

Original Article



Heart Failure Statistics 2025 Update: A Report From the Korean Society of Heart Failure

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ABSTRACT

Background and Objectives: We evaluated 20-year trends in heart failure (HF) epidemiology
in Korea to quantify changes in its burden from 2002 to 2023.

Methods: A nationwide analysis was conducted using a random 50% sample from the Korean
National Health Information Database linked to mortality records (2002–2023). HF was defined
using diagnostic codes recorded as a primary or secondary condition. We calculated crude and
age-standardized rates of prevalence, incidence, hospitalization, and mortality. Survival was
assessed using the Kaplan–Meier method, stratified by inpatient versus outpatient diagnosis.
Trends in heart transplantation and left ventricular assist device implantations were also examined.

Results: By 2023, approximately 1,750,228 individuals had HF (3.41% prevalence). The age-stand-
ardized prevalence has more than doubled from 2002 to 2023. The crude incidence increased
over time; the age-standardized incidence remained stable in men and declined in women.
Hospitalization rates for any cause or secondary HF diagnoses have increased substantially,
whereas primary HF hospitalization rates have remained relatively stable. The annual mortality
rate in patients with HF was approximately 6.0% in 2023, being markedly higher in older adults.
Although short-term survival has improved, particularly in hospitalized patients, long-term
survival remains limited. Use of advanced therapies significantly increased.

Conclusions: The burden of HF in Korea has increased substantially over the past two decades, driven primarily by population aging and improved survival rather than increasing age-adjusted incidence. Despite therapeutic advances, hospitalization and long-term mortality rates remain high, highlighting the need for comprehensive HF strategies in aging societies.

Keywords: Heart failure; Epidemiology; Statistics; Korea

INTRODUCTION

Cardiovascular disease remains the leading cause of death worldwide despite substantial advances in medical care and improved outcomes for many noncommunicable chronic diseases.¹⁾ Among the cardiovascular conditions, heart failure (HF) represents a particularly important and growing public health challenge because of its increasing prevalence, frequent hospitalizations, and poor long-term prognosis. Globally, the number of individuals living with HF increased from 25.4 million in 1990 to 55.5 million in 2021, reflecting population aging and improved survival from other cardiovascular diseases.²⁾ As survival improves, HF has increasingly transitioned from an acutely fatal condition to a chronic disease characterized by multimorbidity, recurrent hospitalization, and sustained long-term mortality.³⁾

Korea provides a distinct context for evaluating long-term trends in HF epidemiology. The country is currently experiencing one of the fastest rates of population aging worldwide, and operates a universal, single-payer health insurance system that enables comprehensive population-based analyses. Previous reports from the Korean Society of Heart Failure documented a marked increase in the prevalence of HF over time.⁴⁾

However, changes in the HF burden are influenced not only by demographic aging but also by shifts in incidence, survival, hospitalization patterns, comorbidities, and the use of advanced therapies. Therefore, a comprehensive long-term evaluation that integrates these dimensions is required to accurately characterize the evolving epidemiology of HF, particularly in rapidly aging Asian societies.

In this study, we report the findings of the Third Korean Heart Failure Fact Sheet published by the Korean Society of Heart Failure. Compared to previous reports, this update extends the follow-up period to 2023 and provides a more comprehensive integration of data. Using nationwide data from the Korean National Health Insurance Service linked to mortality records, we analyzed temporal trends in HF prevalence, incidence, hospitalization, mortality, survival, comorbidities, and advanced HF therapies in Korea from 2002 to 2023. This population-based analysis provides an integrated overview of the changing burden of HF over two decades and offers essential evidence for clinical practice and health policy.

METHODS

Study population and data sources

Korea has a mandatory nationwide health insurance system administered by the National Health Insurance Service (NHIS) that covers virtually the entire population. The National Health Information Database (NHID) compiled by the NHIS includes longitudinal information on healthcare utilization, demographic characteristics, health-screening data, and mortality.⁵⁾

In the NHID claims database, individual diagnoses are coded using the Korean Standard Classification of Diseases (KCD), which is aligned with the International Classification of Diseases, 10th Revision. For the present analysis, individuals with KCD codes corresponding to HF (I50, I42, I11.0, I13.0, I13.2, I25.5, and related subcodes), listed as having either primary or secondary diagnoses, were identified from the claims data. A random 50% sample of these individuals was used for the analysis. This inclusive claims-based definition was intentionally adopted to maximize the sensitivity for identifying HF at the population level while acknowledging the potential for overestimation compared with clinically adjudicated HF. The sampling strategy was designed to preserve national representativeness, while ensuring computational feasibility. Mortality outcomes, including all-cause and cause-specific deaths, were ascertained through linkage with national death certificate data provided by Statistics Korea, enabling complete follow-up at the national level.

The study protocol adhered to the principles of the Declaration of Helsinki and was approved by the Institutional Review Board (IRB) of Yonsei University Health System (IRB No. 4-2024-0528). The requirement for informed consent was waived because the data were fully anonymized.

Definitions and outcome measures

Incident HF was defined as the first recorded healthcare encounter with an HF diagnosis in individuals without any prior HF diagnosis during a 2-year look-back period. This washout period was chosen to balance the risk of misclassification and long-term data availability, which is consistent with previous NHIS-based epidemiological studies. HF-related mortality was defined as death in which HF was recorded as the underlying cause on death certificates.

Hospitalization outcomes included admission for any cause, admission with HF listed as either a primary or secondary diagnosis, and admission with HF recorded as the primary diagnosis. This classification allowed for differentiation between hospitalizations primarily driven by HF and those reflecting HF as a comorbid condition.

Comorbid conditions in patients with HF were identified using relevant KCD codes recorded within the 365 days preceding the final healthcare encounter with an HF diagnosis in each calendar year. Detailed definitions and diagnostic codes for the comorbidities are provided in **Supplementary Table 1**. Mortality outcomes included all-cause mortality in patients with HF, population-level mortality attributed to HF, and in-hospital mortality among patients admitted with HF as the primary diagnosis. Cardiovascular death was defined using KCD codes I00–I99 listed as the underlying cause of death.

Advanced HF therapies

Information on heart transplantation was obtained from the annual reports of the National Institute of Organ, Tissue, and Blood Management. Data on implantable left ventricular assist device (LVAD) were provided by Abbott Korea and Medtronic Korea.

Statistical analysis

Annual crude rates of HF prevalence, incidence, hospitalization, and mortality were calculated for each calendar year. Age-standardized rates were estimated using the direct standardization method, with the 2018 Korean resident population as the reference. Age-specific rates were calculated using 10-year age strata, and all analyses were performed separately for men and women.

Hospitalization rates were calculated as the proportion of individuals experiencing at least one hospitalization within each calendar year, stratified by cause of hospitalization. Hospitalization and mortality rates among patients with HF were calculated annually as proportions. Population-level hospitalization and mortality rates were expressed per 100,000 persons. Age-specific mortality rates among patients with HF were evaluated using 10-year age categories.

For individuals newly diagnosed with HF between 2002 and 2022, the Kaplan–Meier method was used to estimate survival probabilities at 1, 5, 10, and 15 years after the index diagnosis and to generate survival curves. Five-year survival curves and corresponding survival rates were further examined by stratifying patients according to the calendar period of the initial HF diagnosis, grouped into 3-year intervals. In addition, 1-year survival rates were calculated for each diagnosis year and reported on an annual basis. All survival analyses were performed separately for patients whose initial HF diagnosis was made during hospitalization and

those who were diagnosed in the outpatient setting. New inpatient HF cases were defined as individuals first diagnosed with HF during inpatient admission, whereas new outpatient HF cases were defined as those initially diagnosed during ambulatory care.

Temporal trends were evaluated descriptively using calendar year as a continuous variable and were primarily assessed through graphical presentation. Given the population-based nature of the study and the large sample size, analyses focused on epidemiological description rather than causal inference. All analyses were performed by professional statisticians using the SAS software, version 9.3 (SAS Institute Inc., Cary, NC, USA).

RESULTS

Prevalence of HF

Based on the National Health Insurance Database, the estimated number of patients with HF in Korea in 2023 was 1,750,228, corresponding to a prevalence of 3.41% (**Figure 1A**). The prevalence was similar between men (3.40%) and women (3.41%). The prevalence of HF increased continuously from 2002 to 2023, exceeding 1% in 2005 and reaching 2.16% in 2017. Subsequently, the prevalence increased more rapidly, reaching 3.20% by 2022.

