



Original Research Article

A comparative study of the prevalence, diagnosis, prevention and treatment of cardiovascular diseases between Saudi Arabia and the United Kingdom

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Abstract: Cardiovascular diseases (CVDs) remain one of the leading causes of death worldwide, although their impact and management vary considerably across countries. This comparative analysis examines the prevalence, diagnosis, prevention, and treatment of CVDs in Saudi Arabia and the United Kingdom, both of which have contrasting demographic profiles and health system structures. Saudi Arabia has experienced a rapid rise in metabolic risk factors, including obesity, diabetes, hypertension, and dyslipidaemia, which are driven by lifestyle changes due to urbanization. By contrast, the United Kingdom has seen long term declines in CVD mortality due to decades of structured public health interventions, standardized screening programs, and mature clinical pathways. However, socioeconomic inequalities and the nation's ageing population continue to shape disease patterns.

Diagnostic capacity in the UK is supported by national screening initiatives such as the NHS Health Check, widespread use of QRISK3 risk scoring, and integrated electronic health records. Saudi Arabia is rapidly expanding its diagnostic ecosystem, with recent digital innovations and growing investment in primary care, though regional disparities and inconsistent follow up remain challenges. Prevention strategies also differ, with the UK benefitting from long standing population level interventions, while Saudi Arabia has accelerated prevention more recently under Vision 2030, targeting physical inactivity, dietary risks, and metabolic disorders.

Treatment systems further highlight systemic contrasts. The UK maintains standardized acute cardiac care networks, national registries, and robust cardiac rehabilitation services. Saudi Arabia has significantly expanded its cardiovascular infrastructure but continues to face gaps in continuity of care and equitable access. Overall, the comparison underscores the importance of early detection, integrated chronic disease management, and population level prevention policies. This article recognizes that both countries can benefit from cross national learning to strengthen their own cardiovascular health outcomes.

Keywords: Cardiovascular disease, Saudi Arabia, United Kingdom, prevalence, diagnosis, screening, prevention, treatment

INTRODUCTION

Cardiovascular diseases (CVDs) remain one of the leading causes of morbidity and mortality

worldwide, accounting for an estimated 20.5 million deaths annually (World Heart Federation, 2023). There have been significant advances in prevention, diagnosis, and treatment of CVDs, but the impacts

vary significantly across regions due to differences in socioeconomic development, health-system capacity, population demographics, and lifestyle patterns. Saudi Arabia and the United Kingdom represent two contrasting contexts, the former is a rapidly developing Middle Eastern nation undergoing epidemiological transition, while the latter is a high-income European country with a long-established public health infrastructure.

By comparing these two nations, this article aims to provide valuable insights into how cultural, economic, and systemic factors shape cardiovascular health outcomes. Saudi Arabia faces rising rates of obesity, diabetes, and hypertension, driven by sedentary lifestyles and dietary changes associated with modernization (Alqahtani & Alenazi, 2024). Meanwhile, the United Kingdom, despite having one of the world's most comprehensive universal healthcare systems, continues to struggle with persistent socioeconomic inequalities, an ageing population, and lifestyle-related risk factors such as persistent smoking and poor diet (British Heart Foundation, 2023).

This article provides a comparative analysis of the prevalence, diagnosis, prevention, and treatment of cardiovascular diseases in both Saudi Arabia and the United Kingdom. It draws on recent epidemiological data, published national health policies, and peer-reviewed research, to highlight the key similarities and differences, while identifying opportunities for cross-national learning in this important field of healthcare.

1.1 Background: Cardiovascular Disease as a Global Health Challenge

The term Cardiovascular Disease includes a broad range of disorders affecting the heart and blood vessels, including coronary artery disease (CAD), stroke, heart failure, arrhythmias, and peripheral arterial disease. Worldwide, these conditions account for approximately one-third of all deaths, with low-income and middle-income countries being disproportionately affected by this (WHO, 2021).

