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Cardiovascular disease risk across subsectors and occupations in the transportation and storage industry: a national cohort study

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Abstract

Cardiovascular disease (CVD) is a major contributor to global morbidity and mortality. While the transportation industry is recognized as high-risk for CVD, variation across subsectors and occupations remains unclear. We evaluated CVD risk across subsectors and occupations in South Korea's transportation industry. This retrospective cohort study used linked data from Korean National Health Insurance Service and Employment Insurance databases. Male workers aged 35–54 years in 2013 who remained in the same occupation during 2012 and underwent health screening in 2012–2013 were included. Follow-up continued through 2022. We calculated age-standardized incidence rates, standardized incidence ratios (SIRs), and population-attributable fractions across industries, with stratified analyses by subsector, occupation and lifestyle factors. Among 2 300 512 workers, transportation industry exhibited the highest age-standardized CVD incidence rate (558.9 per 100 000 person-years) and population-attributable fraction (1.49%) of all industries. Within 182 551 transportation workers, driving-related occupations showed the highest SIRs, especially in land and freight subsectors. Aviation subsectors had lower CVD incidence and more favorable health indicators. These patterns remained consistent after stratification by obesity and smoking status. Substantial heterogeneity exists in CVD risk across transportation subsectors and occupations. Targeted prevention strategies are needed for high-risk groups, particularly drivers.

Introduction

CVD presents a formidable global health crisis, consistently ranking as a primary driver of mortality and disability worldwide [1]. In 2019, the Global Burden of Disease Study reported that CVD was responsible for 18.6 million deaths globally, constituting approximately 31% of all deaths, with ischemic heart disease and stroke being the leading contributors [2]. In East Asia, including South Korea, CVD remains a critical concern, emerging as the second leading cause of death following cancer, a trend that suggests its significant regional impact [3]. In Canada, CVD accounted for $21.2 billion (11.6% of total illness costs) in 1998, with 63% due to indirect costs such as premature mortality and disability [4]. In South Korea, while age-adjusted CVD mortality rates have declined over recent decades owing to advancements in healthcare and risk factor management, the overall burden persists, driven by an aging population and the increasing prevalence of risk factors such as obesity and diabetes mellitus [5].

CVD is influenced by multiple risk factors across different domains. Individual and behavioral factors include obesity, hypertension, diabetes, smoking, physical inactivity, unhealthy diet, and excessive alcohol consumption [2, 6]. Environmental factors such as air pollution and noise pollution also contribute substantially to cardiovascular risk [7–9]. In occupational contexts, exposures including long working hours, shift work, sedentary behavior, and psychosocial stress have been shown to increase CVD incidence independently of conventional lifestyle risk factors [10, 11]. The transportation industry has been recognized for elevated cardiovascular risk, particularly among professional drivers who face prolonged sedentary behavior, irregular schedules, and environmental stressors such as traffic-related pollution [12–14].

However, the transportation industry is not occupationally homogeneous but encompasses diverse subsectors—land, maritime, aviation, and freight—each characterized by distinct work environments ranging from prolonged isolation in maritime settings [15] and rigorous medical surveillance in aviation [16] to physically demanding tasks in freight operation [17]. Moreover, within each subsector, occupations range from sedentary white-collar managers and administrative staff to customer-facing pink-collar service workers, physically demanding blue-collar manual laborers, and driving-related occupations. These differences suggest that cardiovascular risk may vary substantially across both subsectors and occupational groups, and that the elevated risk documented among drivers may not apply uniformly throughout the industry. Furthermore, whether occupational factors contribute to CVD risk independently of lifestyle behaviors remains unclear, limiting our ability to design appropriately targeted interventions.

Despite this heterogeneity, systematic evidence comparing CVD risk across transportation subsectors and occupations remains limited. Most studies have examined specific occupational groups, particularly drivers, in isolation, precluding identification of which subsectors and occupations should be prioritized for intervention [18–20]. Without subsector- and occupation-specific risk profiles, prevention resources may be inefficiently allocated, and interventions designed for one context may be inappropriate for others. Furthermore, if cardiovascular risk arises from structural workplace features rather than individual lifestyle choices, current individual-focused interventions will be insufficient without workplace-level modifications.

Therefore, this study aimed to provide comprehensive cardiovascular disease risk profiles across subsectors and occupations within South Korea's transportation industry using nationally representative data. By systematically comparing CVD incidence and stratifying by occupations and lifestyle factors, we sought to identify high-risk groups requiring prioritized intervention, examine whether occupational risk patterns persist after accounting for lifestyle factors, and characterize risk heterogeneity across work contexts. This analysis provides the epidemiological foundation for moving from uniform approaches toward subsector- and occupation-tailored prevention strategies.

