

# Analysis of the Trend in the Burden of Ischemic Heart Disease in China from 1990 to 2021

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**Abstract:** *Objective:* This study aims to provide an accurate quantitative analysis of the burden of ischemic heart disease (IHD) in China, and to provide a scientific basis for the development of effective prevention and control strategies. *Methods:* Based on the latest public database GBD2021 (2021 Global Burden of Diseases), the characteristics and trends of incident, prevalence, death, and attributable risk factors of IHD in the Chinese population from 1990 to 2021 were quantitatively analyzed. *Results:* From 1990 to 2021, the burden of IHD in China has significantly increased. The number of incident cases increased from 23.01 million in 1990 to 70.40 million in 2021, with an annual growth rate of 3.97%. The number of prevalent cases increased from 195 million in 1990 to 633 million in 2021, with an annual growth rate of 3.92%. The number of deaths also showed an upward trend, increasing from 547,800 in 1990 to 1.9569 million in 2021, with an annual growth rate of 4.19%. The incidence rate increased from 195.64/100,000 in 1990 to 513.41/100,000 in 2021, with an annual growth rate of 3.36%. The prevalence rate increased from 1657.98/100,000 in 1990 to 4451.34/100,000 in 2021, with an annual growth rate of 3.31%. The death rate increased from 46.57/100,000 in 1990 to 137.54/100,000 in 2021, with an annual growth rate of 3.34%. The age-standardized incidence rate increased from 315.31/100,000 in 1990 to 365.67/100,000 in 2021, with an annual growth rate of 0.66%; the age-standardized prevalence rate increased from 2526.44/100,000 in 1990 to 3042.35/100,000 in 2021, with an annual growth rate of 0.64%; the age-standardized death rate increased from 94.14/100,000 in 1990 to 110.91/100,000 in 2021, with an annual growth rate of 0.72%. These data directly reflect the changing trend of the burden of IHD in China. *Conclusion:* The conclusion section indicates that from 1990 to 2021, the burden of IHD in China has significantly increased, manifested by the continuous rise in incident cases, prevalent cases, and deaths. The research data shows that the annual growth rates of incident cases, prevalent cases, and deaths due to IHD are 3.97%, 3.92%, and 4.19% respectively, reflecting the serious situation of prevention and control of IHD in China. In addition, although the growth rates of age-standardized incidence, prevalence, and death rates are relatively slow, they still show an overall upward trend, which may be related to factors such as population aging, lifestyle changes, and insufficient management of chronic diseases. These findings emphasize the urgency of taking effective prevention and control measures to reduce the impact of IHD on the public health system in China.

**Keywords:** Ischemic heart disease; Disease burden; Attributable risk factors; China

**Online publication:**

## 1. Introduction

Ischemic heart disease (IHD) has long been a leading cause of death and disability. According to the World Health Organization (WHO) report, the death and incidence of ischemic heart disease continue to rise globally <sup>[1]</sup>. In China, due to population aging and lifestyle changes, the disease burden of ischemic heart disease has been increasing. In recent years, despite some progress in the prevention and treatment of ischemic heart disease, its incidence and death rates remain high <sup>[2]</sup>. Existing research has focused more on the clinical treatment of ischemic heart disease and the study of individual risk factors, lacking in-depth research on long-term trends and a wide range of risk factors, especially quantitative research <sup>[3]</sup>. This limits our understanding of the epidemiology of ischemic heart disease and affects the formulation and optimization of prevention strategies. By analyzing the data from the latest disease burden study database, analyzing the proportion of deaths attributed to risk factors for ischemic heart disease in China from 1990 to 2021, it is of great scientific value to reveal the epidemiological trends of the disease, identify high-risk populations, and formulate and implement effective prevention measures <sup>[4]</sup>. Providing more precise data support and decision-making basis for relevant policymakers and public health workers, interventions targeting major risk factors, such as improving diet, increasing physical activity, and controlling hypertension, will be crucial for controlling the future trends of ischemic heart disease <sup>[5]</sup>.

