

Prevalence and Excess Risk of Hospitalization in Heart Failure with Reduced Ejection Fraction

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BACKGROUND

- In 2022, the revised AHA/ACC/HFSA guidelines recognized worsening HF (WHF) as a trajectory defined by worsening symptoms, signs, or functional capacity.¹
- Among patients with HF with reduced ejection fraction (HFrEF), two established risk factors for cardiovascular (CV) death and hospitalization for HF are:
 - WHF
 - ≥ 10 -point lower left ventricular ejection fraction (LVEF)²

HYPOTHESIS

- Patients with HFrEF who have WHF and LVEF $\leq 30\%$ represent a high-risk HFrEF group that makes up a relatively small percentage of the overall HF population yet accounts for a disproportionately large share of the >1 million annual HF hospitalizations in the USA.

METHODS

- To perform this literature synthesis, we evaluated reported statistics³ and US 2020 Census data⁴ to estimate the prevalence of three groups in patients aged ≥ 20 years:
 - Overall HF³
 - HFrEF⁵
 - A third, higher-risk subgroup of HFrEF with LVEF $\leq 30\%$ ⁵
- To these groups, we then applied WHF rates reported for the ACC PINNACLE Registry.⁶
 - For the purpose of this analysis, WHF was defined as having an HF event within the 6–12 prior months, excluding de novo events.
 - HF events were often hospitalization, but also included emergency/urgent use of intravenous diuretics.
- Similarly, using US-reported HF-related hospitalizations,⁷ we applied literature-based event rates or risk rates for the same subgroups,^{2,8,9} to determine national estimates.
 - CV death data were excluded but assumed to have similar risk.

RESULTS

- For HF prevalence (**Figure 1, Table 1**), with an estimated US prevalence of 1810 adults with HF per 100,000 population,³ we estimated HFrEF prevalence rates of 882 per 100,000, including LVEF $\leq 30\%$ prevalence of 634 (72% of HFrEF; 35% of all HF).⁵
 - Within HFrEF, WHF prevalence was estimated at 168 per 100,000 including 126 having LVEF $\leq 30\%$ (7% of all HF).⁶
- For hospitalizations (**Figure 2, Table 2**), among 343 HF hospitalizations per 100,000 population,⁷ 263 (76.7%) were for patients with WHF, the remainder were de novo.⁸ HF hospitalization rates were estimated at 206 for HFrEF overall and 158 for HFrEF with WHF vs 161 and 124 for LVEF $\leq 30\%$ overall and LVEF $\leq 30\%$ with WHF, respectively.^{2,9}
- The higher-risk group with both WHF and LVEF $\leq 30\%$ comprised 7% of patients with HF yet accounted for 36% of all HF hospitalizations (p <0.0001), an excess risk of 416% relative to the average patient with HF (**Figure 3**).