Methods

Data source and study population

This study utilized linked data from South Korea's National Health Insurance Service (NHIS) and Employment Insurance (EI) databases to create a nationwide cohort for assessing CVD risk among transportation workers. The NHIS covers over 97% of the population and includes biennial health screenings with clinical and laboratory data [21, 22], as well as detailed records on demographics, socioeconomic status, diagnoses, treatments, and prescriptions. The EI database includes job titles, workplace IDs, and insurance dates, with occupations classified by the Korean Employment Classification of Occupations (KECO) [23].

To ensure accurate identification of occupational exposure, the NHIS and EI databases were linked using workplace identification numbers as the primary linkage variable, achieving a high matching rate for the study period. This linkage enabled the integration of medical and employment data, providing a robust dataset for assessing CVD risk across industries and occupations.

The cohort included male workers aged 35–54 years in 2013 with health examination in 2012–2013 and who remained in the same industry and occupation throughout 2012. This age range was selected as the period of peak economic activity with meaningful CVD incidence, while maintaining occupational stability throughout follow-up. Exclusion criteria were: (1) prior CVD diagnosis within 1 year before the index date; (2) employment in the Korean Standard Industrial Classification (KSIC) "T" or "U" sectors; and (3) missing data on occupation, industry, body mass index (BMI), or smoking status. We excluded workers employed in KSIC sectors T (Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use) and U (Activities of extraterritorial organizations and bodies) as these sectors are not relevant to occupational health surveillance and represent very small populations with heterogeneous employment characteristics. The study was approved by the Institutional Review Board (IRB) of Severance Hospital (IRB No. 4-2024-0295), and the requirement for obtaining informed consent was waived owing to the retrospective design, in accordance with the Declarations of Helsinki and Istanbul.

Primary outcome

The primary outcome was incident CVD, defined using ICD-10 codes: Ischemic heart disease (Coronary Heart Disease, I20-I25) including angina pectoris and acute myocardial infarction; Cerebrovascular disease (I60-I69) including stroke, cerebral hemorrhage, and cerebral infarction. CVD events were identified when these codes appeared as primary diagnosis during hospitalization. Participants were followed until either a CVD event occurred or until December 2022, whichever happened first.

Cardiovascular risk factors

Cardiovascular risk factors were assessed using National Health Screening Program data from 2012 to 2013. Income level was categorized into four groups (low, low-middle, high-middle, high) based on quartiles of National Health Insurance premiums, which serve as a proxy for household income in South Korea. Hypertension was defined as systolic blood pressure ≥140 mmHg or diastolic blood pressure ≥90 mmHg measured during health screenings, or physician diagnosis with ICD-10 codes I10-I15. Diabetes mellitus was defined as fasting blood glucose ≥126 mg/dL measured during health screenings, or physician diagnosis with ICD-10 codes E10-E14. Hyperlipidemia was defined as total cholesterol ≥240 mg/dL or triglycerides ≥200 mg/dL measured during health screenings, or physician diagnosis with ICD-10 code E78. Obesity was defined as body mass index ≥25 kg/m^2 based on measured height and weight, consistent with Asian-Pacific obesity criteria. Smoking status was classified as ever smokers (current or past) versus never smokers based on self-reported questionnaires. Alcohol consumption was classified as high (≥140 g/week) versus low (<140 g/week) based on self-reported weekly alcohol intake.

Classification of industries and occupations

Industries were classified according to the KSIC, which is based on the International Standard Industrial Classification and categorizes all economic activities into 21 major sections (A through U). The transportation and storage industry was identified using KSIC section H (codes 49-52). Supplementary Table 1 shows a complete list of KSIC sections and their corresponding industry descriptions. Within this industry, subsectors were further categorized into land, maritime, aviation, and freight and warehousing transportation based on the intermediate classification of the KSIC.

Occupational classifications within these subsectors were classified using the primary and secondary occupational classification of the KECO to investigate variations in CVD risk across different occupations. Based on this classification, occupations were further grouped into four categories representing job characteristics: white-collar, driving-related, pink-collar, and blue-collar (non-drivers) occupations (Supplementary Table 2).

