

Healthcare Expenditure for Treatment of cardiovascular disease among hypercholesterolemia Patients in Japan: A Claims Data Analysis

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Introduction

- CVD, particularly stroke and coronary heart disease, are leading causes of death in Japan, with their burden expected to rise due to an aging population and increasing CV risk factors¹⁾.
- A proper understanding of the financial impact of CVD is important for appropriate allocation of healthcare resources²⁾.
- In this study, we analyzed the medical care expenditures of CVD in Japan using claims data.

Methods

- This retrospective cohort study was conducted using the Diagnosis Procedure Combination database from Medical Data Vision Co., Ltd. (Tokyo, Japan)³⁾, covering the period from April 2008 to March 2024.
- This analysis was conducted using Prospection’s analytics platform to identify CV events and estimate the direct medical costs of ischemic stroke (IS;ICD-10:I63), myocardial infarction (MI ;ICD-10:I21,I22), and unstable angina (UA ;ICD-10:I20.0), based on inpatient and outpatient ICD-10 codes recorded in the database.
- Patients with hypercholesterolemia (E78.0) were included in the analysis, and the index date was defined as the first hospitalization due to MI, IS, or UA. Patients with both 1st and 2nd events and a 24-month follow-up period were included in the cost analysis.
- Patients with a diagnosis of cancer (ICD-10: C00–43, C45-C97), liver cirrhosis (ICD-10: K70.3, K71.7, K74.3 K74.4-K74.6), or dialysis (J038) were excluded.
- Short-term costs were defined as those incurred within ≤12 months after the event, and long-term costs as those incurred between >12 and ≤24 months.

