

# Substance use and the insidious rise of cardiovascular disease in young people in Africa: a call to action

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Submitted on: 12<sup>th</sup> September 2025

Published on: 30<sup>th</sup> December 2025

## ABSTRACT

Cardiovascular diseases are one of the world's topmost causes of morbidity and mortality. The rising tide of non-communicable disease in Africa especially among young people might be secondary to a concurrent rise in substance use among this group. Studies addressing cardiovascular complications like arrhythmias, angina and heart failure among African youth abusing substances are severely lacking. This is worsened by the absence of adequate surveillance systems, sensitization on cardiovascular effects from substance use and poor funding to address this issue. Researchers globally, have begun to find associations between substance use and early onset of cardiovascular disease especially in young people without comorbidities but the mechanisms of action are inconclusive. This paper explores a relationship between substance youth and cardiovascular diseases in African Youth and describes associated disease mechanism for commonly abused substances. We argue that cardiovascular diseases owing to substance use is an overlooked problem which might prevent Africa from reaching its WHO Global Action Plan of reducing premature cardiovascular disease mortality by 25 percent by 2025. Solutions proffered include funding African biomedical scientists to uncover the pathways through which illicit drugs cause cardiovascular diseases and to identify therapeutic endpoints. Furthermore, sustained campaigns to discourage substance use and enlighten youth on long- term cardiovascular implications of abuse will go a long way. There is an urgent need for policies that address the root causes

of substance abuse prevalence among young people on the continent and more importantly address emerging cardiovascular effects of substance abuse.

**Keywords:** *substance use, cardiovascular disease, young people, Africa, youth*

## INTRODUCTION

The epidemiological landscape of disease burden in Sub-Saharan Africa (SSA) is undergoing a rapid transition. Historically dominated by infectious diseases, the profile is increasingly shifting toward chronic, non-communicable diseases (NCDs) (Gouda et al., 2019). Thus, between 1990 and 2017, the all-age total Disability-Adjusted Life-Years (DALYs) attributable to Non-Communicable Diseases (NCDs) in Africa increased by 67 percent, raising the proportion of the total burden attributable to NCDs to almost thirty percent (Gouda et al., 2019). Also, in 2017, cardiovascular diseases (CVDs) were identified as the second leading cause of NCD burden across Sub-Saharan Africa, accounting for fifteen percent of all total DALYs (Gouda et al., 2019). The rise of cardiovascular diseases among young people has become a global public health emergency as the age at onset of substance use becomes earlier (Jain et al., 2022). Initially urbanization was majorly seen as the culprit for worsening cardiovascular health in young people in Africa which has 80 percent of the global burden for these ailments, but new research is uncovering the role rising substance use may play (Mutumba et al., 2019). For instance, recent research in South Africa showed that in 2012 cardiovascular disease accounted for over eleven percent of alcohol-attributable and ranked fifth in terms of deaths and DALYs when overall disease burden was studied in the country (Matzopoulos et al., 2022). Furthermore, in 2021, Zimbabwe had the highest proportion of drug use disorder incidence and associated DALY among 15-29 year olds globally (Zhang et al., 2024). This growth in substance-related disability highlights the urgent need to identify the specific epidemiological associations, and risks that connect substance abuse to both the occurrence and risk of CVD across the African continent. In this paper we explore current evidence of the possible bidirectional relationship between substance use and rising cardiovascular disease in Africa and call for more in-depth studies. This is pertinent as Africa is not on track to achieve the WHO Global Action Plan of reducing premature cardiovascular disease mortality by 25 percent by 2025.

### Epidemiology of cardiovascular disease in young people in Africa

Cardiovascular diseases (CVDs) are groups of illnesses affecting the heart and blood vessels, and a major cause of mortality and morbidity worldwide with growing incidence in Africa (Olamide et al., 2023). They include conditions such as stroke, heart failure, hypertension, heart valve diseases, arrhythmias etc. At the turn of the early 2010's, the burden of disease has gradually shifted from communicable diseases like Buruli Ulcer and Schistosomiasis to

