

Epidemiological profile of ischemic heart disease in Albania, 2024

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Abstract

Background: Cardiovascular diseases remain the leading cause of mortality worldwide, with ischemic heart disease as the main contributor. In Albania, circulatory system diseases account for more than half of total mortality; however, updated national epidemiological data on IHD remain limited. Reliable incidence estimates are essential for monitoring trends, identifying high-risk populations, and informing public health interventions.

Aims: This study aimed to describe the epidemiological profile of ischemic heart disease in Albania during 2024 and to assess incidence patterns according to sex, age group, and geographic region, as well as short-term changes compared with 2023.

Study design: This study is a national descriptive cross-sectional epidemiological analysis based on routinely collected hospital surveillance data.

Methods: Data on newly diagnosed ischemic heart disease cases were collected from all hospital services in Albania. Only first-ever cases were included. Incidence rates per 100,000 population were calculated using population data from the 2023 national census (INSTAT). Analyses were stratified by sex, age group, and region, with comparisons between 2023 and 2024 to assess patterns by person, place, and time.

Results: In 2024, the national incidence of ischemic heart disease was 201.3 per 100,000 population, showing a slight decrease compared with 203.2 per 100,000 in 2023. Males accounted

for 69% of all newly diagnosed cases and exhibited an incidence approximately 2.3 times higher than females (279.8 vs. 124.1 per 100,000). Incidence increased markedly with advancing age in both sexes, with the highest rates observed among individuals aged 65–79 years. Significant regional variation was identified, with the highest incidence recorded in Lezhë and Berat regions, while Kukës, Gjirokastrë, and Fier demonstrated the lowest rates. Although national incidence remained relatively stable, localized increases were observed in several regions, particularly among males.

Conclusion: Ischemic heart disease remains a major public health challenge in Albania, with marked disparities by sex, age, and region. Although national incidence has stabilized, the high burden among men and older adults underscores the need for strengthened prevention, improved surveillance, and targeted interventions to support evidence-based cardiovascular health policy.

Keywords: ischemic heart disease; epidemiology; incidence; Albania; cardiovascular diseases.

INTRODUCTION

Cardiovascular diseases (CVDs) remain the leading cause of mortality globally. According to the World Health Organization (WHO), approximately 19.8 million deaths were attributed to cardiovascular diseases in 2022 (1). More than three quarters of these deaths occur in low- and middle-income countries, highlighting persistent global health inequalities. In 2021, among the estimated 18 million premature deaths before the age of 70 caused by non-communicable diseases, at least 38% were due to cardiovascular conditions.

In Albania, diseases of the circulatory system account for more than 52% of total mortality, representing the principal cause of death nationwide. Within this group, Ischemic Heart Disease (IHD) constitutes approximately 23% of all deaths (2). IHD represents one of the most severe manifestations of cardiovascular pathology and primarily results from reduced blood flow and oxygen supply to the myocardium, most commonly due to atherosclerotic coronary artery disease.

The burden of ischemic heart disease reflects the combined influence of demographic changes, population aging, lifestyle-related risk factors, and environmental exposures. Albania, similar to many countries in the Western Balkans, is undergoing epidemiological transition characterized by a declining burden of communicable diseases and a growing prevalence of non-communicable diseases, particularly cardiovascular disorders (3).

National disease registries covering ischemic heart disease are currently operational in Albania and provide a structured mechanism for the systematic collection of data on newly diagnosed cases, hospitalizations, and outcomes, enabling relatively accurate population-based monitoring. These registries represent an essential source of epidemiological information and support evidence-based decision-making in public health planning.

A substantial proportion of cardiovascular diseases is preventable through effective control of modifiable risk factors. Tobacco use, unhealthy dietary patterns, characterized by excessive consumption of salt, sugar, and saturated fats, overweight and obesity, physical inactivity, harmful alcohol consumption, and exposure to ambient air pollution are recognized by the WHO and the European Society of Cardiology (ESC) as major determinants of cardiovascular risk (4–6). Early detection and timely management of these risk factors are crucial for reducing disease incidence and improving long-term outcomes. Epidemiological surveillance constitutes a cornerstone of cardiovascular disease prevention and control (7,8).