The age-standardized prevalence of HF also increased steadily, more than doubling from 1.3% in 2002 to 2.9% in 2023 (**Figure 1B**). Among men, the age-standardized prevalence increased from 1.0% to 2.8%, while among women it increased from 1.6% to 2.9% over the same period.

In 2023, the age-specific prevalence increased steeply with advancing age, reaching 26.5% among individuals aged ≥ 80 years (**Figure 1C**). An increasing trend in prevalence was observed across all age groups over the past two decades, with the highest prevalence consistently observed in individuals aged ≥ 80 years.

Incidence of HF

In 2023, the incidence of HF was 763 per 100,000 persons; 771 per 100,000 persons among men and 756 per 100,000 persons among women (**Figure 2A**). In 2003, the incidence rates were 376 per 100,000 men and 587 per 100,000 women. Over time, the crude incidence increased in both sexes, with a greater increase observed in men.

The age-standardized incidence of HF among men was 676 per 100,000 persons in 2003 and 671 per 100,000 persons in 2023 (**Figure 2B**). Among women, the corresponding rates were 958 and 668 per 100,000 persons, respectively. Thus, the age-standardized incidence remained relatively stable among men, whereas a decrease was observed among women over the study period.

In 2023, the age-specific incidence of HF was 69, 89, 179, 289, 446, 744, 1,494, 2,303, and 3,865 per 100,000 persons for

Heart Failure Statistics 2025 in Korea

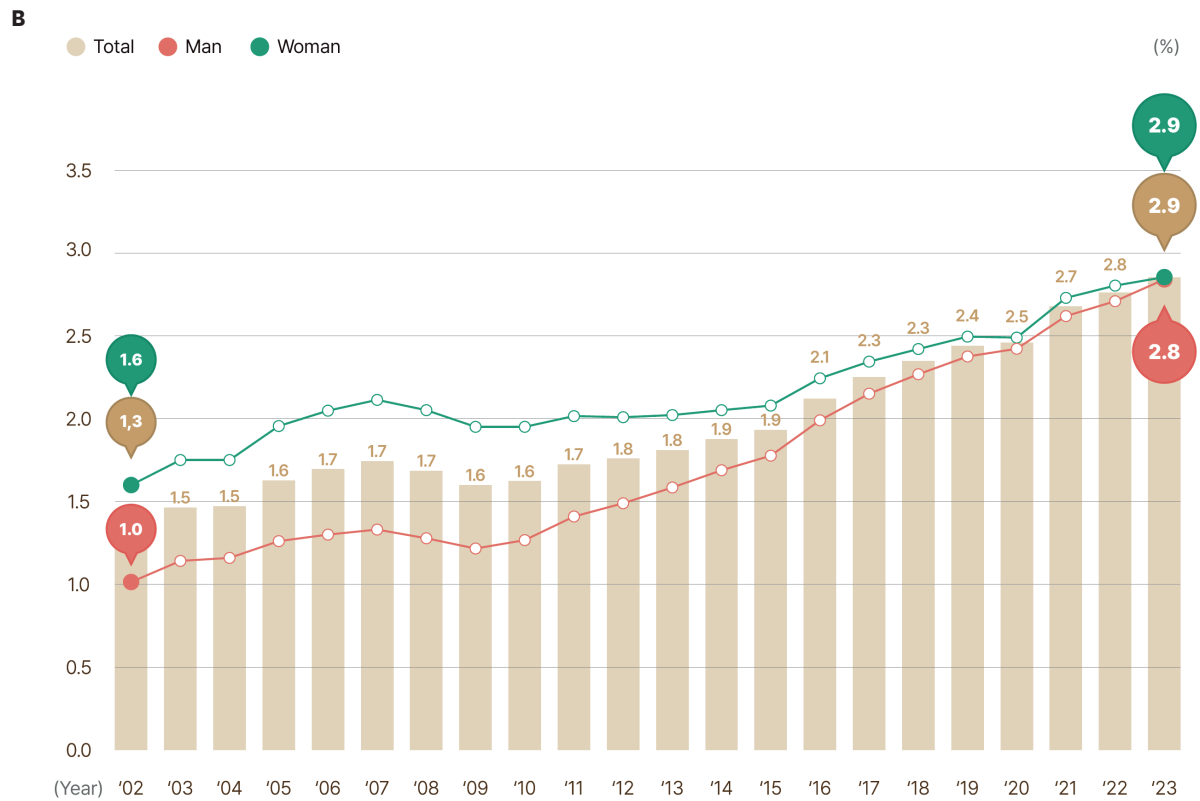
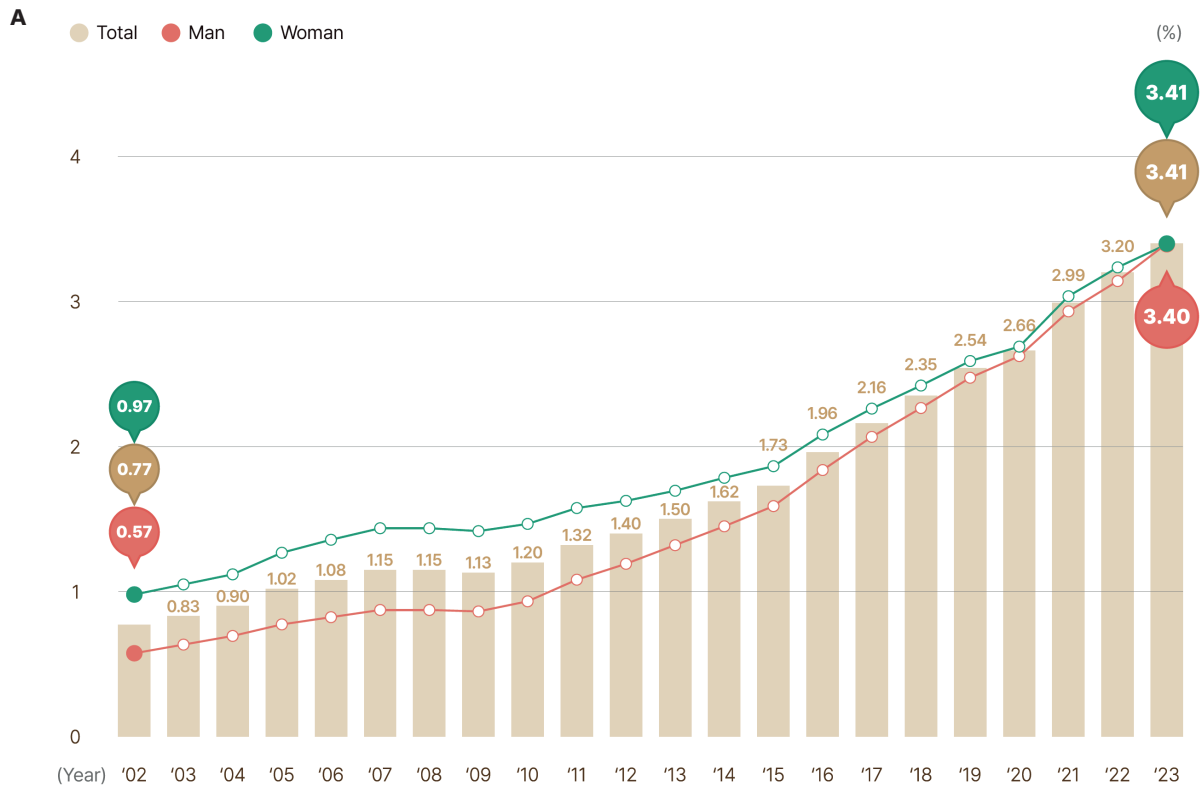


Figure 1. Prevalence of heart failure from 2002 to 2023 in Korea. (A) Temporal trend of crude prevalence. (B) Temporal trend of age-standardized prevalence. (C) Temporal trend of prevalence according to age. (continued to the next page)