Major modifiable risk factors which can aggravate the conditions include Hypertension, Dyslipidaemia, Diabetes mellitus, obesity, tobacco use, physical inactivity and an inadequate or unhealthy diet (Al-Nozha et al., 2017). Both Saudi Arabia and the UK exhibit high prevalence of these risk factors, but the underlying drivers differ. Saudi Arabia's rapid urbanization and lifestyle changes have led to a surge in metabolic risk factors, while the UK's challenges are more closely related to its ageing population and persistent socioeconomic disparities.

In terms of the individual country's contexts, Saudi Arabia has undergone significant demographic and

epidemiological changes over the past four decades. Non-communicable diseases (NCDs) now account for more than 73% of all deaths, with CVDs being the leading cause (Ministry of Health Saudi Arabia, 2022). According to the World Heart Observatory (2021), the country recorded 54,791 CVD deaths in 2021, with an age-standardized mortality rate of 353 per 100,000 population. This report found that high rates of obesity, increased prevalence of diabetes and hypertension, combined with limited historical emphasis on preventive care, were the main contributing factors to this increasing impact.

The United Kingdom has a long history of cardiovascular research, public health interventions, and universal healthcare provision through the National Health Service (NHS, 2022). Despite these strengths, CVD remains a major cause of death, responsible for approximately 25% of all UK deaths annually (BHF, 2023). Over recent years, the UK has made substantial progress in reducing smoking rates and improving acute cardiac care, but challenges persist in addressing underlying health issues such as obesity, dietary risks, and inequalities in access to care across the country.

1.2 Purpose and Structure of the Article

The aim of this article is to compare the epidemiological burden of CVD in Saudi Arabia and the UK. To achieve this, it will examine national differences in diagnostic pathways, including screening and early detection of CVDs. It will evaluate the national prevention strategies of both countries, including lifestyle interventions and policy measures. It will go on to assess treatment approaches, including acute care, long-term management, and health-system capacity in both nations, and finally it will identify any key opportunities for mutual learning and policy improvement. The following sections will explore each of these dimensions in depth.

2. Prevalence of Cardiovascular Diseases in Saudi Arabia and the United Kingdom

Cardiovascular diseases (CVD) remain a leading cause of death around the world, as well as in both Saudi Arabia and the United Kingdom, but the epidemiological patterns in both countries differ widely due to demographic, lifestyle, and systemic factors. Saudi Arabia is experiencing a rapid rise in metabolic risk factors associated with modernization, while the UK faces a high but gradually declining CVD burden due to long-standing public health interventions and improved acute care. These factors will be discussed on this section.

2.1 Prevalence of CVD in Saudi Arabia

Recent data from the World Heart Observatory (2021) show that Saudi Arabia recorded 54,791 cardiovascular deaths in 2021, with an

age-standardized mortality rate of 353 per 100,000 population. This rate is significantly higher than many high-income countries and reflects the country's ongoing epidemiological transition.

According to data from the World Heart Observatory (2021), hypertension prevalence in Saudi Arabia is 30.2% among women and 36.3% among men. Moreover, tobacco smoking prevalence is 14.4% across the population (Yusuf et al., 2020). Obesity and diabetes rates are among the highest globally, with multiple studies reporting adult obesity prevalence exceeding 35% and diabetes prevalence around 18–20 (Al-Habib, et al., 2020).

These risk factors have contributed to a rising incidence of coronary artery disease, heart failure, and stroke. According to the findings of a study by Alqahtani & Alenazi (2024), CVDs are now among the most common chronic conditions in Saudi Arabia, with regional variations linked to differing socioeconomic status and patterns of urbanization patterns across the country .

In terms of epidemiological transition, the trend in Saudi Arabia has seen a shift from infectious to non-communicable diseases, a trend which has been accelerated by factors such as a more sedentary lifestyle, high-calorie diets, increased life expectancy, increased urbanization and reduced levels of physical activity among the populace. Consequently, the country has faced a growing burden of premature CVD mortality, particularly among middle-aged adults (Ahmed et al., 2025).

