

Disease Stability in COPD: A Longitudinal Analysis of the Swedish National Airway Register

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Rationale:

The emerging concept of disease stability in COPD as proposed by the GOLD 2026 document integrates lung function, symptoms, and exacerbations into a multidimensional state defined by the absence of clinically meaningful deterioration in these domains. However, disease stability in real-world COPD populations remains unexplored.

Methods:

We performed a retrospective longitudinal cohort study using data from the Swedish National Airway Register including patients ≥ 18 years with COPD and repeated measurements of FEV₁, COPD Assessment Test (CAT), and exacerbations between 2013–2024. Stability was assessed over 6- and 12-month windows. Disease stability was defined as no exacerbations, CAT score change < 2 points, and absolute FEV₁ change < 0.10 L from baseline. Transitions between stable and unstable states were evaluated longitudinally, and determinants of stability were identified using logistic regression models.

Results:

Among 123,163 registered individuals, 7,648 met inclusion criteria with complete data. Mean age was 69 ± 9 years, 57% were female, and mean FEV₁% predicted 56 ± 18 %. Over 6 months, only 11% achieved stability, declining to 8% at 12 months. Figure 1 illustrates the marked variability across components: at 6 months, 73% were exacerbation-free, 48% maintained stable symptoms, and only 26% met the FEV₁ stability threshold. Similar patterns were observed at 12 months, underscoring lung function as the most labile component. Of those stable at 6 months, 61% remained stable at 12 months. In multivariable logistic regression, higher lung function and codiagnosis of asthma was independently associated with increased odds of achieving stability at both 6- and 12-month windows. Conversely, heavy smoking history (≥ 20 pack-years), obesity and comorbidity were associated with lower odds of stability.

Conclusions:

In routine clinical practice, COPD stability—across lung function, symptoms, and exacerbations—is rare and often transient. Exacerbation-free status is common, but physiological and symptomatic stability are less so, suggesting that disease stability is multidimensional and fragile.

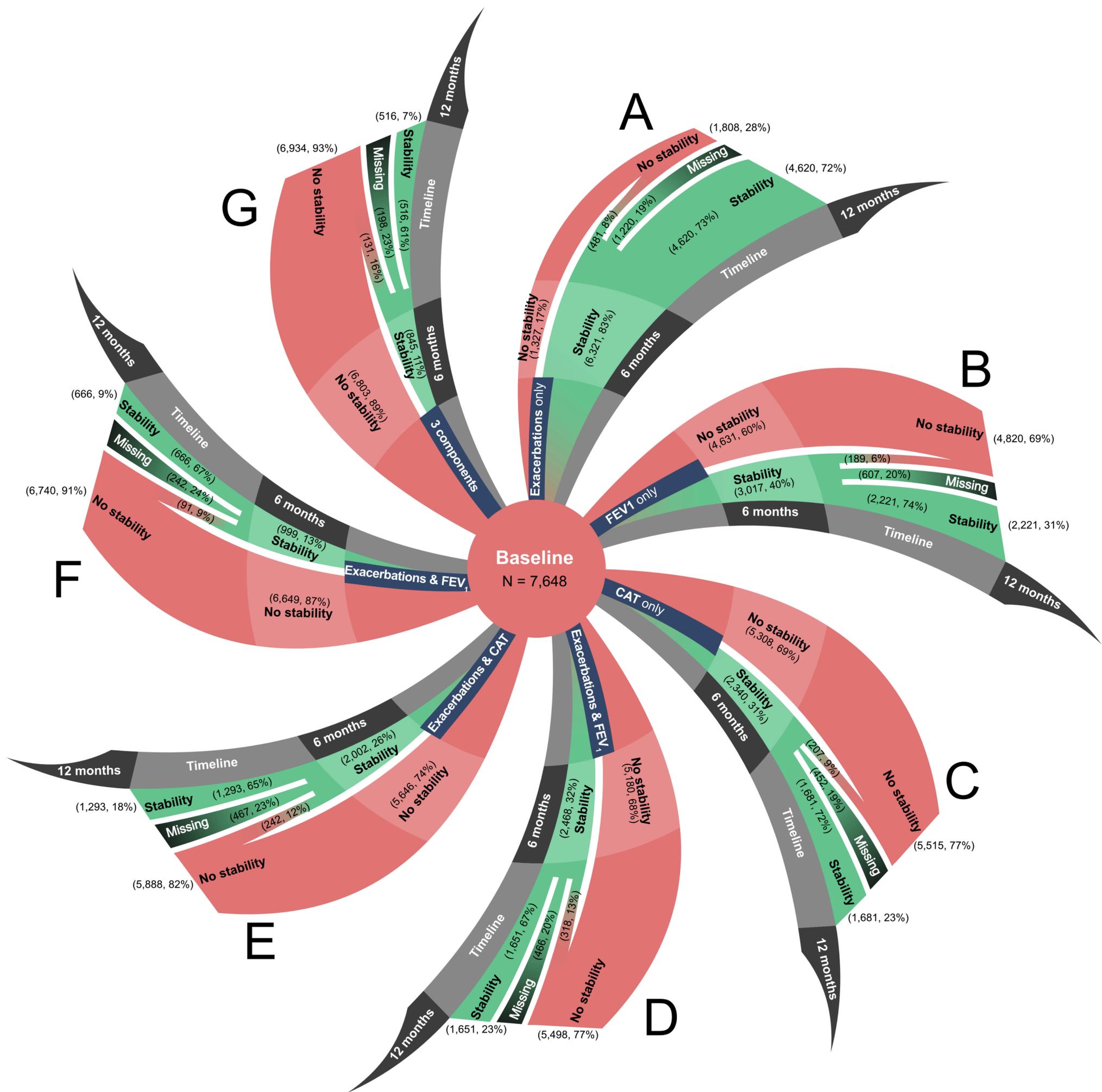


Figure 1: Proportion of patients achieving clinical stability at 6 and 12 months time windows according to seven stability definitions (A–G). Each petal represents one definition, starting from the baseline cohort (N = 7,648). Green segments indicate patients achieving stability and red segments indicate no stability. Stability definitions: (A) Only exacerbations, (B) Only $\Delta FEV_1 < 0.10$ L, (C) Only ΔCAT score < 2 , (D) Exacerbations & $\Delta FEV_1 < 0.10$ L, (E) Exacerbations & ΔCAT score < 2 , (F) $\Delta FEV_1 < 0.10$ L & ΔCAT score < 2 , (G) All measures combined. Data is presented as (n, %). Percentages shown within each segment denote the proportion of patients within that branch relative to the total baseline population.