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Why Should Developing Nations Implement ICD-11 for Morbidity Coding?

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Abstract— The International Classification of Diseases (ICD), maintained by the World Health Organization (WHO), is the global standard for morbidity and mortality coding. The 2022 release of ICD-11 brought improvements such as enhanced clinical detail, user-friendly technology, and multilingual support, offering a significant upgrade from ICD-10. Developing countries often face challenges with ICD-10, including limited morbidity data capture and the high costs of adopting other country-specific modifications. ICD-11 addresses these issues with features like postcoordination, extension codes, and electronic coding tools, which enhance coding accuracy, reduce training costs, and improve interoperability. Pilot studies in Kuwait, China, and Malaysia have demonstrated ICD-11's successful implementation, showing improved coding accuracy, better clinical documentation, and high user satisfaction. Key enablers of success include tailored training, multidisciplinary collaboration, and IT infrastructure readiness, though challenges remain with DRG integration and infrastructure gaps. ICD-11's support for both morbidity and mortality coding, its freely available mapping tools, and its multilingual capabilities improve the international comparability of health data. These findings highlight ICD-11's potential to transform health information systems in developing countries, enhancing data quality and supporting evidence-based policymaking. Strategic investments in technology, effective change management, and stakeholder engagement are essential for successful implementation.
Keywords— ICD-11, Morbidity Coding, Developing Countries, Health Information System, DRG Integration

I. BACKGROUND

The International Statistical Classification of Diseases and Related Health Problems (ICD) is part of the World Health Organization's Family of International Classifications (WHO-FIC). These classifications enable the collection and comparison of health data both nationally and internationally in a standardized way [1].

This is particularly beneficial for developing countries, as the ICD provides a ready-made classification system, saving time, effort, and resources needed to build or import expertise to create a country's own classification. It also allows countries to compare their health statistics with those of both developed and developing nations [2], aiding in the evaluation of health services and planning for improvement among many other uses. That's only possible because everyone speaks the same language on diagnoses: ICD!

ICD is far more widely used and recognized than other terminologies such as SNOMED CT, as evidenced by the number of scholarly articles on each. A search on Google Scholar reveals 1,930,000 articles that reference "ICD," compared to just 45,800 articles mentioning "SNOMED." This significant difference highlights the broader adoption and application of ICD globally in health data collection, research, and clinical practice. So, the best way forwards for developing countries in terms of health information is to keep following the WHO path![3]

ICD-10, endorsed by the World Health Assembly in May 1990, was well-suited for mortality coding but lacked the clinical detail needed for comprehensive morbidity coding. For example, it could classify "type 2 diabetes with ophthalmological complications," but not specify conditions like "type 2 diabetes with nonproliferative diabetic retinopathy without macular oedema." It was also often unable to code laterality, disease course (acute or chronic), and other factors such as whether a condition was present at admission or developed during the stay. As a result, many countries created their own ICD-10 modifications to meet specific needs, such as reimbursement or Diagnosis-Related Groups (DRGs), which posed a threat to the comparability of international morbidity data [4].

What about developing countries? For morbidity coding, some countries rely on free-to-use unmodified ICD-10, missing out on capturing comprehensive morbidity data, and hence are unable to use DRG systems for reimbursement. Others opt to purchase country-specific modifications, such as ICD-10-CM (U.S. Clinical Modifications) or ICD-10-AM (Australian Modification). However, using a DRG system also requires additional expenditure on complementary procedure codes. This, along with the ongoing costs of maintenance and updates, can lead to vendor lock-in, further straining resources [5].

ICD-11 officially came into effect on 1 January 2022. It represents a freely available, strategic solution to international comparability problems [6]. It works well for both morbidity coding and mortality coding and it serves the needs of both developing & developed countries.

II. METHOD

Pilot studies and implementation experiences in countries such as Kuwait, China, and Malaysia, along with the experience of the United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA), were reviewed. Key factors such as infrastructure readiness, training, coding accuracy, and stakeholder engagement are highlighted. The opportunities and challenges of ICD-11 transition or implementation are discussed[7].

