

## **Supplementary material**

**Table S1: Search strategy**

#	Query	Results
S1	(MH "Medical Records Systems, Computerized+") OR (MH "Medical Record Linkage") OR (MH "Electronic Health Records+") OR (MH "Clinical Coding") OR (MH "International Classification of Diseases")	50,268
S2	(MH "Databases as Topic+")	151,665
S3	medical record linkage or medical records linkage or clinical coding or code or codes or coding or codelist* or codeset* or algorithm* or International Classification of Disease* or ICD* or ICD-10 or ICD-9 or ICD-9-CM or ICD 9 or ICD 10	712,365
S4	emr or electronic medical record* or ehr or electronic health record*	44,324
S5	(data* or record*) and (insurance or claim* or administrative or routine* or electr* or digit* or computer* or linked)	1,667,252
S6	S1 OR S2 OR S3 OR S4 OR S5	2,297,452
S7	(MH "Pulmonary Disease, Chronic Obstructive+")	53,773
S8	copd or chronic obstructive pulmonary disease or coad or chronic obstructive airway disease or chronic obstructive lung disease or emphysema or chronic bronchitis or chronic airflow obstruction* or airflow obstruction, chronic or chronic airway obstruction* or airway obstruction, chronic	114,337
S9	S7 OR S8	114,337
S10	S6 AND S9	1,226

Limiters – Date of Publication: 20180101-20191130;  
English Language; Human

**Table S2: Data extraction table**

<b>Variable</b>	<b>Variable value options</b>
<b>Core study details</b>	
PubMed ID	Free text
Article title	Free text
Study location (country)	Free text
Study design	Free text
Data source	Free text
Study aim	Free text
<b>Definition of COPD</b>	
Inclusion criteria notes	Free text
Coding scheme used	ICD-9, ICD-9-CM, ICD-10, ICD-10-CM, ICD-10-CA, Read code, DRG, ATC, Other code, Mix of above codes, No codes reported
Code set used	Free text
Age as criterion?	Y/N
Age - lower limit	Free text
Requirement of multiple claims?	Y/N
More weight to inpatient claims?	Y/N
Requirement of specific treatment?	Y/N
Requirement of spirometry?	Yes spirometry required but results not specified, Yes spirometry required and results specified, No
Requirement of ever-smoker?	Y/N
Exclusion criteria notes	Free text
Exclusion criteria: are patients with asthma excluded?	Y/N
<b>Definitions of COPD severity</b>	

COPD severity notes	Free text
Spirometry- binary	Y/N
Spirometry- ordinal	Y/N
Related to chronic medication use?	Y/N
Related to exacerbations?	Y/N
Other proxies of severity	Free text
<b>Definitions of COPD phenotype</b>	
COPD phenotype notes	Free text
Co-existing asthma	Y/N
Blood eosinophil level	Y/N
Exacerbators	Y/N
GOLD groups	Y/N
Other	Free text
<b>Quality appraisal</b>	
Does the study validate definitions used?	Y/N
Have the definitions used been validated previously in the same dataset used for the study?	Y/N
Other justification of validity?	Free text
Missing data: smoking	Smoking data missing, smoking data not missing, not reported
Missing data: spirometry	Spirometry data missing, spirometry data not missing, not reported
Missing data: other	Free text
Other limitations and measure to minimise limitations	Free text
Reference to RECORD statement	Y/N

**Table S3: Geographical distribution**

<b>Country</b>	<b>Number of studies</b>
USA	52
Taiwan	29
United Kingdom	20
Canada	15
Spain	11
Korea	9
China	7
Italy	6
Sweden	5
Denmark	4
Netherlands	4
Hong Kong	3
Australia	3
Israel	3
Belgium	2
Poland	2
Austria	2
France	2
Scotland	1
Norway and Germany	1
Ireland	1
Singapore	1
Germany	1
Turkey	1

**Table S4: Coding schemes used by studies**

<b>Coding scheme</b>	<b>Number of studies</b>
ICD-9-CM	52
ICD-10	35
No codes reported	28
Mix of other named categories	25
ICD-9	23
Read code	15
Other codes*	4
ICD-10-CM	1
ICD-10-CA	1
N/A	1

ICD 10 = the International Statistical Classification of Diseases and Related Health Problems, 10<sup>th</sup> revision, the replacement of ICD-9. ICD-10-CM = clinical modification of the classification, replacing ICD-9-CM. ICD-10-CA is the Canadian modification.

