

Laboratory-based versus non-laboratory-based CVD risk analysis

Thomas Gaziano and colleagues (March 15, p 923)¹ present a promising tool to predict cardiovascular deaths in developing countries and, not less importantly, western countries. But we could neither find in the non-laboratory-based nor laboratory-based approach one of the strongest, if not the strongest, predictor of cardiovascular deaths: physical inactivity.

Large cohort studies such as the Framingham Heart Study, Nurses' Health Study, Harvard Alumni Health Study, and others all showed the same clear result: physically active participants lived longer and the inactive ones had a worse prognosis. As a result, numerous guidelines² state the value of physical activity in the prevention of all-cause as well as cardiac deaths. Myers and colleagues³ not only showed that physical inactivity is an independent risk factor for cardiovascular death, but a much stronger one than history of hypertension, chronic obstructive pulmonary disease, diabetes, smoking, obesity, and hypercholesterolaemia.³ Leitzmann and colleagues⁴ showed that all-cause mortality, cardiovascular mortality, and cancer mortality inversely correlated with physical activity prescribed according to guidelines in more than 1 million patient-years.

Since both simple validated instruments (eg, questionnaires) and more complex ones (eg, measurement of walking or running speed and distance by global positioning system⁵) exist to measure physical activity, it is time to include measures of physical inactivity in risk scores. Unless we develop scores that include physical inactivity, we will miss the chance of showing to our patients how they could effectively decrease their risk by becoming physically more active.

We declare that we have no conflict of interest.

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- 1 Gaziano TA, Young CR, Fitzmaurice G, Atwood S, Gaziano JM. Laboratory-based versus non-laboratory-based method for assessment of cardiovascular disease risk: the NHANES I Follow-up Study cohort. *Lancet* 2008; **371**: 923–31.
- 2 Graham I, Atar D, Borch-Johnsen K, et al. European guidelines on cardiovascular disease prevention in clinical practice: full text. Fourth 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 J Cardiovasc Prev Rehabil* 2007; **14** (suppl 2): S1–113.
- 3 Myers J, Prakash M, Froelicher V, Do D, Partington S, Atwood JE. Exercise capacity and mortality among men referred for exercise testing. *N Engl J Med* 2002; **346**: 793–801.
- 4 Leitzmann MF, Park YS, Blair AP, et al. Physical activity recommendations and decreased risk of mortality. *Arch Intern Med* 2007; **167**: 2453–60.
- 5 Le Faucheur A, Abraham P, Jaquinandi V, Bouye P, Saumet JL, Noury-Desvaux B. Measurement of walking distance and speed in patients with peripheral arterial disease: a novel method using a global positioning system. *Circulation* 2008; **117**: 897–904.

Thomas Gaziano and colleagues¹ show that a non-laboratory-based method satisfactorily predicts cardiovascular disease. They rightly point out that such a model is of special relevance in developing countries where laboratory testing is inconvenient or unavailable.

However, their risk prediction model includes diabetes history, which relies on blood glucose measurement. Inclusion of diabetes history as a model component is not trivial. First, diabetes history can be reliable only if large segments of the population are repeatedly screened for blood glucose, as in the USA (where the model was derived). Second, diabetes status weighs much in the overall performance of the prediction model, as shown by the largely different risk charts for diabetic and non-diabetic people. This finding is expected since diabetes alone indicates high cardiovascular risk² and diabetes is associated with several other independent cardiovascular risk factors such as low HDL cholesterol and metabolic syndrome.

Glucometers are often not available—or reagents in short supply—in large parts of low-income countries, such as rural settings in many African countries, and most people from these populations are unaware of their diabetes status. Thus, the performance of the proposed model will probably be substantially reduced in these populations because diabetes can be neither established nor excluded in most individuals.

To maximise their usefulness, risk prediction models in resource-scarce settings—or at least one version of such models—should be based entirely on non-laboratory measurements. It would be interesting if Gaziano and colleagues could also present the performance of a version of their model that does not include diabetes history.

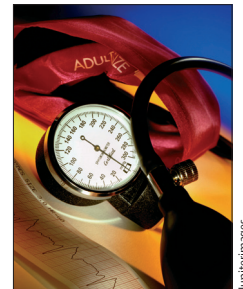
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- 1 Gaziano TA, Young CR, Fitzmaurice G, Atwood S, Gaziano JM. Laboratory-based versus non-laboratory-based method for assessment of cardiovascular disease risk: the NHANES I Follow-up Study cohort. *Lancet* 2008; **371**: 923–31.
- 2 Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults. Executive summary of the third report of the National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III). *JAMA* 2001; **285**: 2486–97.

Thomas Gaziano and colleagues¹ report that the prognostic value of a laboratory-based method for cardiovascular risk assessment was not different from that of a non-laboratory-based method in which total cholesterol was substituted by body-mass index. In interpreting these findings, one should consider that the lack of prognostic difference between the two methods in this study might partly depend on the unexpectedly low contribution of



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