III. RESULTS AND DISCUSSION

The Opportunities

1. Enhanced content

As a classification, ICD-11 is clinically up-to-date. For example, stroke is now classified under nervous system instead of the circulatory system. Influenza has been moved into Chapter 01, Certain infectious or parasitic diseases. There has also been a major restructuring of developmental anomalies[8]. ICD-11 includes new chapters such as chapter 07, Sleep-wake disorders, chapter 17 Conditions related to sexual health, and chapter 26 which is a supplementary chapter dedicated to Traditional Medicine Conditions (figure 1).

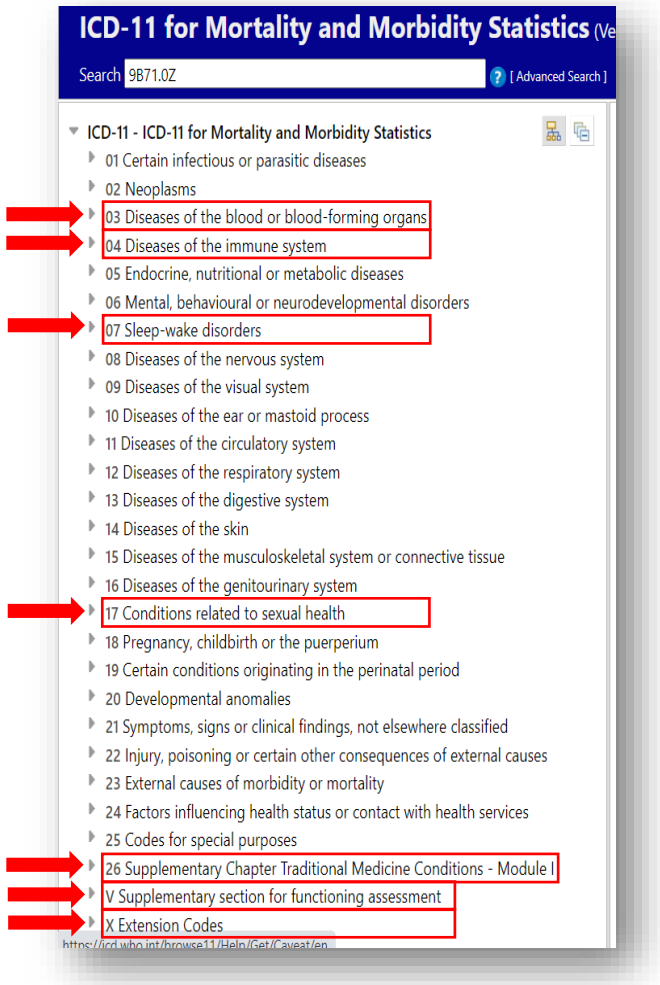

Fig.1 New Chapters

ICD-11 has a wealth of details. In addition to diagnoses, injuries, signs and symptoms, it can also code aspects such as laterality, anatomy, infectious agents, mechanisms of harm, histopathology, devices, chemicals and medicaments[9]. New concepts such as extension codes and postcoordination (combining two or more codes to describe a diagnostic entity using a code cluster) enable it to comprehensively describe a clinical condition without the need to create a huge classification. For example: Example, the code cluster 9B10.21&XK9J/5A11 represents the diagnosis "bilateral diabetic cataract due to type 2 diabetes" (figure 2).

ICD-11 is both a classification and a terminology. It has multiple parenting, and logical definitions with the potential of mapping to other terminologies such as SNOMED-CT[10].