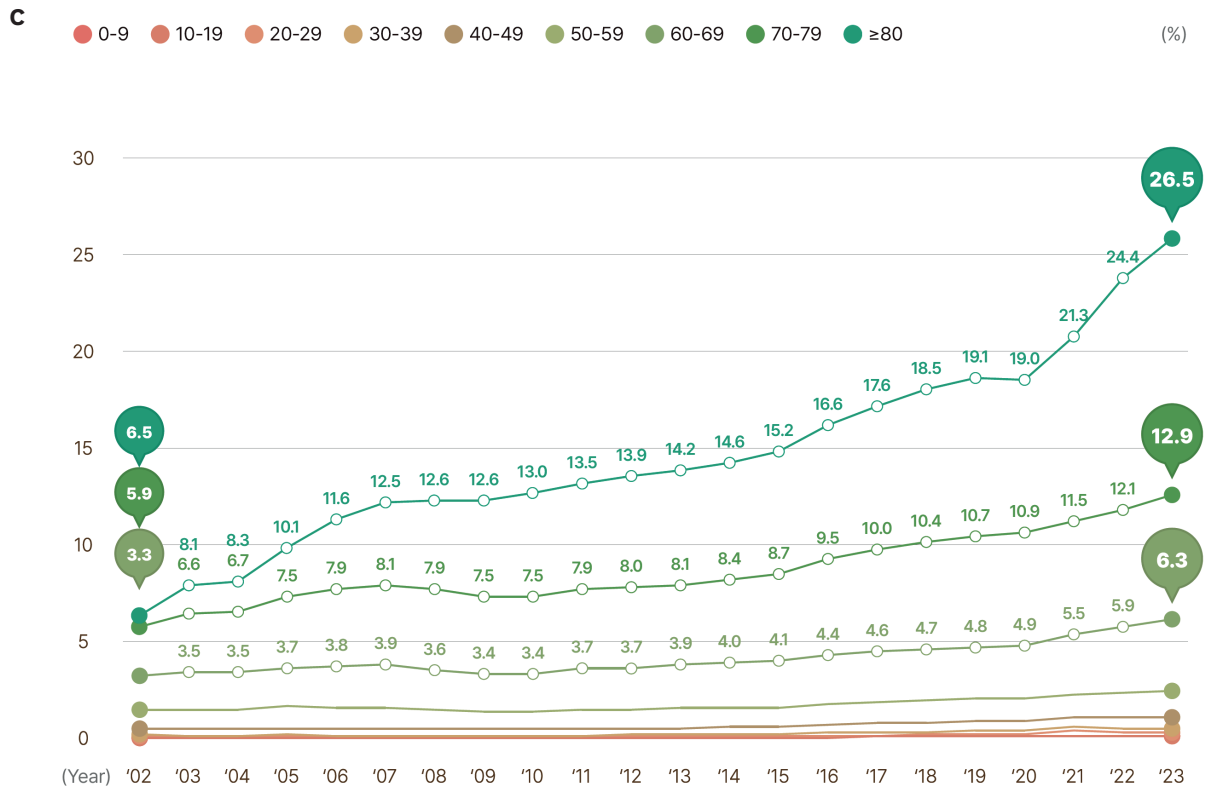


Figure 1. (Continued) Prevalence of heart failure from 2002 to 2023 in Korea. (A) Temporal trend of crude prevalence. (B) Temporal trend of age-standardized prevalence. (C) Temporal trend of prevalence according to age.

individuals aged 0–9, 10–19, 20–29, 30–39, 40–49, 50–59, 60–69, 70–79, and ≥80 years, respectively (**Figure 2C**). Since 2016, incidence rates in most age groups have remained relatively stable.

Hospitalization and mortality for HF in general population

In 2023, hospitalization rates for any cause and for HF as a primary or secondary diagnosis increased substantially in the general population, whereas hospitalization rates with HF as the primary diagnosis remained relatively stable (**Figure 3A**).

The mortality rate due to HF in the general population increased from 3.1 per 100,000 persons in 2002 to 19.6 per 100,000 persons in 2023 (**Figure 3B**). The age-standardized mortality rate was 7.2 per 100,000 persons in 2002 and 14.5 per 100,000 persons in 2023, showing only modest changes over the two-decade period (**Supplementary Figure 1**).

Comorbidity prevalence among patients with HF

Among patients with HF, hypertension was the most prevalent comorbidity, affecting 77.9% of the patients in 2023 (**Figure 4A**). Diabetes mellitus and chronic kidney disease were present in 65.5% and 16.0% of patients, respectively. The prevalence of

hypertension remained relatively stable after 2014, whereas that of diabetes mellitus increased.

In 2023, ischemic heart disease and stroke were present in 50.9% and 13.8% of patients with HF, respectively, with a relatively stable prevalence over the past decade (**Figure 4B**). In contrast, the prevalence of atrial fibrillation (AF) increased steadily, reaching 20.6% in 2023, which is more than twice the prevalence observed in 2002.

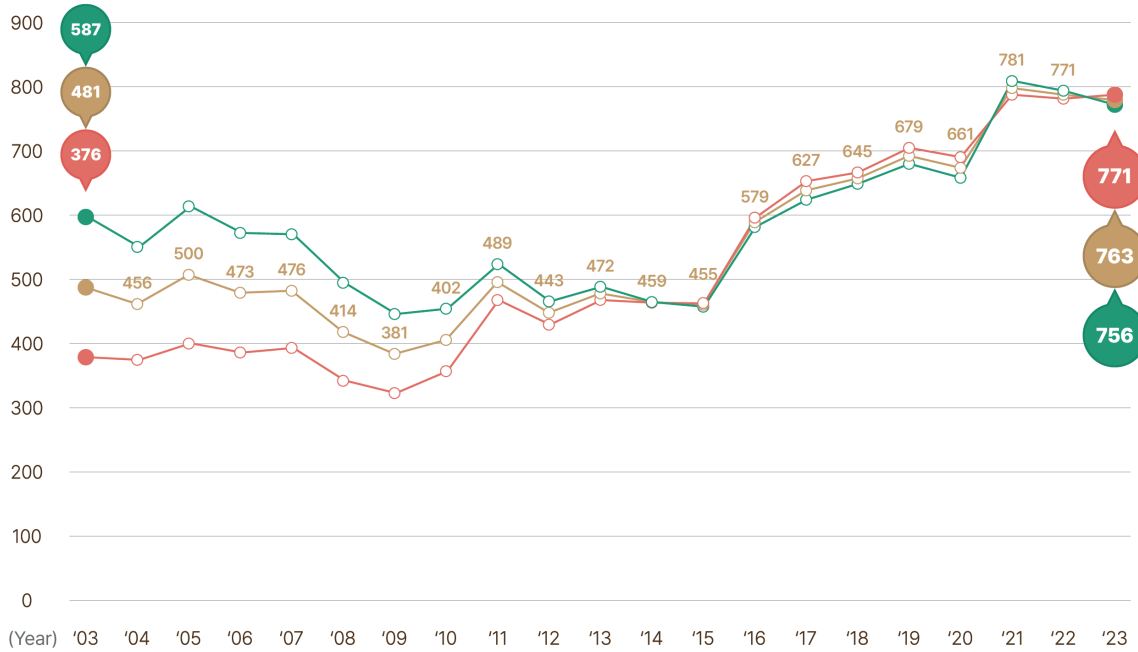
Hospitalization and mortality among patients with HF

In 2023, the hospitalization rate for any cause among patients with HF was 47.3% (**Figure 5A**). Hospitalizations wherein HF was recorded as a primary or secondary diagnosis accounted for 28.0% of the cases, representing an increase over the past two decades. In contrast, hospitalizations with HF as the primary diagnosis remained relatively unchanged, accounting for 2.7% in 2002 and 2.5% in 2023.

The overall annual mortality rate among patients with HF in 2023 was 6.0%: 6.0% among men and 5.9% among women (**Figure 5B**). The mortality rate among men was similar to that observed in 2002, whereas that among women had increased by 1.9 percentage points over the same period.

