



The heart failure burden: What national administrative data reveal about an unseen epidemic

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Heart failure (HF) is one of the leading causes of hospitalisations worldwide and is associated with relatively high mortality rates and poor clinical outcomes [1]. However, the burden of HF is not uniform, with considerable heterogeneity between regions regarding prevalence, incidence, and hospitalisation rates of HF. [1] These differences may influence regional management practices and health care delivery. Therefore, disaggregated data between and within countries are essential to inform national and regional public policy regarding HF management. National registries, or other comprehensive sources of nationwide HF data, provide important epidemiologic insight to support these efforts. In the absence of a national HF registry, investigations into HF prevalence and management become more challenging as it is difficult to fully capture the real-world representation of HF hospital burden and clinical outcomes. In this study, 'Heart Failure Hospitalization in Romania – A national multiannual study based on administrative dataset collection', Chioncel et al. [2] examine the national burden of HF hospitalisations and associated outcomes in Romania using retrospective, aggregated data.

The authors conducted a retrospective real-world study using nationwide aggregated data from diagnosis-related group (DRG) databases from private and public hospitals in Romania between 2017 and 2022. Patients of any age with a primary or secondary diagnosis code for HF were included. Data on age distribution, length of stay, in-hospital mortality, and readmission frequency were collected for annual HF cohorts across the study period. To evaluate the impact of the COVID-19 pandemic, a binary-time indicator was applied to pooled annual hospitalisation counts from the pre-pandemic period (2017–2019) and the COVID-19 pandemic period (2020–2022). Outcomes, including total hospitalisations, HF-related hospitalisations, and HF hospitalisations with HF as the primary diagnosis, were compared between the two periods, with the odds ratio calculated for each outcome.

Between 2017 and 2022, more than 500 public and private hospitals in Romania annually reported DRG cases, with over 300 reporting hospitalisations involving HF as a primary or secondary diagnosis. Across the 6-year study period, HF listed as either a

primary or secondary diagnosis accounted for 12.3%–14.3% of all hospitalisations, representing a substantial share of hospital activity. Furthermore, among patients with HF as the primary diagnosis, subsequent admissions reflected a high burden of rehospitalisation during follow-up. Patients with HF averaged 1.4 hospitalisations per year, with a mean length of stay of 6.7 days (median 6 days). The population was predominantly older, with a mean age of 70.1 ± 10.4 years. However, younger patients under the age of 65 still notably accounted for 30% of hospitalised HF patients. The onset of the COVID-19 pandemic was associated with a substantial decline in both total hospitalisations and HF-related cases. Compared to the pre-pandemic period (2017–2019), total hospitalisations fell markedly in 2020–2021, with partial recovery in 2022, while HF hospitalizations demonstrated a similar but more pronounced decline. HF as the primary diagnosis, which accounted for 1.8%–2.7% of all hospitalisations, notably declined by approximately half during the pandemic years. Correspondingly, both HF-related hospital episodes and the number of HF patients decreased sharply during this time. In-hospital mortality for HF during the pre-pandemic era ranged from 4.0% to 4.3%, approximately twice that observed across all hospitalisations. These rates rose sharply during the pandemic, reaching 8.1% in 2020 and 9.8% in 2021. Lastly, among patients hospitalised with HF as the primary diagnosis, rehospitalisation during follow-up was common but often due to non-HF causes.

Multiple important insights emerge from this study. HF represents a substantial proportion of hospitalisations in Romania, imposing a heavy burden on the health care system. These findings reflect a consistent global pattern and underscore the significant worldwide burden of HF. Although the prognosis of HF patients has improved over the last several decades, HF continues to be associated with poor short- and long-term outcomes [3] highlighting the need for optimisation of AHF management. Achieving euvolemia through augmented diuresis is the cornerstone of AHF management to decrease mortality and HF-related complications. [4] However, optimal decongestion in the real-world remains challenging. [4,5] While intravenous (IV) diuretics have long been the mainstay of AHF management, adjunctive decongestive therapies, such as vasodilators and inotropes, remain underutilised despite evidence supporting their proven efficacy in facilitating decongestion. [4] Consequently, inconsistent application of these therapies contributes to variable and often suboptimal decongestion. Subsequent residual congestion is strongly linked to increased mortality and rehospitalisation rates, further exacerbating the burden of AHF on health care systems, as

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highlighted by Chioncel et al. An underrecognised phenomenon that further contributes to residual congestion is diuretic resistance. [6] In these cases, failure of the nephrons to increase fluid and sodium often necessitates high-dose diuretics; however, transient worsening of renal function can lead to hesitancy in escalating doses of diuretics, perpetuating residual congestion and adverse outcomes. Taken together, these challenges underscore the need for more standardised, evidence-based strategies to optimise decongestion, improve clinical outcomes, and lessen the systemic burden of HF on health care.