## 2. Materials and methods

### 2.1. Data

The data for this study came from the latest Global Burden of Diseases study (GBD2021) database, which provides detailed epidemiological data on ischemic heart disease in China from 1990 to 2021, including the incidence, prevalence and disease burden indicators by age, sex, and region. GBD2021 comprehensively analyzes and estimates the disease burden of 369 diseases or injuries in 204 countries and regions worldwide using a unified, comparable method, and systematically reviews the disease burden attributable to 87 risk factors, making it the most detailed database globally. This study conducted data screening on GBD2021, selecting the region as “China,” the disease as “ischemic heart disease,” the risk factors as “select only level 3 risks,” all years from 1990 to 2021, all ages, and both genders. The definition of ischemic heart disease follows the tenth edition of the International Classification of Diseases (ICD-10) with the codes I20-I25.

### 2.2. Indicator selection

This study used the number of incident cases, prevalence cases, deaths, incidence rate, prevalence rate, death rate, and age-standardized rate (ASR) of incidence, prevalence, and death to assess the trend and burden of ischemic heart disease in China. The above data can be directly obtained from the GBD official website (<https://www.healthdata.org/gbd>).

### 2.3. Statistical methods

All statistical analyses were performed using R software (version 4.2.1) and SAS software (version 9.4) to ensure the accuracy and reliability of the analysis. The significance level was set at  $P < 0.05$  to evaluate the statistical significance of the results.

## 3. Results

### 3.1. Ischemic heart disease incidence in Chinese population from 1990 to 2021

Between 1990 and 2021, the number of cases, incidence rate, and age-standardized incidence rate of ischemic heart disease in the Chinese population showed an increasing trend. Specifically, the number of cases increased from 23.01 million in 1990 to 70.40 million in 2021, with an average annual growth rate of 3.97%; the incidence rate increased from 195.64/100,000 to 513.41/100,000, with an average annual growth rate of 3.36%; while the age-standardized incidence rate increased from 315.31/100,000 to 365.67/100,000, with a relatively slower growth rate of 0.66% per year. Overall, the data reflects a continuous increase in the disease burden of the Chinese population, with this trend particularly significant in terms of the number of cases and incidence rate.

**Table 1.** Incidence of ischemic heart disease in the Chinese population from 1990 to 2021

Years	Incidence number	Incidence ratePer 100,000)	Age-standardized incidence rate (Per 100,000)
1990	2301643.54 (1861968.54-2792193.37)	195.64 (158.27-237.34)	315.31 (255.53-382.49)
1991	2358597.87 (1913191.73-2842002.78)	197.73 (160.39-238.26)	312.64 (254.71-375.39)
1992	2423290.40 (1971469.07-2909909.48)	200.90 (163.44-241.24)	311.10 (254.63-371.54)
1993	2494797.93 (2036346.35-2987969.57)	204.95 (167.29-245.47)	310.56 (255.14-369.70)
1994	2575765.73 (2113971.11-3074059.84)	210.04 (172.38-250.68)	310.96 (256.11-368.85)
1995	2663604.55(2190888.75-3168329.94)	215.90 (177.58-256.81)	312.18 (256.96-369.54)
1996	2787757.55 (2289466.67-3317527.92)	224.85 (184.66-267.57)	316.60 (260.15-375.90)
1997	2958566.21 (2414004.34-3535919.58)	237.64 (193.90-284.01)	325.06 (264.82-388.26)
1998	3150817.04 (2556257.00-3782051.75)	252.14 (204.56-302.66)	335.07 (270.76-402.21)
1999	3342810.85 (2698291.68-4037501.92)	266.54 (215.15-321.93)	344.17 (276.35-415.51)
2000	3498680.68 (2812415.81-4222801.23)	277.87 (223.37-335.39)	349.89 (279.76-422.91)
2001	3634585.03 (2938936.71-4370971.89)	287.35 (232.35-345.57)	353.53 (283.55-425.94)
2002	3778539.11 (3073999.40-4529127.98)	297.22 (241.80-356.26)	357.77 (288.57-427.80)
2003	3926956.48 (3216490.33-4683507.22)	307.25 (251.66-366.44)	362.11 (294.10-431.67)
2004	4081929.44 (3355456.01-4856262.19)	317.60 (261.08-377.85)	366.09 (299.65-434.81)
2005	4235369.19 (3490165.58-5032073.46)	327.60 (269.96-389.22)	369.30 (304.01-436.50)
2006	4408502.07 (3633227.81-5227411.04)	338.77 (279.19-401.70)	372.25 (306.75-439.42)
2007	4602029.85 (3791314.70-5455128.23)	351.16 (289.29-416.25)	375.42 (309.49-442.94)
2008	4799845.36 (3948586.16-5692639.05)	363.65 (299.15-431.29)	378.30 (312.04-446.21)
2009	5000879.35 (4119929.24-5928965.70)	376.30 (310.01-446.13)	380.31 (313.78-448.37)
2010	5183744.16 (4276582.55-6144180.61)	387.73 (319.88-459.57)	380.90 (314.43-448.99)
2011	5353825.16 (4423138.01-6340026.66)	398.39 (329.14-471.78)	379.60(314.49-445.66)
2012	5512804.59 (4568423.34-6504636.73)	408.00 (338.10-481.40)	377.00 (313.57-440.21)
2013	5668991.06 (4706552.37-6661027.06)	417.04 (346.23-490.01)	373.98 (313.25-435.24)
2014	5842409.54 (4871028.05-6840516.75)	427.10 (356.09-500.07)	371.39 (313.65-430.48)
2015	6028606.35 (5040780.02-7046288.13)	437.69 (365.97-511.58)	370.01 (314.39-428.62)
2016	6240096.03 (5222083.89-7329987.73)	449.63 (376.27-528.16)	369.51 (311.51-428.76)
2017	6454427.79 (5391565.54-7608150.16)	461.64 (385.62-544.15)	369.11 (308.23-430.07)
2018	6667323.58 (5523917.03-7925740.82)	473.81 (392.55-563.24)	368.78 (305.54-432.27)
2019	6894607.77 (5701897.18-8254208.93)	487.47 (403.14-583.60)	368.41 (304.08-434.51)
2020	7080914.95 (5830523.85-8451533.06)	498.84 (410.75-595.39)	366.89 (303.04-431.91)
2021	7304573.22 (5815313.24-8949994.68)	513.41 (408.74-629.06)	365.67 (293.32-440.07)
Estimate annual percentage change (%)	3.97 (3.84-4.09)	3.36 (3.23-3.49)	0.66 (0.50-0.82)