Statistical analysis

Standardized incidence ratios (SIRs) were estimated using the indirect method, with the entire study population defined as the reference group. Age-standardization was performed in 5-year intervals. Expected cases were derived by applying these rates to the corresponding industries, with age standardization performed using the indirect standardization method. Ninety-five percent confidence intervals (CIs) for the SIRs were estimated under the assumption of a Poisson distribution.

To assess the proportion of CVD cases attributable to occupational exposure in each industry, population-attributable fractions (PAFs) were calculated using the following equation [24]:

$$\mathrm{PAF} = \mathrm{Pe}(\mathrm{RR}-1)/[1+\mathrm{Pe}(\mathrm{RR}-1)]$$

where Pe denotes the proportion of CVD cases among the exposed group, and RR represents the relative risk of CVD in a given industry compared to the reference group, derived as the ratio of the incidence rate in the exposed group to that in the reference group.

The analysis consisted of three steps. First, SIRs and PAFs were estimated across all industry sectors to evaluate whether the transportation and storage industry presented increased CVD risk relative to other industries. In addition, to assess variation in CVD risk within the transportation and storage industry, SIRs were further calculated across occupational subgroups, stratified by subsector and occupation. Finally, to explore whether lifestyle factors modified the association between occupation and CVD risk, additional stratified analyses were conducted among participants with available health examination data, using BMI, smoking status and alcohol consumption.

All statistical analyses were performed using SAS version 8.2 (SAS Institute Inc., Cary, NC, USA) and R version 4.0.3 (R Foundation for

Statistical Computing, Vienna, Austria). A two-sided *P* values of less than 0.05 was considered indicative of statistical significance.

Results

Study population

The study population initially included 2 746 049 individuals who were employed in the same industry and occupation throughout 2012. After restricting it to those aged 35–54 years in 2013 and excluding individuals with missing data on key variables including occupational classification, a total of 2 300 512 participants were included in the main analysis (**Group 1**). Among them, 182 551 individuals were identified as working in the transportation and storage industry. For analyses that incorporated health examination variables, the population was further reduced to 1 875 041 participants overall (**Group 2**), including 161 070 transportation and storage industry workers (Supplementary Figure 1).

CVD risk across industrial sectors

Table 1 presents the age-standardized incidence rates, SIRs, and PAFs of CVD across industrial sectors among group 1. Among all industries, workers in the mining and quarrying industry (Section B) presented the highest SIR of 1.29 (95% CI, 1.13–1.45), followed by the transportation and storage industry (Section H) with an SIR of 1.19 (95% CI, 1.17–1.22). Notably, despite being second in terms of SIR, the transportation and storage industry indicated the highest age-standardized incidence rate of 558.9 per 100 000 person-years and the highest PAF of 1.49% among all industries.

Occupational and subsector differences in CVD risk factors

Among transportation and storage industry workers including group 2, baseline characteristics varied substantially across subsectors and occupations (Supplementary Table 3). Land transportation driving-related workers showed the highest prevalence of cardiovascular risk factors, including hypertension (28.3%), obesity (45.3%), and smoking (81.9%). Aviation workers exhibited the lowest prevalence of these risk factors and the highest proportion of high-income earners, including health-related selection processes in this subsector.

Subsector-specific CVD risk within transportation and storage industry

Among transportation and storage industry workers including group 1, land transportation exhibited the highest CVD risk (SIR 1.28, 95% CI 1.25–1.30), followed by maritime (SIR 1.20, 95% CI 1.02–1.39) and freight (SIR 1.04, 95% CI 1.00–1.09). Aviation workers showed reduced risk (SIR 0.72, 95% CI 0.64–0.80) compared to non-transportation workers (Table 2). Across all transportation occupations, driving-related workers showed the highest CVD risk (SIR 1.35, 95% CI 1.31–1.38), followed by pink-collar (SIR 1.14, 95% CI 1.06–1.23) and blue-collar (non-drivers) (SIR 1.10, 95% CI 1.05–1.15). White-collar workers showed near-baseline risk (SIR 0.98, 95% CI 0.94–1.03) (Table 3).

Table 4 presents CVD risk stratified by both subsector and occupation. In land transportation, driving-related occupations exhibited the highest SIR (1.44, 95% CI 1.38–1.51), substantially exceeding white-collar (SIR 1.11, 95% CI 1.01–1.21), pink-collar (SIR 1.12, 95% CI 1.01–1.25), and (non-drivers) groups (SIR 1.21, 95% CI 1.13–1.29). In maritime transportation, (non-drivers) showed the highest SIR (1.39, 95% CI 0.74–2.23), though confidence intervals were wide due to small numbers. In aviation, all occupational groups showed SIRs below or near 1.0, with driving-related occupations showing the lowest (SIR 0.34, 95% CI 0.15–0.64). In freight/warehousing, pink-collar workers had the highest SIR (1.25, 95% CI 1.05–1.47), followed by driving-related occupations (SIR 1.14, 95% CI 1.03–1.26).

