Poster Abstract Submission

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Abstract:

Population Health Management and Value-Based Health Care: A Rapid Review for highlighting Evidence, Opportunities, and Barriers from the adoption of Artificial Intelligence and Machine Learning Authors: Fabrizio Giovanni Vaccaro,1 Alessandro Ambrosi,2 Pietro Barbieri,3 Carlo Signorelli,3 Verdiana Morando1,4 1. Education & Consultancy Unit, GSD Healthcare, Dubai, United Arab Emirates 2. Public Health Unit, Vita-Salute San Raffaele University, Milano, Italy 3. Health Management Unit, San Raffaele Hospital, Milano, Italy 4. Gulf Medical University, Ajman, United Arab Emirates Contemporary Health Systems face the challenge of sustainability and high-quality care to provide effective, efficient, safe, integrated, patient-centered, timely, and equitable healthcare services. Significant threats are the demographic and epidemiologic transitions, the comorbidity increase, the care & technology rise of costs, and the healthcare staff shortage. Population Health Management (PHM) is a discipline related to Public Health that aims to integrate knowledge and tools from different sectors to improve population health following Value-Based Health Care (VBHC) principles. This discipline is based on population health data analytics and business intelligence, i.e., the process of transforming data into information and, through discovery, into knowledge to guide action. A massive amount of health data is currently produced and recorded. However, this valuable resource is often misused or under-used for various reasons: misalignment between technology advances and professional capabilities, legal restrictions, poor data quality, unclear data governance, or lack of technology. Therefore, the connection between data analysis and decision-making in health policy and healthcare service delivery is difficult to reach and can improve. Artificial Intelligence (AI) and Machine Learning (ML) are technological tools that can substantially help find the connection between data, evidence, and decision-making. The workgroup has conducted a rapid review of the scientific literature to define the state of the art in adopting AI and ML on PHM and VBHC internationally to identify the main application sectors, tools, opportunities, and barriers. AI is the adoption of complex algorithms to perform specific data analytics tasks automatically. Besides, ML enables the constant finetuning of the performance of these tasks identifying common patterns in the analyzed data. AI and ML application on PHM and VBHC has started recently and has few routine applications, while slightly more implementations can be retrieved on the clinical decision-making support. Nevertheless, some lessons can be deduced. The translational step from research to practice is a major challenge. Therefore, the collaboration between decision-makers, enterprises with sound experience in big-data management, public health professionals and epidemiologists, clinical specialists, and economists is crucial to driving the successful implementation of AI and ML in the real-world setting. Also, the collected evidence suggests AI and ML could be tested to improve the performance of typical PHM analytical techniques such as Risk Stratification, Case Finding, Population Segmentation, and others. In addition, AI and ML

can support overcoming poor data-quality collection and linkage limitations from different data sources. AI and ML represent a big opportunity for PHM. Indeed, PHM relies on leveraging health data and analytics to guide policymaking and improve population health, individual healthcare experience, health system quality, health professional experience, and cost control. Nevertheless, shared knowledge on the potential applications of AI and ML on PHM is limited among the key decision-makers as the research on this topic is also limited. In addition, professional expertise and multidisciplinary collaborations are difficult to achieve and sustain on a large scale. Nevertheless, some of the barriers and evidence identified in the present research can help overcome these challenges and accelerate the translation process of AI and ML applications for PHM from the research to the daily healthcare delivery setting.