

## A Comprehensive Review of Automated ICD -10 Categorization Model: Methodologies, Challenges, and Future Directions

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In healthcare systems worldwide, the manual assignment of ICD-10 (International Classification of Diseases, 10th Revision) codes presents significant challenges, including resource constraints, lengthy processing times, and potential inaccuracies. This comprehensive review of the literature analyzed existing research papers on automated ICD-10 coding systems, focusing on machine learning methodologies such as decision trees, natural language processing (NLP), and deep learning models. The review comprehensively evaluates the performance, accuracy, and implementation challenges of these techniques across diverse healthcare settings. By examining studies from multiple healthcare settings, this paper highlights the potential of automated systems to improve diagnostic precision, reduce manual workloads, and enhance overall healthcare efficiency. The evaluation highlights major obstacles, including data availability, integration with existing systems, and the need for ongoing training of healthcare professionals, with brief implications for developing countries like Sri Lanka. Finally, this comprehensive analysis recommends future research areas to help automated ICD-10 coding systems become more widely used, which would ultimately lead to better healthcare outcomes worldwide.

**Keywords:** *ICD - 10 codes, classification method, ICD - 10 code assignment, machine learning*