

The Clinical Journey of Chronic Pulmonary Patients Across Continents: An OMOP/OHDSI Network Observational Study

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Preliminary descriptive analysis | Additional harmonization and comparative analyses planned

Background

Cohort characterization using the OMOP Common Data Model (CDM) provides a standardized foundation for observational research. Hospitalized patients with chronic obstructive pulmonary disease (COPD) frequently have substantial cardiopulmonary comorbidity, acute complications, and complex healthcare utilization. As an initial output of the Hospital Israelita Albert Einstein (HIAE)–Johns Hopkins Medicine (JHM) collaboration, this preliminary study describes COPD hospitalization cohorts at a Brazilian private non-profit hospital and a US academic medical center. The objective is to establish a descriptive baseline for subsequent harmonized comparative analyses, rather than draw definitive conclusions about differences in clinical practice or outcomes.

Methods

This preliminary, parallel retrospective cohort characterization used electronic health record data mapped to the OMOP CDM and analyzed in OHDSI ATLAS at each institution. Institutional approvals were reported for HIAE (94734525.7.0000.0071) and JHM (IRB00445313). Adults aged 40 years or older were included based on qualifying hospitalization events with COPD-related diagnoses around the index admission. Both sites covered 2017–2025. Analyses examined demographics, Charlson Comorbidity Index (CCI), baseline conditions, inpatient diagnoses, medication exposures, procedures, prior utilization, mortality, and length of stay. HIAE also computed the Hospital Frailty Risk Score (HFRS). Temporal windows included historical and more proximal measures. Results are descriptive and remain subject to further harmonization of cohort definitions, measurement windows, and denominators. JHM reported 84,060 hospitalizations; HIAE reported 17,838 unique patients and 31,581 cohort records.

Preliminary results

Both cohorts had similar mean ages (JHM 69.7 years; HIAE 70.8 years). The descriptive results suggest cross-site differences in measured comorbidity burden, acute respiratory failure, mortality, utilization, and medication exposures. The values below reproduce those in the source abstract; differences should not yet be interpreted as adjusted or definitively comparable estimates.

Characteristic	JHM (Hopkins)	HIAE (Einstein)
Cohort size (as reported)	84,060 hospitalizations	17,838 patients; 31,581 cohort records
Study period	2017–2025	2017–2025
Mean age (years)	69.7 ± 11.1	70.8 ± 15.5
Sex (% male)	47.5%	52.3%
Mean Charlson Index	5.5 ± 3.1	2.97
Mean HFRS	Not computed	12.41
Mean LOS (days)	7.8 ± 12.4	Not reported
Hypertension	73%	62.0%

Coronary artery disease	48%	Not reported separately
Heart failure (CHF)	42%	Not reported separately
Hyperlipidemia	62%	41.8%
Type 2 diabetes	43%	Not reported separately
Nicotine dependence (remission)	58%	Not reported
Major depressive disorder	33%	Not reported
Pneumonia during hospitalization	40%	29.9%
Acute respiratory failure	38%	9.0%
Mortality (site-specific definitions to be harmonized)	12.0%	8.1%
30-day mortality	8.7%	4.3%
Prior outpatient visits (mean)	17.1	13.2
Prior inpatient visits (mean)	2.2	3.5
Prior ER visits (mean)	0.7	3.0

Note: Measures and denominators have not yet been fully harmonized across sites; “cohort records” should not be assumed equivalent to unique patients or hospitalizations without verification.

Utilization and prescribing patterns

Reported mean prior outpatient visits were higher at JHM (17.1 vs 13.2), whereas prior inpatient visits (2.2 vs 3.5) and emergency department visits (0.7 vs 3.0) were higher at HIAE. These are unadjusted descriptive measures and may reflect differences in care settings and data capture. Medication exposure patterns also differed: the poster lists acetaminophen, ondansetron, and fentanyl among common JHM exposures, and dipyrone, propofol, and fentanyl at HIAE. At JHM, reported short-acting bronchodilator exposures were lower at discharge than during hospitalization (SABA 63% vs 25%; SAMA 52% vs 15%). The different care settings and observation windows preclude inferring a medication reconciliation gap from these preliminary figures.

Limitations and areas for further analysis

This is a preliminary, descriptive, non-causal analysis. Cohort construction, patient-versus-hospitalization denominators, observation windows, coding practices, and completeness of EHR capture may differ across sites. The mortality row currently combines site-specific terminology (“in-hospital / overall mortality”); harmonization will clarify definitions and ascertainment periods. Pneumonia prevalence differs between the poster’s comparison table (40% JHM; 29.9% HIAE) and one of its figures (35% JHM; 31.9% HIAE); further analysis will determine whether these reflect different phenotypes or windows. Likewise, the proportion labeled COPD in a comorbidity visualization requires clarification relative to the COPD-related index cohort definition. The reported percentages and outcomes are retained as supplied, not reconciled by assumption. Further validation, denominator checks, and harmonized comparative analyses will clarify these points.

Conclusions

This preliminary bi-institutional OMOP/OHDSI analysis demonstrates the feasibility of cross-country cohort characterization and suggests differences in COPD-related disease burden and care patterns between the United States and Brazil. These descriptive observations are not definitive cross-system comparisons and require additional validation and harmonization of cohort definitions, denominators, and outcome measures. Further analyses will examine clinical pathways, treatment patterns, and patient outcomes within the ongoing HIAE–JHM collaboration.