Continuous monitoring of incidence, prevalence, mortality, and risk-factor distribution enables the assessment of temporal trends and facilitates the identification of high-risk population groups according to age, sex, geographic area, and socioeconomic status. Such information is fundamental for estimating the overall disease

burden and for guiding targeted prevention strategies.

Furthermore, epidemiological data allow for evaluation of the effectiveness of national prevention programs and health policies over time. These data also inform the allocation of human and financial resources within the healthcare system, contribute to strengthening primary healthcare services, and support the development of sustainable strategies for cardiovascular disease prevention and management.

International and regional comparisons provide additional value by enabling benchmarking of national indicators against those of neighboring countries and European standards. This comparative perspective supports policy adaptation based on best practices and enhances the national response to cardiovascular diseases.

The present article aims to provide a comprehensive epidemiological profile of ischemic heart disease in Albania during 2024, contributing to a clearer understanding of current trends and supporting evidence-based public health interventions.

MATERIALS AND METHODS

This study represents a descriptive epidemiological analysis based on national-level data processed and analyzed using standard statistical methods for the calculation of key epidemiological indicators. These include incidence rates standardized by age, sex, and place of residence.

From a methodological perspective, it should be noted that while newly diagnosed cases of acute myocardial infarction are minimally influenced by population health-seeking behavior, other clinical forms of ischemic heart disease do not always result in hospital admission. Consequently, notable year-to-year fluctuations may occur in the reported incidence of non-acute ischemic conditions.

Regarding the organization of healthcare services in Albania, regional hospitals primarily function as centers for the clinical management of acute myocardial infarction and other severe forms of ischemic heart disease, whereas the University Hospital Center “Mother Teresa” (QSUT) serves as the national tertiary referral center.

Data on newly diagnosed cases of ischemic heart disease were collected from all hospital services, including emergency departments and inpatient wards. Case identification was based on individual patient medical records completed for each newly diagnosed case. The largest proportion of reported cases originated from the University Hospital Center “Mother Teresa” (QSUT), reflecting its role as the main national referral institution.

Only incident cases of ischemic heart disease diagnosed for the first time were included in the analysis. Particular attention was given to ensuring that cases represented neither recurrent events nor duplicate records. The dataset therefore reflects first-ever diagnoses of ischemic heart disease.

The data presented in this study cover incidence during the calendar year 2024 and were compared with data from the preceding year. Incidence rates per 100,000 population were calculated based on the number of newly reported hospital cases and the corresponding annual population estimates for both years (2023–2024), using population data derived from the 2023 National Census conducted by the Albanian Institute of Statistics (INSTAT).

Statistical analysis was performed to estimate incidence levels by administrative region (county), age group, and sex over the two-year study period, enabling comparative assessment across the epidemiological triad of person, place, and time.

The study is based on data obtained from national and international sources, with the objective of providing a comprehensive overview of the epidemiological situation of cardiovascular diseases in Albania.

RESULTS

1. *National Incidence of Ischemic Heart Disease*

In 2024, the national incidence of ischemic heart disease (IHD) in Albania reached 201.3 cases per 100,000 population, representing a slight decrease compared with 2023, when an incidence rate of 203.2 per 100,000 population was reported.

Sex-specific analysis showed that males accounted for 69% of all newly diagnosed cases included in the study, whereas females represented 31%, indicating a substantially higher disease burden among men.

As illustrated in Figure 1, this sex disparity remained pronounced in 2024, with a markedly higher incidence observed among males (279.8 per 100,000 population) compared with females (124.1 per 100,000 population), corresponding to an approximately 2.3-fold higher risk among men.

