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Predictive Modeling Applied to Primary Care Accreditation: A Large-Scale Experience in Brazil's Unified Health System

São Paulo, one of the largest cities in the world, is implementing one of the most extensive primary healthcare accreditation projects ever conducted, covering 465 Basic Health Units (UBS) and reaching approximately seven million users of Brazil's Unified Health System (SUS). This initiative is part of the municipal program called "Avança Saúde"and follows the methodology of the National Accreditation Organization (ONA, from the Portuguese Organização Nacional de Acreditação), Brazil's leading healthcare accreditation framework.
This study presents an approach that integrates applied statistics and artificial intelligence to develop a predictive model based on historical data from assessment cycles (organizational diagnosis, self-assessment, and certification). The modeling process was conducted employing computational tools and programming techniques in Python and R, to execute data engineering tasks—including extraction, cleaning, transformation, and integration—and to perform rigorous analyses of large-scale operational and administrative datasets.
The predictive model is intended to support public health decision-making by enabling the prioritization of health units with the greatest potential for improvement within the accreditation process, thereby optimizing resource allocation. All data were sourced from the ONA Integrare system, in compliance with ethical standards and data anonymization protocols.
With over 50,000 Basic Health Units operating throughout Brazil, this research demonstrates high potential for large scale implementation in Brazil, offering evidence-based strategies to enhance primary care quality and strengthen the SUS across diverse contexts.

Special/ Invited session

Classification

Mainly application

Keywords

Quality Certification, Artificial Intelligence, Healthcare

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