Study design

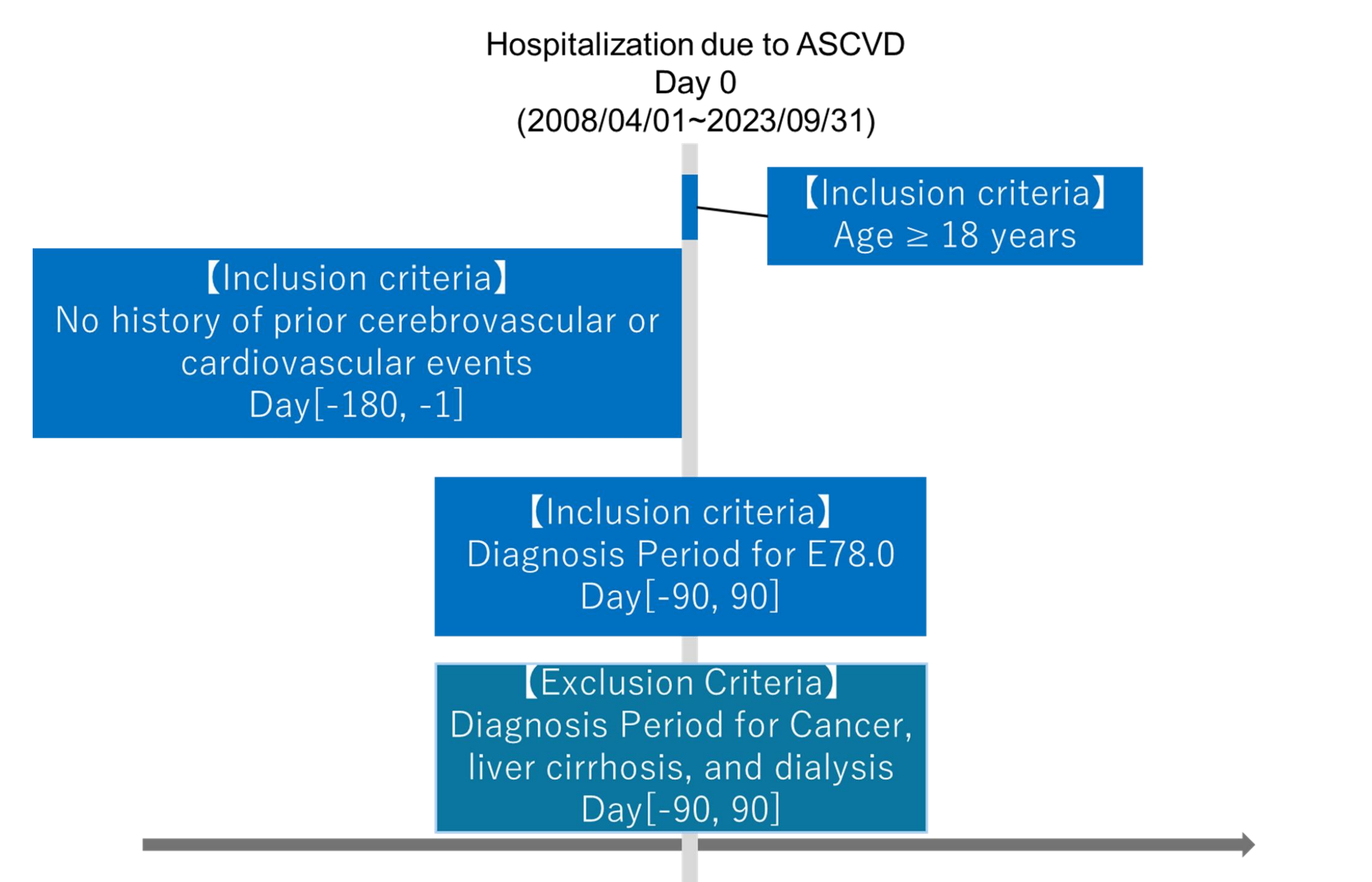


Figure 1.Study design

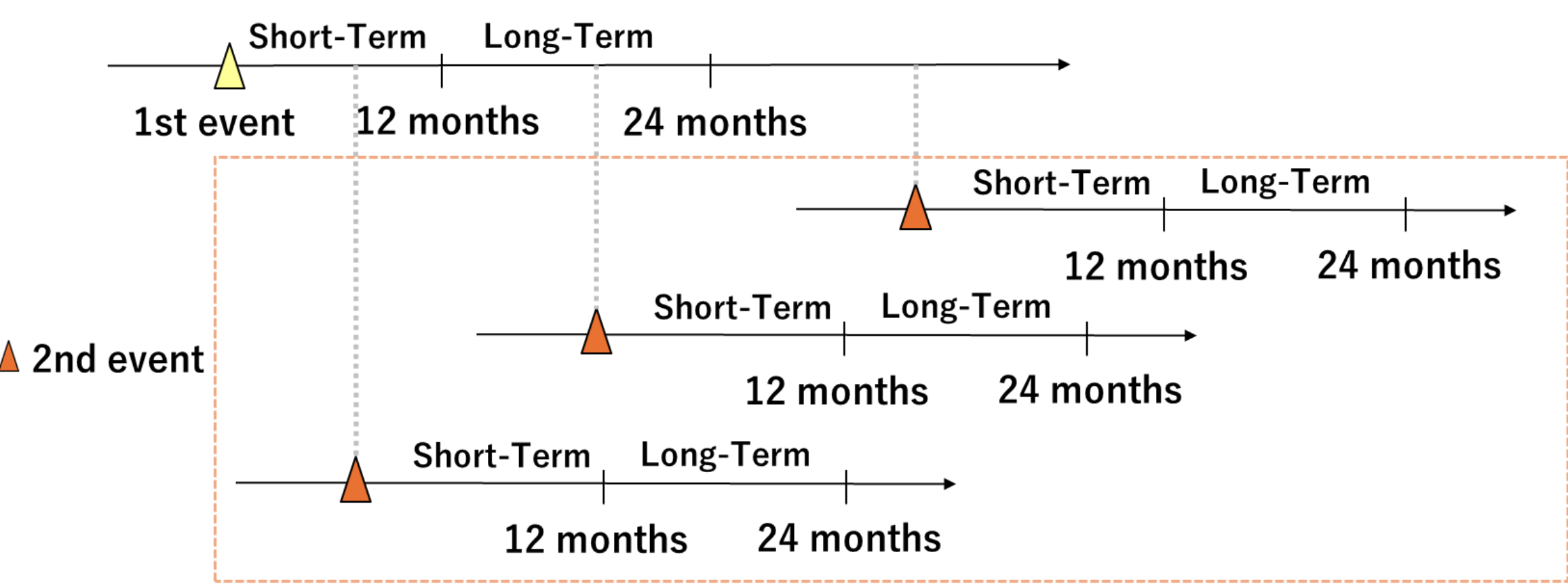


Figure 2. Design of Short-Term and Long-Term Cost Evaluation

Results

- A total of 178,058 patients were included in the analysis.
- Mean age of 72.25 years; 68.82% were male.

Table 1. Direct Medical Costs in Short-Term and Long-Term Periods Following CV Events