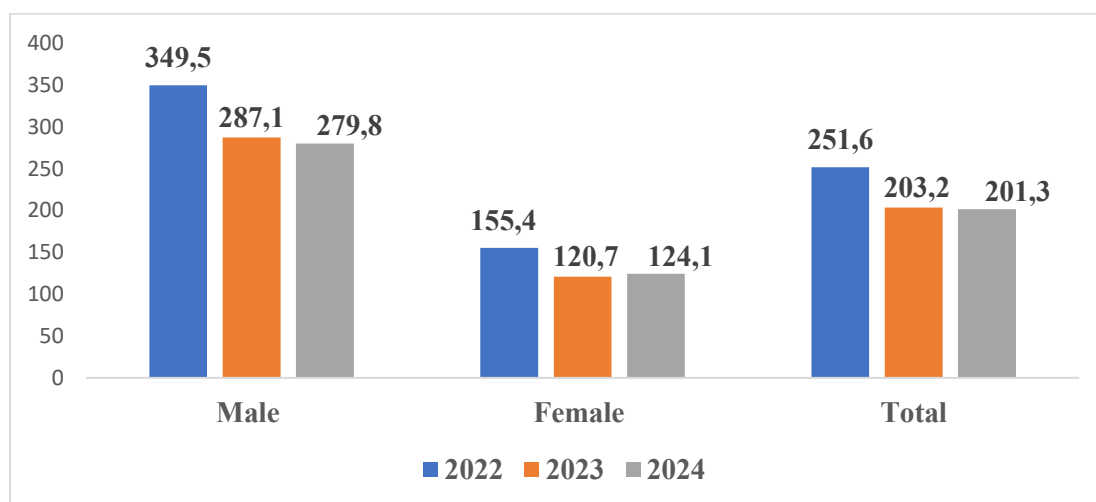


Figure 1. Incidence of ischemic heart disease by sex (/100,000 population), 2022–2024

Overall trends indicate that IHD incidence remained consistently higher among males throughout the period 2022–2024. A gradual decline in incidence was observed among men over time, while among women a decrease was noted until 2023, followed by a slight increase in 2024. At the national level, total incidence declined between 2022 and 2023 and remained nearly stable during 2024.

2. Regional Distribution of Incidence

Figure 2 presents the incidence of ischemic heart disease per 100,000 population by county (city) for the years 2023 and 2024. At the national level, total incidence in 2024 showed a modest decline compared with the previous year.

As in 2023, the highest incidence rates in 2024 were recorded in the counties of Lezhë (337.1 per 100,000) and Berat (252.6 per 100,000). Counties with consistently high incidence levels in both

years included Tirana, Korçë, Vlorë, and Elbasan, with rates ranging from 200.8 to 227.4 per 100,000 population and minimal variation between years.

The lowest incidence rates in both 2023 and 2024 were observed in Kukës, Gjirokastrë, and Fier counties, with values ranging from 99.4 to 172.6 per 100,000 population.

Table 1 presents county- and sex-specific incidence rates for both study years. In all counties and in both years, males consistently exhibited substantially higher incidence rates than females. In 2023, incidence among males was 287.1 per 100,000, compared with 120.7 per 100,000 among females. In 2024, male incidence decreased slightly to 279.8 per 100,000, while female incidence remained relatively stable at 124.1 per 100,000.

