ICD-11 Information & References - Version 1.0

This compilation of links to ICD-11 tools and information as well as published papers is provided for those interested in learning more about ICD-11. Each reference includes a brief description to assist in locating information on a specific topic. We encourage you to use the "find" function to search for keywords to help you find answers to specific ICD-11 topics.*

Year	Resource	Link	Annotation
2019	World Health Organization (WHO). (2020, September 27). *ICD-11*. ICD-11. https://icd.who.int/en	WHO ICD Home Page	The World Health Organization (WHO) ICD-11 homepage describes the purposes and uses of ICD11 as a classification and terminology, highlights ICD11 features, provides diverse ICD11 use cases, presents a world map with the status of ICD11 implementation across WHO member states, and includes links to webinars, news, and other ICD11 resources.
2019	WHO ICD-11 Implementation or Transition Guide, version 1.05, copyright 2019	WHO ICD-11 Implementation or Transition Guide	The WHO ICD-11 Implementation or transition guide provides background on the development of ICD11 and describes the ICD11 components. The Guide outlines key issues to address in the planning leading up to and during implementation for countries to transition from an existing ICD to ICD-11. The table of contents includes for example, improvements and additions, digital compatibility and interoperability with information systems, implementation for mortality vs morbidity, early-adopters, pilot testing, stakeholder involvement, key recommended actions, and a template timetable for implementation (to name a few).

2021	WHO-FIC Content Model Reference Guide, World Health Organization (WHO) 2021 https://icd.who.int/browse11. Licensed under the Creative Commons Attribution No Derivatives 3.0 IGO license (CC BY-ND 3.0 IGO).	ContentModelGuide.pdf (who.int)	This draft guide defines and explains the Content Model used for the WHO Family of International Classifications, which presently includes ICD, ICF, and ICHI. The guide includes definitions and clarifying information on the technical specifications of the content model, including for example content model building blocks (entities, hierarchy, terms), linearizations, postcoordination, logical definitions, and extension codes.
2023	WHO ICD-11 Reference Guide 2023-02	WHO ICD-11 Reference Guide	The WHO ICD-11 Reference Guide provides information to understand and use ICD-11. It is organized in three parts. Part 1 is an introduction to ICD-11, including for example, the structure and taxonomy, main uses for mortality and morbidity, and maintenance. Part 1 is intentionally broad, for those with little to no knowledge or experience with ICD-11. Part 2 describes how to use ICD-11, including for example, coding and reporting guidelines, browser and coding tools, conventions, stem codes, extension codes, postcoordination, and details on mortality coding rules and statistics. Part 3 describes what's new in ICD-11 compared to ICD-10.
2024	WHO ICD-11 Coding tool Mortality and Morbidity Statistics (MMS) 2024-01	WHO ICD-11 Coding Tool	This link provides access to the WHO online ICD-11 coding tool for mortality and morbidity statistics (MMS). The smart coding tool is a simple automated way to find and select ICD-11 MMS code categories.
2024	WHO ICD-11 Browser for Mortality and Morbidity Statistics, 2024-01	ICD-11 Browser	This link provides access to the WHO online Browser for ICD-11 mortality and morbidity statistics (MMS). The online browser provides access to browse codes in the ICD-11 MMS hierarchy and review descriptions, exclusions, index terms, related categories, coding notes and instructions, and postcoordination suggestions.

