

NEW PAPERS

The special role of arterial hypertension as a cardiovascular risk factor

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For many years, we have been treating patients in primary prevention as well as patients with established cardiovascular disease in the cardiology outpatient clinic at the University Heart and Vascular Center Hamburg, Germany. Every day, we speak about prevention and strive to convey the special importance of known risk factors and the need to optimize them. Their significance has long been clear to all of us.

The recently published studies by the Global Cardiovascular Risk Consortium - one on the effect of classical risk factors on cardiovascular disease and all-cause mortality (Magnussen et al., 2023), and another on the impact of their absence or modification on individual lifespan (Magnussen et al., 2025) - provide a robust evidence base to support our daily clinical practice.

The Global Cardiovascular Risk Consortium dataset currently compiles individual-level data from 133 cohort studies conducted across 39 countries and 6 continents, encompassing over 2 million participants. This constitutes one of the most comprehensive efforts to date in evaluating the impact of risk factors on cardiovascular disease development and life expectancy on a global scale.

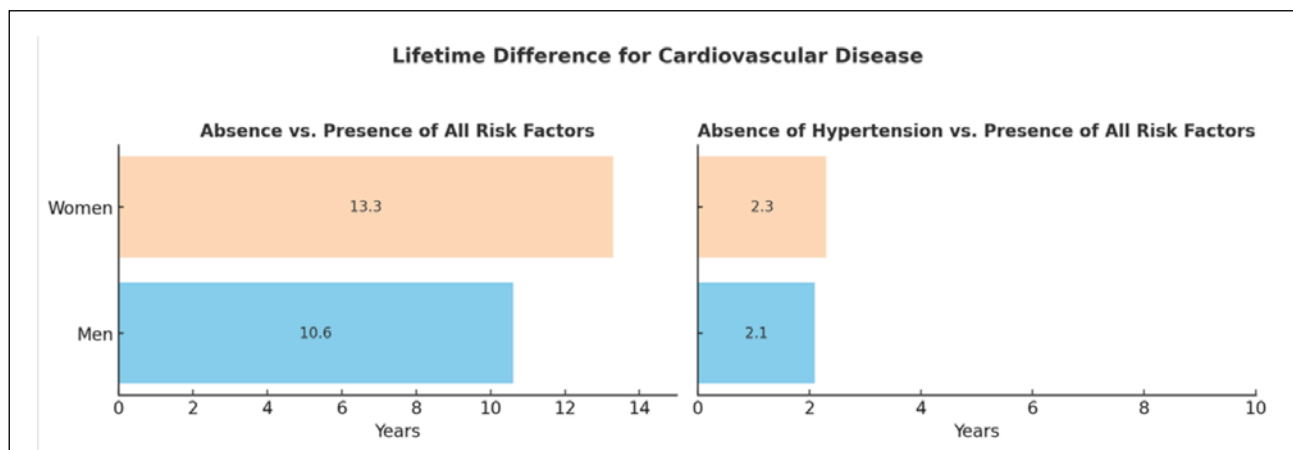
Cardiovascular diseases account for approximately one-third of all deaths worldwide. The most well-established risk factors include arterial hypertension, diabetes mellitus, smoking, elevated non-HDL cholesterol, and unhealthy body weight (body-mass index <20 or ≥ 25 kg/m²). As these risk factors are potentially modifiable, gaining a deeper understanding of their influence on disease incidence and mortality is crucial for guiding effective global prevention strategies.

The first study from the Consortium (Magnussen et al., 2023), which analyzed data from 1.5 million participants, assessed the impact of the five classical risk factors on global cardiovascular disease incidence and mortality. Population attributable fractions (PAFs) were calculated to estimate the proportion of disease theoretically preventable through elimination of a risk factor. The study found that over a 10-year period, more than half of new cardiovascular disease cases - 57% in women and 53% in men - could be prevented by control of the five risk factors. Among them, high blood pressure had the greatest impact, with a PAF of nearly 30%.

