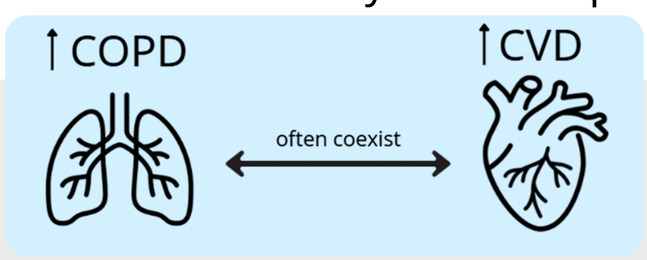
Mortality in COPD and Cardiovascular Disease Comorbidity

Rabahi MF[1]; Oliveira JCB[2]

Introduction

COPD is responsible for a wide range of comorbidities, among which cardiovascular disease (CVD) stands out as the most serious and life-threatening. **COPD often worsens the prognosis of CVD**, and growing evidence suggests it may also contribute to its development. **Patients with COPD have a higher risk of CVD** than the general population or matched controls, indicating that this association extends beyond simple coexistence [1].



Objective

This study aimed to **quantify the impact of CVD on all-cause mortality among Brazilian COPD patients** using ten-year real-world data from the public health system.

Methodology

A retrospective cohort analysis was conducted using the NEXUS administrative database [2]. The study included **54,950 adults** aged over 40 years, who received at least one specialized COPD medication from the Brazilian Unified Health System (SUS) **between January 2015 and December 2019.** Patients were followed until December 31, 2024, and classified as CVD-positive (CVD+) if any cardiovascular diagnosis was recorded at baseline or during follow-up, or CVD-negative (CVD-) otherwise. Overall survival was estimated separately for males and females using the **Kaplan-Meier method**. Within each sex, survival curves for the CVD+ and CVD- groups were compared using log-rank tests.

Conclusion

In this real-world Brazilian cohort, cardiovascular disease nearly tripled the ten-year in patient mortality risk in COPD patients, regardless of sex. These findings emphasize the urgent need for an integrated task-force cardiovascular-respiratory care pathways to reduce mortality in this vulnerable population.

Results

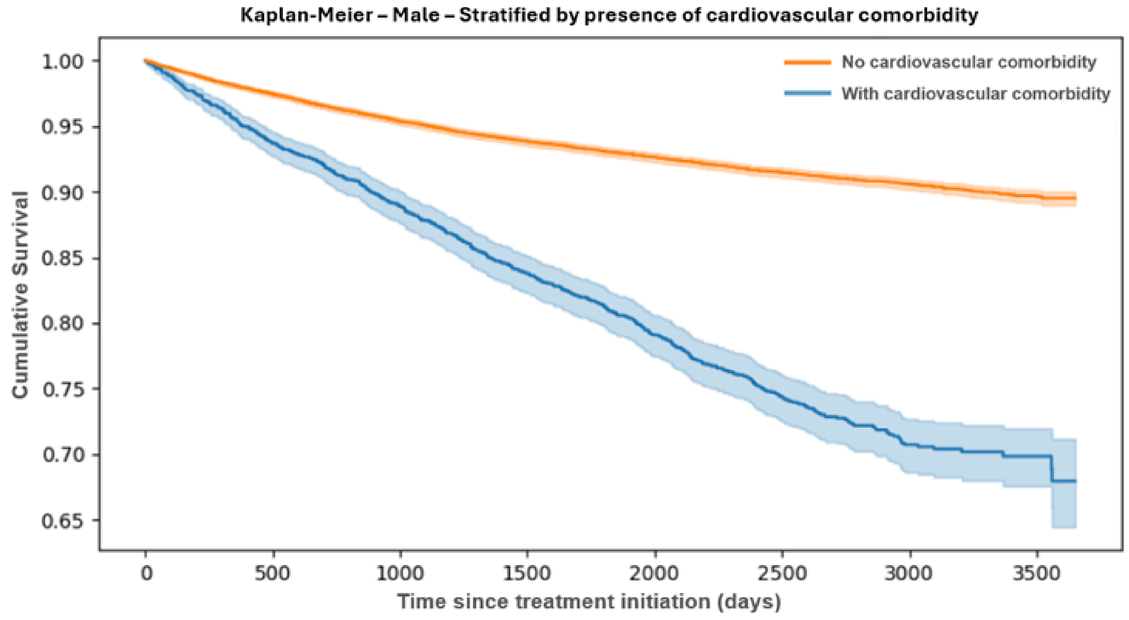
Of a total of **54,950 patients**, 5,238 (9.5%) had CVD. CVD+ patients demonstrated significantly higher inpatient mortality across both sexes.