Figure 1. Estimating prevalence of the three risk groups

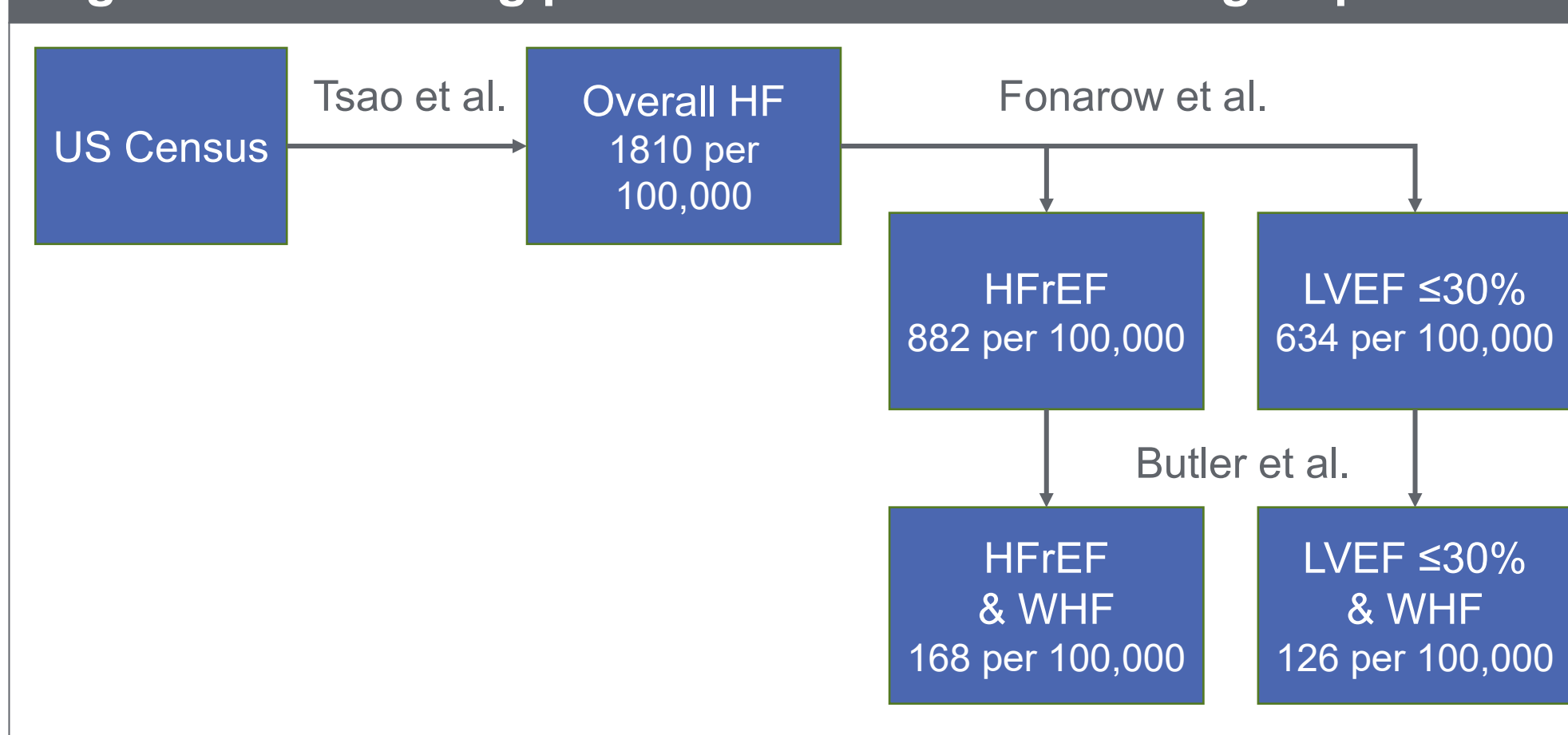


Table 1. Estimated prevalence of the three risk groups

| | Prevalence per 100,000 | | Proportion | | Data source |
|------------------|------------------------|-----|------------|------|---|
| | Overall | WHF | Overall | WHF | |
| HF | 1810 | | 100% | | Tsao, ³ Census ⁴ |
| HFrEF | 882 | 168 | 49% | 9.3% | Fonarow ⁵ |
| LVEF $\leq 30\%$ | 634 | 126 | 35% | 7.0% | Fonarow, ⁵ Butler ⁶ |