### 3.2. Incidence of ischemic heart disease in Chinese population from 1990 to 2021

Between 1990 and 2021, the number of patients, incidence rate, and age-standardized incidence rate in the Chinese population have all significantly increased. The number of patients increased from 195 million in 1990 to 633 million in 2021, with an annual growth rate of 3.92%; the incidence rate increased from 1657.98/100,000 to 4451.34/100,000, with an annual growth rate of 3.31%; the age-standardized incidence rate increased from 2526.44/100,000 to 3042.35/100,000, with an annual growth rate of 0.64%. These data indicate that the overall disease burden of the Chinese population has sharply increased in the past 30 years, with the number of patients and incidence rate showing particularly significant growth, while the growth rate of the age-standardized incidence rate is relatively moderate but still trending upwards. This phenomenon may reflect the impact of multiple factors such as population aging, lifestyle changes, and the increasing incidence of chronic diseases. The growing trend presented by the data highlights the significant challenges faced by medical and public health management. See **Table 2**.

**Table 2.** The prevalence of ischemic heart disease in the Chinese population from 1990 to 2021

Years	Prevalence number	Prevalence rate (Per 100,000)	Age-standardized prevalence rate (Per 100,000)
1990	19505463.06 (16754811.28-22537174.00)	1657.98 (1424.17-1915.68)	2526.44 (2189.97-2914.97)
1991	20202201.12 (17439989.49-23233544.66)	1693.66 (1462.09-1947.80)	2536.30 (2212.00-2925.34)
1992	20924583.91 (18144620.87-23936399.45)	1734.70 (1504.23-1984.38)	2548.87 (2231.15-2923.79)
1993	21664755.03 (18841475.26-24664065.48)	1779.82 (1547.88-2026.22)	2563.65 (2254.24-2925.36)
1994	22449987.57 (19571237.18-25442191.58)	1830.70 (1595.95-2074.70)	2580.23 (2277.79-2932.58)
1995	23248863.00 (20352220.36-26293561.97)	1884.41 (1649.63-2131.20)	2598.06 (2301.39-2941.09)
1996	24139126.68 (21154331.74-27294468.99)	1946.94 (1706.20-2201.43)	2621.30 (2324.01-2963.93)
1997	25131504.78 (22024970.69-28410799.30)	2018.61 (1769.09-2282.01)	2652.10 (2351.94-2997.63)
1998	26186955.04 (22945313.99-29607093.13)	2095.62 (1836.20-2369.31)	2686.70 (2382.19-3039.38)
1999	27319197.61 (23940481.23-30885312.69)	2178.30 (1908.89-2462.64)	2721.20 (2411.67-3085.89)
2000	28416025.25 (24908389.43-32161590.48)	2256.88 (1978.29-2554.36)	2751.61 (2437.19-3121.45)
2001	29603053.64 (25952542.76-33517484.55)	2340.44 (2051.82-2649.91)	2784.01 (2463.59-3156.39)
2002	30914192.37 (27127323.80-35015580.60)	2431.71 (2133.84-2754.33)	2823.25 (2496.09-3198.91)
2003	32268983.08 (28345119.35-36566336.50)	2524.73 (2217.73-2860.95)	2862.93 (2529.11-3241.94)
2004	33655647.70 (29593923.78-38156547.54)	2618.66 (2302.63-2968.86)	2896.65 (2556.74-3279.98)
2005	34918421.92 (30696302.91-39598097.31)	2700.88 (2374.31-3062.84)	2918.22 (2572.77-3304.75)