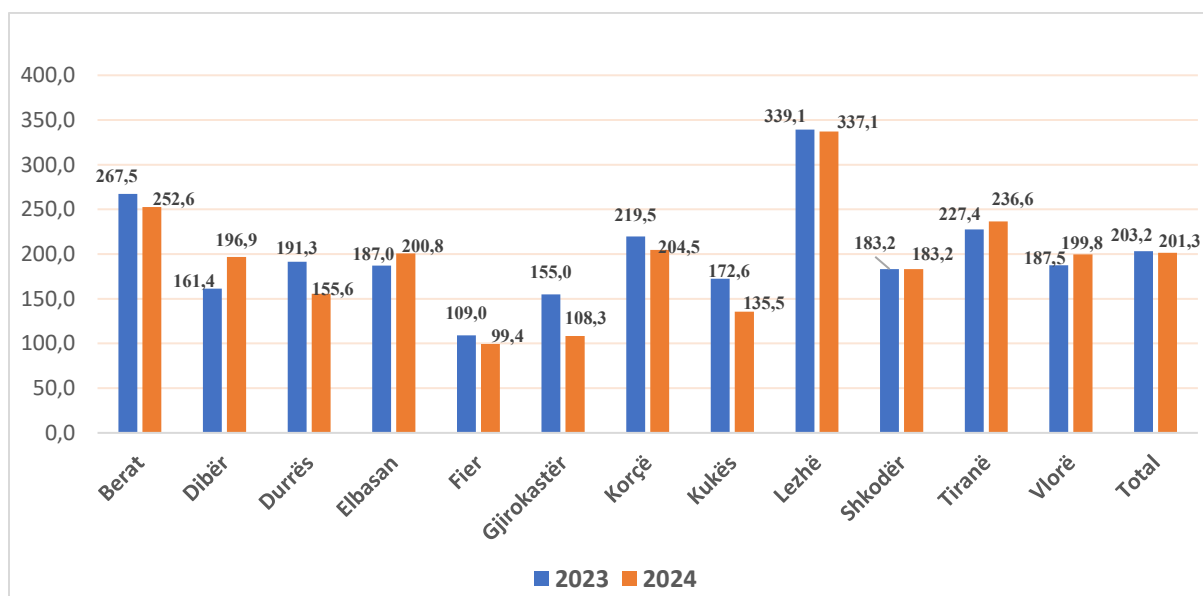


Figure 2. Incidence of ischemic heart disease by county (/100,000 population), 2023–2024

Table 1. Incidence of IHD (per 100,000 population) by county and sex

Incidence of IHD 2023			Incidence of IHD 2024			
County	Males	Females	Total	Males	Females	Total
Berat	382.3	154.7	267.5	283.5	222.2	252.6
Dibër	229.4	92.2	161.4	294.2	97.9	196.9
Durrës	264.4	117.7	191.3	230.1	80.5	155.6
Elbasan	272.8	100.9	187.0	293.4	107.8	200.8
Fier	155.7	61.9	109.0	140.8	57.7	99.4
Gjirokastrër	234.8	73.9	155.0	145.5	70.5	108.3
Korçë	301.3	136.4	219.5	284.1	123.5	204.5
Kukës	260.3	84.2	172.6	183.2	87.4	135.5
Lezhë	436.9	241.4	339.1	430.9	243.4	337.1
Shkodër	255.3	112.7	183.2	263.1	105.0	183.2
Tiranë	329.3	131.7	227.4	332.9	146.3	236.6
Vlorë	250.0	125.2	187.5	290.9	108.9	199.8
Total	287.1	120.7	203.2	279.8	124.1	201.3

These findings confirm the persistence of a significant sex gap in ischemic heart disease morbidity, with males experiencing approximately 2.3 times higher incidence than females in both years, in line with established epidemiological patterns.

A comparative regional analysis revealed temporal variations between 2023 and 2024. Increases in incidence were observed in Dibër, Elbasan, Shkodër, Tirana, and Vlorë, predominantly among males. The most notable increases were recorded in Elbasan and Tirana, affecting both sexes, with an approximate 1.1-fold rise. Dibër also demonstrated a considerable increase, particularly among men.

More moderate increases were observed in Shkodër and Vlorë for both sexes. Conversely, declines in incidence were documented in Berat, Gjirokastrër, Kukës, and Durrës. The county of Korçë remained relatively stable across both years, indicating consistency in reporting and epidemiological trends.

3. Age and Sex-Specific Incidence Patterns

Table 2 illustrates age- and sex-specific incidence rates of ischemic heart disease for 2023 and 2024. A marked increase in incidence with advancing age was observed in both years, with substantially higher rates among males compared with females across all age groups.