Figure 2. Estimating rates of hospitalization for HF

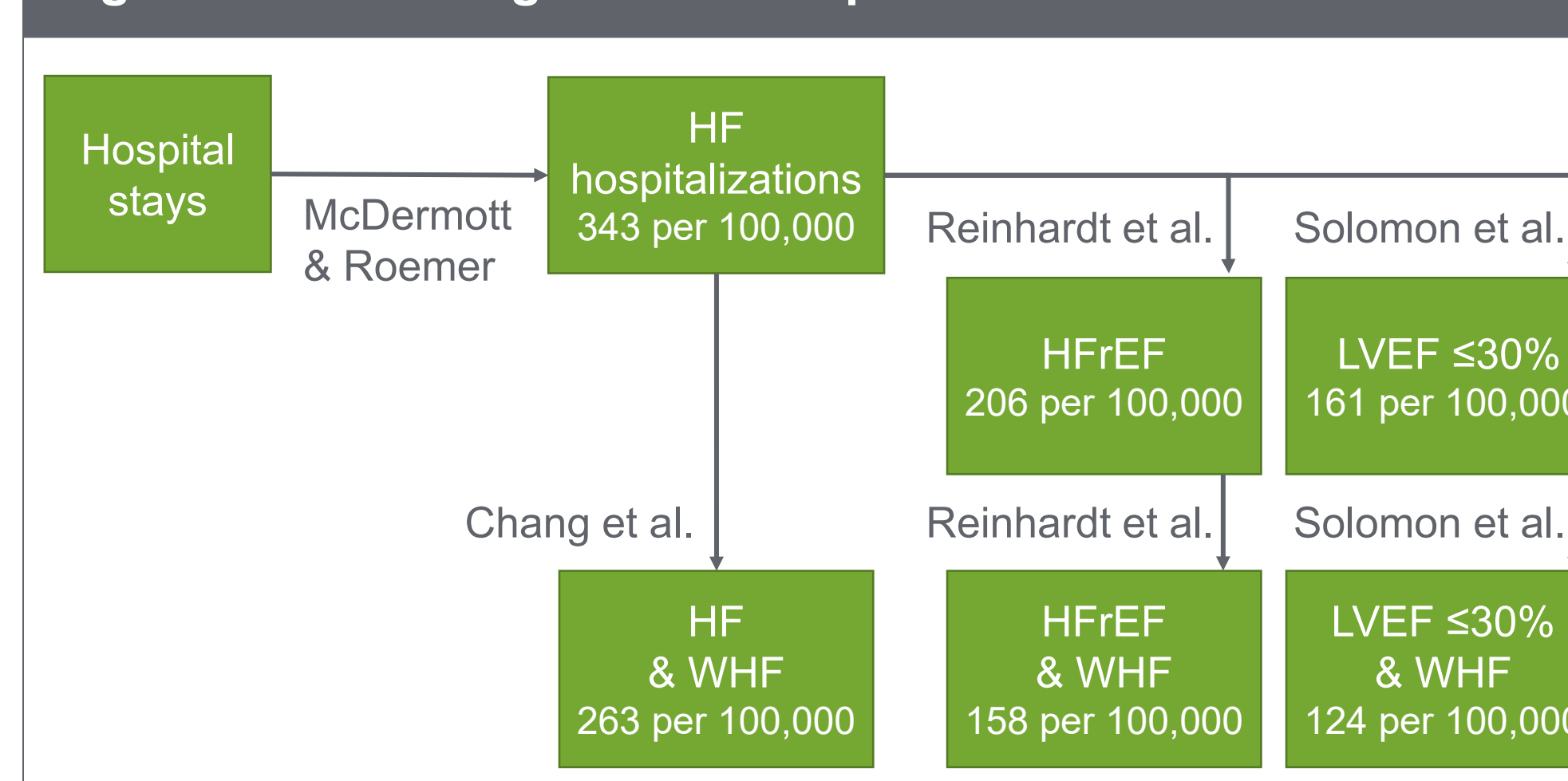
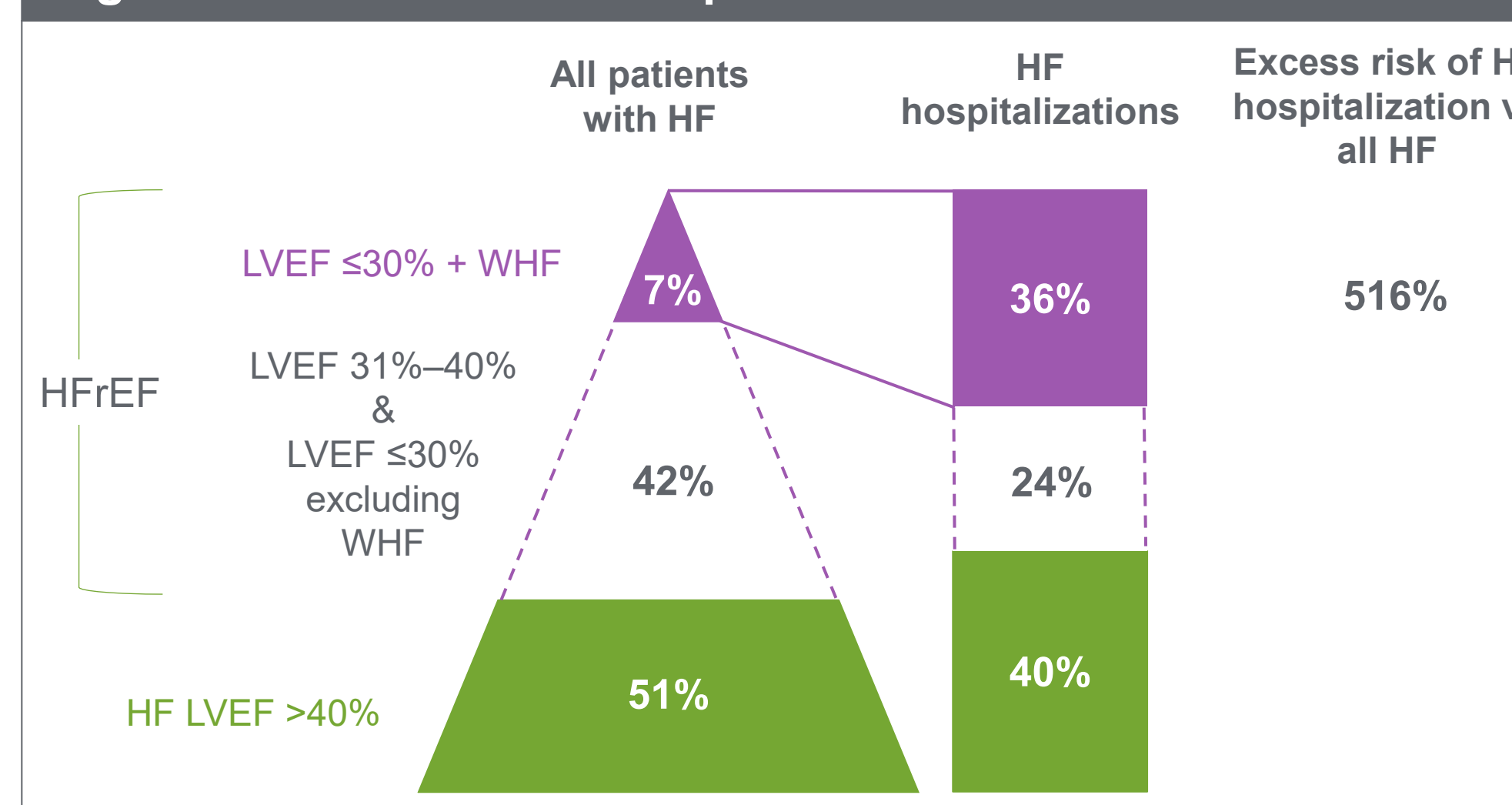