2006	36249422.23 (31867937.60-41111506.48)	2785.57 (2448.88-3159.20)	2931.71 (2586.30-3319.37)
2007	37701987.61 (33150061.73-42727893.90)	2876.83 (2529.50-3260.33)	2945.18 (2600.20-3334.13)
2008	39185120.84 (34461899.39-44373122.15)	2968.74 (2610.90-3361.80)	2957.75 (2612.73-3348.23)
2009	40747953.67 (35847951.46-46110914.43)	3066.15 (2697.44-3469.69)	2968.30 (2621.56-3360.61)
2010	42245269.06 (37186400.10-47791953.45)	3159.85 (2781.46-3574.73)	2975.82 (2627.54-3367.50)
2011	43817869.60 (38569495.10-49635976.89)	3260.59 (2870.05-3693.53)	2980.54 (2631.55-3374.85)
2012	45439232.16 (39994419.64-51532609.43)	3362.90 (2959.94-3813.87)	2983.95 (2635.31-3380.21)
2013	47086686.30 (41440807.70-53463289.61)	3463.90 (3048.57-3933.00)	2986.61 (2639.51-3385.13)
2014	48896322.80 (43017464.77-55575959.19)	3574.50 (3144.74-4062.81)	2988.89 (2642.65-3390.72)
2015	50649639.49 (44525011.10-57651512.85)	3677.30 (3232.63-4185.65)	2991.10 (2643.67-3396.42)
2016	52548108.69 (46049250.45-59850310.16)	3786.33 (3318.05-4312.48)	2993.41 (2636.80-3406.64)

**Table 2 (Continued)**

Years	Prevalence number	Prevalence rate (Per 100,000)	Age-standardized prevalence rate (Per 100,000)
2017	54477860.82 (47606565.30-62260995.08)	3896.39 (3404.94-4453.06)	2996.21 (2623.48-3416.64)
2018	56421673.47 (48920827.01-64873905.36)	4009.58 (3476.54-4610.23)	2999.18 (2612.82-3438.36)
2019	58507368.32 (50349417.02-67374007.83)	4136.64 (3559.85-4763.54)	3001.80 (2604.63-3449.53)
2020	60520844.78 (52067731.40-69806351.01)	4263.58 (3668.07-4917.72)	3004.82 (2613.04-3459.08)
2021	63331311.50 (53812323.83-76196537.00)	4451.34 (3782.29-5355.60)	3042.35 (2601.68-3629.87)
Estimate annual percentage change (%)	3.92 (3.88-3.95)	3.31 (3.26-3.36)	0.64 (0.56-0.72)

### 3.3. Death of ischemic heart disease in Chinese population from 1990 to 2021

Between 1990 and 2021, the number of deaths, death rate, and age-standardized death rate all showed significant increases in the Chinese population. The number of deaths increased from 547,800 in 1990 to 1,956,900 in 2021, with an average annual growth rate of 4.19%; the death rate increased from 46.57/100,000 to 137.54/100,000, with an average annual growth rate of 3.34%; and the age-standardized death rate increased slightly from 94.14/100,000 to 110.91/100,000, with an average annual growth rate of 0.72%. Despite the significant increases in the number of deaths and death rate, the slow increase in the age-standardized death rate indicates a relatively stable death risk due to diseases against the background of changes in population age structure. This trend may reflect the contribution of advances in medical technology and public health interventions to reducing the risk of death. However, the overall increase in the number of deaths and death rate also highlights the significant health challenges posed by chronic diseases and an aging population. See **Table 3**.