2.2 Prevalence of CVD in the United Kingdom

The United Kingdom has one of the most comprehensive cardiovascular data systems in the world, largely due to the British Heart Foundation (BHF) and NHS datasets. According to Statista (2025), the UK recorded a CVD mortality rate of 255 deaths per 100,000 population in 2019, with Scotland showing the highest rate at 326 per 100,000. According to the British Heart Foundation (2023), CVDs are responsible for around 170,000 deaths annually, representing one in four deaths in the UK. Statista records show that coronary heart disease alone accounted for almost 480,000 inpatient diagnoses in 2019/20, while the UK has over 1.8 million inpatient episodes annually which are related to circulatory system diseases.

With regard to its risk factor profile, the UK has made considerable progress in reducing smoking rates and improving hypertension control (UK Biobank, 2023). Despite this progress, several challenges remain. Firstly, obesity prevalence continues to rise, particularly among lower-income groups across the UK. Secondly, dietary risks related to high salt intake and low fruit and vegetable intake remain significant negative contributors. Thirdly, the

ageing UK population increases the prevalence of heart failure and atrial fibrillation, particularly among the older demographic.

2.3 Comparative Analysis

Saudi Arabia's mortality rate is substantially higher than that of the UK, despite the country having a younger population. This suggests differences in risk factor control, early detection, and access to specialized care. Table 1 below shows the mortality rates in both countries based on government published data (World Heart Federation (2023) and British Heart Foundation, 2023).

Indicator	Saudi Arabia	United Kingdom
Age-standardized CVD mortality (per 100,000)	353	255 (2019)
Total annual CVD deaths	54,791	~170,000

Table 1: Mortality rates due to CVDs in Saudi Arabia and the UK

In terms of the risk factor burden, Saudi Arabia shows higher prevalence of Hypertension, Diabetes, and obesity. By contrast, the UK shows a higher prevalence of smoking, particularly in a historical context, although this is now declining, as well as a higher prevalence of age-related CVDs due to its older population structure (British Heart Foundation, 2023). Thus, the UK's long-established NHS and decades of public health campaigns have contributed to gradual declines in CVD mortality. In contrast, Saudi Arabia's rapid modernization has outpaced preventive health infrastructure, leading to rising CVD incidence.

In summary, Saudi Arabia faces a rapidly increasing CVD burden driven by metabolic risk factors and lifestyle changes. The UK faces a high but stabilizing or declining burden due to improved prevention and treatment. Mortality rates remain higher in Saudi Arabia despite its younger population, indicating possible systemic gaps in both disease prevention and early detection.

3. Diagnosis and Screening Approaches for Cardiovascular Diseases

Early diagnosis and effective screening are essential for reducing cardiovascular morbidity and mortality. Both Saudi Arabia and the United Kingdom have implemented national strategies to improve detection of hypertension, dyslipidaemia, diabetes, and early signs of coronary artery disease. However, the maturity, reach, and integration of these systems differ significantly, all of which will be discussed in this section.

3.1 Diagnostic Approaches in Saudi Arabia

Saudi Arabia has made notable progress in

expanding its diagnostic capacity, but challenges remain in terms of standardization, accessibility, and early detection across the country. Saudi's Vision 2030 health transformation programme has accelerated investment in digital health, screening tools, and primary care strengthening (Vision 2030 Health Sector Transformation Program, 2022). Historically, Saudi Arabia lacked an effective and unified national CVD screening programme, but recent initiatives have begun to address this issue. One major development was the introduction of Huma's digital heart risk assessment tool, launched in partnership with the Bayer company in 2024. This assessment tool provides rapid, non-invasive cardiovascular risk evaluation and supports the country's Vision 2030 goals for preventive care (DH Arab, 2024). The tool uses algorithms derived from 15+ years of UK Biobank data, enabling risk prediction without blood tests or blood pressure measurements. Its deployment marks a shift toward digital-first screening in Saudi Arabia, and is an example of how one healthcare system can learn from the experience of another country.