Another key pillar of AHF management is guideline-directed medical therapy (GDMT). GDMT is central to HF management, improving cardiovascular outcomes and reducing HF rehospitalisation and mortality by targeting the underlying pathophysiologic mechanisms that drive congestion and volume overload. [7] Activation of the sympathetic system and the renin-angiotensin-aldosterone system (RAAS) plays a critical role in perpetuating HF progression and congestion. [8] The foundational components of GDMT, including RAAS inhibitors, mineralocorticoid receptor antagonists, sodium-glucose cotransporter-2 inhibitors, and beta-blockers, block these maladaptive pathways, thereby breaking the cycle of neurohormonal activation [7]. Importantly, beyond their disease-modifying effects, these therapies have also been shown to facilitate decongestion and improve cardiovascular outcomes. The landmark STRONG-HF trial demonstrated that early in-hospital initiation and rapid up-titration of GDMT not only enhanced clinical decongestion but also reduced HF readmissions and all-cause mortality. [7] Moreover, this strategy was associated with sustained decongestion following discharge, in contrast to standard care, which was often characterised by recurrent congestion and weight gain. As highlighted by Chioncel et al. [2], patients hospitalised with HF as the primary diagnosis across Romanian hospitals experience a substantial burden of rehospitalisation. In this context, early initiation and rapid optimisation of GDMT represent a critical opportunity to reduce rehospitalisation rates, improve mortality, and ultimately lessen the overall burden of HF.

The final important consideration this study brings to light is that close follow-up is key in HF patients. Restrictions in health care access during the COVID-19 pandemic likely contributed to the observed decline in hospital admissions across Romanian hospitals reported in this study during this period. The corresponding doubling of in-hospital mortality rates during the pandemic era compared to the pre-pandemic era underscores the detrimental effects of limited health care access and the importance of timely care on HF outcomes. Even in the post-pandemic era, achieving the close follow-up required to optimise GDMT and monitor HF progression remains challenging, [7] highlighting the need for improved care accessibility in already inundated health care systems. One promising approach is remote patient monitoring (RPM). Using novel non-invasive devices combined with machine-learning algorithms, RPM devices can track parameters, such as blood pressure, weight, and pulse oximetry, to detect early signals of decompensation that may not be perceptible to the clinician. [9] Non-invasive RPM devices, such as the Bodyport

smart scale and the Cardiosense wearable patch, offer safe, low-cost means to monitor patients' clinical status outside of traditional clinical encounters. [10,11] While no technology has been widely adopted yet and evidence supporting their effectiveness in reducing hospitalisations has been mixed, [9,12] RPM remains an evolving field, with ongoing research exploring the factors that influence its efficacy. Furthermore, the integration of artificial intelligence and machine-learning algorithms to interpret RPM data remains in relatively early development but holds significant promise for alerting clinicians to early signs of decompensation. [9] Although optimal strategies are still being defined, RPM represents a potential low-cost, non-invasive tool to improve outcomes and reduce HF-related hospitalisations by providing an alternative avenue for close patient monitoring when traditional encounters are unavailable.

Overall, Chioncel et al. [2] provide valuable insights into the substantial burden of HF hospitalisations in Romania, reflecting a pattern that is observed globally. Their findings reflect underlying, persistent challenges in HF management that continue to put strain on health care systems, including residual congestion that contributes to HF readmissions and mortality, as well as the detrimental impact of limited health care access. Addressing these gaps will require a multipronged approach. First, there remains an unmet need for safe and effective decongestion strategies to achieve complete decongestion in hospitalised HF patients. In parallel, early initiation and rapid up-titration of GDMT is crucial in aiding decongestion and improving cardiovascular outcomes through mitigation of neurohormonal activation. Beyond optimisation of medical therapy, further exploration into strategies to expand access to care and close follow-up, potentially through emerging innovative modalities such as RPM, will be critical to optimising these foundational aspects of HF management. As HF continues to impose substantial morbidity, mortality, and economic burden, these strategies represent key opportunities to improve outcomes, reduce rehospitalisations, and ultimately transform the management of HF at both national and global levels. Continued research, standardised implementation of evidence-based therapies, and integration of technology-driven monitoring will be essential to meet the evolving needs of this high-risk population.

Conflicts of Interest

The authors have each completed the International Committee of Medical Journal Editors Form for uniform Disclosure of Potential Conflicts of Interest. No authors have any potential conflict of interest to disclose.

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