\*‘Other codes’ includes the Anatomical Therapeutic Chemical Classification System (ATC), Diagnosis-related Group codes (DRG), International Classification of Primary Care (ICPC)

**Table S5: ICD-10 code sets used to identify COPD**

<b>ICD-10 code sets</b>	<b>Number of studies</b>
J44	14
J41-44	10
J40-44	7
J41, J43-44	5
J43, J44	3
J42-44	2
J43-44, except J43.0	2
J44.1	2
J40, J41.0, J41.1, J41.8, J42, J43.0, J43.1, J43.2, J43.8, J43.9, J44.0, J44.1, J44.9	1
J40, J47	1
J40-42, J44	1
J40-44, J47	1
J41, J43	1
J41.0, J41.1, J41.8, J42, J43.9, J44.0, J44.1, J44.9	1
J41-43	1
J41-44, J47	1
J42, 44	1
J42-44, except J43.0	1
J44.0, J44.1, J44.9	1
J44.1, J44.8, J44.9	1

Includes studies which used ICD-10, ICD-10-CM or ICD-10-CA alone, or in combination with other coding schemes.

**Table S6: Lower age limit used in definition of COPD**

<b>Lower age limit</b>	<b>Number of studies</b>
40	76
35	13
18	12
20	8
45	6
65	6
66	5
55	5
50	4
30	2
25	1
60	1



**Table S7: Smoking data**

<b>Is smoking data missing?*</b>	<b>Number of studies</b>
Yes	44
No	66
Not reported	75

  

<b>If study has access to smoking data, are never-smokers included in the analysis?</b>	
Yes	33
No	9
Not reported	24

\*Missing here means that information regarding smoking was not available in the database being interrogated

**Table S8: Phenotyping by blood eosinophil level – thresholds used by studies**

<b>Blood eosinophil threshold</b>	<b>Number of studies</b>
150 cells/ $\mu$ L	4
2% (of total white cell count)	3
300 cells/ $\mu$ L	2
200 cells/ $\mu$ L and/or 2%	1
‘Always above’, ‘fluctuating above and below’, and ‘never above’ cut off points of 100, 150, and 300 cells/ $\mu$ L	1
<2%, 2-4%, >4% and 150, 150–300, 300 cells per $\mu$ L	1

% = blood eosinophil concentrations as percentage of total white blood cell count;  
 cells/ $\mu$ L = absolute count of blood eosinophils