Thus, it is fair to say that hypertension diagnosis in Saudi Arabia is improving but remains inconsistent. A comparative study in the *Vascular and Endovascular Review* (2025) highlights gaps in the following areas in Saudi Arabia: standardized diagnostic pathways; follow-up systems; and patient awareness of their own hypertension status. The study concludes that these gaps contribute to late detection and poor control rates. However, the same study found that Saudi Arabia has expanded access to echocardiography, cardiac catheterization laboratories, CT coronary angiography, and both lipid and metabolic screening. Despite this progress, access to such diagnostic screening varies by region, with rural areas facing shortages of specialists and diagnostic equipment. The findings from Alqathani and Alenazi (2024) emphasize the need for national registries and integrated electronic health records to improve diagnostic continuity.

3.2 Diagnostic Approaches in the United Kingdom

The UK has one of the most structured and comprehensive cardiovascular diagnostic systems globally, supported by the National Health Service (NHS) and resulting from decades of public health investment. The UK operates several established screening pathways, including the NHS Health Check for adults aged 40–74, routine blood pressure and cholesterol screening for older patients, the use of atrial fibrillation detection in primary care, and QRISK3-based cardiovascular risk assessment (Townsend et al., 2022). Collectively, these programmes have contributed to the earlier detection of hypertension, dyslipidaemia, and diabetes. The UK's structured approach contrasts with Saudi Arabia's more variable diagnostic landscape. The UK's diagnostic ecosystem benefits from the UK

Biobank (this was used in the Saudi digital tool described earlier), national registries for heart failure, myocardial infarction, and stroke incidences, as well as integrated electronic health records. These systems support predictive analytics, population-level risk stratification, and rapid clinical decision-making. Moreover, standardized pathways ensure the timely diagnosis of acute coronary syndromes (via rapid access chest pain clinics), heart failure (NT-proBNP testing + echocardiography), arrhythmias (24-hour Holter monitoring, use of event recorders).

3.3 Comparative Analysis

Saudi Arabia is accelerating digital screening, while the UK benefits from decades of structured programmes.

Feature	Saudi Arabia	United Kingdom
National CVD screening program	Emerging (digital-first tools)	Established (NHS Health Check)
Population coverage	Growing, uneven	High, standardized
Digital health integration	Rapidly expanding	Highly mature

Table 2: Summary of Diagnostic Approaches in Saudi Arabia and the UK

As presented in Table 2 above, Saudi Arabia's diagnostic pathways vary by region and facility, whereas the UK has national guidelines and uniform protocols. Saudi Arabia is beginning to adopt predictive algorithms (for example, the Huma tool), while the UK has long used QRISK and national registries to centralize data.

Saudi Arabia faces regional disparities in specialist availability. The UK faces long waiting times but maintains universal access. In summary, Saudi Arabia is rapidly modernizing its diagnostic ecosystem, with digital tools playing a central role. The UK has a mature, standardized diagnostic system with strong data infrastructure. Both countries are investing in early detection, but the UK's long-standing programs give it an advantage in population-level screening.

4. Prevention Strategies for Cardiovascular Diseases

Prevention is the cornerstone of cardiovascular disease (CVD) control. Both Saudi Arabia and the United Kingdom have implemented national strategies to reduce risk factors such as hypertension, dyslipidaemia, diabetes, obesity, and smoking. However, the maturity, reach, and effectiveness of these strategies differ significantly due to variations in health-system structure, public health capacity, and population behaviour.

4.1 Prevention Strategies in Saudi Arabia

Saudi Arabia has recognized CVD as a **national**

public health priority, as highlighted in the report published by the National Heart Center (2022), which outlines comprehensive recommendations for primary and secondary prevention. The country's prevention efforts have intensified under Vision 2030, which emphasizes lifestyle modification, early detection, and improved chronic disease management.

Saudi Arabia faces high levels of modifiable risk factors, such as obesity, hypertension, diabetes, and dyslipidaemia, all of which are driven by sedentary lifestyles and dietary patterns (Tash & Al-Bawardy, 2023). Primary prevention strategies implemented thus far include national campaigns promoting physical activity, the introduction of regulations to reduce sugar consumption, for instance, a sugar-sweetened beverage tax, public health messaging on smoking cessation, the expansion of community sports facilities. Despite these efforts, uptake remains uneven, and cultural norms continue to influence physical activity levels, especially among women.

