

**Title:** Survival in people with heart failure and atrial fibrillation

**Topic:** D - Heart failure

**Category:** Bedside

**Options:** Young Investigator Award option (population sciences) [First author under 40 years old]

**Trial registration:** The study protocol was approved by the independent scientific advisory committee (ISAC) to the Medicine and Healthcare products Regulatory Authority (protocol number 19\_125).

**Funding acknowledgements:** This study was undertaken as part of NRJ's Wellcome Trust doctoral research fellowship (grant number 203921/Z/16/Z) with additional funding from the National Institute for Health Research (NIHR) Collaboration for Leadership in Applied Health Research and Care (CLAHRC) Oxford at Oxford Health NHS Foundation Trust (P2-001). The funders did not have any role in the design of the study, analysis and interpretation of the data, or writing of the results for publication.

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## Abstract

**Background:** People with chronic heart failure (HF) have a poor prognosis, with survival rates at five year follow-up close to 50%.<sup>1</sup> More than half of patients with HF will develop atrial fibrillation (AF). The presence of AF in people with HF has been associated with a poor prognosis, irrespective of left ventricular ejection fraction.<sup>2,3</sup> However, the majority of studies to date have analysed prognosis among secondary care cohorts or randomised trial participants, who may not be representative of patients with chronic HF in the community.<sup>2</sup>

**Purpose:** To examine the association between survival in patients with HF and AF compared to either condition alone, among a large primary care cohort.

**Methods:** We extracted data from the Clinical Practice Research Datalink of primary care records from 1<sup>st</sup> January 2000 to 31<sup>st</sup> December 2018 and included all patients aged 45 years and over who were registered at an up-to-standard practice for a minimum of 12 months. Records were linked to Hospital Episode Statistics for secondary care data. The primary outcome was all-cause mortality. Exposure groups were defined as HF+AF, HF or AF, with exposure status treated as a time-varying covariate across follow-up. We used Kaplan-Meier curves to compare survival in people with HF and AF, compared to people with either condition alone or neither. We also report a Cox regression model for risk of all-cause mortality among people with HF and AF, adjusting for age, sex, ethnicity, smoking status and comorbid cardiovascular disease.

**Results:** There were 314,042 deaths during the study follow-up. The average age of participants was 58.0 years (SD 10.6) and 51.4% were women. In an unadjusted Cox regression analysis, people with HF and AF were at the greatest risk of death (HR 5.48, 95% CI 5.37 to 5.59), followed by people with HF alone (HR 5.09, 95%CI 5.01 to 5.17), and AF alone (HR 3.39, 95%CI 3.33 to 3.44) compared to people with neither HF nor AF. However, in the fully adjusted analysis, the risk of death was similar among people with HF and AF (HR 1.30, 95% CI 1.27 to 1.33) compared to people with HF alone (HR 1.36, 95% CI 1.34 to

1.39), though it remained higher than the risk in people with AF alone (HR 1.12, 95% CI 1.10 to 1.14). In a cumulative hazard plot, the risk of death across follow-up was similar among people with HF and AF, compared to those with HF alone.

**Conclusion:** In our large community cohort, we found HF and AF was associated with a worse prognosis than either condition alone. Further research could aim to identify preventive strategies that might improve prognosis among this high-risk group of patients.