As in 2023, the age distribution in 2024 followed a progressive upward trend with increasing age. The mean age at diagnosis in 2023 was 66 years for males and 70 years for females. Similarly, in 2024, the mean age at diagnosis remained nearly unchanged, at 66 years for males and 69 years for females.

Table 2. Incidence of IHD (/100,000 population) by age group and sex

Incidence of IHD 2023			Incidence of IHD 2024			
Age Group	Males	Females	Total	Males	Females	Total
0-4	0.0	0.0	0.0	0.0	0.0	0.0
5-9	0.0	0.0	0.0	0.0	0.0	0.0
10-14	1.4	0.0	0.7	1.4	1.5	1.5
15-19	5.6	2.8	4.2	1.4	1.4	1.4
20-24	7.2	6.8	7.0	5.8	2.7	4.2
25-29	8.2	8.4	8.3	8.2	4.2	6.2
30-34	39.1	4.0	22.1	18.9	5.4	12.4
35-39	57.4	16.4	37.6	37.0	4.1	21.1
40-44	113.5	16.9	64.2	101.7	22.6	61.3
45-49	182.6	57.9	116.7	189.9	40.8	111.1
50-54	341.0	109.7	218.9	316.5	86.6	195.1
55-59	470.2	144.5	302.1	406.5	139.0	268.5
60-64	530.4	185.3	355.0	599.5	187.3	390.0
65-69	821.7	316.1	566.0	733.0	297.4	512.8
70-74	831.7	374.8	599.0	823.6	420.1	618.1
75-79	984.6	509.9	742.4	984.6	538.9	757.2
80-84	866.4	503.6	669.7	930.3	605.6	754.2
85+	723.0	392.4	537.6	856.2	531.5	674.1
Total	287.1	120.7	203.2	279.8	124.1	201.3

Incidence remained minimal in individuals under 30 years of age, with fewer than 10 cases per 100,000 population in both years. The risk was very low below the age of 40, although not negligible among males aged 35–39 years.

Among females aged 80–84 years, incidence levels were comparable to those observed among males aged 60–64 years. In men, incidence peaked between the ages of 65 and 79 years and declined thereafter. In contrast, incidence among women continued to increase beyond this age range, although it never reached the levels observed among men.

A slight decline in incidence after the age of 80 was noted for both sexes, primarily reflecting reduced population size within these age groups. For each study year, males demonstrated consistently higher incidence rates across all age

categories. In 2024 (Figure 3), the sex difference remained particularly pronounced in the 65–84-year age groups, where male incidence was approximately twice as high as female incidence (823.6 vs. 420.1 per 100,000 population in the 70–74-year age group).

Although incidence decreased slightly for both sexes over time, the male-to-female ratio remained stable, reflecting the greater exposure of men to major cardiovascular risk factors, including tobacco use, hypertension, dyslipidemia, unhealthy diet, and psychosocial stress.

DISCUSSION

The present study provides a comprehensive overview of the epidemiological profile of ischemic heart disease (IHD) in Albania during