Saudi Arabia is expanding screening programmes for hypertension, diabetes, and dyslipidaemia. The National Heart Center emphasizes the need for systematic risk calculation and improved LDL-cholesterol management to reduce CVD burden. In addition, recent digital innovations—such as the Huma cardiovascular risk assessment tool—support early identification of high-risk individuals and align with Vision 2030's preventive care goals. Secondary prevention in Saudi Arabia focuses on improving the management of established CVD and high-risk conditions. Key strategies implemented thus far include standardizing dyslipidaemia treatment pathways, expanding cardiac rehabilitation services, improving adherence to antihypertensive and lipid-lowering therapies, and strengthening follow-up systems within the primary care system. However, despite this progress, studies highlight gaps in continuity of care, patient education, and long-term adherence to medications, particularly in rural regions (Al-Shaikh et al., 2020).

4.2 Prevention Strategies in the United Kingdom

The UK has one of the most comprehensive CVD prevention frameworks globally, supported by the NHS, the British Heart Foundation, and decades of public health policy. The NHS Health Check is a national screening program for adults aged 40–74, designed to identify risk factors such as Hypertension, Dyslipidaemia, Diabetes, obesity, and smoking. This programme has significantly improved early detection and risk stratification across the population.

Moreover, the UK has implemented wide-ranging policies to reduce CVD risk, which include the

introduction of smoking bans in public places, higher tobacco taxation and the introduction of plain packaging to discourage the purchase of such products (Scarborough et al. 2019). The government also introduced salt reduction initiatives in processed foods, alongside national dietary guidelines and the promotion of active travel and physical activities in the community (Public Health England, 2020). These interventions have contributed to long-term declines in smoking rates and improvements in population-level blood pressure control.

Secondary prevention in the UK is supported by standardized clinical guidelines, such as those published by NICE, and integrated care pathways. Key components of this strategy include Statin therapy for high-risk individuals, Antiplatelet therapy for coronary artery disease, structured cardiac rehabilitation programmes, heart failure management pathways, and digital monitoring tools for chronic disease management.

The UK's strong primary care system through the General Practitioner service ensures continuity of care and regular follow-up for patients with established CVD (NHS Digital, 2021).

4.3 Comparative Analysis

The UK benefits from decades of public health investment, while Saudi Arabia is rapidly scaling up preventive care.

Aspect	Saudi Arabia	United Kingdom
National prevention strategy	Emerging, Vision 2030-driven	Long-established, NHS-integrated
Screening programs	Expanding, digital-first	Universal, standardized
Public health legislation	Growing (e.g., sugar tax)	Extensive (e.g., smoking bans, salt reduction)

Table 3: Comparative summary of policy maturity and infrastructure

To unpick Table 3 above, Saudi Arabia struggles with high levels of obesity, diabetes, and dyslipidaemia, while the UK's main challenges relate to socioeconomic inequalities and the ageing population across the country. Saudi Arabia's cultural and environmental factors limit physical activity uptake, whereas the UK has more established infrastructure for active lifestyles. The UK's standardized guidelines and strong primary care system support effective secondary prevention. Saudi Arabia is improving but still faces gaps in adherence, follow-up, and regional equity.

In summary, Saudi Arabia is rapidly strengthening its prevention strategies, with a strong focus on

digital tools and Vision 2030 reforms. The UK has a mature, comprehensive prevention framework with proven population-level impact. Both countries face challenges: Saudi Arabia with metabolic risk factors, and the UK with persistent inequalities and ageing demographics.

5. Treatment Modalities and Health-System Capacity

Effective treatment of cardiovascular diseases (CVDs) depends on timely access to acute care, availability of specialized services, standardized clinical guidelines, and long-term management of chronic conditions. Saudi Arabia and the United Kingdom both invest heavily in cardiovascular care, but their systems differ in maturity, structure, and population needs. Saudi Arabia is rapidly expanding its cardiovascular infrastructure as part of Vision 2030 reforms, while the UK benefits from decades of established NHS pathways but faces pressures from aging populations and service demand.

