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COR-VIDENS: AN INTEGRATED PLATFORM FOR PREDICTING CARDIOVASCULAR DISEASE PREVENTION AND OVERUSE COSTS

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Relevance: Cardiovascular diseases remain the leading cause of mortality worldwide. Despite decades of research yielding validated risk prediction tools, proven to improve outcomes, routine clinical use remains low, with only 41% of eligible patients receiving guideline-recommended therapies. The primary barriers are time constraints (5–10 minutes per manual calculation), difficulty recalling complex scoring criteria across dozens of tools, and fragmentation across platforms. This fragmentation disproportionately affects vulnerable populations—elderly patients, women, and ethnic minorities—who often present atypically and are inconsistently managed. This study investigates how consolidating existing cardiovascular risk scores into a single automated platform can address these implementation gaps.

Aim: to develop and clinically validate an integrated digital platform that uses existing cardiovascular risk prediction scores into an automated tool to reduce risk assessment time, improve consistency, and enhance guideline adherence.

Materials and methods: The Cor-Videns platform was built on a microservices architecture that follows international standards, bringing together 38 existing, peer-reviewed cardiovascular risk scores into one easy-to-use interface. Rather than inventing new algorithms, the platform automates risk calculation with a modular engine that applies each published score exactly as written, while a Data Integration Layer pulls patient data directly from hospital electronic health records. For statistical validation, we used McNemar's test to assess diagnostic accuracy, parametric tests to compare decision times, and subgroup analyses to ensure the tool works well for vulnerable populations, setting significance at $p < 0.05$. To validate the heart failure suite, we prospectively tested 25 patients with atherosclerosis (13 men and 11 women) at the 4th Minsk Clinical Hospital. Meanwhile, the cardiovascular disease (CVD) suite was evaluated on a larger cohort of 213 patients with chronic kidney disease, 115 with rheumatoid arthritis, and 105 with diabetes mellitus (117 women and 96 men, aged 21 to 80), using data from hospitals including Bristol Royal Infirmary and Oxford John Radcliffe Hospital, which gave us a true multi-center assessment.

Results and their discussion: In standard practice, clinicians calculated appropriate risk scores in only 43% of indicated cases, primarily due to time constraints (67%), difficulty recalling criteria (52%), or simply not thinking to use them (38%). With Cor-Videns, scores were automatically calculated for every patient, leading to substantial improvements: diagnostic accuracy increased from 72% to 90% ($p < 0.001$); guideline adherence improved from 68% to 94%; decision time decreased by 37% (from 6.7 to 4.2 minutes, $p = 0.002$); and medication dosing errors were reduced by 83%. The platform's FHIR-compliant architecture provided seamless EHR interoperability, saving 2.5 minutes per assessment. Critically, the platform delivered the largest benefits for vulnerable populations: diagnostic accuracy improved by 20% for elderly patients, 18% for women, and 19% for ethnic minorities—not through new algorithms, but by ensuring consistent application of existing scores often overlooked in these groups.

Conclusions. This abstract demonstrates that a digital platform consolidating existing cardiovascular risk scores into a single automated tool significantly improves clinical care. By making proven scores easier to access and use, the platform increased diagnostic accuracy by 28%, reduced decision time by 37%, and improved guideline adherence from 68% to 94%. Its success stems not from novel algorithms, but from consistent application of existing knowledge—addressing the implementation gap by putting validated tools at clinicians' fingertips. Notably, the platform improved outcomes for vulnerable populations (elderly, women, ethnic minorities) by ensuring consistent score application regardless of demographics, thereby reducing unconscious bias and advancing healthcare equity.