In a recently published follow-up study (Magnussen et al., 2025), the Consortium demonstrated that 50-year-olds with normal blood pressure and cholesterol levels, a healthy body weight, who do not smoke and do not have diabetes remain free of cardiovascular disease significantly longer and also have greater overall life expectancy. Among middle-aged individuals, women without any of the five risk factors experienced a delay of 13.3 years and men 10.6 years in the onset of cardiovascular disease compared to their counterparts with all five risk factors. Furthermore, women without risk factors lived 14.5 years longer, and men 11.8 years longer, than individuals of the same age with all five risk factors.

Of course, by age 50, most of our patients already present with one or more risk factors. However, this should not discourage them - or us as physicians. Even in midlife, reducing risk factors can lead to substantial health benefits. For example, controlling high blood pressure between the ages of 55 and 60 results in the

Figure: Lifetime difference (in years) for women and men for cardiovascular disease. The left panel shows the additional life expectancy associated with the absence of the five classical risk factors compared to their presence. The right panel shows the additional life expectancy associated with the absence of arterial hypertension using a dichotomized regional standard deviation score <2 vs. ≥ 2 , while all other risk factors are present.



highest additional life-years free of cardiovascular disease: an additional 2.4 years for women and 1.2 years for men.

The Global Cardiovascular Risk Consortium applied a systolic blood pressure target of below 130 mmHg, a threshold deemed clinically relevant according to international guidelines (McEvoy et al. 2024, Whelton et al. 2018). The findings were clear: the higher the baseline risk factor level, the greater the potential gain in life expectancy from its reduction. Even in midlife, lowering blood pressure can result in a meaningful extension of lifespan. Elevated blood pressure is therefore the most important modifiable risk factor for gaining additional healthy years of life free from cardiovascular disease, and it is also one of the most critical determinants of overall life expectancy.

For patients without a diagnosis of hypertension but with elevated blood pressure values above 130/80 mmHg and an increased cardiovascular risk profile, we recommend initiating lifestyle modifications. These include regular physical activity (at least 150 minutes per week), achieving and maintaining a stable and healthy BMI between 20 and 25 kg/m², adopting a balanced diet - such as the Mediterranean diet - reducing alcohol consumption, and quitting smoking.

Only a portion of our patients are able to successfully implement these lifestyle recommendations. In some cases, it can be challenging to make the decision to initiate antihypertensive therapy after three months of lifestyle changes without meaningful improvement in blood pressure.

However, the data outlined above provide a strong scientific foundation for these decisions and support more effective communication with patients about the potential long-term benefits.

The five classical risk factors account for more than half of all cardiovascular disease cases. At the same time, their absence at age 50 is associated with over a decade of additional life. Even when a risk factor is present in midlife, modifying it can still result in meaningful gains in life expectancy. These findings highlight the global importance of both preventing and treating cardiovascular risk factors - especially arterial hypertension.

With this knowledge, we will continue conversations about cardiovascular prevention and modifiable risk factors with renewed motivation, confident that the recommended interventions can truly improve both the cardiovascular health and longevity of our patients.

References:

- Magnussen CG, et al. Global effect of cardiovascular risk factors on lifetime estimates. *N Engl J Med.* 2025. <https://doi.org/10.1056/NEJMoa2415879>
- Magnussen CG, et al. Global effect of modifiable risk factors on cardiovascular disease and mortality. *N Engl J Med.* 2023;389(14):1273–1285. <https://doi.org/10.1056/NEJMoa2206916>
- McEvoy JW, et al. ESC guidelines for the management of elevated blood pressure and hypertension. *Eur Heart J.* 2024;45(38):3912–4018. <https://doi.org/10.1093/eurheartj/ehae178>
- Whelton PK, et al. ACC/AHA guideline for the management of high blood pressure in adults. *Hypertension.* 2018;71(6):e13–e115. <https://doi.org/10.1161/HYP.0000000000000065>

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