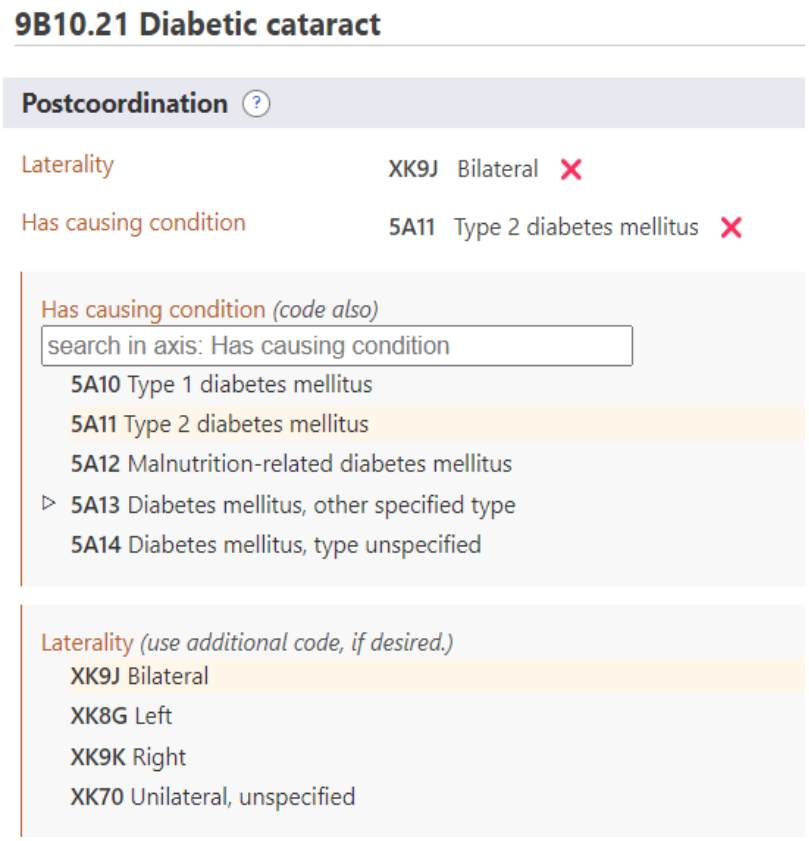

Fig.2 Postcoordination example

2. User-friendly technology

The results of the descriptive analysis above, it was informed that 68.9% of employees thought that the structure was in the good category. Then 29.9% of employees think that the structure in the category is adequate, and 1.2% of employees think that the structure in the category is bad. The average value of this variable is 39.0 and is included in the good category [11].

ICD-11 is fully electronic using the ICD-11 Coding Tool. The ICD-11 API (Application Programming Interface) makes it easy to embed the ICD-11 Coding Tool in any software[12]. Anyone can use the Tool online or offline without need for special software. It is a flexible search engine with a Google-like search. ICD-11 coding starts with typing the diagnosis or condition in the search box of the Coding Tool. The tool is smart and searches as the user types. It also provides a word list to help narrow down the search results. The content includes many synonyms and abbreviations making the search user-friendly[13]. All the user needs to do at this point is select the matching term, or one closest to it, among the displayed search results.

These electronic tools enable easier training because using ICD-11 is less complicated than using ICD-11 which involved searching two books: the alphabetical index and the tabular list.

ICD-11 is physician-friendly because codes can be automatically saved as the diagnosis is documented by the physician which can be very helpful in countries suffering a shortage of coders.

3. Translations

In ICD-11, each entity has a unique Uniform Resource Identifier (URI) eliminating language-related discrepancies. The 2024 release of ICD-11 is available in ten languages and more are planned for the 2025 release. ICD-11 is updated annually.

4. Mapping to and from ICD-10

Free ICD-10/ICD-11 mapping tables can be downloaded from the ICD-11 browser.

5. Maintenance transparency & engagement

An online, transparent proposal mechanism that allows experts from around the world to propose changes and improvements to both the classification and content is available. This system enables developing countries to suggest local term variations and synonyms commonly used in their healthcare systems, ensuring the classification remains relevant and adaptable to diverse contexts.

6. Multiple uses

ICD-11 is not only used for mortality coding. It has multiple uses related to morbidity coding such as reimbursement (DRG's). There is an ongoing casemix/DRG system adaptation with the help of Nordic countries that includes both ICD-11 and ICHI (the International Classification of Health Interventions). Primary healthcare can also benefit from ICD-11. A good example is UNRWA's practical experience with ICD-11 implementation for primary care. ICD-11 is useful for disease registration e.g., cancer registration or rare disease registries. Furthermore, ICD-11's features and content enable better reporting and classification of patient safety events.