## List of studies included in scoping review

- (1) Abad-Arranz M, Moran-Rodríguez A, Mascarós Balaguer E, Quintana Velasco C, Abad Polo L, Núñez Palomo S, et al. Community Assessment of COPD Health Care (COACH) study: A clinical audit on primary care performance variability in COPD care. *BMC Medical Research Methodology* 2018 /7;18(1).
- (2) Aksoy E, Karakurt Z, Gungor S, Ocakli B, Ozmen İ, Yildirim E, et al. Neutrophil to lymphocyte ratio is a better indicator of COPD exacerbation severity in neutrophilic endotypes than eosinophilic endotypes. *International Journal of COPD* 2018;13:2721-2730.
- (3) Amin AN, Bollu V, Stensland MD, Netzer L, Ganapathy V. Treatment patterns for patients hospitalized with chronic obstructive pulmonary disease. *American Journal of Health-System Pharmacy* 2018 /3;75(6):359-366.
- (4) Ando T, Adegbala O, Akintoye E, Ashraf S, Pahuja M, Briasoulis A, et al. Is transcatheter aortic valve replacement better than surgical aortic valve replacement in patients with chronic obstructive pulmonary disease? A nationwide inpatient sample analysis. *Journal of the American Heart Association* 2018 /4;7(7).
- (5) Annavarapu S, Goldfarb S, Gelb M, Moretz C, Renda A, Kaila S. Development and validation of a predictive model to identify patients at risk of severe COPD exacerbations using administrative claims data. *International Journal of COPD* 2018;13:2121-2130.
- (6) Baliatsas C, Smit LAM, Dückers MLA, Van Dijk CE, Heederik D, Yzermans CJ. Patients with overlapping diagnoses of asthma and COPD: Is livestock exposure a risk factor for comorbidity and coexisting symptoms and infections? *BMC Pulmonary Medicine* 2019 /6;19(1).
- (7) Barbosa-Lorenzo R, Ruano-Ravina A, Fernández-Villar A, López-Pardo E, Carballeira-Roca C, Barros-Dios J. COPD prevalence and hospital admissions in Galicia (Spain). An analysis using the potential of new health information systems. *Pulmonology* 2018 11;24(6):323-329.
- (8) Bell CF, Coutinho AD, Farrelly E, Lokhandwala T, Landsman-Blumberg P. Clinical and economic outcomes associated with the use of fluticasone propionate 250 mcg and salmeterol 50 mcg combination versus tiotropium bromide 18 mcg as initial maintenance treatment for chronic obstructive pulmonary disease in managed care. *Journal of Medical Economics* 2018 /6;21(6):629-638.
- (9) Bengtson LGS, DePietro M, McPheeters J, Fox KM. Real-world outcomes in patients with chronic obstructive pulmonary disease initiating long-acting mono bronchodilator therapy. *Therapeutic Advances in Respiratory Disease* 2018 /5;12.
- (10) Bishwakarma R, Zhang W, Li YL, Kuo YF, Cardenas VJ, Sharma G. Metformin use and health care utilization in patients with coexisting chronic obstructive pulmonary disease and diabetes mellitus. *International Journal of COPD* 2018 /3;13:793-800.

- (11) Bloom CI, Elkin SL, Quint JK. Changes in COPD inhaler prescriptions in the united kingdom, 2000 to 2016. *International Journal of COPD* 2019;14:279-287.
- (12) Bloom CI, Slaich B, Morales DR, Smeeth L, Stone P, Quint JK. Low uptake of palliative care for COPD patients within primary care in the UK. *European Respiratory Journal* 2018;51(2).
- (13) Bogart M, Glassberg MB, Reinsch T, Stanford RH. Impact of prompt versus delayed initiation of triple therapy post COPD exacerbation in a US-managed care setting. *Respir Med* 2018 12;145:138-144.
- (14) Bogart M, Stanford RH, Laliberté F, Germain G, Wu JW, Duh MS. Medication adherence and persistence in chronic obstructive pulmonary disease patients receiving triple therapy in a USA commercially insured population. *International Journal of COPD* 2019;14:343-352.
- (15) Bogart M, Stanford RH, Reinsch T, Hull M, Buikema A, Hulbert E. Clinical characteristics and medication patterns in patients with COPD prior to initiation of triple therapy with ICS/LAMA/LABA: A retrospective study. *Respir Med* 2018 /9;142:73-80.
- (16) Broderick J, Mc Grath C, Cullen K, Talbot D, Gilmor J, Baily-Scanlan M, et al. Effects of pulmonary rehabilitation on exercise capacity and disease impact in patients with chronic obstructive pulmonary disease and obesity. *Physiotherapy (United Kingdom)* 2018 /6;104(2):248-250.
- (17) Casas-Mendez F, Abadías MJ, Yuguero O, Bardés I, Barbé F, de Batlle J. Treatment strategies after acute exacerbations of chronic obstructive pulmonary disease: Impact on mortality. *PLoS ONE* 2018 12;13(12).
- (18) Celli BR, Navaie M, Xu Z, Cho-Reyes S, Dembek C, Gilmer TP. Medication management patterns among Medicare beneficiaries with chronic obstructive pulmonary disease who initiate nebulized arformoterol treatment. *International journal of chronic obstructive pulmonary disease* 2019;14:1019-1031.
- (19) Chalmers JD, Poole C, Webster S, Tebbboth A, Dickinson S, Gayle A. Assessing the healthcare resource use associated with inappropriate prescribing of inhaled corticosteroids for people with chronic obstructive pulmonary disease (COPD) in GOLD groups A or B: An observational study using the Clinical Practice Research Datalink (CPRD). *Respiratory Research* 2018 /4;19(1).
- (20) Chan HS, Ko FWS, Chan JWM, So LKY, Lam DCL, Chan VL, et al. Comorbidities, mortality, and management of chronic obstructive pulmonary disease patients who required admissions to public hospitals in Hong Kong – Computerized data collection and analysis. *International Journal of COPD* 2018 /6;13:1913-1925.
- (21) Chen CY, Liao KM. The impact of atrial fibrillation in patients with COPD during hospitalization. *International Journal of COPD* 2018;13:2105-2112.

