The Impact of Covid-19 on the International Classification of Diseases (ICD)

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Abstract

The covid 19 pandemic has significantly affected the international classification of disease causing a rapid adaptation to conquer the upcoming health challenges. It is a global standard for reporting diseases and health conditions, that is maintained by the World Health Organization, the ICD. An urgent announcement of specified ICD codes like U07.1 for the exact number of cases and U07.2 for the clinical data were made during the COVID-19 in order to track the accurate number of viruses throughout the world. For effective health interventions and international comparison this standardization was very important. Inorder to track the numbers and effects of the disease a new code was introduced post-COVID-19 syndrome (U09.9), that played a very important role. These changes improved the management of patients and also helped in research. But the lack of health data reporting and the number of health systems that support the ICD updates were also noticed in the pandemic. This is the only reason to have a perfect and efficient infrastructure for the health information and the changes that were made in the ICD was done globally. The improving of the infrastructure is the one of the most important part in the innovation of ICD and other systems that are related to global health sector. One thing that should be kept in mind is to keep the system updated. This shows the reason why to invest in the health information infrastructure, it is to achieve efficiency and accuracy in all data reporting.

Index Terms: Covid 19, ICD, Codes, ICD-11.

1. INTRODUCTION

The changes that were bought by the pandemic all around the globe, especially in the field of healthcare were all remarkable. The system that is managed by the World Health Organization International Classification Of Diseases (ICD) was the one that was effected more. It is the method to document diseases and their treatments using standard language, this is to gather data and track the information related to health. [1].

International Classification of Diseases (ICD)

The system that is only designed to cover the diversity and coding of diseases, health related issues, and other issues that are related to health, is the International Classification Of Diseases (ICD). World Health Organization created this system and are still managing it. This system is capable of assigning standard language which assists multiple nations. The ICD is highly important for epidemiological tracking, management of health issuesz practice for the clinical studies, and research. It was invented in 19th century, named as International List of Causes of Death but after 1893 ICD was updated multiple times so that it would be useful for the medical science and public Health needs. Every update that was made only focuses on the importance of accuracy, relevance, and comprehensiveness of the classification

system. ICD-11 is the most recent updated version of this system that was updated in January 2022 by making a milestone in the history of disease classification [2].

2. STRUCTURE AND ORGANIZATION

The ICD is a system that hierarchically structured, classifying diseases and health related conditions into different categories and then these categories of other further broken down into subcategories this organization deals with both analysis which means the high level and the detailed held data after classification each disease or condition is address with a unique code making the identification and tracking easier. For example, in the version ICD-10 the code that is assigned to diabetes mellitus is E10-E14, each type is classified as for type 1 diabetes it's E10 and for typer 2 it's E11. This type of thorough coding makes sure that the documentations and analysis of different health problems are accurate [3]. There are several different roles that ICD plays in the healthcare department such as:

Care and Disease Management: By standardizing health condition coding and classification, the International Classification of illnesses (ICD) helps manage treatment and illnesses. Standardization improves healthcare practitioner communication, documentation, and patient care. Public health care and disease management surveillance depend on the International Classification of Diseases. Effective population-wide illness monitoring, and management need systematic health data capture, recording, and analysis, which the ICD provides. An ICD-standardized system for tracking medical diagnoses, therapies, and medical results improves care management. Information in electronic health records (EHRs) is consistent and comparable across healthcare settings because providers utilize ICD codes. Uniformity allows healthcare personnel to readily communicate and access data about patients, improving continuity and quality. Disease management surveillance includes continuous health data collection, analysis, and interpretation to limit disease transmission and effects. This is made possible by the ICD, which standardizes illness classification and reporting worldwide.

Clinical Practice: The codes that are assigned by the ICD are then utilized by the healthcare sector to record diagnosis and treatments in patient documentation. This makes sure that they have a precise and consistent documentation, which is very important for the patient medical billing and insurance.

Health Management: The health administrators and the policymakers use the data that is given by the ICD to allocate the resources, services for healthcare are planned and performance of the health system are checked. The information that is gained from the ICD code helps to identify the priority of data related to health and effective decisions are made.

Research: The coded data that is taken from the ICD is used by the researchers to study the diseases, risky factors, results and the treatment. The universal classification allows the researchers to compare and aggregate the information from different sources that improves the quality and accuracy of the research outcomes [3].