Stratified analysis by lifestyle factors

A stratified analysis by lifestyle factors including obesity, smoking status and alcohol consumption identified occupational differences in CVD risk (Supplementary Table 4) using transportation and storage industry workers including group 2. In land transportation, driving-related occupations showed paradoxically higher SIRs among non-obese (1.44, 95% CI: 1.38–1.51) than obese workers (1.28, 95% CI: 1.22–1.33), and among low alcohol consumers (1.41, 95% CI: 1.36–1.46) than high consumers (1.33, 95% CI: 1.26–1.40). Similar counterintuitive patterns appeared for smoking status. In the maritime subsector, non-smoking driving-related occupations showed a notably elevated SIR of 2.02 (95% CI: 0.9–3.82), though results were characterized by wide confidence intervals due to small event numbers. The aviation subsector maintained SIRs below 1.0 across most lifestyle strata. In

Table 1. CVD incidence rates, SIRs, and PAFs by industrial sector

Korean National Standardized Industrial Classification						
Section	Description	N at risk	N of Events	Rate[§]	PAF	SIR (95% CI)
A	Agriculture, forestry and fishing	5456	283	539.662	0.040	1.18 (1.05−1.32)
B	Mining and quarrying	4111	258	654.778	0.048	1.29 (1.13−1.45)
C	Manufacturing	984 805	36 257	376.607	−2.042	0.95 (0.94−0.96)
D	Electricity, gas, steam and air conditioning supply	18 843	784	425.561	0.031	1.04 (0.97−1.12)
E	Water supply; sewage, waste management, materials recovery	21 397	1094	528.879	0.139	1.16 (1.09−1.23)
F	Construction	215 003	9459	452.151	1.038	1.12 (1.1−1.14)
G	Wholesale and retail trade	230 767	7587	335.666	−0.377	0.96 (0.94−0.98)
H	Transportation and storage	195 222	10 539	558.896	1.485	1.19 (1.17−1.22)
I	Accommodation and food service activities	292 37	1011	353.299	−0.048	0.96 (0.9−1.02)
J	Information and communication	153 038	4787	318.300	−0.563	0.91 (0.88−0.94)
K	Financial and insurance activities	145 453	5968	419.717	0.177	1.03 (1.01−1.06)
L	Real estate activities	48 037	2006	428.848	−0.059	0.97 (0.93−1.01)
M	Professional, scientific and technical activities	143 545	4901	348.356	−0.410	0.93 (0.9−0.95)
N	Business facilities management and business support services; rental and leasing activities	91 036	3331	374.660	−0.148	0.96 (0.93−0.99)
O	Public administration and defence; compulsory social security	31 348	1587	523.377	0.140	1.11 (1.06−1.17)
P	Education	19 331	715	378.482	0.016	1.02 (0.94−1.1)
Q	Human health and social work activities	53 772	2052	390.713	0.087	1.04 (0.99−1.08)
R	Arts, sports and recreation related services	19 761	736	381.074	0.016	1.02 (0.94−1.09)
S	Membership organizations, repair and other personal services	50 393	1894	384.512	0.020	1.01 (0.96−1.05)

Abbreviation: CVD, Cardiovascular disease; SIR, standardized incidence ratio; PAF, Population attributable fraction; CI, Confidence interval.

Table 2. CVD incidence rates and SIRs by subsector in the transportation and storage industry

Subsector in transportation and storage	N at risk	N of Events	Rate (per 100 000)	SIR (95% CI)
Land	119 872	7419	527.453	1.28 (1.25–1.3)
Maritime	3392	168	493.597	1.2 (1.02–1.39)
Aviation	10 933	321	296.720	0.72 (0.64–0.8)
Freight	48 354	1926	434.772	1.04 (1–1.09)

Abbreviation: CVD, Cardiovascular disease; SIR, standardized incidence ratio; CI, Confidence interval.
*: Standardized Incidence Ratio was calculated using all non-transportation industry workers aged 35–54 years in 2013 as the reference population.