non-communicable diseases after decades of public health intervention on communicable diseases across Africa countries. Key among the non-communicable diseases on the rise are cardiovascular diseases which continues to rise in children, adolescents and young adults. In sub-Saharan Africa, CVDs account for 37 percent of all non-communicable disease deaths, with the tendency of disease occurrence two decades earlier in the young population of this continent as opposed to in high-income countries (Minja et al., 2022). Further the absolute number of CVD deaths has increased by 50 percent in the last 3 decades (Minja et al., 2022). Initially rapid urbanization was deemed a major culprit, highlighted in studies as responsible for this surge on CVDs in the continent which soon outstripped that of the global population and currently accounts for 80 percent of global burden of CVDs (Mendis et al., 2011). Urbanization with its attendant change in lifestyle from diet to physical activity have now been considered the traditional risk factors and de-facto explanation for CVDs rise in young people in Africa, but substance use requires critical recognition as an important risk factor especially in this age group. In Nigeria, Africa's most populous nation, the Nigerian Drug Law Enforcement Agency (NDLEA) estimates that 40 percent of the country's youth is deeply involved in substance use especially alcohol and cannabis (Onifade et al., 2015). Also, the United Nations Office of Drug and Crime reports high substance use especially cannabis between ages 15 – 39 years with average age of onset for substance use being 19 (UNODC, 2018). This early use of substance leads to poor health outcomes, possibly earlier onset of CVDs as atherosclerotic events happens. Unfortunately, the 2020 World Drug Report projects drug abuse among young people in low-and middle -income countries to grow in the next decade with consequences for cardiovascular health of young people (United Nations,2020). The World Health Organization's declaration that declaration that no amount of alcohol is safe further necessitates urgent action to curb alcohol and drug use among young people (WHO, 2023).

### **Drugs of Abuse and CVD among young people in Africa**

Sub-Saharan Africa is expected to see a 150 percent increase in the number of drug users by 2050 (Zachary Donnenfeld, 2019). Recent studies have shown a yearly rise in the proportion of young people experiencing heart attacks over the last 10 years noting substance use as a recurring denominator (American College of Cardiology, 2019). Poor mental health has currently been demonstrated to have cardiovascular implications globally. In the US, young people with depression and poor mental health are increasingly being seen to have premature CVD (Kwapong et al.,2023). Epidemiological data on substance use among adolescents in the continent reveals varying substance use patterns with highest documented rates in South Africa (up to 44.6 percent of any substance), and West Africa (31 – 32 percent), whereas Eastern Africa demonstrated high rates of alcohol use (50 percent) and Central Africa had limited data focused mainly on tobacco use, up by 14 percent (Flavio et al., 2024). Substance use rates were higher in males (about 50.2 percent) as opposed to

females across all regions (Flavio et al., 2024). Furthermore, among adolescents, alcohol abuse was the most prevalent, followed by khat, stimulants and tobacco in sub-Saharan Africa (Ebrahim et al., 2024). However, tobacco use is expected to exceed 200 million by year 2030 (Keats et al., 2017; Madjiguene et al., 2024).

Substance use among young people is fuelled by several risk factors such as unemployment, lack of education, social and environmental influences with attendant individual, community and global consequences (Alhammad et al., 2022). The mechanism of CVD occurrence in young people owing to substance use is primarily believed to be through accelerated cardiovascular aging (Scott et al., 2021). Cannabis use, opioid abuse, as well as methamphetamines have been shown to cause blood vessel stiffness leading to elevated blood pressure, and atherosclerotic heart disease (Bachi et al., 2017). Furthermore, substance use is also linked with electrical remodelling of the heart leading to heart failure and rhythmic changes (Kevil et al., 2019). Considering the growing evidence of rising substance use and exponential increase of CVDs among young population in Africa, there is a need to critically consider this relationship as not just another risk factor for CVDs.

## **METHODOLOGY**

A literature search was conducted on PubMed, Google Scholar, and Scopus, using the search terms: “cardiovascular disease cannabis Africa”, “cardiovascular disease substance abuse Africa”, “cardiovascular disease tobacco Africa”, “cardiovascular disease alcohol Africa”. And the search was limited to studies conducted between 2015 to 2025. After removing duplicates, and conducting a long read of articles, a narrative review and synthesis of literature on substance abuse associated cardiovascular disease in Africa was done. This review prioritized original research and reviewed reference list of selected papers for additional papers.

## **RESULTS**

### **Dyslipidemia and insulin resistance in alcohol abuse**

Alcohol use increases the development of dyslipidemia which in turn accelerates the emergence of CVD if unchecked. In Ghana, a study showed that alcohol users who had comorbid HIV infection had a higher risk of developing dyslipidemia as opposed to those who did not use that substance (Abdulai et al., 2025). Additionally, alcohol abuse was implicated as a cause of insulin resistance which is associated with increased risk of hypertension and other cardiovascular diseases (Kufe et al., 2016).

### **Hypertension and Elevated Blood Pressure in alcohol abuse**

Studies across sites in West, East and South Africa demonstrate that early exposure to substance abuse could confer a high risk for developing cardiovascular disease in later life.

