# It is time to treat cannabis as an important risk factor for cardiovascular disease

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Legalisation of medical and recreational cannabis commerce is spreading around the world, associated with increased use[1] and falling perception of the risk.[2] Frequent cannabis use has increased in several countries, and many users believe that it is a safe and natural way to relieve pain or stress.[3] In contrast, a growing body of evidence links cannabis use to significant harms throughout life, including cardiovascular health of adults.

The robust meta-analysis of cannabis use and cardiovascular disease by Storck *et al*[4] in this issue of *Heart* raises serious questions about the assumption that cannabis imposes little cardiovascular risk. The pooled risk ratios from 24 epidemiological studies published between January 2016 and January 2023 were 1.29 (95% CI 1.05 to 1.59) for myocardial infarction (MI), 1.20 (1.13 to 1.26) for stroke and 2.10 (1.29 to 3.42) for cardiovascular death.[4] In addition, they report that four additional papers published since then yielded similar results.

All but five of the papers included in the meta-analysis controlled for tobacco use, which is important because tobacco use is common among cannabis users so is a potentially important confounder. Many older studies of cannabis use and cardiovascular disease did not control for tobacco or were not able to exclude the possibility that associations found between cannabis and cardiovascular disease were not due to confounding with tobacco smoking. It may also be that falling smoking rates at a time when cannabis use is increasing helped separate the effects. Smoking cannabis and tobacco are independent additive risk factors for cardiovascular disease, and the risk increases even in cannabis users with no history of cigarette or e-cigarette use.[2]

The biggest limitation of many of the individual studies included in the meta-analysis is the imprecise measurement of cannabis exposure. Only four of the 24 papers collected data on dose and assessed dose–response. Most just measured 'current', past 30-day, past year or 'ever' use, or a positive drug test without specifying mode of administration, product potency or intensity of use. While most respondents likely inhaled the cannabis (mostly smoking), use patterns are changing rapidly, making it important for future studies to collect data on mode of administration and potency. As a result, many of the respondents who scored as positive for cannabis use may have been light or intermittent users, which would have led to lower estimates of risk. For comparison, the estimate of MI risk by Storck *et al*[4] of 1.29 (1.05 to 1.59) is similar to the MI risk of 1.41 (1.11 to 1.80) observed among occasional tobacco smokers in Norway.[5]

Storck *et al*[4] discuss only potential pathophysiological mechanisms related to cannabinoids. Other compounds in cannabis products also have cardiovascular effects; animal studies show that inhaled cannabis aerosols (whether generated by burning or vapourising) depleted of cannabinoids have negative effects on vascular endothelial function.[6 7] Greater understanding of the pathophysiology is needed to clarify whether cardiovascular risks are limited to inhaled products or extend to other forms of cannabis exposure. Cannabis consumed today has also changed markedly from previous years, particularly after 2018 when the latest data were collected in the studies included in Storck *et al*'s meta-analysis.[4] Cannabis flower has a much higher tetrahydrocannabinol (THC) content than in the past. A wide array of inhaled high potency cannabis concentrates, synthetic psychoactive cannabinoids made from hemp such as Δ-8-THC and edibles have proliferated. The use of higher potency products is associated in turn with increased frequent and problem use.[8] How these changes affect cardiovascular risk requires clarification, as does the proportion of risk attributable to cannabinoids themselves versus particulate matter, terpenes or other components of the exposure.

In the USA, daily cannabis use in adults aged 35–50 tripled between 2008 and 2023 from 2.5% to 7.5%, and is approaching rates in young adults and nearly matching daily alcohol use (7.6%) and daily cigarette use in 35–50-year-olds (7.8%).[9] In addition, any past 30-day cannabis use more than doubled from 2008 to 2023 in 35–50-year-olds to 19.2% and is present in 13.7% of 55–65-year-olds, almost double past 30-day cigarette use. The situation in young adults aged 19–30 is even more concerning, with quadrupling of daily use since 1990, which now affects one in 10 (10.4%) of this age group (vs 3.6% for daily alcohol use and 3.6% for daily use of cigarettes), with 28.7% partaking in the past 30 days.[9]

Storck *et al*[4] conclude that "These findings should encourage investigating cannabis use in all patients presenting with serious cardiovascular disorders". We go further. Cannabis use, like tobacco and alcohol use, should be assessed in all patients. At least in the USA, health professionals are the most influential source of cannabis information regardless of patient age, cannabis use or state legal status,[10] making it important for clinicians to ask about use, educate all patients about cannabis risks and take cannabis use into account in clinical decision making.

In addition to changes in clinical practice, there is an important role for public health and public policy in addressing the risks identified by Storck *et al*.[4] While the trend towards legalisation is established, that does not mean that the risks of cannabis use should be minimised or its use encouraged. Given the high and growing prevalence of use and especially of frequent use, cannabis has the potential to further aggravate the recent reversal in the historical decline of 60% in US death rates from cardiovascular disease since the 1950s.[11]

Cannabis needs to be incorporated into the framework for prevention of clinical cardiovascular disease. So too must cardiovascular disease prevention be incorporated into the regulation of cannabis markets. Effective product warnings and education on risks must be developed, required and implemented. Cardiovascular and other health risks must be considered in the regulation of allowable product and marketing design as the evidence base grows. Today that regulation is focused on establishing the legal market with woeful neglect of minimising health risks. Specifically, cannabis should be treated like tobacco: not criminalised but discouraged, with protection

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of bystanders from secondhand exposure.[12 13]

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