Table 3. CVD incidence rates and SIRs by occupation in the transportation and storage industry

Occupation	N at risk	N of Events	Rate (per 100 000)	SIR (95% CI)
White-collar	50 401	2017	410.732	0.98 (0.94–1.03)
Driving-related	81 900	5331	559.776	1.35 (1.31–1.38)
Pink-collar	13 703	734	481.351	1.14 (1.06–1.23)
Blue-collar (non-drivers)	36 547	1752	455.474	1.1 (1.05–1.15)

Abbreviation: CVD, Cardiovascular disease; SIR, standardized incidence ratio; CI, Confidence interval.
*: Standardized Incidence Ratio was calculated using all non-transportation industry workers aged 35–54 years in 2013 as the reference population.

Table 4. CVD incidence rates and SIRs by subsector and occupation in the transportation and storage industry

Subsector in transportation and storage	Occupation	N at risk	N of Events	Rate (per 100 000)	SIR (95% CI)
Land	White-collar	21 522	950	430.719	1.04 (0.97–1.1)
	Driving-related	71 515	4897	574.664	1.38 (1.34–1.41)
	Pink-collar	9330	556	495.075	1.15 (1.05–1.25)
	Blue-collar (non-drivers)	17 505	1016	489.062	1.19 (1.12–1.26)
Maritime	White-collar	1710	69	469.208	1.07 (0.82–1.35)
	Driving-related	849	48	496.518	1.24 (0.91–1.63)
	Pink-collar	98	4	445.352	1.06 (0.27–2.66)
	Blue-collar (non-drivers)	735	47	545.154	1.41 (1.02–1.86)
Aviation	White-collar	8828	278	306.114	0.74 (0.65–0.83)
	Driving-related	891	9	348.349	0.34 (0.15–0.64)
	Pink-collar	889	23	279.043	0.69 (0.42–1.02)
	Blue-collar (non-drivers)	325	11	536.413	1.15 (0.52–1.98)
Freight	White-collar	18 341	720	426.395	1.03 (0.96–1.11)
	Driving-related	8645	377	474.084	1.14 (1.03–1.26)
	Pink-collar	3386	151	524.530	1.25 (1.05–1.47)
	Blue-collar (non-drivers)	17 982	678	407.842	0.97 (0.9–1.05)

Abbreviation: CVD, Cardiovascular disease; SIR, standardized incidence ratio; CI, Confidence interval.
*: Standardized Incidence Ratio was calculated using all non-transportation industry workers aged 35-54 years in 2013 as the reference population.

freight/warehousing, pink-collar workers showed elevated SIRs across lifestyle categories, with low alcohol consumers showing SIR 1.30 (95% CI: 1.03–1.60).

Discussion

This study assessed the risk of CVD across subsectors and occupations within the transportation and storage industry using nationally representative data from the NHIS and EI databases. The transportation and storage industry exhibited the highest age-standardized incidence rate and PAF for CVD among all industries. CVD risk is highly heterogeneous across transportation subsectors, with land transportation workers showing elevated risk (SIR 1.28, 95% CI 1.25–1.31) while aviation workers showed reduced risk (SIR 0.80, 95% CI 0.74–0.86). Within subsectors, occupational differences are substantial: among land transportation workers, driving-related workers exhibited the highest risk (SIR 1.44, 95% CI 1.38–1.51) while white-collar workers showed near-baseline risk (SIR 1.11, 95% CI 1.01–1.21).Moreover, occupational risk patterns persisted across all lifestyle strata (obesity, smoking, alcohol consumption), with paradoxical associations suggesting that workplace exposures dominate over individual health behaviors in determining CVD risk among transportation workers.

Previous studies have reported an elevated CVD risk in transportation jobs compared to other industries [12–14, 25, 26]. However, these studies have predominantly focused on specific occupational groups—most often professional drivers—thereby limiting the ability to characterize CVD risk heterogeneity across the diverse subsectors and occupations that constitute the industry. Our subsector- and occupation-stratified analyses reveal distinct risk patterns with important implications for targeted prevention.

The elevated CVD risk in land transportation shows cumulative occupational exposures including prolonged sedentary postures, irregular schedules, traffic pollution, and psychosocial stress among drivers [12]. In contrast, aviation workers showed markedly reduced risk due to stringent pre-employment screening and ongoing fitness-for-duty evaluations that systematically exclude workers with cardiovascular risk factors [16, 27, 28]. Maritime and freight workers showed intermediate risks indicating competing forces: occupational hazards such as prolonged isolation, limited healthcare access [29, 30], and combined exposure to driving and heavy physical labor [31], potentially offset by healthy worker selection effects.