5.1 Treatment Modalities in Saudi Arabia

Saudi Arabia has significantly expanded its cardiovascular treatment capacity in recent years. The report published by the National Heart Centre (2022) emphasizes that CVD is a national health priority, requiring coordinated action across prevention, diagnosis, and treatment. To this end, Saudi Arabia has invested in modernizing acute cardiac care, including the expansion of cardiac catheterization laboratories, increased availability of percutaneous coronary intervention (PCI), the development of specialized cardiac centres in major cities, alongside improved emergency response systems. Despite this progress, access remains uneven across the country. For instance, urban centres such as Riyadh and Jeddah have advanced facilities, while rural regions face shortages of cardiologists, interventional specialists, and advanced imaging equipment (Al-Shaikh et al., 2020). Dyslipidaemia and hypertension are major contributors to CVD in Saudi Arabia. Thus, the national healthcare guidelines emphasize the use of Statin therapy for high-risk individuals, LDL-cholesterol management as a central treatment target for identified at-risk patients, and standardized treatment algorithms for both primary and secondary prevention. Despite these guidelines, studies show that unidentified and untreated dyslipidaemia remains common, contributing to high CVD prevalence (Al-Shaikh et al., 2020).

Alongside these measures, Saudi Arabia is strengthening its chronic disease management through primary care restructuring, increased use of digital health platforms, and national registries for chronic conditions. Despite this progress, challenges persist in the areas of medication adherence, continuity of care, and effective follow-up after acute

cardiac events. These gaps continue to contribute to higher mortality and recurrent events.

According to the Vision 2030 Health Sector Transformation Program (2022), the Saudi government reforms aim to expand private sector involvement, improve the quality and efficiency of care, modernize basic infrastructure, and increase access to specialized services. According to the US-Saudi Business Council (2025), healthcare spending reached SAR 196 billion (\$52.2 billion) in 2021, reflecting the scale of investment in system modernization.

5.2 Treatment Modalities in the United Kingdom

The UK has one of the most structured cardiovascular treatment systems globally, supported by the NHS and decades of clinical research. Thus, the UK provides 24/7 primary PCI networks, rapid access chest pain clinics, standardized pathways for myocardial infarction (STEMI/NSTEMI), national audits (MINAP, NICOR) to monitor the outcomes of patients. These systems have contributed to significant reductions in mortality from acute coronary syndromes over the past two decades.

According to NICE (2023), the UK follows the NICE guidelines for Statin therapy, for instance atorvastatin for primary and secondary prevention, Antiplatelet therapy (aspirin, clopidogrel), Antihypertensive regimens, as well as heart failure medications (ACE inhibitors, beta-blockers, ARNI therapy). These guidelines are widely implemented due to the centralized structure of the NHS. In addition, the UK has a well-established cardiac rehabilitation system, offering exercise programmes, psychological support, lifestyle counselling, and advice on medication optimization. Participation rates in such programmes vary by region, but the system is more mature than in Saudi Arabia. Moreover, the UK's strong primary care system supports long-term management through regular follow-up consultations, widespread use of electronic health records, risk stratification tools, and integrated care pathways. This continuity of care is a major advantage compared to more fragmented systems.

5.3 Comparative Analysis

In terms of treatment modalities, Saudi Arabia is catching up rapidly but still faces regional disparities.

Aspect	Saudi Arabia	United Kingdom
Acute cardiac care	Rapidly expanding; uneven distribution	Mature, standardized national networks
Cardiac rehabilitation	Growing but limited	Well-established nationwide
Primary care role	Strengthening; historically	Central to chronic disease

Aspect	Saudi Arabia	United Kingdom
	specialist-driven	management
National registries	Emerging	Extensive (MINAP, NICOR, UK Biobank)

Table 4: Summary of comparative treatment features of Saudi Arabia and the UK

To unpick Table 4 above, according to the World Heart Federation (2023), Saudi Arabia's CVD mortality rate remains higher (353 per 100,000) compared to the UK (255 per 100,000). This situation reflects issues relating to later presentation, lower screening coverage, persistent gaps in chronic disease management, and variability in treatment access across the country. The UK benefits from long-established systems but faces pressures from its ageing population and increasing service demand. Systemic challenges remain in both countries. For instance, in Saudi Arabia there are still regional inequities, workforce shortages, limited rehabilitation access, and a high burden of metabolic risk factors. In the United Kingdom, there are persistent issues with long NHS waiting times, workforce burnout, socioeconomic inequalities and the rising demand from older adults.