- (22) Chen H, Li Q, Kaufman JS, Wang J, Copes R, Su Y, et al. Effect of air quality alerts on human health: a regression discontinuity analysis in Toronto, Canada. *The Lancet Planetary Health* 2018 /1;2(1):e2-e3.
- (23) Chen HC, Wu CF, Chong IW, Wu MT. Exposure to cooking oil fumes and chronic bronchitis in nonsmoking women aged 40 years and over: A health-care based study. *BMC Public Health* 2018 /2;18(1).
- (24) Chen KY, Wu SM, Liu JC, Lee KY. Effect of annual influenza vaccination on reducing lung cancer in patients with chronic obstructive pulmonary disease from a population-based cohort study. *Medicine (United States)* 2019 11;98(47).
- (25) Chen W, Johnson KM, FitzGerald JM, Sadatsafavi M, Leslie WD. Long-term effects of inhaled corticosteroids on bone mineral density in older women with asthma or COPD: a registry-based cohort study. *Archives of Osteoporosis* 2018 12;13(1).
- (26) Chen W, Sin DD, FitzGerald JM, Sadatsafavi M. The Impact of Care Specialty on Survival-Adjusted Medical Costs of COPD Patients After a Hospitalization: a longitudinal analysis. *Journal of General Internal Medicine* 2018 /9;33(9):1528-1535.
- (27) Choi J, Oh JY, Lee YS, Hur GY, Lee SY, Shim JJ, et al. The association between blood eosinophil percent and bacterial infection in acute exacerbation of chronic obstructive pulmonary disease. *International Journal of COPD* 2019;14:953-959.
- (28) Choi J, Oh JY, Lee YS, Hur GY, Lee SY, Shim JJ, et al. *Pseudomonas aeruginosa* infection increases the readmission rate of COPD patients. *International Journal of COPD* 2018;13:3077-3083.
- (29) Choi J, Oh JY, Lee YS, Min KH, Hur GY, Lee SY, et al. Harmful impact of air pollution on severe acute exacerbation of chronic obstructive pulmonary disease: Particulate matter is hazardous. *International Journal of COPD* 2018 /3;13:1053-1059.
- (30) Chung WS, Lin CL. Acute respiratory events in patients with bronchiectasis–COPD overlap syndrome: A population-based cohort study. *Respir Med* 2018 /7;140:6-10.
- (31) Contoli M, Campo G, Pavasini R, Marchi I, Pauletti A, Balla C, et al. Inhaled corticosteroid/long-acting bronchodilator treatment mitigates STEMI clinical presentation in COPD patients. *Eur J Intern Med* 2018;47:82-86.
- (32) de Miguel-Díez J, López-de-Andrés A, Esteban-Vasallo M, Hernández-Barrera V, de Miguel-Yanes JM, Méndez-Bailón M, et al. *Clostridium difficile* infection in hospitalized patients with COPD in Spain (2001–2015). *Eur J Intern Med* 2018 11;57:76-82.
- (33) de Miguel-Díez J, López-De-andres A, Hernández-Barrera V, de Miguel-Yanes JM, Méndez-Bailón M, Jiménez-García R. Trends and hospital outcomes of lung transplantation among patients with and without chronic obstructive pulmonary disease in Spain: A national population-based study (2001–2015). *International Journal of COPD* 2019;14:729-737.
- (34) de Miguel-Díez J, López-de-Andrés A, Hernández-Barrera V, de Miguel-Yanes JM, Méndez-Bailón M, Muñoz-Rivas N, et al. Influence of COPD on outcomes of patients