Even within the same subsector, occupational groups showed substantial risk heterogeneity. The highest CVD risk among driving-related occupations may be attributable to prolonged sitting, irregular schedules, and psychosocial stress, whereas the near-baseline risk among white-collar workers could indicate greater job control and regular schedules [32]. Intermediate risks among pink-collar and blue-collar (non-drivers) suggest distinct exposure profiles involving customer service stress with irregular hours and physically demanding work under time pressure, respectively.

The elevated CVD risk among driving-related occupations likely operates through distinct physiological pathways: prolonged sedentary work promotes vascular dysfunction [33, 34], irregular schedules disrupt circadian and autonomic regulation [35], and chronic stress activates neuroendocrine pathways causing vascular injury [36, 37]. These mechanisms suggest that occupational CVD risk cannot be fully explained by conventional lifestyle factors.

Indeed, lifestyle-stratified analyses revealed paradoxical patterns—non-obese drivers showed higher risks than obese drivers, likely indicating healthy worker survivor effects whereby workers with multiple risk factors exit demanding occupations earlier. Despite these inconsistent lifestyle associations, occupational differences remained pronounced across all strata. Land transportation consistently showed elevated SIRs while aviation maintained reduced risks, regardless of lifestyle factors. This persistence underscores that workplace-level interventions must be prioritized over individual behavior modification approaches.

A major strength of this study is the use of linked NHIS and EI data, which enabled the assessment of CVD risk at both subsector and occupational levels within the transportation and storage industry. This approach allowed for a detailed stratification of occupational groups, facilitating the identification of high-risk subpopulations that may be overlooked in analyses based solely on broad industry categories. The linkage of objective health examination data and employment records improved assessment validity in this large cohort.

However, some limitations should be considered. First, the analysis was limited to male workers aged 35–54 in 2013, restricting the generalizability of the findings. The exclusion of female workers particularly limits the representativeness of the aviation subsector, where they comprise the majority of occupations like cabin crew. Furthermore, focusing only on this middle-aged range may have failed to capture the accelerated CVD risks typically seen in older populations, potentially underestimating the long-term impact of occupational exposures. Further research should include diverse gender and age groups for a more comprehensive assessment. Second, occupational exposure and employment stability were assessed using records from a single year, which may not adequately capture cumulative or long-term effects. Third, although adjustments were made for obesity and smoking, residual confounding from unmeasured factors such as alcohol use, physical activity, diet, psychosocial stress, and family history of CVD may persist. Fourth, outcome definitions were based on claims data, which may be affected by diagnostic coding errors and healthcare utilization differences. Lastly, the healthy worker survivor effect may have led to underestimation of CVD risk, as workers with poor health may have left hazardous jobs. The 1-year stability criterion may reduce bias, though long-term attrition remains.

Despite these limitations, this study provides robust evidence on differential CVD risk across occupational subgroups within the transportation and storage industry and highlights the need to incorporate occupational factors into cardiovascular risk assessment and prevention strategies.

Conclusion

By leveraging linked health insurance and employment data, this study provides detailed occupational risk indicators that allow for the identification of high-risk subgroups within the transportation workforce. This study identified elevated CVD risk among transportation and storage workers, particularly in driving-related occupations, with substantial variation across subsectors and occupations. These findings highlight the need for targeted, occupation-specific prevention strategies within the transportation and storage industry that go beyond lifestyle modification alone and underscore the importance of incorporating occupational factors into cardiovascular risk assessment and prevention.

Supplementary data

Supplementary data are available at *EURPUB* online.

Conflict of interest

The authors declare that they have no conflicts of interest.

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Ethics statement

The study was approved by the Institutional Review Board (IRB) of Severance Hospital (IRB No. 4-2024-0295).

Patient consent statement

The requirement for obtaining informed consent was waived owing to the retrospective design, in accordance with the Declarations of Helsinki and Istanbul.

Data availability

The data underlying this article were provided by the National Health Insurance Service (NHIS) of Korea under licence. Data will be shared on request to the corresponding author with permission of the NHIS.

Key points

- CVD risk in transportation workers varies dramatically by subsector and occupation, challenging uniform prevention approaches.
- Elevated risk in land/freight drivers persists after adjusting for lifestyle factors, indicating need for workplace-level interventions beyond individual health promotion.
- The elevated CVD risk among drivers is attributed to occupation-specific factors beyond common risk factors like obesity and smoking, suggesting heterogeneous risk profiles across subsectors.

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