Year	Citation	Link	Description
2024	WHO ICD-11 Training Package,	[WHO ICD-11 Training](#)	The WHO ICD-11 Training package includes multiple educational units, beginning with how to use the education tool and the coding tool and browser. There are also 12 additional training units which collectively provide education on each chapter of ICD-11.
2024	WHO ICD API	[Home Page ICD API](#)	This link is the home page for the WHO's ICD API which allows programmatic access to ICD. The site includes current documentation on how to access and use the API as well as how to deploy the ICD API locally and other announcements.
2020	Fung KW, Xu J, Bodenreider O. The new International Classification of Diseases 11th edition: a comparative analysis with ICD-10 and ICD-10-CM. J Am Med Inform Assoc. 2020 May 1;27(5):738-746. doi: 10.1093/jamia/ocaa030. PMID: 32364236; PMCID: PMC7309235.	[The New International Classification of Diseases 11th edition_a comparative analysis with ICD-10 and ICD-10-CM](#)	First broad comparison of ICD-11 to ICD-10-CM. Methods included forward and backward mapping (round-tripping) as well as manual coding of a subset. Of 388 ICD-10-CM codes examined, about 60% could be represented fully by pre or postcoordinated ICD11 codes.
2020	Khair, S., Quan, H., Eastwood, C., Doktorchik, C., Zhao, J., Losev, T., Denny, K., Baker, S., & Lu, M. (2020). Paving the Way: A Cost and Outcome Evaluation Framework for the Transition from the 10th to the 11th Version of the International Classification of Disease. *Perspectives in Health Information Management / AHIMA, American Health Information Management Association*	[Paving the Way: A Cost and Outcome Evaluation Framework for the Transition from the 10th to the 11th Version of the International Classification of Disease](#)	the paper presents a Canadian study to create a cost and outcome estimation framework for the transition from ICD-10-CA to ICD-11 in Canada. The costs of transitioning to ICD11 are based on literature reviews and interviews which are adapted for the Canadian context. The authors also estimated outcomes and anticipated benefits using face validity and criterion validity methods. The techniques presented are proposed as a benchmark methodology for other countries to evaluate adoption of ICD-11.
2021	Harrison, J. E., Weber, S., Jakob, R., & Chute, C. G. (2021). ICD-11: An international classification of diseases for the Harrison JE, Weber S, Jakob R, Chute CG. ICD-11: an international classification of diseases for the twenty-first century. BMC Med Inform Decis Mak. 2021 Nov 9;21(Suppl 6):206. doi: 10.1186/s12911-021-01534-6. PMID: 34753471;	[ICD-11_an international classification for the twenty-first century](#)	The article presents an overview of ICD11, both the content and changes in the design for use in the digital age. The article describes the information framework of ICD11, including the Foundation, linearizations, and the common ontology. It also describes features such as clustering, support for digital communication with the unique resource identifiers (URI), and

Year	Citation	Link	Summary
	PMCID: PMC8577172. twenty-first century. *BMC Medical Informatics and Decision Making*, *21*(Suppl 6), 206–206. https://doi.org/10.1186/s12911-021-01534-6		the coding tool as an index. The anticipated benefits of ICD11 are discussed and there are examples of ICD10 codes compared to ICD11.
2021	Fenton SH, Giannangelo KL, Stanfill MH. Preliminary study of patient safety and quality use cases for ICD-11 MMS. J Am Med Inform Assoc. 2021 Oct 12;28(11):2346-2353. doi: 10.1093/jamia/ocab163. PMID: 34472597; PMCID: PMC8510379.	Preliminary study of patient safety and quality use cases for ICD-11 MMS	In this study, the authors applied ICD11 codes to specific use cases, for patient safety and quality, to determine the suitability of ICD11. For pressure ulcers, ICD-11 MMS postcoordinated code clusters exceeded ICD-10-CM capabilities. For 3 electronic clinical quality measures, ICD-11 MMS fully represented the disease concepts when postcoordination was used. The authors concluded that ICD-11 would benefit both use cases and call for further investigation on tooling and guidelines to implement ICD11 with postcoordination. The article also includes an online supplement with a framework for ICD-10-CM use cases, made available for further input and evaluation.
2021	*Whitepaper 2021	IFHIMA*. (2021, February 17). https://ifhima.org/whitepaper-2021/	IFHIMA Fosters Planning for ICD-11 Adoption with Global Case Studies	This whitepaper from the International Federation of Health Information Management Associations provides a background on the development, content, and characteristics of ICD11, compared to ICD10. This is an excellent primer, with a nice synopsis of the technical features of ICD11 with the value of each and examples of ICD11 codes compared to ICD10 codes. It also summarizes benefits of ICD11 and provides adoption and implementation strategies, calling out unique challenges and opportunities for developing nations. A skills and knowledge self-assessment for ICD11 is included in an Appendix. Finally, this international paper includes detailed case studies in ICD11 planning and implementation from the WHO as well as the