Table 2. Estimated HF hospitalizations for the three risk groups

| | HFH per 100,000 | | Proportion | | Data source |
|------------------|-----------------|-----|------------|-------|---------------------------------------|
| | Overall | WHF | Overall % | WHF % | |
| HF | 343 | 263 | 100% | 76.7% | Chang, ⁸ HCUP ⁷ |
| HFrEF | 206 | 158 | 60% | 46.0% | Reinhardt ⁹ |
| LVEF $\leq 30\%$ | 161 | 124 | 47% | 36.0% | Solomon ² |

HCUP, Healthcare Cost and Utilization Project; HFH, hospitalization for heart failure

Figure 3. Excess risk of hospitalization for HF



Pyramid shows the proportion of patients with HF by subgroups with reduced LVEF. The purple section indicates the group with LVEF ≤ 30 and WHF. These patients make up 7% of the population with HF, yet account for an estimated 36% of hospitalizations for HF.

CONCLUSIONS

- Patients with WHF and LVEF $\leq 30\%$ are a small proportion of the total HF population yet account for more than one-third of all HF hospitalizations, with >4 -fold disproportionate risk of HF hospitalization vs the average patient with HF.
- Improved quality, outcomes, value, and efficiency may be fostered by focusing resources toward this easily identifiable subgroup of patients with HF, to help achieve full dose and range of guideline-directed treatments, with consideration of new treatment options, especially when tolerability challenges arise.

Contact information

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