| Event | Cost Category | 1st event | | | | 2nd event | | | |
|-------|------------------------------------|-----------------|--------|----------------|--------|-----------------|----------|----------------|----------|
| | | Short Term Cost | | Long Term Cost | | Short Term Cost | | Long Term Cost | |
| | | Mean | SE | Mean | SE | Mean | SE | Mean | SE |
| IS | Drug Cost | 173,121 | 2.66 | 168,474 | 17.08 | 187,865 | 5.37 | 187,609 | 22.84 |
| | Elective Revascularization Cost | 297,043 | 436.11 | 251,894 | 863.38 | 269,117 | 1,402.80 | 248,226 | 1,894.55 |
| | Monitoring Cost - ALT/AST | 2,067 | 0.00 | 1,577 | 0.01 | 2,313 | 0.01 | 1,763 | 0.02 |
| | Monitoring Cost - Blood Test | 981 | 0.21 | 1,097 | 0.24 | 1,157 | 0.54 | 1,276 | 0.60 |
| | Monitoring Cost - Cholesterol | 716 | 0.01 | 848 | 0.02 | 730 | 0.04 | 898 | 0.05 |
| | Monitoring Cost - Return Visit | 9,048 | 0.75 | 9,089 | 0.89 | 9,877 | 2.32 | 9,927 | 2.78 |
| | Monitoring Cost - Specific Disease | 5,798 | 4.46 | 6,356 | 4.57 | 5,977 | 12.82 | 6,512 | 13.17 |
| | Others | 1,635,939 | 1.95 | 328,807 | 5.34 | 1,628,006 | 6.52 | 409,499 | 14.40 |
| | Total | 2,124,713 | 446 | 768,141 | 892 | 2,105,041 | 1,430 | 865,710 | 1,948 |
| MI | Drug Cost | 261,337 | 2.93 | 190,808 | 29.61 | 339,399 | 36.16 | 307,259 | 178.40 |
| | Elective Revascularization Cost | 256,687 | 140.02 | 238,119 | 331.26 | 231,117 | 1,042.79 | 239,365 | 1,763.38 |
| | Monitoring Cost - ALT/AST | 4,136 | 0.03 | 1,505 | 0.02 | 4,206 | 0.16 | 1,883 | 0.03 |
| | Monitoring Cost - Blood Test | 1,327 | 0.15 | 1,141 | 0.19 | 1,460 | 0.73 | 1,353 | 0.90 |
| | Monitoring Cost - Cholesterol | 1,368 | 0.01 | 887 | 0.02 | 1,268 | 0.08 | 988 | 0.07 |
| | Monitoring Cost - Return Visit | 8,436 | 1.14 | 6,863 | 1.48 | 8,924 | 6.78 | 8,530 | 8.25 |
| | Monitoring Cost - Specific Disease | 6,071 | 4.75 | 5,908 | 5.51 | 5,898 | 29.68 | 6,153 | 33.36 |
| | Others | 2,229,810 | 47.36 | 326,626 | 6.47 | 2,188,796 | 22.24 | 458,544 | 37.49 |
| | Total | 2,769,173 | 196 | 771,857 | 375 | 2,781,067 | 1,139 | 1,024,076 | 2,022 |
| UA | Drug Cost | 217,063 | 4.12 | 171,216 | 17.66 | 228,056 | 11.99 | 206,657 | 22.98 |
| | Elective Revascularization Cost | 253,514 | 255.96 | 241,218 | 627.98 | 240,339 | 722.34 | 243,905 | 1,099.82 |
| | Monitoring Cost - ALT/AST | 2,827 | 0.03 | 1,444 | 0.02 | 2,475 | 0.04 | 1,643 | 0.01 |
| | Monitoring Cost - Blood Test | 1,139 | 0.24 | 1,053 | 0.33 | 1,249 | 0.50 | 1,203 | 0.61 |
| | Monitoring Cost - Cholesterol | 1,082 | 0.02 | 820 | 0.03 | 1,093 | 0.04 | 917 | 0.04 |
| | Monitoring Cost - Return Visit | 7,469 | 1.24 | 6,102 | 1.66 | 7,474 | 2.69 | 6,205 | 3.30 |
| | Monitoring Cost - Specific Disease | 6,098 | 3.86 | 5,440 | 4.95 | 5,967 | 7.46 | 5,486 | 10.05 |
| | Others | 1,700,991 | 8.21 | 316,079 | 10.69 | 1,430,302 | 17.88 | 392,100 | 19.52 |
| | Total | 2,190,184 | 274 | 743,372 | 663 | 1,916,954 | 763 | 858,116 | 1,156 |

SE: Standard Error

Conclusion

- Based on this large and contemporary real-world study, CVD presents a substantial cost burden to the Japanese healthcare system.
- Clinical information may not have been captured if patients received care or were hospitalized at other medical institutions, potentially limiting follow-up.

Reference

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2. Luengo-Fernandez R, Walli-Attaei M, Gray A, Torbica A, Maggioni AP, Huculeci R, Bairami F, Aboyans V, Timmis AD, Vardas P, Leal J. Economic burden of cardiovascular diseases in the European Union: a population-based cost study. Eur Heart J. 2023 Dec 1;44(45):4752-4767. doi: 10.1093/eurheartj/ehad583. PMID: 37632363; PMCID: PMC10691195.

3. Medical Data Vision Co., Ltd. MDV Database.; Available at: Medical Data Vision Co., Ltd. Accessed Oct 6, 2025.