For instance, research on rural adolescents in Nigeria, identified alcohol abuse and smoking of any substance as significant determinants of increased hypertension risk (Ayogu et al., 2021). Furthermore, this study revealed that the likelihood of having hypertension alone without comorbid impaired glucose tolerance was three times higher among adolescents who smoked any substance and used alcohol were three and two times higher respectively (Ayogu et al 2021). These results in rural adolescents suggest that the foundations of cardiovascular disease, driven by substance use, are being established long before adulthood and may not be exclusively confined to urban centres or older population in Africa. Importantly, this heightened risk extends into young adulthood as shown by a study in Cameroon. In this work, over twenty percent of participants aged engaged in hazardous alcohol consumption (Nansseu et al., 2019). Also, in that study alcohol use was found to be positively correlated with both elevated systolic blood pressure and diastolic blood pressure. Similarly, a study conducted in East Africa, reported high rates of alcohol use among patients with elevated blood pressure seeking healthcare (Kavishe et al 2015). More recently, a cross sectional study in South Africa, reported that over sixty percent of people who abused alcohol only, reported elevated blood pressures (Oladimeji et al., 2025).

### **Tobacco Use and CVD risk**

A Ghanaian study on people living with HIV demonstrated that smoking might be protective against dyslipidemia. Here, it was suggested that this occurrence was due to survival bias and the low prevalence of smoking in the cohort (Abdulai et al.,2025). Also, in a survey in Tanzania and Uganda, current smoking was associated with a lower risk of hypertension. For this study, this inverse relationship was attributed to unrecorded or uncontrolled confounding factors (Kavishe et al., 2015). Conversely, in Nigerian adolescents, smoking any substance at all, increased the likelihood of developing arterial hypertension (Ayogu et al., 2021). This contrast in outcomes across studies highlights the complexity in the relationship between substance abuse and CVD risk.

### **Khat chewing and risk of developing hypertension**

Current research shows that people who chew Khat are twice more likely to develop hypertension compared to non-chewers (Moloro et al., 2025). Furthermore, in that article, individuals who spent more than six hours in a chewing session are almost nine times more likely to have elevated diastolic blood pressure (Moloro et al., 2025). Another study in Ethiopia also found a non-linear increase in the odds of developing hypertension linked to the quantity of Khat consumed (Gebremedhin et al., 2021). In that work, moderate Khat chewing which was defined as chewing one bundle per session was three times more likely to increase ones odds of developing hypertension. On the other hand, heavy Khat chewing, defined as chewing two or more bundles per session was eighteen times more likely to accelerate the emergence of hypertension (Gebremedhin et al., 2021).

## Cannabis and Acute Coronary Syndrome

Limited studies currently offer insight into the pathophysiology of myocardial infarction secondary to acute cannabis toxicity in the African population. A cross-sectional study examining young male patients presenting with acute myocardial infarction in Egypt provides important revelations (Draz El et al., 2017). Here, the cannabis-only users, who typically lacked established traditional risks such as hypertension, diabetes, or dyslipidemia (aside from being smokers), had severe cardiac injury (Draz El et al., 2017). Following analysis of Electroencephalograph reports, ST-segment elevation myocardial infarction (STEMI) was noted as the dominant type of event in cannabis-only users, while non-ST-segment elevation myocardial infarction (NSTEMI) was prevalent in the non-drug user group (Draz EL et al., 2017). Furthermore, coronary angiography in this study revealed that none of the cannabis-only users had normal coronary arteries, the major blood supplier to the heart muscle. Hence, these results suggest that cannabis exposure likely triggers acute coronary events, leading to myocardial ischemia and infarction, rather than relying solely on the slow progression of chronic atherosclerotic disease.

## Polydrug use and exponential risk of developing cardiovascular disorders

In many African urban centres polydrug use contributes to increased cardiovascular risk. For example, in Johannesburg, a major South African city, most individuals seeking healthcare reported using polysubstance use from methamphetamines to cocaine (Oladimeji et al 2025). Combining these drugs could heighten their hyper stimulatory effect on the cardiovascular system, rapidly elevating blood pressure, consequently increasing the risk for complications like stroke (Oladimeji et al 2025). This buttresses the urgency for comprehensive clinical screening in high-burden urban settings, since the combined physiological impact of these drugs contributes significantly to the overall CVD burden.

## DISCUSSION

Broadly, these studies provide evidence which suggests the culpability of substance use acts as an agent of direct vascular damage as in hypertension and acute myocardial infarction. On the other hand, the literature in this review demonstrates that substance abuse can advance indirect metabolic risks like poor diet, and physical inactivity, consequently accelerating the time to CVD manifestation which emerges in adolescence.