			following countries: Canada, the Eastern Mediterranean Region, and Japan.
2021	Fung KW, Xu J, McConnell-Lamptey S, Pickett D, Bodenreider O. Feasibility of replacing the ICD-10-CM with the ICD-11 for morbidity coding: A content analysis. J Am Med Inform Assoc. 2021 Oct 12;28(11):2404-2411. doi: 10.1093/jamia/ocab156. PMID: 34383897; PMCID: PMC8510319.	[Feasibility of replacing the ICD-10-CM with the ICD-11 for morbidity coding_a content analysis](#)	This study evaluated the feasibility of replacing ICD-10-CM with ICD-11 by examining the most frequently used ICD-10-CM codes from each chapter manually recoded in ICD11. Results showed 23% coverage without postcoordination, but with postcoordination (the "game changer") and the addition of only 9 extension codes, nearly 60% of the 943 ICD-10-CM codes could be fully represented by ICD11. the authors conclude that the move from ICD-10-CM to ICD-11 is not more disruptive than from ICD-9-CM to ICD-10-CM.
2022	Chute CG, Çelik C. Overview of ICD-11 architecture and structure. BMC Med Inform Decis Mak. 2022 May 16;21(Suppl 6):378. doi: 10.1186/s12911-021-01539-1. PMID: 35578335; PMCID: PMC9109286.	[Overview of ICD-11 architecture and structure](#)	This article describes the architecture and structure of ICD11 including the Foundation layer, the content model and how a traditional tabular list of hierarchical codes (a linearization) is derived. It also describes and explains residual categories, the shoreline, postcoordination, and sanctioning rules.
2022	Mabon K, Steinum O, Chute CG. Postcoordination of codes in ICD-11. BMC Med Inform Decis Mak. 2022 May 17;21(Suppl 6):379. doi: 10.1186/s12911-022-01876-9. PMID: 35581649; PMCID: PMC9112606.	[Postcoordination of codes in ICD-11](#)	Postcoordination (a functional feature new to ICD in ICD-11) provides a way to combine (link) codes to describe more details of a clinical concept. The linked concepts are stored and reported as a cluster. The article explains the postcoordination feature and provides several examples of postcoordinated code clusters.