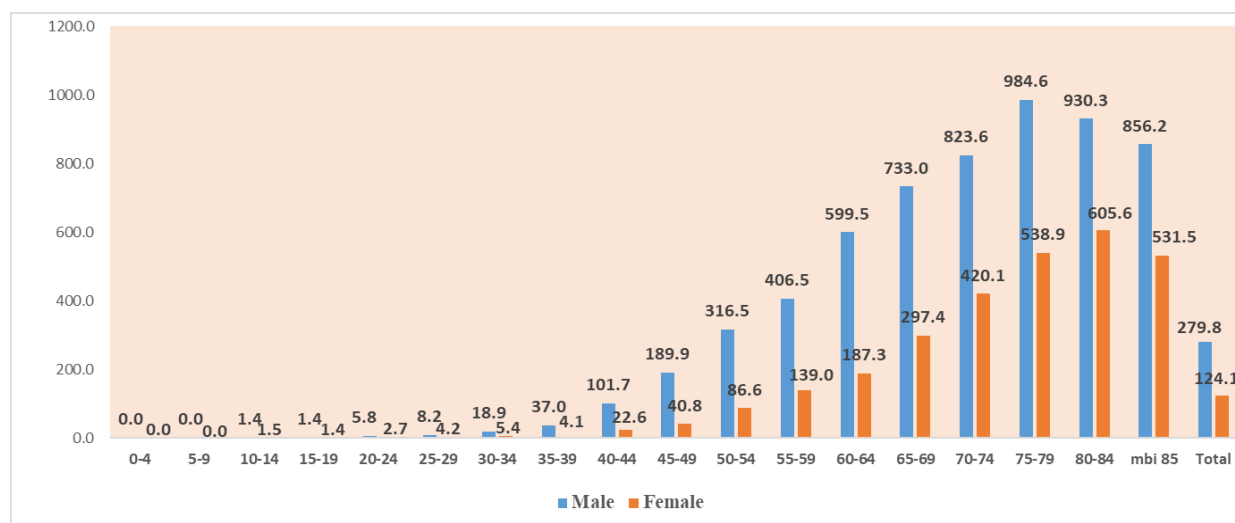


Figure 3. Incidence of ischemic heart disease by age group and sex (/100,000 population), 2024

2024 and highlights important patterns related to sex, age, and geographic distribution. Overall, the findings indicate a relatively stable national incidence of IHD, with a slight decline compared with 2023, alongside persistent demographic and regional disparities.

The modest decrease observed at the national level is consistent with trends reported in several European countries, where stabilization or gradual reductions in ischemic heart disease incidence and mortality have been documented over the past decade. According to a large retrospective analysis of ischemic heart disease mortality trends in Europe between 2008 and 2022, most Western and Central European countries experienced a sustained decline in mortality, primarily attributed to improved cardiovascular risk-factor control, early diagnosis, and advances in acute cardiac care (9). Although the present study focuses on incidence rather than mortality, the stabilization observed in Albania may reflect similar improvements in access to hospital-based care, particularly for acute myocardial infarction.

However, when compared with broader European trends, Albania continues to exhibit a relatively high burden of ischemic heart disease, especially among males and older age groups. Data from the Global Burden of Disease (GBD) Study indicate that despite overall reductions in age-standardized mortality rates across Europe since the 1990s, substantial heterogeneity persists between Western Europe and Eastern and Southeastern regions (10–12). Countries in

Eastern and Southeastern Europe, including those in the Western Balkans, continue to report higher rates of ischemic heart disease compared with the European Union average.

The pronounced sex differences observed in this study, with males exhibiting approximately 2.3-fold higher incidence than females, are consistent with global epidemiological patterns. Analyses from the GBD 2021 Study demonstrate that men experience significantly higher ischemic heart disease incidence, prevalence, and mortality across nearly all regions worldwide (11). This disparity has been attributed to a combination of biological factors and differential exposure to modifiable risk factors, including higher rates of tobacco use, occupational stress, hypertension, and adverse lipid profiles among men.

Age-specific findings further align with international evidence. The progressive increase in incidence with advancing age observed in Albania mirrors patterns reported globally. According to the Global Burden of Disease Study 2021, ischemic heart disease remains the leading cause of cardiovascular morbidity and mortality among adults aged 60 years and older, with a sharp rise after the fifth decade of life (13). The earlier and steeper increase among men compared with women, as demonstrated in the present study, is similarly reported in both European and global datasets.

Regional variation within Albania represents another important finding. Counties such as Lezhë, Berat, Tirana, and Elbasan consistently exhibited higher incidence rates, whereas Kukës,

Gjirokastër, and Fier showed lower levels. Similar intra-country geographic disparities have been described across Europe, often reflecting differences in socioeconomic status, access to healthcare services, prevalence of cardiovascular risk factors, and urban–rural inequalities. GBD-based analyses emphasize that subnational inequalities contribute substantially to the overall cardiovascular burden, particularly in countries undergoing epidemiological transition (11).