Heart Failure Statistics 2025 in Korea

A ● Total ● Man ● Woman (/100,000 persons)



B ● Total ● Man ● Woman (/100,000 persons)

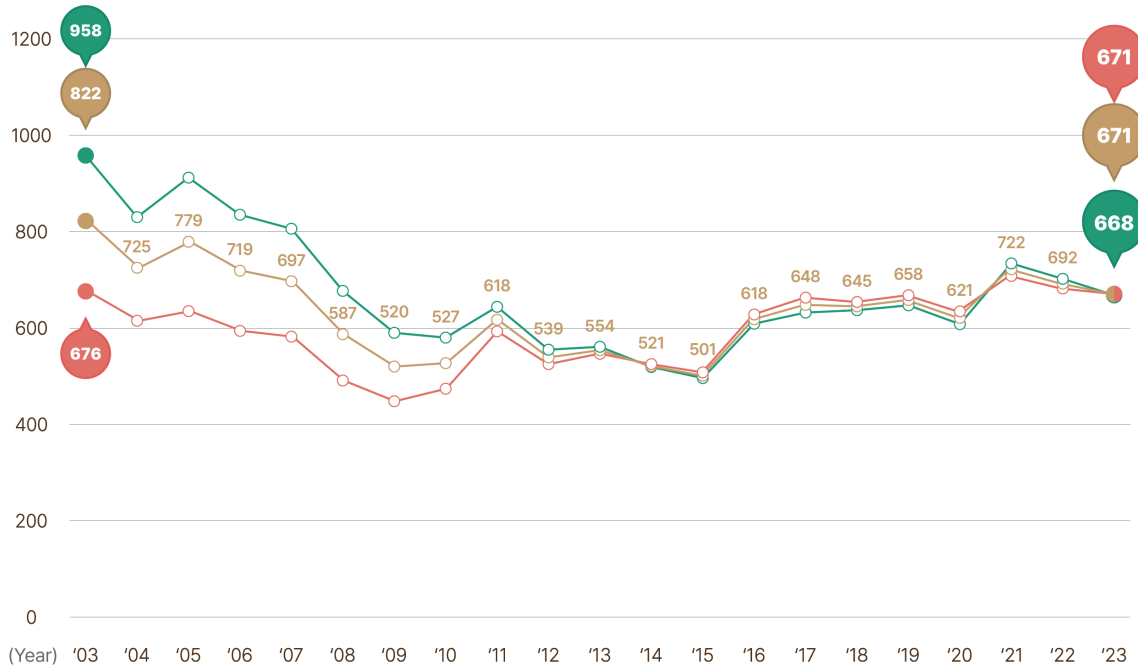


Figure 2. Incidence of heart failure from 2002 to 2023 in Korea. (A) Temporal trend of crude incidence. (B) Temporal trend of age-standardized incidence. (C) Temporal trend of incidence according to age. (continued to the next page)

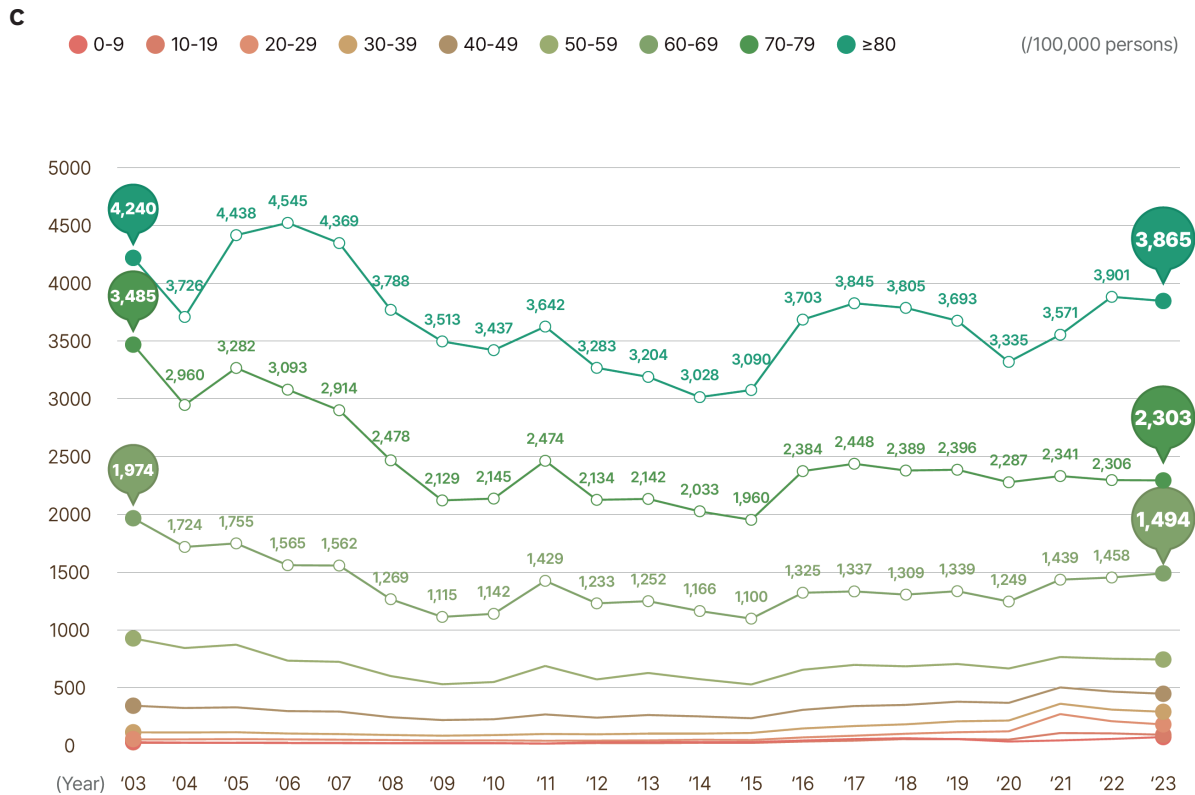


Figure 2. (Continued) Incidence of heart failure from 2002 to 2023 in Korea. (A) Temporal trend of crude incidence. (B) Temporal trend of age-standardized incidence. (C) Temporal trend of incidence according to age.

In 2023, age-specific mortality rates among patients with HF were 1.4%, 0.7%, 0.8%, 0.9%, 1.3%, 1.8%, 2.6%, 4.5%, and 13.6% for those aged 0–9, 10–19, 20–29, 30–39, 40–49, 50–59, 60–69, 70–79, and ≥80 years, respectively (**Figure 5C**). Mortality rates within most age groups showed a slight decrease or remained relatively stable over time.

Among patients hospitalized with HF as the primary diagnosis, in-hospital mortality increased during the study period (**Figure 5D**). In 2023, the overall in-hospital mortality rate was 16.9%, including cardiovascular mortality of 9.1% and HF-specific mortality of 5.4%.

Survival among patients with HF

Among all the patients newly diagnosed with HF, the 1-, 5-, 10-, and 15-year survival rates were 91%, 79%, 66%, and 54%, respectively (**Figure 6A**). For patients first diagnosed during hospitalization, the corresponding survival rates were 77%, 59%, 42%, and 31%, respectively (**Figure 6B**). Patients first diagnosed in an outpatient setting had more favorable outcomes, with 1-, 5-, 10-, and 15-year survival rates of 96%, 87%, 74%, and 61%, respectively.

The 1-year survival rate among patients first diagnosed with HF during hospitalization improved over time, reaching 81.1% in

2023, and has remained stable since 2016 (**Figure 6C**). In contrast, the 1-year survival rate among patients first diagnosed in the outpatient setting remained consistently high (96.9%) throughout the study period (**Figure 6D**).

Five-year survival rates improved over successive diagnostic periods. Among patients first diagnosed during hospitalization between 2003 and 2005, the 5-year survival rate was <50% (**Figure 7A**). Thereafter, this rate increased steadily, exceeding 60% among patients diagnosed after 2015. A similar pattern was observed among patients first diagnosed in the outpatient setting, with 5-year survival rates increasing modestly over time (**Figure 7B**).

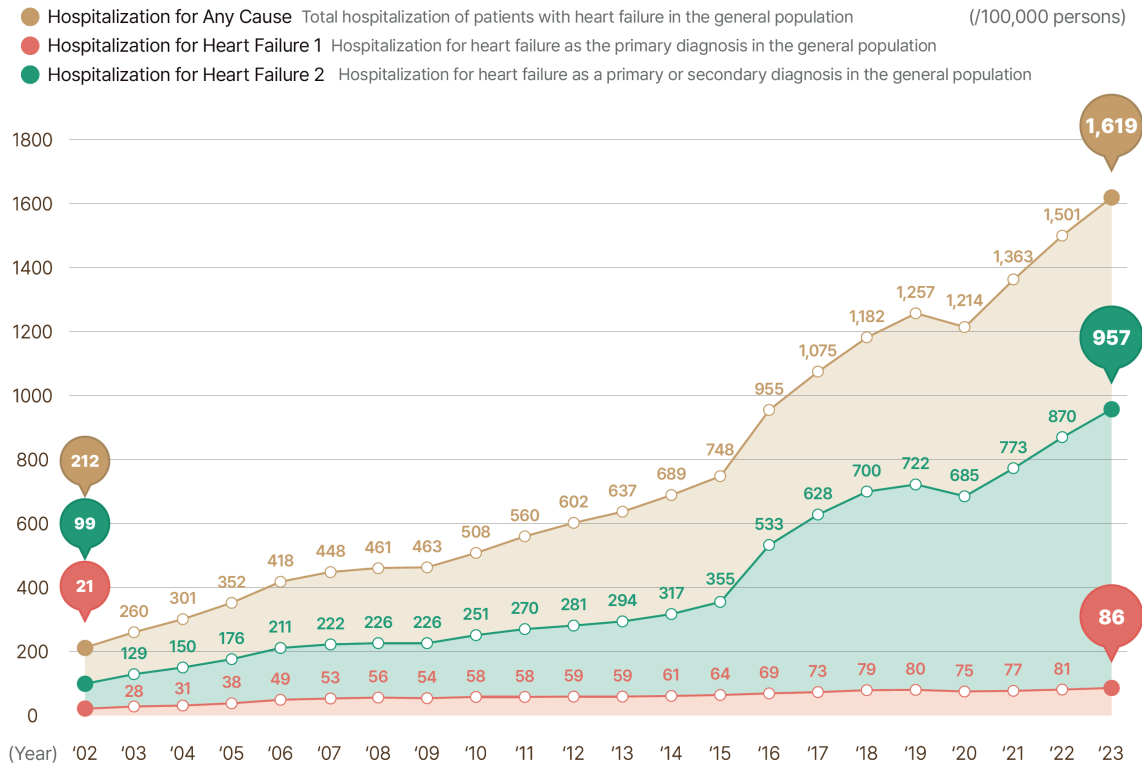
Heart transplantation and implantable LVADs