2023	Feinstein JA, Gill PJ, Anderson BR. Preparing for the International Classification of Diseases, 11th Revision (ICD-11) in the US Health Care System. JAMA Health Forum. 2023 Jul 7;4(7):e232253. doi: 10.1001/jamahealthforum.2023.2253. PMID: 37505488; PMCID: PMC10495107.	[Preparing for ICD-11 in the US Healthcare System](#)	This paper highlights evolutions in ICD represented in the 11th version, lists benefits of the new ICD11, and describes associated challenges for ICD11 implementation. The authors provide their perspective on key strategies to successfully implement ICD11 in the US and a helpful figure that summarizes the major aspects of the US healthcare system that are currently dependent on the ICD system.
2023	Fung, K. W., Xu, J., McConnell-LampteFung KW, Xu J, McConnell-Lamptey S, Pickett D, Bodenreider O. A practical strategy to use the ICD-11 for morbidity coding in the United States without a clinical modification. J Am Med Inform Assoc. 2023 Sep 25;30(10):1614-1621. doi: 10.1093/jamia/ocad128. PMID: 37407272; PMCID: PMC10531107.y, S., Pickett, D., & Bodenreider, O. (2023). A practical strategy to use the ICD-11 for morbidity coding in the United States without a clinical modification. *Journal of the American Medical Informatics Association : JAMIA*. https://doi.org/10.1093/jamia/ocad128	[A practical strategy to use the ICD-11 for morbidity coding in the United States without a clinical modification](#)	This study describes and evaluates practical strategies to replace ICD-10-CM with ICD-11, without creating a clinical modification (i.e. without creating an ICD-11-CM). Approaches examines include the use of stem codes from the ICD-11 MMS, exposing Foundation entities, adding postcoordination, with adding new stem codes as a last resort. The study examined 1725 ICD-10-CM codes and found 35% coverage with ICD-11 stem codes, 46% with Foundation entities, and 89% with postcoordination. The authors concluded the existing ICD-11 content can fully represent 89% of ICD-10-CM codes, if postcoordination is used. The options examined should be considered, and the coding guidelines and hierarchical structures of ICD-10-CM vs. ICD-11 need further investigation.
2023	Eastwood CA, Southern DA, Doktorchik C, Khair S, Cullen D, Boxill A, Maciszewski M, Varela LO, Ghali W, Moskal L, Quan H. Training and experience of coding with the World Health Organization's International Classification of Diseases, Eleventh Revision. Health Inf Manag. 2023 May;52(2):92-100. doi: 10.1177/18333583211038633. Epub 2021 Sep 23. PMID: 34555947; PMCID: PMC10170554.	[Training and experience of coding with the World Health Organization's International Classification of Diseases, Eleventh Revision](#)	This Canadian study describes the training materials, training process, and experience of 6 medical coders in Canada who coded over 3000 inpatient charts using ICD11. The paper includes detailed description of the process used to train the coders on ICD11, including development of materials, inter-rater reliability testing, and training measurement. The training experience was evaluated and input was used to update the WHO ICD11 browser and reference guide.

Year	Reference	Link	Description
2023	BMC Medical Informatics supplement on ICD-11	Spotlight on ICD-11: New Features and New Opportunities | BMC Medical Informatics and Decision Making (biomedcentral.com)	This BMC web page includes a compilation of articles published by BMC in 2021 - 2023. Thus this is a convenient single link that includes several references of interest (many of which are included individually in this list as well).
2024	Zhang M, Wang Y, Jakob R, Su S, Bai X, Jing X, Xue X, Liao A, Li N, Wang Y. Methodologies and key considerations for implementing the International Classification of Diseases-11th revision morbidity coding: insights from a national pilot study in China. J Am Med Inform Assoc. 2024 Mar 1:ocae031. doi: 10.1093/jamia/ocae031. Epub ahead of print. PMID: 38427850.	Methodologies and key considerations for implementing the International Classification of Diseases-11th revision morbidity coding_insights from national pilot study in China	This paper reports on a nationwide ICD11 implementation pilot study in 59 hospitals in China. The pilot study was conducted over 2 months and included morbidity coding at 56 hospitals of over 3 million diagnoses for over 800 thousand patients. The authors describe key considerations for implementation of ICD11 in China, including ICD11 content, tools, training, clinical documentation, and down stream data utilization. Coder testing based on training reflected 82.9% accuracy for ICD11 overall.
2024	Nikiema JN, Thiam D, Bayani A, Ayotte A, Sourial N, Bally M. Assessing the impact of transitioning to 11th revision of the International Classification of Diseases (ICD-11) on comorbidity indices. J Am Med Inform Assoc. 2024 Mar 15:ocae046. doi: 10.1093/jamia/ocae046. Epub ahead of print. PMID: 38489540.	Assessing the impact of transitioning to 11th revision of the International Classification of Diseases (ICD-11) on comorbidity indices	This study describes the use of common comorbidity indices as a case study to proactively assess the impact of transitioning to ICD-11 for mortality and morbidity statistics in Canada. They mapped previous ICD code versions to ICD-11 MMS and compared the population's distribution of Charlson and Elixhauser comorbidity indices. The authors found there were alterations in the population distribution between ICD versions and conclude that implementing ICD-11 MMS potentially hinders comparability of comorbidity burden.

* Work-product of the NCVHS Workgroup on Timely and Strategic Action to Inform ICD-11 Policy