3. IMPACT OF ICD-11

The ICD-11 is the most advanced version of the classification of diseases and health conditions, which includes some of the important updates and features that were not present in the ICD-10. These features do play an important role in the knowledge of medical and technology [4]. Some of the important features includes:

Digital Readiness: ICD-11 works as the electronic health records and the digital health systems which allow small integration and exchange of information.

Enhanced specificity: This updated version includes more that information and perfect codes for the documentation of difficult health conditions.

Global Relevance: The ICD-11 is the work of the world's best health professionals, that makes sure it is applicable across the different health systems and nations.
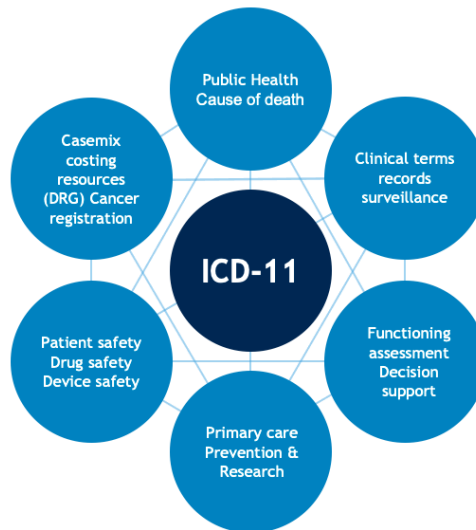
Fig.1. Some other Highlights of ICD-11

The Onset of COVID-19 and Initial ICD Response

The novel coronavirus SARS-COV-2 was caused by a rapid spread of COVID-19, that needed a quick announcement from the health organizations throughout the world. Due to the accurate and quick recording of the COVID-19 cases that were in record was due to the emergency codes that were issued by the WHO as the pandemic was progressed in 2022. This step was very important as it was done to track down the number of cases that were affected by the virus and give required instructions to the public health interventions and comparing the results on an international level.

The specific codes that were issued by the ICD for the COVID-19 were U07.1 for the cases that were confirmed by the laboratories and U07.2 for the cases that confirm without the laboratory confirmation or epidemiological diagnosis. These codes helped the health authorities to track down the number of cases but also the prevention [5].

4. CHALLENGES IN ICD ADAPTATION

Although the system was updated but still it faced different challenges during the pandemic. One of the major issues that were faced was the in the coding system lacks granularity in the coding system. As the information was gathered on the COVID-19, it was prominent that the virus was affecting in different variations like the mild respiratory issues to the complex complications like the acute respiratory distress syndrome (ARDS), multisystem inflammatory syndrome in children (MIS-C), and long COVID. The present ICD codes that were issued were not able to hold the complexity, that results in issuing more detailed and to the point codes choices.

Apart from this the implementation of the new codes was becoming a challenge to the health data reporting and the number of health systems in order to get efficient results. Due to lack of resources, some areas faced the problem of upgrading the health information systems, that caused inconsistent information

collection and reporting. After facing such challenges, the need for a robust health information infrastructure was highlighted in order to make sure the adoption of ICD updates worldwide [6].

Enhancements and Revisions to the ICD

The WHO and the stakeholders show the interest in the improvement of the ICD response and relevance, after faces the challenges in pandemic. New codes were issued to record the different versions and aftereffects of the COVID-19. For example, for the post COVID-19 situation the code (U09.9) was issued, to record the information about the aftereffects of the COVID-19 on different patients. In order to deal with the upcoming health issues more discussion is needed for the ICD framework in the reference of flexibility and adoptability. Which means that still a lot of potential is lacking in the system for the interim updates or on further classification that can help in public health emergencies. Such features will make the ICD the best option or tool for the tracking of diseases and health management in this dynamic world [7].