The annual number of heart transplantations in Korea increased from 11 in 2002 to 245 in 2023. After 2007, the annual volume markedly increased, exceeding 100 cases from 2012 onward. Although minor fluctuations were observed, transplantation activity increased throughout the 2010s, peaked at 194 cases in 2019, and rebounded sharply in 2023, after a modest decline in the early 2020s (**Figure 8A**).

Implantable LVAD use increased rapidly after 2019, reaching 124 cases in 2023, with the HeartMate 3 (Abbott, Abbott

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A



B

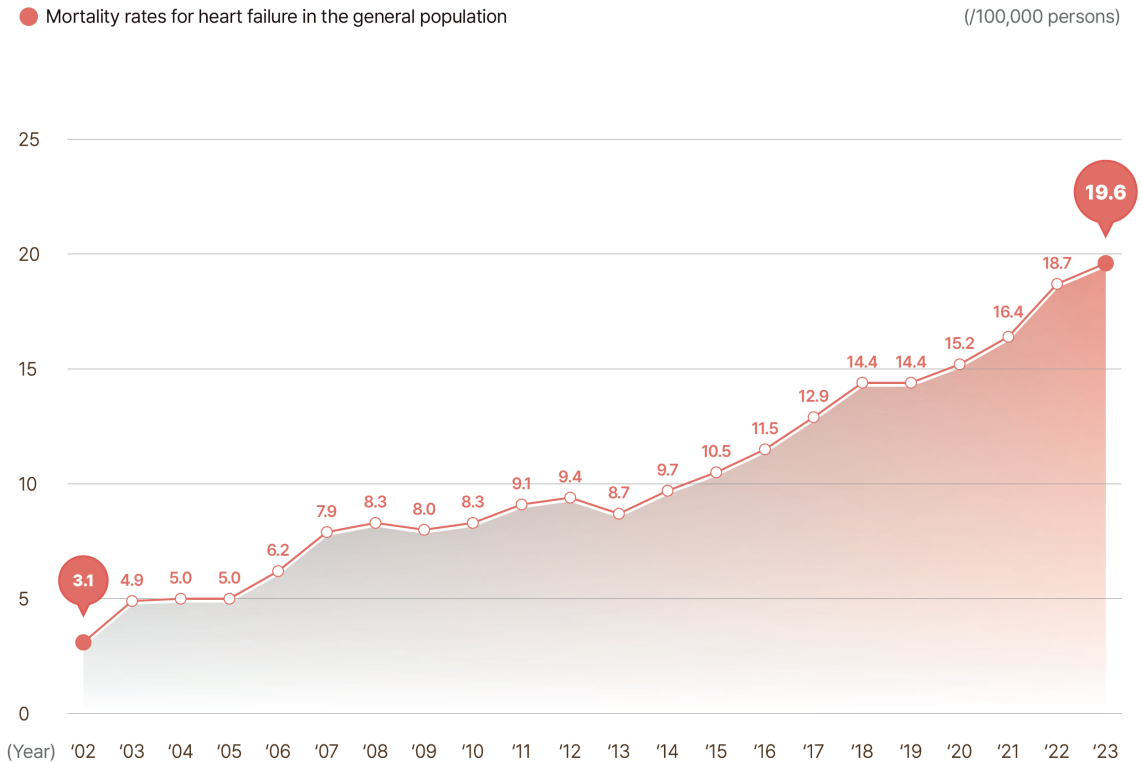


Figure 3. Hospitalization rate for HF and mortality rate for HF in general population from 2002 to 2023 in Korea. (A) Temporal trend of hospitalization rates for any cause, for HF as primary or secondary diagnosis, and for HF as primary diagnosis. (B) Temporal trends of mortality rates for HF. HF = heart failure.

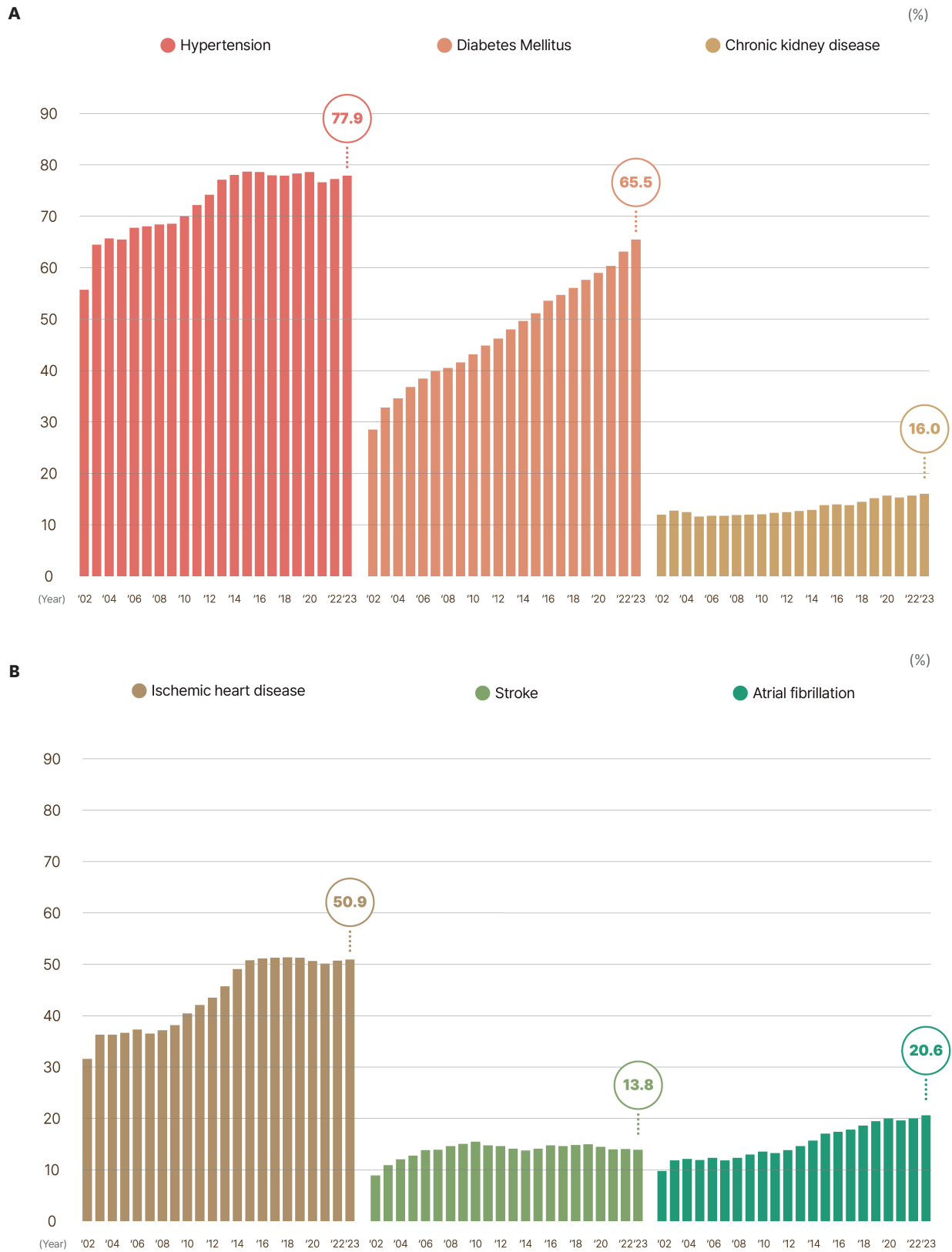


Figure 4. Prevalence of comorbidities among patients with heart failure from 2002 to 2023 in Korea. (A) Temporal trend of prevalence of hypertension, diabetes mellitus, and chronic kidney disease. (B) Temporal trend of prevalence of ischemic heart disease, stroke, and atrial fibrillation.