The Challenges

a. Translations not in official languages take time due to high level of detail
b. Countries moving directly from ICD-9 to ICD-11 face mapping problems
c. ICD-11 is completely electronic, needs computers to install API.

Is infrastructure in developing countries ready?

1. A DRG system that uses ICD-11 is yet to be developed
2. ICHI is newly released and is not used yet for procedure coding by any country
3. Countries using DRG systems, are unlikely to adopt ICD-11 until ICHI is fully ready to be used for procedure coding, and a DRG is developed with both ICD-11 & ICHI

Experience From Developing Countries

1. ICD-11 in Primary Care - UNRWA's experience

UNRWA followed six steps to successfully implement ICD-11:
Step 1: Establishing a taskforce (including IT)
Step 2: Creating a project for integrating ICD- 11 into the e-Health system.
Step 3: Developing the new user interface design (UI)
Step 4: Piloting ICD-11 within outpatient module in the e-health system
Step 5: Training of Medical Officers
Step 6: Launching ceremony of the ICD-11 integrated into the e-Health on 22 Sept 2020

2. Kuwait's ICD-11 experience

The first ICD-11 morbidity pilot for inpatient discharges in a public general hospital was conducted in Kuwait in 2021. The pilot included: engaging stakeholders; selecting the setting; building a common understanding of the discharge process; evaluating and preparing IT infrastructure; ICD-11 training; small-scale pre-pilot testing; implementing the pilot while providing on-site support and collecting data for analysis including a brief user-experience survey. Overall, physicians were satisfied with the experience.

Facilitators for success included national health system influence, leadership commitment, a multidisciplinary team approach, physician-tailored training, using social media for training, and providing on-site support.

Challenges included potential IT problems, and difficulties relating to training and engaging physicians. Issues to consider include DRG system requirements, and comparability of ICD-11 pilot results from different countries.

Conclusion, ICD-11 can be successfully implemented for documenting diagnoses by physicians in a public hospital by installing the coding tool on the electronic hospital information system. Implementing ICD-11 requires effective change management, stakeholder-tailored communication, and innovative ideas for training to match the electronic nature of ICD-11 and its potential new users, physicians [14].

3. China's experience

ICD-11 morbidity coding was implemented across 59 hospitals in China as part of a pilot study. Among these hospitals, 58 integrated ICD-11 Coding Software into their health information management systems, and 56 adopted ICD-11 for morbidity coding. Over a two-month pilot phase, 3,723,959 diagnoses for 873,425 patients were coded. Key considerations for the transition included enhancing ICD-11 content, refining tools, offering systematic and tailored training, improving clinical documentation, promoting the use of downstream data, and establishing a national implementation process. The overall coding accuracy was 82.9% when considering the full coding field (including postcoordination) and 92.2% when only one stem code was used.

In conclusion, this nationwide pilot has improved China's technical readiness for ICD-11 implementation in morbidity coding and highlighted important factors for future transitions. The high accuracy and intercoder reliability achieved after brief training emphasize ICD-11's potential to reduce training costs while delivering high-quality health data. The insights and lessons learned from this study have contributed to WHO's work on ICD-11 and can help guide other countries in planning their own transitions.

4. Malaysia's experience

A study was conducted to investigate the factors influencing the intention to use the ICD-11 among medical record officers. The study findings showed that 10 factors have a significant impact. Users' subjective norm was the most influential factor in their intention to use ICD-11. Unexpectedly, perceived usefulness and was found to have no significant influence. This study is important for policymakers in strategising ICD-11 implementation efforts [15].

IV. CONCLUSIONS AND SUGGESTIONS

ICD-11 offers developing countries a valuable opportunity to modernize their health information systems and achieve global comparability in morbidity coding. By overcoming existing challenges and utilizing the technological advancements of ICD-11, these nations can enhance the quality of health data, support evidence-based decision-making, and align with international health standards.

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