**Table 3.** Death due to ischemic heart disease in the Chinese population from 1990 to 2021

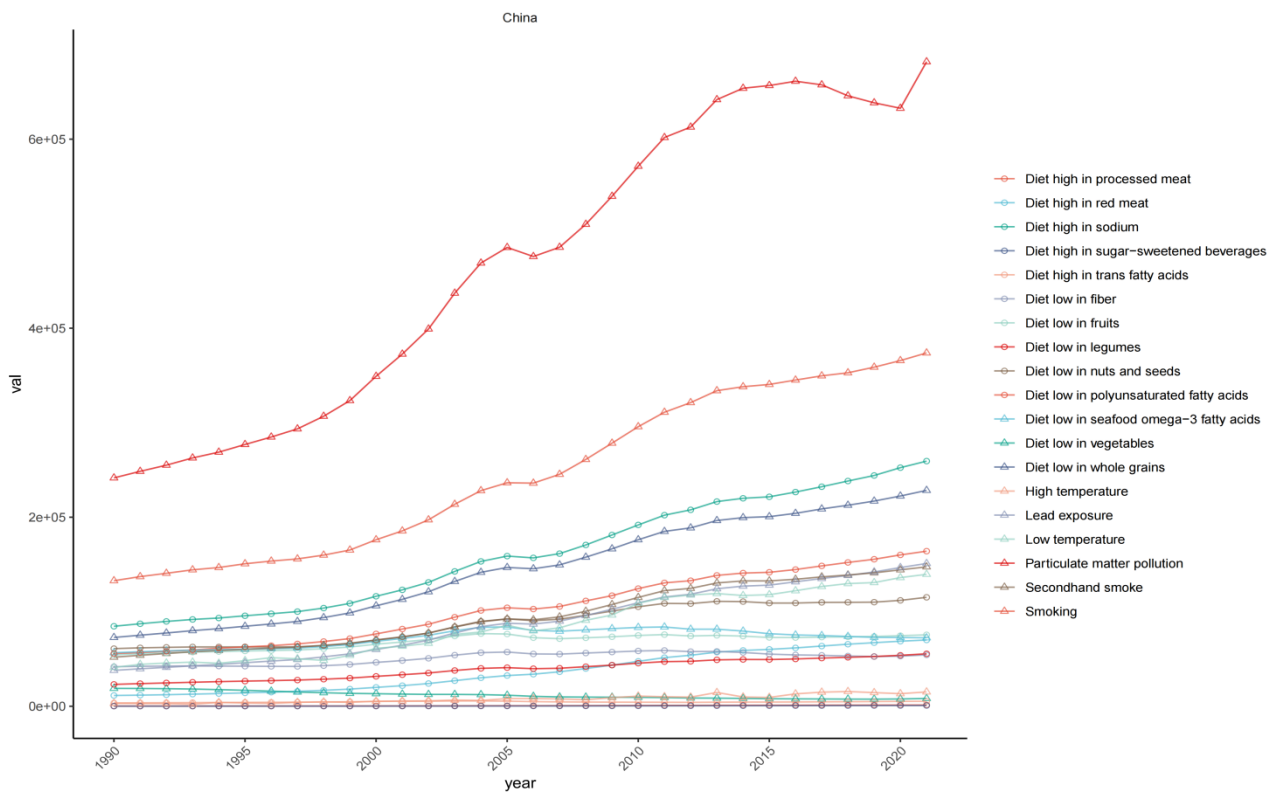
Years	Death number	Death rate (Per 100,000)	Age-standardized death rate (Per 100,000)
1990	547845.09 (486106.46-617005.67)	46.57 (41.32-52.45)	94.14 (84.01-105.89)
1991	564240.10 (505333.14-630911.40)	47.30 (42.36-52.89)	93.68 (84.04-104.13)
1992	580310.21 (515454.38-649433.17)	48.11 (42.73-53.84)	93.24 (82.33-104.37)
1993	598491.41 (534713.97-668360.02)	49.17 (43.93-54.91)	93.33 (82.64-103.96)
1994	613315.42 (558240.37-675046.22)	50.01 (45.52-55.05)	93.04 (84.07-101.94)
1995	632536.10 (577250.36-692514.02)	51.27 (46.79-56.13)	93.21 (84.20-101.83)
1996	651146.51 (595843.68-706350.44)	52.52 (48.06-56.97)	93.20 (84.92-102.23)
1997	671473.99 (613315.39-730563.38)	53.93 (49.26-58.68)	93.29 (84.70-101.19)
1998	702969.71 (644786.04-763408.52)	56.26 (51.60-61.09)	94.93 (84.95-103.10)
1999	742063.04 (680874.45-810880.74)	59.17 (54.29-64.66)	97.30 (87.76-106.26)
2000	802453.08 (735229.66-865637.13)	63.73 (58.39-68.75)	102.55 (93.42-110.72)
2001	857947.15 (783959.35-927649.66)	67.83 (61.98-73.34)	107.12 (97.22-115.49)
2002	921529.49 (854922.94-993553.43)	72.49 (67.25-78.15)	111.77 (102.38-119.91)
2003	1012719.64 (941278.27-1089802.05)	79.24 (73.65-85.27)	121.09 (111.19-130.40)
2004	1091193.19 (1011146.31-1168586.99)	84.90 (78.67-90.92)	126.77(115.56-135.43)
2005	1134785.86 (1048334.96-1215984.63)	87.77 (81.09-94.05)	128.04 (117.20-136.90)
2006	1120404.87 (1029500.75-1201170.91)	86.10 (79.11-92.30)	120.83 (109.69-129.45)