54,950	5,238 (9.5%)	49.5% / 50.5%	66.3
COPD Patients	CVD Patients	Male / Female	Mean Age (SD 10.88)

Males

In **males** (Figure 1), inpatient mortality was 25.8% (676/2,616) for CVD+ vs. 8.8% (2,157/24,546) for CVD- patients (HR=3.236, 95% CI: 2.968-3.528; p<0.001).

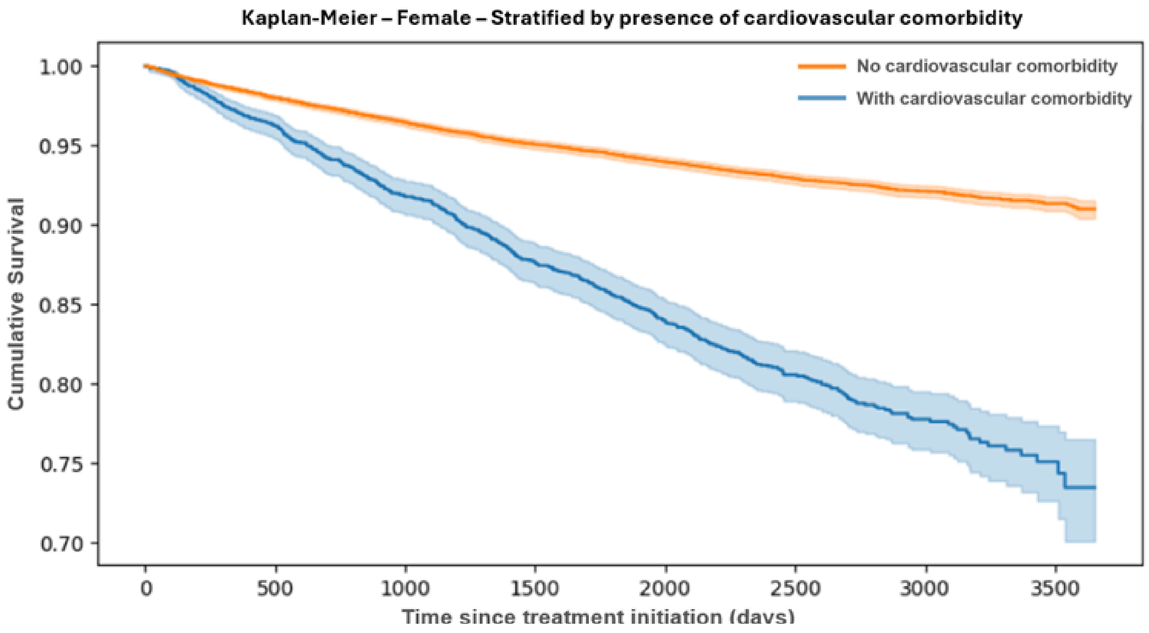
Figure 1. Mortality of Male Patients with COPD according to CVD morbidity, Brazil, 2015-2024



Females

In **females** (Figure 2), inpatient mortality was 20.1% (525/2,615) for CVD+ vs. 7.3% (1,825/25,133) for CVD- patients (HR=2.96, 95% CI: 2.69-3.26; p<0.001).

Figure 2. Mortality of Female Patients with COPD according to CVD morbidity, Brazil, 2015-2024



Discussion

CVD had a major impact on survival in COPD, **nearly tripling 10-year mortality risk**, in both sexes (HR 3.23 in males; 2.96 in females). This highlights the **bidirectional relationship between COPD and CVD,** where each condition worsens the prognosis of the other, creating a reinforcing cycle of disease burden. Early CVD detection and cardio-respiratory integrated care should be prioritized to reduce preventable deaths.

References

[1] Sá-Sousa, A.; Rodrigues, C.; Jácome, C.; Cardoso, J.; Fortuna, I.; Guimarães, M.; Pinto, P.; Sarmento, P. M.; Baptista, R. **Cardiovascular Risk in Patients with Chronic Obstructive Pulmonary Disease: A Systematic Review.** Journal of Clinical Medicine, v. 13, n. 17, p. 5173, 2024. DOI: 10.3390/jcm13175173. Available at: https://www.mdpi.com/2077-0383/13/17/5173

[2] Oliveira, J. C. B.; Julian, G.; Maruyama, J. M. **Data Standardization in Brazil: An OMOP Common Data Model Approach in a DATASUS Cohort**. Presentation at ISPOR Europe 2023, Copenhagen, Denmark, November 2023. Available at: https://www.ispor.org/docs/default-source/euro2023/isporeurope2023oliveirapt7poster133843-pdf.pdf?sfvrsn=e84ead06_0

www.precisiondata.ai