Disparity in resource utilization and clinical outcome of lung diseases in the US

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Background and Objective

- Individuals of racial minorities have less access to high-quality medical treatment, which exacerbates disparities in the burden of lung disease
- To gain insights into gender and racial disparities with respect to resource utilization and clinical outcomes of patients with three prominent lung diseases – pneumonia, chronic obstructive pulmonary disease (COPD), and lung cancer.

Methodology

- A retrospective study using the Optum® de-identified Market Clarity Dataset (linked claims and electronic health records or EHR of patients) was done among adult (>=18 years) patients with 2 or more claims and/ or EHR with ICD-10 diagnosis code for Pneumonia at least 48 hours apart or ICD-10 diagnosis code for COPD or Lung cancer at least 30 days apart during 1st Jan 2019 to 30th Sep 2022.
- Index date was defined as the first claim or EHR encounter with a Pneumonia/ COPD/ Lung cancer diagnosis. Only incident patients with no Pneumonia/ COPD/Lung cancer diagnosis in claims or EHR encounter during preceding 12 months from index date were included.
- All patients were followed-up for 12 months from index date to examine the gender and racial disparities in disease-specific resource utilization pneumococcal or influenza vaccines[2], smoking cessation counselling[1], antibiotics[3] within 2 days of pneumonia diagnosis, anti-cancer[4] treatment within 60 days of lung cancer diagnosis, Palliative care[7], ICU care/mechanical ventilation[6], readmission rate (admission for the disease within 30 days of previous discharge) and clinical outcome[5] in different cohorts using the appropriate medical codes.
- Additionally, lung cancer patients who took genetic testing were identified using clinical notes, and COPD patients who used steroid-based maintenance therapy were identified using NDC codes and followed for 12 months to explore racial, and insurance type disparity.

Demographic characteristic	Pneumonia Cohort (n-293,898)	COPD Cohort (n-184,063)	Lung Cancer Cohort (n-6,540)
Gender			
Male	133,023	83,250	2,864
Female	160,875	100,813	3,676
Race / Ethnicity			
African American	40,614	22,320	674
Caucasian	188,408	129,983	4,723
Insurance type			
Commercial	157,127	75,415	3,311
Medicare	84,870	74,412	2,655
Medicaid	51,901	34,236	574

Results

Pneumonia Cohort

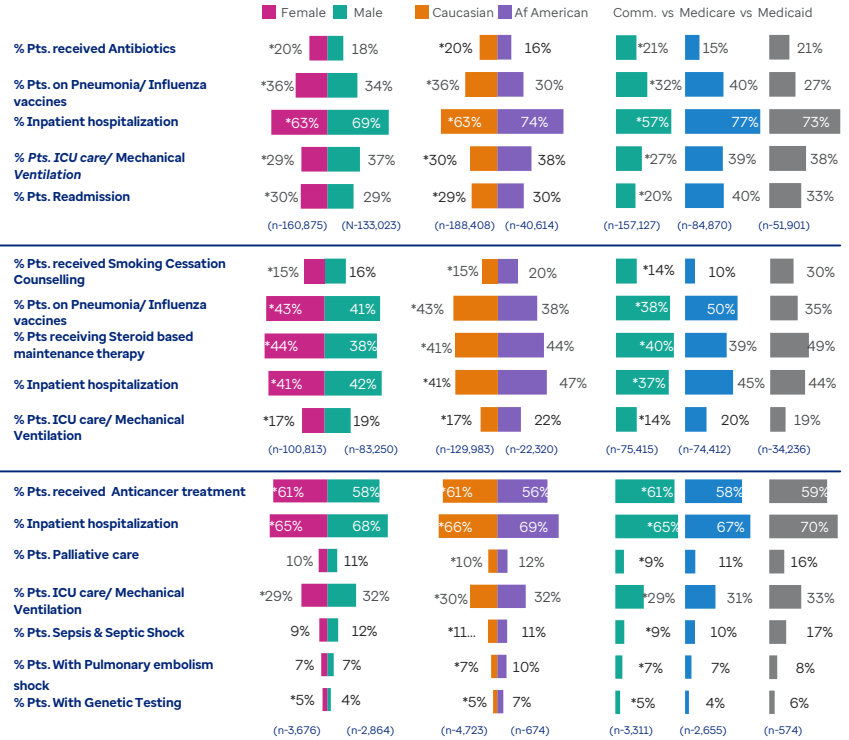
- In the Pneumonia cohort (n=293,898), significant differences were observed for all the metrics at gender, race, and insurance type; Medicare patients received significantly lower antibiotics within two days of 1st diagnosis as compared to other two – Commercial and Medicaid patients. during the follow up period. significantly fewer males and African Americans received Pneumococcal/ influenza vaccines
- Substantial variation was witnessed in ICU Care/mechanical ventilation and readmission rates according to gender, race, and insurance types

COPD Cohort

- Treatment patterns varied significantly in the COPD cohort (n=184,063). While a higher proportion of female individuals and African Americans received steroid-based maintenance therapy, a smaller percentage of African Americans received influenza vaccine and smoking-related Pneumonia.
- Considerable variance was seen in the counseling provided for smoking cessation. A higher proportion of male, African American, and Medicaid patients received more counseling
- Significant variations in ICU care/mechanical ventilation were noted according to insurance type, gender, and ethnicity.

Lung Cancer Cohort

- In the lung cancer cohort (n=6,540), gender demonstrated no significant differences for various analyzing parameters when compared to the other two cohorts.
- Genetic testing demonstrated significant differences by gender, ethnicity & insurance type. A higher number of females went for genetic testing compared to males.
- Significant disparities in treatment type, inpatient hospitalization, palliative care, and clinical outcomes were explicitly demonstrated by the type of insurance. Medicaid patients experienced significantly higher inpatient hospitalization, ICU care/mechanical ventilation, and sepsis & shock as clinical outcomes than Commercial & Medicaid patients.



Conclusion and Limitation

- Study highlight existence of gender, racial disparity in treatment patterns and resource utilization of acute and chronic lung diseases. The study lacked certain socioeconomic variables, and did not account for differences in disease severity at presentation

* *Denotes significant difference (p<0.0001)* ***Af Am:*** *African American* **, *Cau:*** *Caucasian*, ***Comm:*** *Commercial*

1. Smoking Counselling patients - CPT codes (99406,99407) and NDC Codes(Nicotine, transdermal system, Nicotine polacrilex, gum and Nicotine, lozenge). **2**. Vaccines - CPT Codes(4040F,90653 to 90674,90732,90756) and NDC codes (Pneumococcal and Influenza vaccine). **3**. Antibiotics:: (macrolide,, tetracycline, fluroquinolone,, beta lactum). **4**. Anticancer drugs NDC Codes(Asparaginase, Sonidegib, Belinostat and others) & CPT Codes(Chemotherapy administration, subcutaneous or intramuscular, with or without local anesthesia, Chemotherapy, push technique, Home infusion for chemo etc.) **5**.Clinical Outcome: Sepsis & Septic shock(A40,A41,R65), Acute respiratory failure & ARDS(J80,J96.0,J96.2), Pulmonary embolism(I26). **6**. ICU/Mechanical ventilation: Procedure Codes & Revenue Codes .**7**. Palliative care: (ICD10 Z51.5; HCPCS codes G0031, G0034, G0048, G9988-G9999, M1017, and M1059)

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