**Table 3 (Continued)**

Years	Death number	Death rate (Per 100,000)	Age-standardized death rate (Per 100,000)
2007	1156084.44 (1070316.63-1254412.60)	88.21 (81.67-95.72)	119.84 (109.25-129.98)
2008	1228027.92 (1129019.45-1319493.04)	93.04 (85.54-99.97)	122.43 (110.86-131.67)
2009	1311069.91 (1202808.32-1408720.00)	98.65 (90.51-106.00)	125.55 (114.30-134.90)
2010	1397875.67 (1270120.68-1519060.98)	104.56 (95.00-113.62)	128.61 (115.72-139.52)
2011	1475835.37 (1343771.97-1610369.31)	109.82 (99.99-119.83)	129.74 (117.27-141.08)
2012	1507664.56 (1367758.27-1665726.50)	111.58 (101.23-123.28)	125.83 (112.66-138.66)
2013	1582166.42 (1412869.14-1742803.73)	116.39 (103.94-128.21)	126.49 (111.76-139.15)
2014	1619183.42 (1441002.02-1791030.38)	118.37 (105.34-130.93)	123.93 (110.07-136.68)
2015	1636752.66 (1445192.34-1818317.06)	118.83 (104.92-132.01)	119.66 (104.42-132.35)
2016	1679983.57 (1466179.61-1893807.51)	121.05 (105.64-136.46)	117.56 (101.20-132.05)
2017	1733182.57 (1511905.10-1978481.09)	123.96(108.14-141.51)	116.12(101.26-132.40)
2018	1779729.76 (1548828.17-2053695.73)	126.48 (110.07-145.94)	114.28 (98.88-131.90)
2019	1833899.24 (1575149.17-2104476.93)	129.66 (111.37-148.79)	112.84 (96.62-128.60)
2020	1894813.51 (1627657.44-2194723.28)	133.49 (114.67-154.61)	112.00 (94.81-129.52)
2021	1956859.43 (1634477.57-2280131.16)	137.54 (114.88-160.26)	110.91 (92.42-128.56)
Estimate annual percentage change (%)	4.19 (4.00-4.38)	3.34 (3.08-3.60)	0.72 (0.51-0.94)

### 3.4. Number of deaths attributed to ischemic heart disease in Chinese population from 1990 to 2021

During the years 1990–2021, the number of deaths in China attributed to ischemic heart disease due to various risk factors has significantly increased. **Figure 1** shows that particulate air pollution and smoking are the leading risk factors causing the most deaths, followed by high sodium intake diets and low fruit and vegetable intake. The number of deaths related to particulate air pollution increased from approximately 200,000 in 1990 to around 600,000 in 2021. High sodium diets, low fruit and vegetable intake, and smoking also showed significant upward trends. The significant increase in these main risk factors reflects the major impact of lifestyle and environmental changes on the death rate of ischemic heart disease. Meanwhile, other factors such as high red meat consumption, high processed meat consumption, and low fiber and whole grain intake are also gradually increasing in their impact. Overall, lifestyle and environmental factors are key drivers of the increasing death rate of ischemic heart disease in China.