When contextualized within the Western Balkan region, Albania’s epidemiological profile appears comparable to neighboring countries with similar demographic structure and health system organization. Studies based on GBD data indicate that countries in Southeastern Europe continue to experience slower declines in ischemic heart disease burden compared with Western Europe, partly due to delayed implementation of comprehensive prevention strategies and persistent exposure to behavioral and environmental risk factors (12).

Notably, recent global analyses have also highlighted emerging concerns regarding ischemic heart disease among younger and middle-aged populations. Although incidence in individuals under 40 years of age remains low in Albania, the presence of measurable risk among males aged 35–39 years is consistent with findings reported by Song et al. (13), who documented increasing relative burden of ischemic heart disease among young and middle-aged adults in several regions worldwide. This

underscores the importance of early prevention strategies targeting lifestyle-related risk factors.

Overall, the findings of this study are in line with international evidence derived from large-scale epidemiological analyses, particularly those based on the Global Burden of Disease framework. While Albania demonstrates signs of stabilization in ischemic heart disease incidence, the persistent sex gap, pronounced age gradient, and regional inequalities indicate an ongoing need for strengthened prevention, early detection, and targeted public health interventions.

STRENGTHS AND LIMITATIONS

Strengths

This study presents several important strengths. First, it is based on national-level data collected from all hospital services in Albania, including emergency departments and inpatient units, providing broad population coverage and enhancing the representativeness of the findings. The inclusion of only first-ever diagnosed cases of ischemic heart disease reduces the risk of case duplication and allows for a more accurate estimation of incidence.

Second, the use of standardized epidemiological indicators and stratified analyses by sex, age group, and geographic region enables a detailed assessment of disease distribution across the epidemiological triad of person, place, and time. The comparison of two consecutive years further allows for evaluation of short-term trends and regional variability.

Third, the integration of census-based population denominators from the 2023 INSTAT census strengthens the validity of incidence rate calculations and improves comparability across regions and demographic groups.

Finally, the study provides one of the most recent national epidemiological assessments of ischemic heart disease in Albania, offering timely evidence to support health system planning and cardiovascular disease prevention strategies.

Limitations

Several limitations should be considered when interpreting the findings. First, the analysis is based exclusively on hospital-reported cases and therefore may underestimate the true population burden of ischemic heart disease, particularly for chronic or less severe forms that do not result in hospitalization.

Second, variations in healthcare-seeking behavior, diagnostic practices, and reporting completeness between regions may have influenced observed geographic differences. These factors may partly explain year-to-year fluctuations in incidence in certain counties.

Third, the study does not include information on individual-level cardiovascular risk factors, clinical severity, treatment pathways, or outcomes, limiting the ability to explore causal relationships or assess disease prognosis.

Finally, although short-term temporal comparisons were possible, longer trend analyses would provide a more robust understanding of

epidemiological dynamics and should be considered in future studies.

CONCLUSION

This study provides a comprehensive epidemiological assessment of ischemic heart disease in Albania during 2024, highlighting a relatively stable national incidence alongside pronounced disparities by sex, age, and geographic region.

Although a slight decline in incidence was observed compared with the previous year, ischemic heart disease continues to represent a major public health burden, particularly among men and older adults. The persistence of significant sex differences and regional inequalities reflects ongoing exposure to modifiable cardiovascular risk factors and underscores the need for targeted prevention efforts.

The findings are consistent with regional and global evidence derived from the Global Burden of Disease framework and confirm that Albania remains within the broader pattern observed in Southeastern Europe, where progress in reducing cardiovascular disease burden has been slower compared with Western Europe.

Strengthening epidemiological surveillance, enhancing primary prevention, promoting early risk detection, and reducing regional and socioeconomic inequalities should remain central priorities of national cardiovascular health policy. The evidence presented in this study contributes to a clearer understanding of the current

epidemiological landscape of ischemic heart disease in Albania and provides a valuable foundation for evidence-based public health planning and future research.

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Conflict of Interest Statement: The authors declare that they have no conflict of interest.

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