Heart Failure Statistics 2025 in Korea

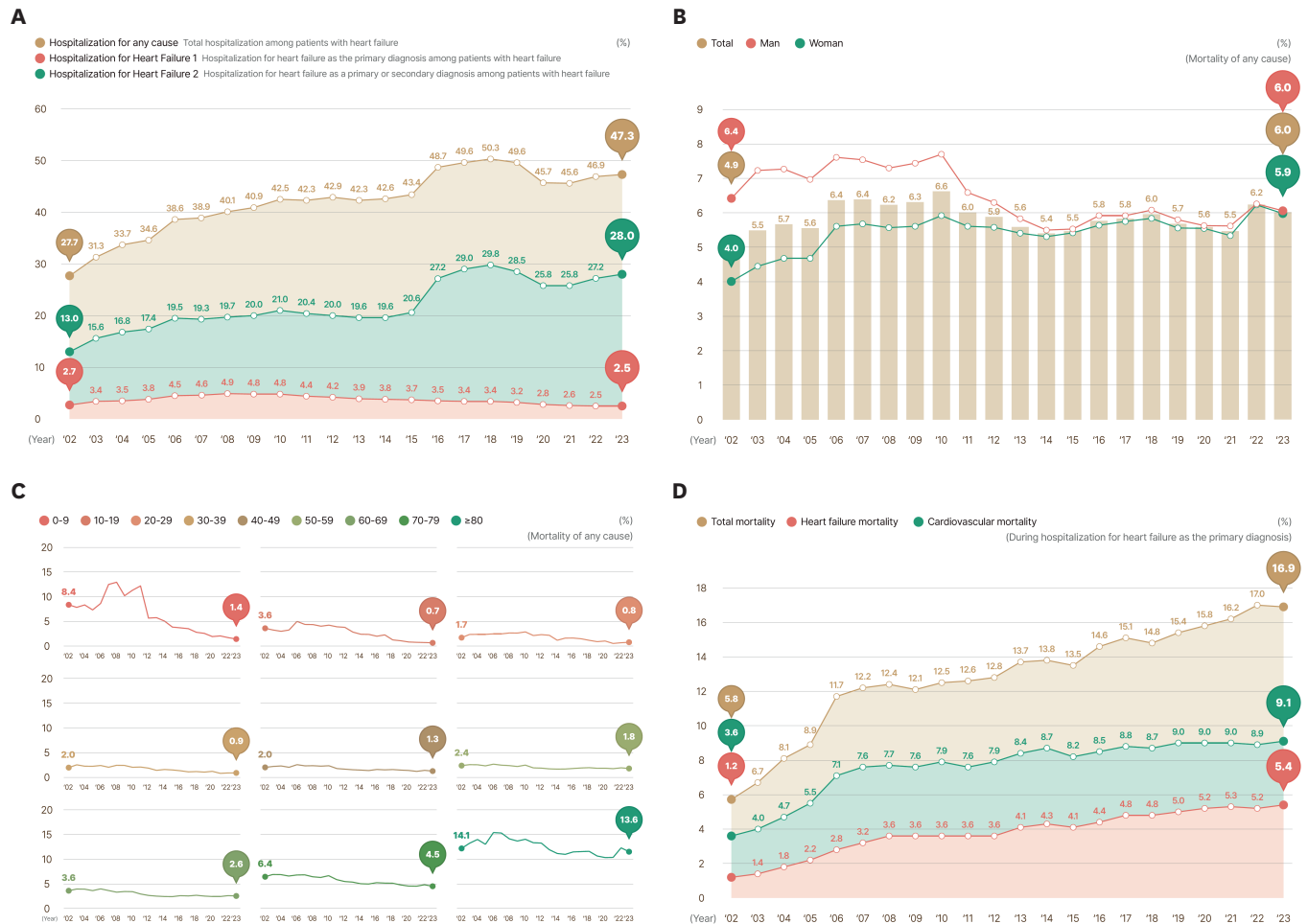


Figure 5. Hospitalization and mortality rates among patients with HF from 2002 to 2023 in Korea. (A) Temporal trend of hospitalization rates for any cause, for HF as primary or secondary diagnosis, and for HF as primary diagnosis. (B) Temporal trend of mortality rates for any cause. (C) Temporal trend of mortality rates for any cause according to age. (D) Temporal trend of in-hospital mortality rates for any cause, cardiovascular disease, and HF. HF = heart failure.

Park, IL, USA) becoming the predominant device in recent years (**Figure 8B**). The initial expansion was driven primarily by HeartWare devices (Medtronic, Minneapolis, MN, USA), whereas HeartMate 3 became the predominant device after its introduction, accounting for nearly all implants since 2022. In contrast, the use of the HeartMate 2 (Abbott) declined steadily and was no longer observed after 2021.

DISCUSSION

In this nationwide population-based study spanning more than two decades, we provided a comprehensive overview of the evolving epidemiology of HF in Korea. Using linked national health insurance and mortality data from 2002 to 2023, we demonstrated a marked and sustained increase in the burden of HF. This increase was characterized by a rapidly rising prevalence, persistently high

hospitalization rates, and substantial long-term mortality despite improvements in short-term survival.

One of the most prominent findings of this study was the rapid increase in the prevalence of HF in Korea. The crude prevalence increased steadily over the study period, exceeding 3% in recent years. This estimate appears higher than those reported in many Western populations, such as the United States (approximately 1.9%–2.6% in the 2025 American Heart Association statistics) and Europe (median 1.7% in the 2019 Heart Failure Association Atlas).^{6,7} This trend in Korea mirrors the epidemiological patterns observed in Japan, another super-aged society, where the HF prevalence is estimated to be between 2.2% and 6.5%. These findings suggest that Korea is entering an advanced stage of the HF epidemic, characterized by population aging and prolonged survival.

Our findings suggest that the explosive increase in the prevalence of HF in Korea is driven primarily by rapid population aging and improved survival from competing cardiovascular risks, rather

Heart Failure Statistics 2025 in Korea



Figure 6. Survival curves and 1-year survival rates among patients with HF. The 15-year survival rates were estimated using the Kaplan-Meier method. (A) Fifteen-year survival curve for all newly diagnosed HF patients. (B) Fifteen-year survival curves for newly diagnosed HF in inpatient and outpatient setting. (C) One-year survival rate after diagnosis of HF in inpatient setting. (D) One-year survival rate after diagnosis of HF in outpatient setting. HF = heart failure.

than an intrinsic increase in disease susceptibility.⁸⁾ This interpretation is supported by the observation that age-standardized HF incidence remained stable among men and declined among women over the study period, despite increasing crude incidence. This pattern is consistent with trends reported in Western populations, where better management of risk factors such as hypertension and ischemic heart disease has mitigated the new onset of HF despite the growing older adult population.^{9,10)}

Age-specific analyses further highlighted the disproportionate contribution of older adults to the overall burden of HF. Individuals aged 80 years or older consistently exhibited the highest prevalence and the steepest increase over time. Given Korea's rapidly aging population, these findings suggest that the absolute number of patients with HF will continue to increase, placing rising demand on the healthcare system.