Implications of the Pandemic on Care and Disease Management

COVID-19 has forced quick healthcare practice changes and new diagnostic codes. As in-person contacts were reduced to decrease viral transmission, telemedicine accelerated, having a major influence. Telehealth services now have new ICD codes for adequate documentation and reimbursement, assuring continuity of treatment and social distancing. Digital health solutions were emphasized, but technological access discrepancies were also shown, underlining the need for inclusive healthcare legislation. Due to the pandemic, COVID-19-specific ICD codes such U07.1 for confirmed cases and U09.9 for post-COVID symptoms were quickly created and implemented. These codes have helped monitor the virus's transmission and influence public health actions [8]. Comprehensive COVID-19 case documenting has aided epidemiological research, improving illness knowledge and treatment regimens. Integration of EHRs with public health reporting systems allows real-time data gathering and analysis for trend and outcome monitoring. Improved monitoring enabled prompt public health actions including funding allocation and vaccination programs. Pandemic also showed the need for more flexible health information systems that can quickly react to new health risks. The experience showed the need of maintaining health information infrastructure and capacity-building, especially in resource-limited contexts, and the relevance of consistent coding in global health security. The pandemic has shown how diagnostic codes can manage healthcare emergencies and create robust, egalitarian systems [9].

5. IMPACT OF THE ICD ON PRIMARY AND DISEASE MANAGEMENT

There many positive features of ICD in the world of healthcare, public health, and research. But it most useful for the epidemiological tracking. As the information or the codes that were generated by the system were used to track down the virus and monitor it.

This factor is very important as it covers the outbreaks, tracks down the cause of disease, and timely updates the public health interventions. For example, the codes that were issued by the ICD in emergency for the COVID-19 cases helped in accurate tracking and displaying the importance of system adaptability in such breakdown [10].

In the reference of clinical aspect, the ICD covers the documentation of diagnoses and treatments. The ICD codes are used by the healthcare providers to record the patient's current situation, resulting in professional and efficient communication. These procedures are very important for the patients and the healthcare providers. Apart from this the documentation is also important for the medical billing and for the insurance, as it is less corrupt and have no to less errors [11].

The ICD plays a very important role in health management and policymaking. The data that is gathered by the ICD is used by the administrators and policymakers to provide the resources efficiently, provide healthcare services and check the progress of health systems. This data also helps to set the priorities and efficient use of resources. For example, the places that are more affected by the virus should get more resources than others

If we talk about the research, the ICD provides a universal framework that improves the quality and comparatibility of information that is related to health. The codes that are issued by the ICD are used by researchers for the conduction of research for further studies on diseases, the factors that are associated with it, and the treatment of the diseases. This universal classification allows the integration and comparison of data from different sources. This plays a very important role in the field of medical knowledge as it improves the outcomes globally [12].

6. SCOPE OF THE ICD

The future of ICD is very vast, as it covers a wide range of diseases, health conditions, and issues that are related to health. The design of the ICD is comprehensive and efficiently covers everything from the diseases that are infectious to the diseases that are chronic to injuries and mental health disorders. This wide range that the ICD covers makes it the most useful system across the different health systems [13].

The major aspect of the ICD's future is the adaptability to the innovations in medical knowledge and public health. Which means it will be revised accordingly to include any new diseases that can help in any innovation in medical science. The updated version ICD-11 has the most significant features over the previous updates that include more information and to the point codes to overcome the complexity of modern healthcare. For example, the current updated version of the ICD includes all the codes that are related to the COVID-19 which includes the long-term impact as well as the short-term impacts [14].

Apart from this the scope of ICD includes the use of the system in different health related departments like the health insurance, legal and forensic medicines, and also in health economics. If we talk about the health insurance the ICD cords are very important for generating the clams and covering the claims. In the field of legal and forensic medicines it can be used to classify the cause of death and injuries perfectly. In the health economics ICD will use the code to analyse the economic pressure of disease and will timely inform the policymakers [15].

7. CONCLUSION

The strengths and the weaknesses of the international classification of diseases (ICD) were impacted by the COVID-19 pandemic. This study is all about how the ICD has covered all the aspects of medical related issues and how it overcame the challenges faced by the COVID-19 and the broader aspect of the system. The flexibility and critical role in public health was shown by the World Health Organisation as it announced the specific ICD codes for the covid-19 cases. The creation of such emergency codes like U07.1 for the confirm cases and U07.2 for the clinically diagnose cases to find the accurate reading of the virus worldwide. During the pandemic many of the healthcare systems faced difficulty implementing the new ICD codes efficiently. This was due to the limited resources to update their health information systems effectively. Which resulted in the loss of data as well as resources. This is the reason to improve the infrastructure of the health information so that it should have enough capacity to go through the updating process.