hospitalized with heart failure: Analysis of the Spanish National Hospital Discharge Database (2001–2015). *Int J Cardiol* 2018 10;269:213-219.

(35) de Miguel-Díez J, López-de-Andrés A, Hernández-Barrera V, Jiménez-Trujillo I, Méndez-Bailón M, de Miguel-Yanes JM, et al. Postoperative pneumonia among patients with and without COPD in Spain from 2001 to 2015. *Eur J Intern Med* 2018 /7;53:66-72.

(36) De Schreye R, Smets T, Deliens L, Annemans L, Gielen B, Cohen J. Appropriateness of End-of-Life Care in People Dying From COPD. Applying Quality Indicators on Linked Administrative Databases. *J Pain Symptom Manage* 2018 10;56(4):541-550.e6.

(37) Desai R, Patel U, Singh S, Bhuvra R, Fong HK, Nunna P, et al. The burden and impact of arrhythmia in chronic obstructive pulmonary disease: Insights from the National Inpatient Sample. *Int J Cardiol* 2019 /4;281:49-55.

(38) Dziankowska-Zaborszczyk E, Bryla M, Ciabiada-Bryla B, Maniecka-Bryla I. Standard expected years of life lost (SEYLL) due to chronic obstructive pulmonary disease (COPD) in Poland from 1999 to 2014. *PLoS ONE* 2019 /3;14(3).

(39) Epstein D, Nasser R, Mashiach T, Azzam ZS, Berger G. Increased red cell distribution width: A novel predictor of adverse outcome in patients hospitalized due to acute exacerbation of chronic obstructive pulmonary disease. *Respir Med* 2018 /3;136:1-7.

(40) Faes K, Cohen J, Annemans L. Resource Use During the Last Six Months of Life Among COPD Patients: A Population-Level Study. *J Pain Symptom Manage* 2018 /9;56(3):318-326.e7.

(41) Flynn RWV, MacDonald TM, Chalmers JD, Schembri S. The effect of changes to GOLD severity stage on long term morbidity and mortality in COPD 11 Medical and Health Sciences 1102 Cardiorespiratory Medicine and Haematology. *Respiratory Research* 2018 12;19(1).

(42) Fu PK, Tung YC, Wang CY, Hwang SF, Lin SP, Hsu CY, et al. Early and late do-not-resuscitate (DNR) decisions in patients with terminal COPD: A retrospective study in the last year of life. *International Journal of COPD* 2018;13:2447-2454.

(43) Galvis JN, Vargas MV, Robinson HN, Tyan P, Gu A, Wei C, et al. Impact of chronic obstructive pulmonary disease on laparoscopic hysterectomy outcome. *Journal of the Society of Laparoendoscopic Surgeons* 2019 /1;23(1).