## Relationship between lifestyle factors, metabolic risk and emerging cardiovascular disease

The studies in this review explore the relationship between lifestyle factors, metabolic risk and substance use. Substance use often occurs simultaneously as other high-risk behaviours like poor diet, affecting goal-directed behavior and establishing a complementary cycle that accelerates CVD development (Adelowo et al., 2025, Boua et al., 2021). This finding aligns

with a qualitative study in Kenyan adolescents which reported that substance use behaviour was a negative influence at the intrapersonal level (Ssewanyana et al., 2018). In that study, substance abuse led to sedentary lifestyle and poor nutritional habits in adolescents which included high intake of carbohydrates, and sugar-dense processed foods (Ssewanyana et al., 2018). This potentially explains high levels of dyslipidemia and consequent elevated blood pressures in the adolescents in Nigeria (Ayogu et al., 2025). In the same vein, other works have documented that excessive alcohol intake positively correlates with high Body Mass Index which then lays the foundation for chronic inflammation and subsequent cardiovascular disease (Nansseu et al., 2019). By affecting emotional regulation and coping, substance use might heighten CVD risk and eventual development.

### **Poor medication adherence and occurrence of cardiovascular diseases**

Beyond its complicity in initiating CVD, substance use negatively affects medication adherence in those already diagnosed with cardiovascular diseases. Substance abuse weakens the effectiveness of clinical management of these chronic conditions, acting as a barrier to adherence that then increases the risk of downstream complications and mortality. For instance, a cross-sectional study in Ethiopia examining adherence among diabetic and hypertensive patients showed that participants with current substance use history were more likely to have poor medication adherence (Shimmels et al 2021). Infact, poor medication adherence was eleven times higher in substance users than non-users (Shimmels et al 2021). The results of this study provide evidence that substance use is not merely an additional CVD risk factor, but a severe impediment that cripples national efforts at slowing the rise of NCDs. The findings of the aforementioned study provide a possible explanation for high levels of poor adherence to anti-hypertensive medication prescribed among substance users who had elevated blood pressures in South Africa (Oladimeji et al 2025). Conclusively, the failure to take current medications results in uncontrolled hypertension and diabetes, accelerating the progression toward fatal and non-fatal CVD outcomes. Hence, this occurrence could inflate the Disability Adjusted Life Years burden across Sub-Saharan Africa, as a consequence.

### **Pursuing change in CVD health outcomes in the African young**

Increased substance use among young people in Africa is not an isolated phenomenon and can be argued to be directly proportional to the struggles of African economies battling youth unemployment, and societal pressures for upward mobility and lifestyle attainment (Onaolapo et al., 2022; Nyongesa et al., 2021). Substance use has now become a coping mechanism in the face of daunting circumstances. In addition to addressing issues of governance, and societal values there is a key importance of also acting locally from clinics, community health centres, to global health institutions in addressing the rising cardiovascular illness owing to substance use in Africa.



Today it is necessary that we begin to re-evaluate our approach to clinical assessment of young people presenting with CVDs like hypertension by exploring possible underlying substance use. Screening for substance use as an important risk factor for cardiovascular disease in young people should begin to see major traction in the African setting. This implies that for instance, the emergency room where a young person might present for angina is a critical opportunity to investigate comorbid substance abuse (Turuba et al.,2022). This setting presents a unique opportunity for collecting data as well as sensitizing young people. Conversely, in mental health settings, cardiovascular disease testing should also be prioritized.

Appropriate clinical assessments would mean little if health surveillance systems and associated infrastructure are not developed and maintained. Failure to do so would mean a loss of valuable epidemiological data on cardiovascular disease outcomes among young people reporting in hospitals and clinics across the continent. Hence, tracking progress and pitfalls would be near in possible, which would mean missed opportunities for change in NCDs outcomes.

Funding large longitudinal studies is crucial for ensuring we understand the mechanisms by which different commonly abused drugs by young people leads to cardiovascular disease. This will lead also to the evolution of large databases for mental health research across the continent which is severely lacking. Also, there is a place for increasing biomedical research training and output in this area to help elucidate the pathophysiology of cardiovascular diseases induced by substance abuse.

## CONCLUSION

As the 2020's draw to a close, morbidity and mortality from CVDs among young people in Africa will only grow if the role of substance use is not tackled and novel interventions aimed at reducing it. Curtailing the economic burden of CVDs which also takes a toll on mental health and contributes to poor health outcomes of overall disease management is extra motivation to investigate the greater role of substance use and rising CVD among young people in Africa. Achieving this will secure the continents' future and contribute to global prosperity.



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