outcome type 2 — Less specificity in ICD-11 at stem code level. For each outcome type 2, codes were assessed for post-coordination. This ICD-11 feature allows stem codes and extension codes to be combined to provide supplementary or additional descriptive detail. For outcome type 2 cases, classification specialists identified whether the addition of extension codes and/or additional stem codes could provide a partial or exact match of the ICD-10-CA and ICD-11 codes.

Reliability was tested through comparison of the outputs to WHO ICD-10/ICD-11 mapping tables available and through inter-rater reliability.

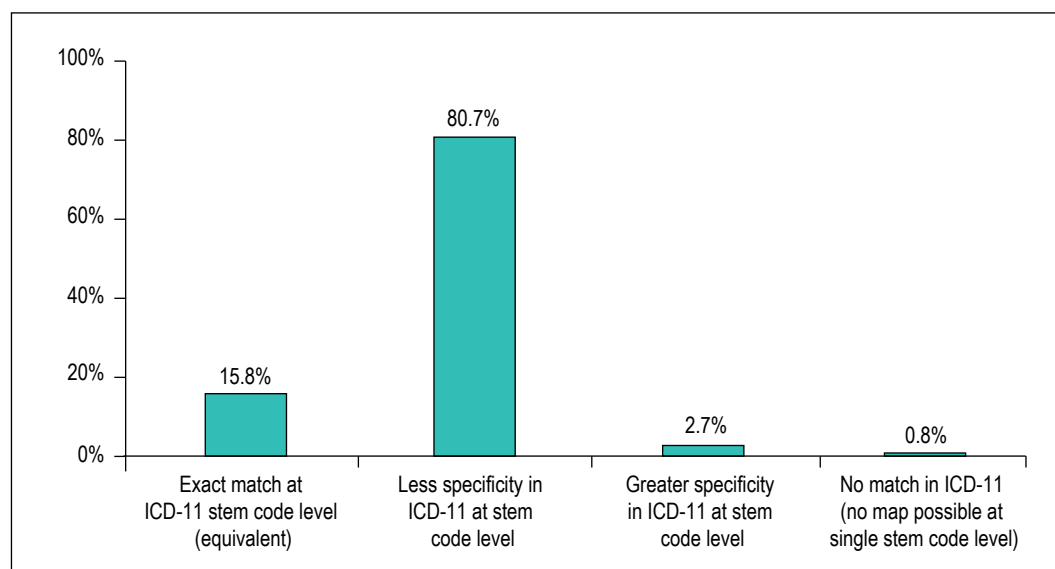
## Results

Of the 6,625 codes assessed using the ICD-11 coding tool (June 2018 implementation version), 15.8% (n = 1,046) were found to be exact or conceptual matches between ICD-10-CA and ICD-11. For outcome type 3, 2.7% (n = 181) had greater specificity in ICD-11 than in ICD-10-CA. For outcome type 2, 80.7% (n = 5,346) had less specificity, meaning some detail was lost (see figure below).

Where ICD-11 was less specific, post-coordination — combining more than one code — enabled exact matches in 53.5% (n = 2,860) of codes assessed and partial matches in 24.7% (n = 1,321). A total of 18.0% (n = 1,165) were unmatched, meaning additional specificity could not be added. For those cases that were unmatched, the classification specialist could not identify extension codes to complete a partial or exact match of the ICD-10-CA code in ICD-11.

In 0.8% (n = 52) of cases, there was no match, meaning that no ICD-11 match could be found. During validation, it was clear that ICD-10-CA “other specified” codes were being mapped to outcome type 4. While some had no matches at all, some provided exact matches when searching the ICD-10-CA inclusion terms (Table 2). The majority of no matches were related to Canada-specific content modifications.

**Figure** Percentage of total codes by outcome type



Outcome type	Percentage of total codes
Exact match at ICD-11 stem code level (equivalent)	15.8%
Less specificity in ICD-11 at stem code level	80.7%
Greater specificity in ICD-11 at stem code level	2.7%
No match in ICD-11 (no map possible at single stem code level)	0.8%

**Table 1** Outcome types 1 to 4 (example)

Outcome type	ICD-10-CA code and code title	ICD-11 stem code and code title	Stem code with extension codes
Exact match at ICD-11 stem code level (equivalent)	<b>F41.1</b> Generalized anxiety disorder	<b>6B00</b> Generalised anxiety disorder	Not applicable
Less specificity in ICD-11 at stem code level	<b>C67.2</b> Malignant neoplasm later wall bladder	<b>2C94.Z</b> Malignant neoplasm of bladder, unspecified	<b>2C94.Z&amp;XA3JA5</b> Lateral wall of bladder
Greater specificity in ICD-11 at stem code level	<b>I25.13</b> Atherosclerotic heart disease of artery bypass graft	<b>BA80.1</b> Coronary atherosclerosis of autologous bypass graft	Not applicable
No match in ICD-11 (no map possible at single stem code level)	<b>F07.2</b> Postconcussional syndrome	No match	Not applicable

**Table 2** Outcome type 4: Other specified ICD-10 code

**A:** No match of ICD-10-CA code title to ICD-11 stem code, exact match to ICD-11 stem with use of ICD-10 inclusion terms

Outcome type	ICD-10-CA code and code title	ICD-11 stem code and code title	Stem code with extension codes
No match in ICD-11 (no map possible at single stem code level)	<b>C94.7</b> Other specified leukaemias	No match	Not applicable

**B:** Inclusion terms at C94.7 *Other specified leukaemias*: Acute basophilic leukaemia and Aggressive NK-cell leukaemia

Outcome type	ICD-10-CA code and code title	ICD-11 stem code and code title	Stem code with extension codes
Exact match at ICD-11 stem code level (equivalent)	Acute basophilic leukaemia	<b>2A60.37</b> Acute basophilic leukaemia	Not applicable
Exact match at ICD-11 stem code level (equivalent)	Aggressive NK-cell leukaemia	<b>2A90.3</b> Aggressive NK cell leukaemia	Not applicable

## Limitations

These findings represent preliminary results, with further analysis and validation required after the release of the updates to the implementation browser. During the project, there were challenges with the assignment of outcome type, post-coordination and validation of the results related to ICD-11 implementation browser content updates. This was due to code pathways and structure changes. Future implementation browser updates will provide additional content, such as inclusion and exclusion notes at the code level and post-coordination options at the code level. These updates will support accurate assignment of outcome type and post-coordination. CIHI will continue to collaborate with the WHO to support and provide feedback on content and functionality of the classification.

## Conclusion

Overall, ICD-11 covers the content of ICD-10-CA, with 80% of codes identified as having less specificity at the ICD-11 stem code level. This is not an unexpected finding, given the new architecture of ICD-11. Additional research will be required to identify whether post-coordination provides enough specificity to adequately support all Canadian enhancements to ICD-10-CA and CIHI health indicator reporting, as well as to identify opportunities that ICD-11 presents for greater specificity in reporting. This will include a review of the complexity of the post-coordination and of the partial and non-applicable post-coordination types that were identified during this project. Code utilization patterns across Canada will be used to assess pan-Canadian impact for this project's selected set of ICD-10-CA codes. The number of times an ICD-10-CA code has been assigned will be an important factor in determining the impact of less-specificity or no-match situations and of post-coordination complexity.

While no decision has been made regarding the implementation of ICD-11 for morbidity statistics in Canada, CIHI's ongoing assessment of fitness for use and the impact of transitioning from ICD-10-CA to ICD-11 will inform decision-making about ICD-11 implementation in Canada.

## Acknowledgements

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