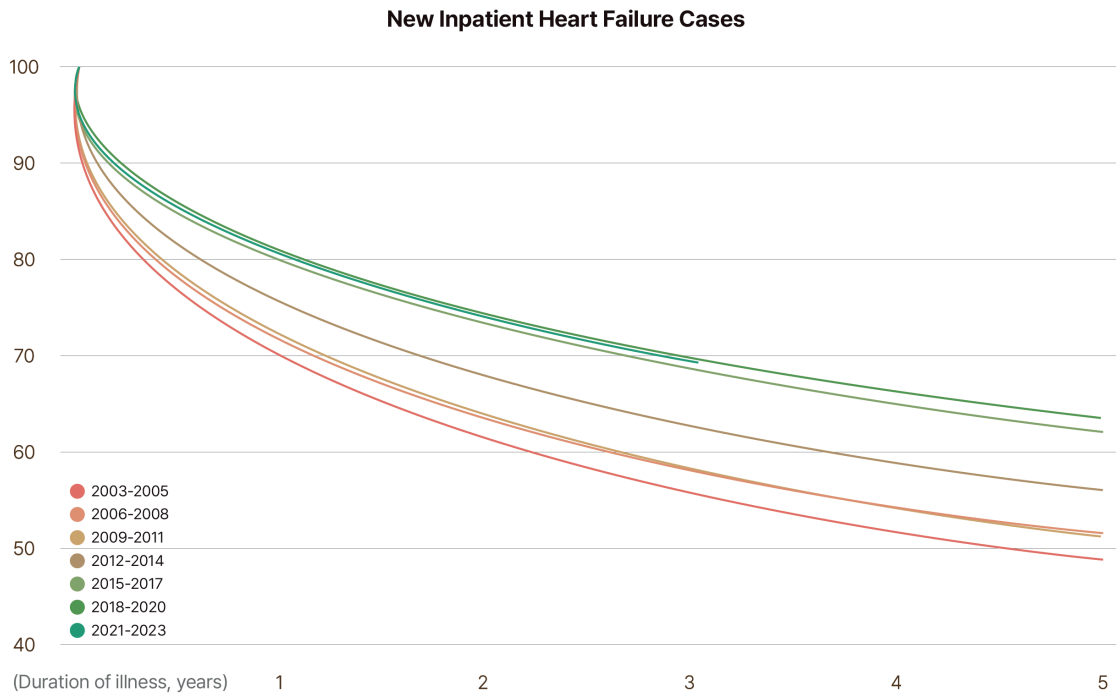
In contrast to the pronounced increase in prevalence, trends

in HF incidence showed a more nuanced pattern. While the crude incidence increased over time, particularly among men, the age-standardized incidence remained relatively stable in men and declined among women. The incidence patterns observed in Korea were consistent with those reported in Western populations. Large population-based studies from North America and Europe have demonstrated that despite increasing crude incidence driven by population aging, age-standardized HF incidence has remained stable or declined over the past two decades.^{9,10)} Taken together, these findings suggest that the expanding HF population is driven primarily by improved survival and population aging. Specifically, the marked increase in incidence among older age groups underscores the importance of age-related factors and comorbidities in the development of HF. The relative stabilization of the incidence rates in recent years may reflect improvements in the prevention and management of upstream cardiovascular risk factors.^{11,12)}

A

*Patients newly diagnosed with heart failure in the inpatient setting

● Survival rate (%)



B

*Patients newly diagnosed with heart failure in the outpatient clinic

● Survival rate (%)

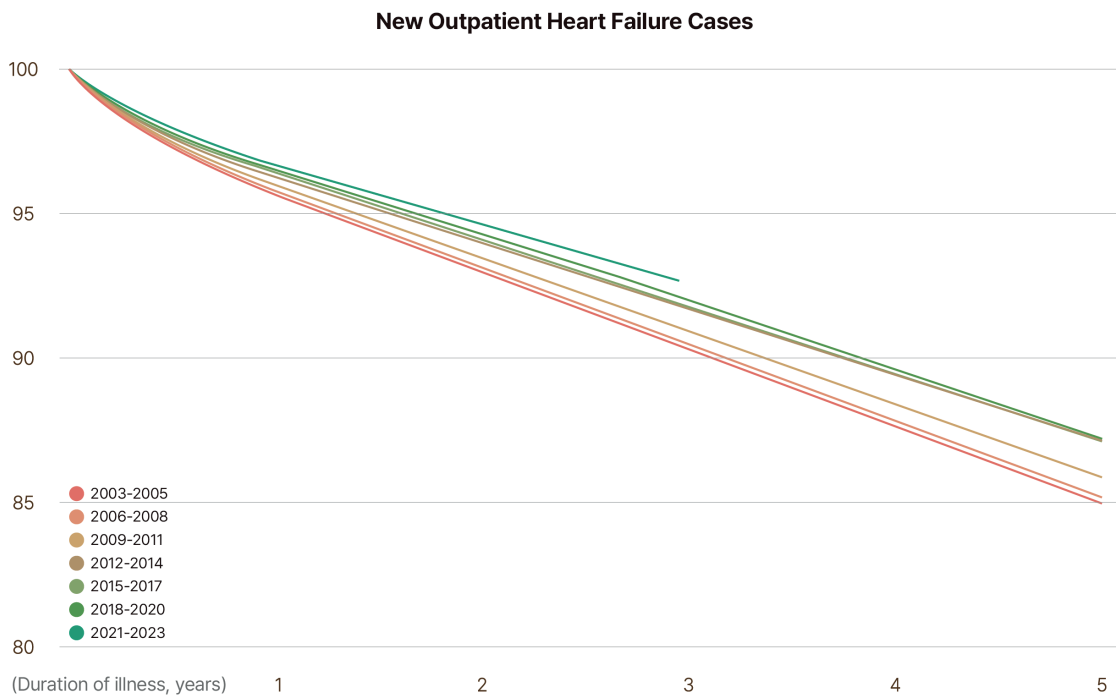
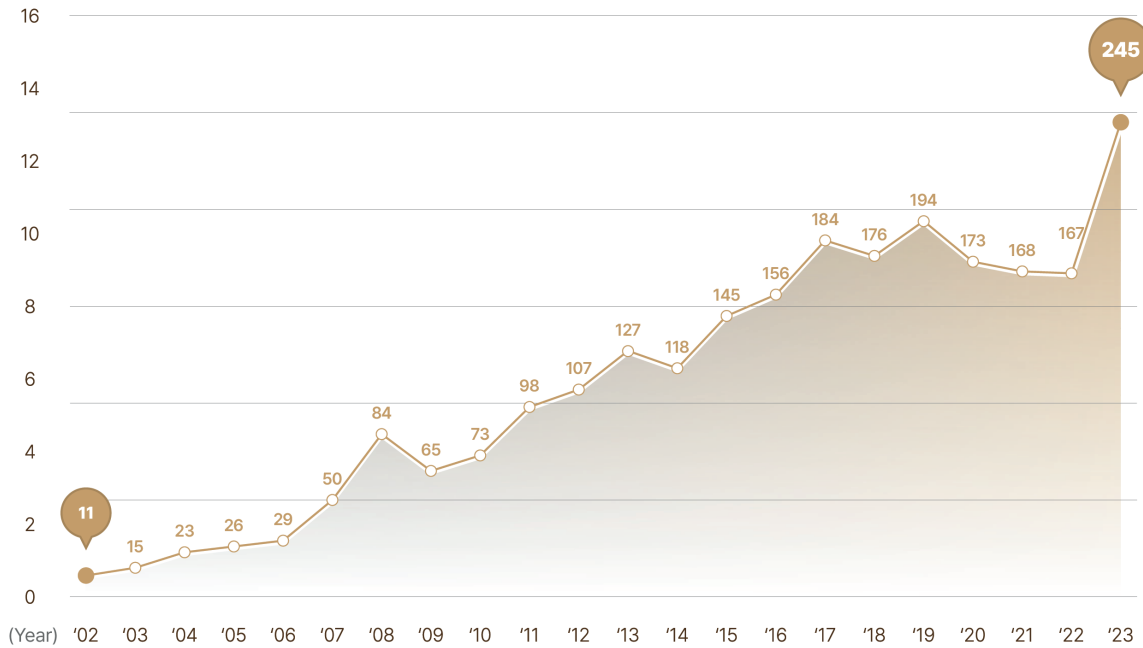


Figure 7. Five-year survival curves among patients newly diagnosed with HF according to calendar period of diagnosis. Five-year survival rates were estimated using Kaplan-Meier method and analyzed by grouping patients according to calendar period of initial HF diagnosis in 3-year intervals. (A) Five-year survival curves among patients newly diagnosed with HF in inpatient setting. (B) Five-year survival curves among patients newly diagnosed with HF in outpatient setting. HF = heart failure.

