

## Strategies for the Prevention of CVD

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The European Guidelines for the Prevention of Cardiovascular Disease ([www.escardio.org](http://www.escardio.org)) are based on the concept of “total risk,” an approach that takes into account the continuous and synergistic nature of the factors that contribute to cardiovascular disease (CVD) risk. Risk levels were developed using data from the SCORE project [Conroy RM et al. *Eur Heart J* 2003] and have been translated into a series of tables for ease of use. “Using this approach,” said Professor David A. Wood, Imperial College, London, UK, “cardiovascular risk can be estimated by taking into account all of the risk factors, rather than examining a single risk factor in isolation.”

Prof. Wood suggested that if we are going to measure CVD risk in this way, we should use the same multifactorial approach for prevention. However, the evidence for this approach is extrapolated from a variety of meta-analyses of unifactorial randomized clinical trials that show that:

- Significant reductions in coronary heart disease (CHD) events and stroke can be achieved by reducing systolic blood pressure (BP) by 10 mm Hg and diastolic BP by 5 mm Hg, regardless of a prior history of vascular disease, CHD, or stroke [Law MR et al. *BMJ* 2009]
- Significant reductions in major vascular events can be achieved with reductions in LDL cholesterol [CTT Collaborators. *Lancet* 2005]
- With some caveats about total mortality, the probability of nonfatal MI can be reduced with intensive versus standard glucose-lowering treatment [Ray K et al. *Lancet* 2009]

In contrast, the evidence for a multifactorial approach is not as strong in studies that use a multiple risk factor reduction strategy in primary prevention [Ebrahim S et al. *Cochrane Database of Systemic Reviews* 2006]. Prof. Wood noted, however, that the reductions in BP and cholesterol in these multifactorial trials were considerably smaller than in unifactorial trials and suggested that perhaps if they had been greater, much more overall benefit would have been seen. For secondary prevention and rehabilitation, however, the evidence for a multifactorial intervention is much more compelling; yet, there is great variability across Europe in the provision of such services. Average attendance to at least one rehabilitation session among all patients was only 36%, with country-specific rates ranging from 0% (Greece and Spain) to 86% (Lithuania). Patients who received a coronary artery bypass graft were most likely to be offered and attend rehabilitation (68%); ischemia patients were least likely (16%). The risk factors that were most affected by these programs were exercise, followed by smoking. Substantially less of an impact was seen for cholesterol and BP reduction [Taylor R et al. *Am J Med* 2004].

In closing, Prof. Wood said that “the strategies for the primary and secondary prevention of CVD should be unified. All patients should be provided with a comprehensive program that addresses all aspects of care, including lifestyle, psychosocial factors, risk factor management, and medication adherence.”

“There are essentially two approaches to combat CVD: one is targeting the high-risk population; the other is to try to treat the population as a whole,” said Professor Diederick E. Grobbee, MD, University Medical Center, Utrecht, The Netherlands.

Highlights from the

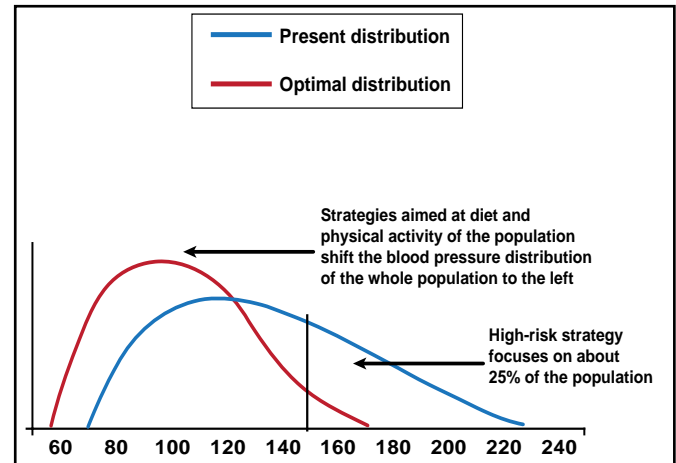


The high-risk strategy, which starts with risk stratification and then proceeds to targeted treatment, is the most familiar. It clearly benefits those at risk and is based on reductions in individual risk that outweigh the side effects of treatment. It is an affordable approach. High-risk strategies are not a solution to the epidemic of CVD in our society, however, since they fail on a number of levels:

1. Inadequate detection and diagnosis
  - the majority of at-risk individuals reside in underdeveloped countries that do not have medical resources
2. Inadequate prediction of risk
  - most events occur at modest elevations of risk
  - a single risk factor is not very powerful to discriminate high from low risk
  - modest elevations in multiple risk factors may share common etiology (eg, the metabolic syndrome)
  - risk scores are still far from perfect
  - important population groups will easily be missed (eg, the young)
3. Insufficient treatment
  - in the highest risk group, there is marked undertreatment, and in the lowest risk group, there is marked overtreatment
4. Lack of compliance/motivation of physician and/or patient
5. Expensive for nonestablished market economies
6. Targets only a small fraction (~25%) of the population at risk

The alternative approach—a population strategy—considers risk in populations rather than risk in individuals (Figure 1).

**Figure 1. Population Strategy.**



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There are some clear benefits for the population strategy. It tackles the underlying causes of CVD, and the effects are magnified over the entire population—it can change the norm. “There are also problems,” said Prof. Grobbee. Low-risk individuals are not likely to benefit very much (the so-called prevention paradox), which leads to poor motivation (public and physician). In addition, little is known about the cost-benefit ratio or what the risks might be.

Population strategies fail for several reasons:

1. Responsibility for individuals unclear
2. Message not sexy, not fashionable
3. Requires societal attitudes
4. Politics
5. Economics (can be expensive)
6. Incomplete understanding of lifestyle factors and ways to influence them

In conclusion, Prof. Grobbee said that prevention, using multiple strategies, needs to be moved higher on the global agenda.