



# Heart failure mortality in relation to unequal access to Renin-Angiotensin system blocking therapy.

## A register based study

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**1. Conclusion:** Therapy with Renin-Angiotensin system blockade is beneficial for survival in HF patients regardless of sex or age. Yet older patients and women receive less of these drugs. In this unselected cohort of real world HF patients, lack of access to RAS blockade increases HF specific mortality in all age strata and in both sexes. Adherence to HF treatment guidelines need to be improved.

**3. Methods:** Register data of all adult Swedish patients hospitalized for HF in 2006-2010 were analyzed by cox regression models to produce crude and adjusted HRs for death from HF due to lack of RAS blockade, sex and age. Stratified HRs were also computed.

Hazard Ratio for death from heart failure	
N = 73 666	HR (95% CI)
Female sex	1.09 (1.03-1.15)**
Lack of RAS-blockade	1.76 (1.66-1.87)***
Age 20-64	ref
Age 65-74	1.24 (0.99-1.55)ns
Age 75-84	3.10 (2.56-3.76)***
Age 85+	5.93 (4.90-7.18)***

Hazard Ratios adjusted for age or sex and comorbidity with hypertension, other heart disease, renal failure, diabetes mellitus, lung disease, cerebrovascular disease, and cancer; and treatment with beta blocker and mineralocorticoid receptor antagonist.  
RAS blockade, Renin-Angiotensin system blockade.  
\*p< 0.05, \*\*p< 0.01, \*\*\*p< 0.001

**2. Background:** Not all eligible patients receive treatment with Renin-Angiotensin system (RAS) blockade despite well established mortality reductions. Clinical trials and community based studies have confirmed effects in both sexes and in older patients. The role of RAS blockade in women is still unsettled. This is the first large scale real world study to investigate effects of sex, age and RAS blockade on HF specific mortality in a Swedish setting. Previously published data from the same cohort revealed lower access to RAS blockade in women, elderly, and unemployed HF patients.\*

**4. Results:** A total of 51 % of patients received RAS blocking therapy. A lack of RAS blockade independently increased the risk of death from HF by 75 %. The risk associated with lack of RAS blockade was significantly increased for both sexes. The oldest patients also had a significantly increased risk of HF death associated with lack of RAS blockade.

Our results suggest that sex and age inequity in treatment has important implications for HF mortality. The role of socio-economic inequity in mortality remains to be investigated in future studies.