A

(Unit: Number of Patients)

Source: The National Institute of Organ, Tissue and Blood Management (KONOS) 2023



B

● Total ● HeartMate 2 ● HeartMate 3 ● Heartware Ventricular Assist Device

(Unit: Number of Patients)

Source: Research from Abbott Korea and Medtronic Korea

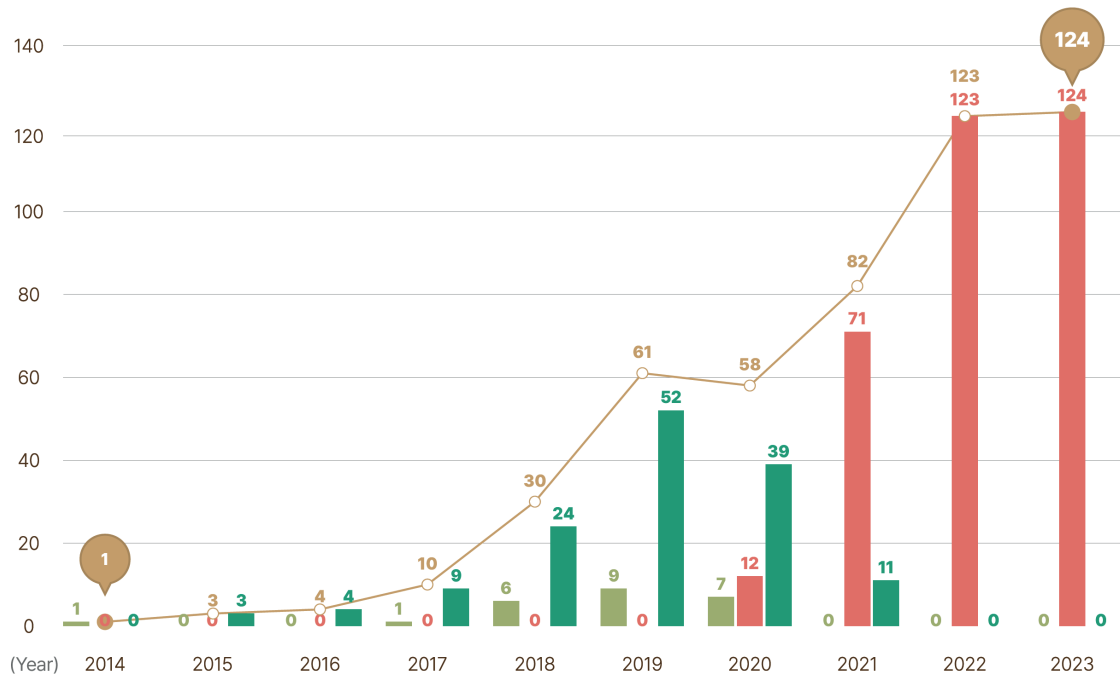


Figure 8. Temporal trends in advanced heart failure therapies in Korea from 2002 to 2023.

(A) Annual number of heart transplantations in Korea. (B) Annual number of implantable left ventricular assist device implantations, stratified by device type. Numbers represent total annual volume of procedures.

However, the persistently high incidence in older adults indicates that HF remains a major public health challenge.

Hospitalization remains a defining feature of the HF burden.^{7,13)} We observed a substantial increase in total hospitalizations among patients with HF, driven largely by admissions for any cause and for HF listed as a secondary diagnosis, whereas hospitalizations with HF as the primary diagnosis remained relatively stable. This divergence suggests that HF increasingly functions as a chronic comorbid condition rather than as an isolated cause of hospitalization, reflecting the growing burden of multimorbidity in aging populations.¹⁴⁾ These findings highlight the limitations of HF-focused management strategies alone and emphasize the need for integrated multidisciplinary care models that address comorbid conditions and transitions of care.

Despite advances in HF therapy, mortality associated with HF remains substantial. Although age-standardized mortality in the general population showed only modest changes over time, the absolute mortality rates increased in parallel with the growing HF population. Among patients with HF, the overall annual mortality remained at approximately 6%, with markedly higher mortality observed in older age groups. Although it is lower than the 13.5% annual mortality rate in patients with chronic HF reported in a previous meta-analysis,¹⁵⁾ the in-hospital mortality rate for patients admitted with a primary diagnosis of HF remained high at 16.9% in 2023. This figure is higher than the rates typically reported in clinical registries, such as the 2.8–5.5% in-hospital mortality observed in the U.S. Get With The Guidelines–Heart Failure registry or the European Society of Cardiology–Heart Failure Long-Term Registry.^{16,17)} This discrepancy likely reflects the inclusion of unselected, real-world patients, including very old individuals, those with advanced or end-stage HF or cardiogenic shock, and palliative admissions, which are often underrepresented in clinical registries.

The comorbidity profile of Korean patients with HF is undergoing a distinct transition. Although hypertension remains the most common comorbidity, the prevalence of AF has doubled over the past 20 years, affecting 20.6% of patients with HF in 2023. This rapid increase aligns with global trends¹⁸⁾ but occurs at a steeper trajectory in Korea due to the rapid pace of population aging. The rising burden of AF is particularly concerning given its close association with HF with preserved ejection fraction, a phenotype increasingly dominant in aging societies.¹⁹⁾

The concurrent increase in diabetes mellitus parallels the trends observed in populations with HF across the United States and Europe.^{11,20,21)} This underscores the growing relevance of Cardiovascular-Kidney-Metabolic (CKM) syndrome in the context of HF. CKM syndrome is not only a key driver of HF development but is also closely linked to adverse clinical outcomes. Recent pivotal trials have demonstrated that agents targeting metabolic and

renal pathways, such as sodium-glucose cotransporter 2 inhibitors and finerenone, confer significant prognostic benefits in HF.^{22,23)} The integration of these agents as cornerstones of therapy likely reflects a paradigm shift, recognizing HF as a complex condition driven by evolving comorbidities and metabolic pathophysiology. The increasing use of heart transplantations and durable LVADs reflects the growing population of patients with advanced HF and the evolution of therapeutic options in Korea. In Korea, the number of heart transplants has increased significantly through various policy efforts to secure donors; however, since 2018, the country has faced a donor shortage. LVADs implantation has increased markedly, corresponding directly with the expansion of national insurance reimbursement coverage in recent years.²⁴⁾ Specifically, the sharp increase in LVAD implantation following reimbursement approval demonstrates how policy interventions can effectively unlock access to life-saving therapies in patients with advanced HF. Nevertheless, the absolute number of patients receiving advanced HF therapies remains small relative to the overall HF population, indicating that these interventions alone cannot offset the broader societal burden of HF.

Taken together, our findings illustrate a shift in HF from an acutely fatal condition to a chronic disease associated with prolonged survival, frequent hospitalization, and high long-term mortality. This epidemiological transition has important implications in healthcare planning. Strategies that focus solely on acute management are unlikely to adequately address the increasing burden of HF. Instead, comprehensive approaches encompassing prevention, early diagnosis, chronic disease management, and the coordinated care of multimorbidities are required. At the policy level, these results underscore the need for healthcare systems to prepare for a sustained increase in HF-related resource utilization, particularly among older adults. Population-based data, such as those presented here, are essential for informing the rational allocation of medical resources and designing effective public health interventions.

This study has several limitations. First, detailed clinical information such as left ventricular ejection fraction, symptom severity, and laboratory findings was not available, limiting phenotype-specific and severity-based analyses. Second, HF was identified using administrative claims data, which may have been subject to misclassification. Although validated algorithms for identifying HF using claims data have shown acceptable to high validity, limitations related to phenotypic accuracy remain, particularly for patients managed in outpatient settings.²⁵⁾ As demonstrated in prior systematic reviews, improving the validity of HF research using claims data requires harmonization with clinical data sources, such as medical records or registries. Accordingly, similar to efforts in other countries, coordinated initiatives at both the academic society and national levels are needed in Korea to

integrate administrative claims data with detailed clinical datasets. Third, changes in diagnostic practices and treatment guidelines over time may have influenced the observed temporal trends. Despite these limitations, the use of nationwide longitudinal data with complete mortality linkage provides a robust assessment of HF epidemiology at the population level. Moreover, the consistency of our findings with the international data supports the external validity of the observed epidemiological patterns.

In conclusion, the burden of HF in Korea has increased substantially over the past two decades, driven by population aging and improved survival. Although short-term outcomes have improved, hospitalization and long-term mortality rates have remained high. These findings highlight the need for comprehensive strategies encompassing prevention, chronic disease management, and health system preparedness to address the growing impact of HF on aging societies.

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Conflict of Interest

Chan Joo Lee serves as an associate editor of the *International Journal of Heart Failure*, but has no role in the decision to publish this article. Except for that, no potential conflict of interest relevant to this article was reported.

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SUPPLEMENTARY MATERIALS

Supplementary Table 1

The KCD codes for comorbidities

Supplementary Figure 1

Temporal trend of age-standardized heart failure mortality rate.

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