In summary, Saudi Arabia is rapidly modernizing its cardiovascular treatment system, with major investments under Vision 2030. The UK has a mature, standardized system with strong primary care and national registries. Treatment outcomes remain better in the UK due to earlier detection, structured pathways, and long-term management. Saudi Arabia's rapid modernization offers opportunities for innovation, particularly in digital health and infrastructure expansion. Both countries face systemic pressures that require sustained investment and policy reform.

6. Discussion and Conclusion

This comparative analysis of cardiovascular diseases (CVDs) in Saudi Arabia and the United Kingdom reveals both shared challenges and distinct national patterns shaped by demographics, health-system maturity, and socioeconomic factors.

Saudi Arabia faces a rapidly rising CVD burden, driven by high rates of obesity, diabetes, hypertension, and sedentary lifestyles. The age-standardized CVD mortality rate of 353 per 100,000 is significantly higher than the UK's 255 per 100,000, despite Saudi Arabia having a much younger population. This suggests systemic gaps in early detection, risk-factor control, and long-term management.

The UK, by contrast, has seen long-term declines in CVD mortality due to decades of public health

interventions, structured screening programs, and standardized treatment pathways. However, socioeconomic inequalities and an aging population continue to drive persistent CVD morbidity.

The UK benefits from a mature, standardized diagnostic ecosystem, including the NHS Health Check program, QRISK3 risk scoring, and national registries. Saudi Arabia is rapidly expanding its diagnostic capacity, with innovations such as the Huma digital heart-risk assessment tool, which leverages UK Biobank data to support early detection in Saudi Arabia.

However, Saudi Arabia still faces regional disparities in access to diagnostic services, particularly in rural areas. The major challenge facing the UK is not access but waiting times, workforce shortages, and increasing service demand.

Saudi Arabia's prevention efforts have accelerated under Vision 2030, with policies such as sugar-sweetened beverage taxes, physical activity campaigns, and digital screening tools. However, the country continues to struggle with high metabolic risk factors and limited uptake of lifestyle interventions.

The UK has a long history of population-level prevention, including smoking bans, salt-reduction initiatives, and structured screening. These interventions have contributed to improved blood pressure control and reduced smoking prevalence. In summary, the UK's cardiovascular treatment system is highly structured, with 24/7 PCI networks, widespread use of national audits (MINAP, NICOR), standardized NICE guidelines, and strong primary care integration. Saudi Arabia is investing heavily in expanding cardiac centres, catheterization laboratories, and chronic disease management programmes. However, challenges remain with regard to continuity of care, medication adherence, and the availability of cardiac rehabilitation.

In terms of cross-country learning, this article suggests that Saudi Arabia could benefit from expanding its structured national screening programmes, strengthening primary care as the hub of chronic disease management, developing national CVD registries, and scaling up its cardiac rehabilitation services. On the other hand, the UK could learn from Saudi Arabia in terms of its rapid adoption of digital health tools, its large-scale investment in modernizing its healthcare infrastructure, and the widespread integration of AI-driven risk assessment technologies.

Cardiovascular diseases remain a major public health challenge in both Saudi Arabia and the United Kingdom, but the underlying drivers and system

responses differ markedly. Saudi Arabia is navigating a rapid epidemiological transition, with rising metabolic risk factors and expanding healthcare infrastructure. The UK, while benefiting from decades of structured prevention and treatment systems, faces pressures from aging populations and persistent inequalities. Both countries stand to benefit from continued investment in prevention, digital innovation, and health-system strengthening. Ultimately, reducing the burden of CVD requires coordinated action across clinical, public health, and policy domains.

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