Future Directions and Lessons Learned

The pandemic taught a very important lesson for the future of the ICD and the global health information systems. One of them is to keep the systems updated before time and make sure to have proper revisions. Apart from this the pandemic also showed the importance of investing in the health information infrastructure, so that their capacity should be increased, and the world can have accurate and up to date information regarding any future issue.

REFERENCES

1. Murk W, Gierada M, Fralick M, Weckstein A, Klesh R, Rassen JA. "Diagnosis-wide analysis of COVID-19 complications: an exposure-crossover study." CMAJ : Canadian Medical Association journal = journal de l'Association medicale Canadienne, vol. 193, pp.E10-E18, 2021.

2. Hong, Y., & Zeng, M. L. International classification of diseases (ICD). *KO Knowledge Organization*, vol. 49, no. 7, pp.496-528, 2023.

3. Fritz, April G., ed. International classification of diseases for oncology: ICD-O. World Health Organization, 2000.

4. Chute, Christopher G., and Can Çelik. "Overview of ICD-11 architecture and structure." *BMC Medical Informatics and Decision Making*, vol.21, no. 6, pp.378. 2021

5. Hong, Yi and Marcia Lei Zeng, 2022. "International Classification of Diseases (ICD)". *Knowledge Organization*, vol. 49, no. 7, pp. 496-528, August 2022.

6. Kim, Hyeji, Doyeon An, Yeojin Lee, and Hyekyung Woo. "An overview and future challenges of the WHO International Classification of Disease ICD-11." *Journal of Health Informatics and Statistics* vol.47, no. 4, pp.241-249. 2022.

7. Bhatt, Ankeet S., Erin E. McElrath, Brian L. Claggett, Deepak L. Bhatt, Dale S. Adler, Scott D. Solomon, and Muthiah Vaduganathan. "Accuracy of ICD-10 Diagnostic Codes to Identify COVID-19 Among Hospitalized Patients". *Journal of General Internal Medicine*, vol. 36, no. 8, pp. 2532-5, 2021.

8. Buysse, B., C. Coombs, and J. Albano. "EPH170 Diagnoses of Long COVID in the United States: Analysis of a Large Claims Database." *Value in Health*, vol. 26, no. 6, 2023.

9. Shahmanzari, M., Tanrisever, F., Eryarsoy, E., & Şensoy, A. "Managing disease containment measures during a pandemic". *Production and Operations Management*, vol. 32, no. 5, pp.1362-1379, 2023.

10. Panozzo, Catherine A., Tiffany S. Woodworth, Emily C. Welch, Ting-Ying Huang, Qoua L. Her, Kevin Haynes, Catherine Rogers et al. "Early impact of the ICD-10-CM transition on selected health outcomes in 13 electronic health care databases in the United States." *Pharmacoepidemiology and drug safety*, vol. 27, no. 8, pp.839-847. 2018

11. Rath, Benjamin, Florian Doldi, Kevin Willy, Christian Ellermann, Julia Köbe, Fatih Güner, Florian Reinke, Philipp Sebastian Lange, Gerrit Frommeyer, and Lars Eckardt. "Ventricular arrhythmia burden in ICD patients during the second wave of the COVID-19 pandemic." *Clinical Research in Cardiology*, pp.1-6, 2023.

12. Hohl, Corinne M., Andrei Karpov, Lisa Reddekopp, and Jürgen Stausberg.. "ICD-10 Codes Used to Identify Adverse Drug Events in Administrative Data: A Systematic Review". *Journal of the American Medical Informatics Association*, vol. 21, no. 3, pp.547-57, 2014.

13. Harrison, James E., Stefanie Weber, Robert Jakob, and Christopher G. Chute. "ICD-11: an international classification of diseases for the twenty-first century." *BMC medical informatics and decision making*, vol. 21, pp.1-10, 2021.

14. Hirsch, J. A., G. Nicola, G. McGinty, R. W. Liu, R. M. Barr, M. D. Chittle, and L. Manchikanti. "ICD-10: history and context." *American Journal of Neuroradiology,* vol. 37, no. 4, pp.596-599, 2016

15. Cassell, Kelsie, Casey M. Zipfel, Shweta Bansal, and Daniel M. Weinberger. "Trends in non-COVID-19 hospitalizations prior to and during the COVID-19 pandemic period, United States, 2017–2021." *Nature Communications*, vol. 13, no. 1, pp.5930, 2022.