(44) Gao N, Li C, Ji J, Yang Y, Wang S, Tian X, et al. Short-term effects of ambient air pollution on chronic obstructive pulmonary disease admissions in Beijing, China (2013–2017). *International Journal of COPD* 2019;14:297-309.

(45) García-Talavera I, Figueira-Gonçalves JM, Gurbani N, Pérez-Méndez L, Pedrero-García A. Clinical characteristics of COPD patients with early-onset desaturation in the 6-minute walk test. *Pulmonology* 2018 /9;24(5):275-279.

(46) Gayle A, Dickinson S, Morris K, Poole C, Mathioudakis AG, Vestbo J. What is the impact of GOLD 2017 recommendations in primary care? - a descriptive study of patient

classifications, treatment burden and costs. *International Journal of COPD* 2018;13:3485-3492.

(47) Gedebjerg A, Szépligeti SK, Wackerhausen LMH, Horváth-Puhó E, Dahl R, Hansen JG, et al. Prediction of mortality in patients with chronic obstructive pulmonary disease with the new Global Initiative for Chronic Obstructive Lung Disease 2017 classification: a cohort study. *The Lancet Respiratory Medicine* 2018 /3;6(3):204-212.

(48) Geraets I, Schermer T, Kocks JWH, Akkermans R, Bischoff E, van den Bemt L. Primary care cohort study in the sequence of diagnosing chronic respiratory diseases and prescribing inhaled corticosteroids. *npj Primary Care Respiratory Medicine* 2018 12;28(1).

(49) Germini F, Veronese G, Marcucci M, Coen D, Ardemagni D, Montano N, et al. COPD exacerbations in the emergency department: Epidemiology and related costs. A retrospective cohort multicentre study from the Italian Society of Emergency Medicine (SIMEU). *Eur J Intern Med* 2018 /5;51:74-79.

(50) Gershon AS, Thiruchelvam D, Chapman KR, Aaron SD, Stanbrook MB, Bourbeau J, et al. Health Services Burden of Undiagnosed and Overdiagnosed COPD. *Chest* 2018 /6;153(6):1336-1346.

(51) Giannico OV, Ambrosino I, Patano F, Germinario C, Quarto M, Moretti AM. Educational level, marital status and sex as social gender discharge determinants in chronic obstructive pulmonary disease exacerbations: A time-to-event analysis. *Monaldi Archives for Chest Disease* 2019;89(2):7-14.

(52) Gonzalez AV, Coulombe J, Ernst P, Suissa S. Long-term Use of Inhaled Corticosteroids in COPD and the Risk of Fracture. *Chest* 2018 /2;153(2):321-328.

(53) Goto T, Camargo CA, Faridi MK, Yun BJ, Hasegawa K. Machine learning approaches for predicting disposition of asthma and COPD exacerbations in the ED. *Am J Emerg Med* 2018 /9;36(9):1650-1654.

(54) Goto T, Faridi MK, Camargo CA, Hasegawa K. Time-varying readmission diagnoses during 30 days after hospitalization for COPD exacerbation. *Med Care* 2018 /8;56(8):673-678.

(55) Goto T, Hirayama A, Faridi MK, Camargo CA, Hasegawa K. Obesity and severity of acute exacerbation of chronic obstructive pulmonary disease. *Annals of the American Thoracic Society* 2018 /2;15(2):184-191.

(56) Goto T, Tsugawa Y, Faridi MK, Camargo CA, Hasegawa K. Reduced Risk of Acute Exacerbation of COPD After Bariatric Surgery: A Self-Controlled Case Series Study. *Chest* 2018 /3;153(3):611-617.

(57) Granfeldt A, Wissenberg M, Hansen SM, Lippert FK, Torp-Pedersen C, Skaarup SH, et al. Severity of chronic obstructive pulmonary disease and presenting rhythm in patients with out-of-hospital cardiac arrest. *Resuscitation* 2018 /5;126:111-117.

- (58) Greiver M, Sullivan F, Kalia S, