

Editorial Comment

Are Cardiac Risk Scores Useful in Daily Clinical Practice?

CHRISTINA CHRYSOHOOU

First Department of Cardiology, School of Medicine, University of Athens, Hippokratia Hospital, Athens, Greece

Key words: Risk estimation; cardiovascular disease prevention; SCORE.

Address:
Christina Chrysohoou

46 Paleon Polemiston St.
16674 Glyfada, Greece
chrysohoou@usa.net

As cardiovascular diseases (CVD) represent the most common cause of hospitalisation and mortality, imposing a great burden on national health care systems, the need for accurate risk prediction seems more relevant than ever. Global risk assessment, a product of the past two decades, analyses how several risk factors interact with each other and modify the probability of an individual's experiencing a fatal or non-fatal cardiovascular event. Thus, a number of multivariate risk prediction scores have been developed to estimate CVD risk over time intervals ranging from 4 to 12 years.¹ The pioneer in this area was the Framingham Heart Study score sheet.¹ At the beginning of the 2000s, the Working Group on Epidemiology and Prevention of the European Society of Cardiology proposed a risk prediction chart based on data from 12 European cohort studies, which included 205,000 individuals and 2.7 million years of follow up, during which 5652 fatal coronary heart disease events were observed (the Systematic Coronary Risk Estimation [SCORE] project).² In addition, based on this score, European countries were separated into those with "high" or "low" risk; however, several concerns were raised about the applicability of the charts for estimating risk in all European populations. This is because any risk estimation system will over-predict in countries in which mortal-

ity has fallen and under-predict in those in which it has risen. Thus, the HellenicSCORE³ was proposed for the prediction of the 10-year risk for fatal CVD events in the Greek population, based on sex, age, smoking habits, total cholesterol, and systolic blood pressure levels, and using the risk point-estimates suggested by the ESC SCORE model and the national statistics for CVD mortality as end-points. However, the main question raised is whether real outcomes and risk estimation in cohorts exist. A Swiss survey among general practitioners and internists working in clinical practice revealed that 74% rarely or never used total risk prediction rules, because of fears of oversimplification of risk assessment or overuse of medical therapy, especially in elderly individuals where, given their advanced age, risk may be overestimated.⁴ Furthermore, the majority of the physicians believed that the information resulting from prediction scores is frequently unhelpful for clinical decision-making. Thus, performing validation of the total risk scores remains crucial for their appropriate use. In the article by Panagiotakos et al in this issue of the HJC, the authors report findings from a 10-year follow up of the ATTICA study, which revealed that the initially developed HellenicSCORE showed great accuracy, yielding a 95.6% match for fatal CVD cases and a 93.2% match for fatal and non-fatal CVD cases, while

no sex, age-group, or comorbidity interactions were observed.⁵

However, there are several limitations to the use of risk, as most of the current CVD prevention risk calculators focus on short-term (5- or 10-year) risk, and therefore are inevitably more likely to classify the elderly as at high risk and the young as at low risk. This has caused serious concern among some physicians about overestimating the risk in national populations, which may lead to overuse of medical therapy with an increased possibility of adverse effects. Eventually, the question arises as to whether it is ethical to use those scores on an individual risk assessment basis. It is hard to inform a person who is free of CVD that he or she has a specific probability of dying during the next 10 years, based on mathematical modelling. The consequences for his/her daily life may be unpredictable! Thus, presenting relative, as opposed to absolute risk estimation, is an option for discussing CVD risk with individuals who are free of disease. The relative risk chart may be helpful in identifying and counselling people, even if their absolute risk levels are low. In this way, the individual may be informed, not about the probability of dying, but about the benefit in terms of total risk reduction accruing from risk factor modification through changes in lifestyle habits and adherence to medication. Furthermore, the total risk approach allows flexibility: if perfection cannot be achieved with one risk factor, rela-

tive risk can still be reduced by trying harder with others. Thus, in the case of individuals, especially younger ones, a low absolute risk may conceal a very high relative risk, and the use of the relative risk chart or calculation of their “risk age” may help in advising them effectively about the need for intensive lifestyle efforts.

References

1. D’Agostino RB Sr, Vasan RS, Pencina MJ, et al. General cardiovascular risk profile for use in primary care: the Framingham Heart Study. *Circulation*. 2008; 117: 743-753.
2. Perk J, De Backer G, Gohlke H, et al. European Guidelines on cardiovascular disease prevention in clinical practice (version 2012). The Fifth Joint Task Force of the European Society of Cardiology and Other Societies on Cardiovascular Disease Prevention in Clinical Practice (constituted by representatives of nine societies and by invited experts). *Eur Heart J*. 2012; 33: 1635-1701.
3. Panagiotakos DB, Fitzgerald AP, Pitsavos C, Pipilis A, Graham I, Stefanadis C. Statistical modelling of 10-year fatal cardiovascular disease risk in Greece: the HellenicSCORE (a calibration of the ESC SCORE project). *Hellenic J Cardiol*. 2007; 48: 55-63.
4. Eichler K, Zoller M, Tschudi P, Steurer J. Barriers to apply cardiovascular prediction rules in primary care: a postal survey. *BMC Fam Pract* 2007; 8: 1.
5. Panagiotakos DB, Georgousopoulou EN, Fitzgerald AP, Pitsavos C, Stefanadis C. Validation of the HellenicSCORE (a calibration of the ESC SCORE project) regarding 10-year risk of fatal cardiovascular disease in Greece. *Hellenic J Cardiol* 2015; 56: 302-308.

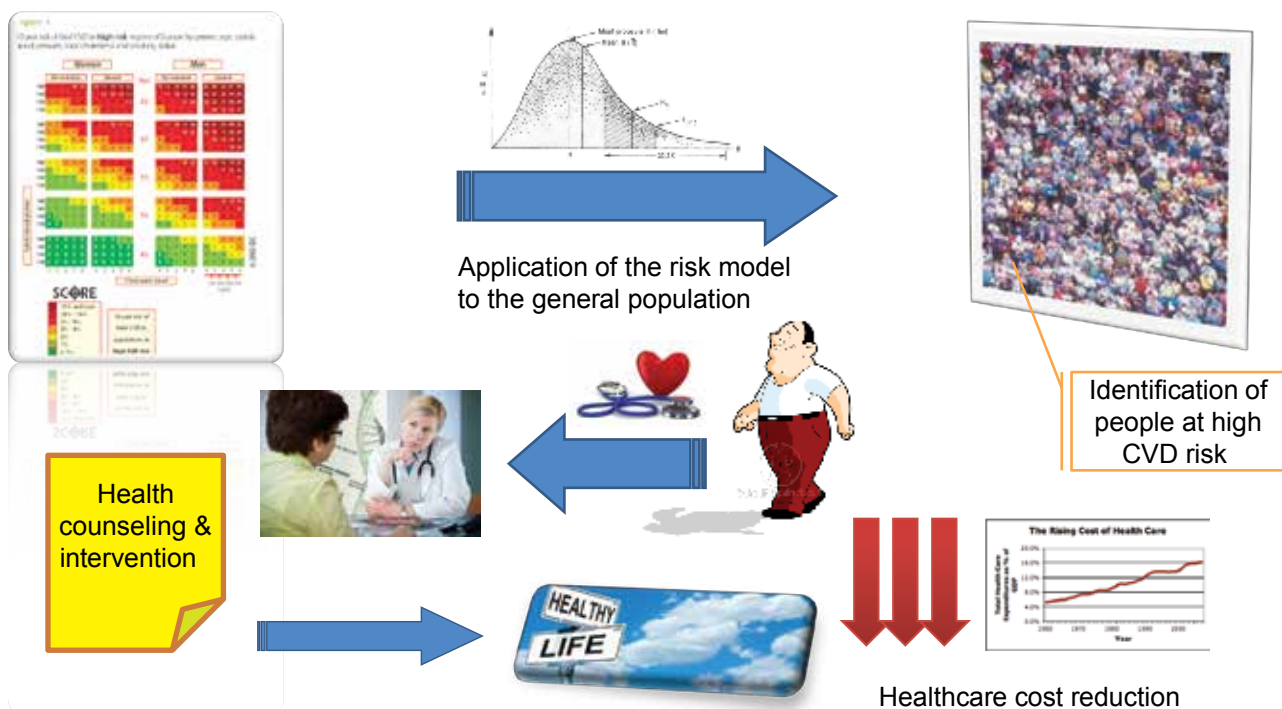


Figure 1. Conceptual model of the usefulness of CVD risk scores in the community.