

A sex-specific prediction model is not enough to achieve equality for women in preventative cardiovascular medicine

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This commentary refers to ‘SCORE2 risk prediction algorithms: new models to estimate 10-year risk of cardiovascular disease in Europe’, by the SCORE2 working group and European Society of Cardiology (ESC) Cardiovascular Risk Collaboration, <https://doi.org/10.1093/eurheartj/ehab309> and the discussion piece ‘SCORE2 models allow consideration of sex-specific cardiovascular disease risks by region’, by S. Hageman *et al.*, <https://doi.org/10.1093/eurheartj/ehab761>.

We wish to congratulate Hageman *et al.*¹ for their important study ‘SCORE2 risk prediction algorithms: new models to estimate 10-year risk of cardiovascular disease in Europe’. The advanced methodological approach undertaken, and the development of sex-specific prediction models will improve the prediction of cardiovascular disease in women and men across Europe.

Awareness of sex inequalities in the provision of cardiovascular health care is increasing.^{2,3} Although we highly appreciate the authors efforts to address this by developing a sex-specific cardiovascular risk tool, this will not be enough to achieve equality for women in the area of preventative cardiovascular medicine. When a sex-specific approach is proposed, it is crucial that the data is provided on a sex-disaggregated level to aid in the interpretation of performance and to enable further validation of research findings.^{3,4} It should be mandatory that sufficient details of the risk algorithms are provided to replicate the findings in both men and women. This does not only include the end product, the SCORE2 risk charts, but also the risk equation on which the risk charts are based upon. Unfortunately, the authors only present a male example in their study (Supplemental Methods,

Table 1), therefore precluding further evaluation of the reproducibility of the SCORE2 risk equation in women.

The components of the SCORE2 risk equation are (i) the sex-specific beta-coefficients of predictors, (ii) the mean value of which each predictor is centred, and (iii) the sex-specific 10-year survival for individuals in the baseline group. For men, all components of the SCORE2 risk equation are included in the report. For women, the female-specific beta-coefficients of predictors are not provided, and the reported female-specific hazard ratios lack precision (rounded by two decimals) for women on a similar level as for men (rounded by four decimals). Furthermore, the 10-year survival for women in the baseline group is not reported, which prevents calculation of risk in women using the SCORE2 risk equation in other cohorts.

We therefore ask the authors to provide female-specific beta-coefficients and 10-year baseline survival for women, so that the SCORE2 risk equation can be determined in women in future research to ensure the findings of this important study can be generalized to both women and men. This will enable future studies addressing the impact of implementing the SCORE2 risk equation on the prevention of cardiovascular disease in men and women and will contribute to our shared goal of sex-equality in the provision of cardiovascular health care.

Funding

D.M.K. is supported by a grant from Health Data Research UK, which is funded by the UK Medical Research Council, Engineering and Physical Sciences Research Council, Economic and Social Research Council, Department of Health and Social Care (England), Chief Scientist Office of the Scottish Government Health and Social Care Directorates, Health and Social Care Research and Development Division (Welsh Government), Public Health Agency (Northern

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Ireland), British Heart Foundation, and Wellcome. A.S.V.S. is supported by a British Heart Foundation Intermediate Clinical Research Fellowship (FS/19/17/34172). N.L.M. is supported by a Chair Award (CH/F/21/90010), a Programme Grant (RG/20/10/34966), and a Research Excellence Award (RE/18/5/34216) from the British Heart Foundation.

Conflict of interest: A.S.V.S. has received honoraria from Abbott Diagnostics. N.L.M. has acted as a consultant for Abbott Diagnostics, Siemens Healthineers, Roche, and LumiraDx. D.M.K. report no conflict of interest.

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