**Figure 1.** Changes in the number of deaths attributed to ischemic heart disease by risk factors in the Chinese population from 1990 to 2021.

## 4. Discussion

Based on the Global Burden of Disease Study 1990–2021 (GBD 2021), this study quantitatively analyzed the disease burden of ischemic heart disease (IHD) in the Chinese population and its attributable risk factors. By comprehensively assessing the incidence, prevalence, death, and indicators related to age-standardized rates, this study revealed the long-term changing trends of the disease burden of IHD in China and identified the major risk factors. The rising trend of the burden of IHD disease.

### 4.1. Incidence, prevalence and death of IHD

From 1990 to 2021, the incidence, prevalence, and death of IHD in the Chinese population have shown a significant increasing trend. According to the latest report, the incidence of IHD in the population aged 70 and above is particularly prominent<sup>[5]</sup>. This group of people tends to have poor cardiovascular health due to aging, making them an important group at risk for IHD. This phenomenon may be related to population aging, westernization of lifestyle, and insufficient management of chronic diseases<sup>[6]</sup>. With rapid economic development, there have been significant changes in the dietary habits of Chinese residents, with increased intake of high-fat, high-salt, and high-sugar foods, along with decreased physical activity, all of which increase the risk of IHD<sup>[7]</sup>. In addition, the rapid urbanization process in China has brought challenges to environmental quality, such as air pollution and noise pollution, which pose additional threats to cardiovascular health.

### 4.2. Identification and analysis of risk factors

This study identified particulate matter air pollution, smoking, high sodium diet, and low fruit and vegetable

intake as the major risk factors for IHD<sup>[8]</sup>. Particulate matter air pollution<sup>[9]</sup>, as an environmental factor, has been widely recognized for its adverse effects on the cardiovascular system. Long-term exposure to polluted air can lead to increased inflammation and oxidative stress, thereby promoting the development of atherosclerosis. Smoking, as a preventable risk factor, exerts its negative effects on the cardiovascular system mainly by promoting vasoconstriction and increasing the risk of thrombus formation. In addition, unhealthy dietary habits such as high sodium intake and low fruit and vegetable consumption are also important driving factors for the onset of IHD. A high sodium diet can lead to high blood pressure, while low fruit and vegetable intake is associated with increased oxidative stress and inflammation.

### **4.3. Public health strategies and intervention measures**

In the face of the continuous increase in the burden of IHD, it is particularly urgent to develop effective public health strategies and interventions<sup>[10]</sup>. Firstly, it is necessary to strengthen health education and raise public awareness of IHD and its risk factors. Secondly, it is important to change unhealthy lifestyles through legislation and policy measures such as tobacco control, restricting unhealthy food advertising, and promoting healthy dietary patterns. In addition, environmental management is also crucial in reducing the risk of IHD, including improving air quality and reducing noise pollution. Lastly, strengthening the management of chronic diseases, and improving the control rate of underlying diseases such as hypertension and diabetes, is equally essential for preventing the occurrence of IHD.

### **4.4. Limitations and future directions**

Although this study provides a comprehensive analysis of the disease burden of IHD and its risk factors in the Chinese population, there are some limitations. Firstly, the data sources of the GBD database are diverse, which may lead to issues regarding data quality and consistency. Secondly, this study did not delve into the impact of genetics, psychosocial factors, and other factors on the onset of IHD. Future research should consider incorporating data from more dimensions to fully understand the epidemiological characteristics of IHD. Additionally, conducting more targeted intervention studies to evaluate the effectiveness of different public health strategies in reducing the burden of IHD is warranted.

## **5. Conclusion**

In conclusion, this study revealed the rising trend of the IHD disease burden in the Chinese population and its major risk factors, providing a scientific basis for the development and optimization of public health strategies<sup>[11]</sup>. Faced with the health challenges brought by IHD, concerted efforts from the government<sup>[12]</sup>, public health institutions, medical facilities, and the general public are needed to implement comprehensive preventive and control measures to alleviate the social and economic burden of IHD.

## **Disclosure statement**

The authors declare no conflict of interest.

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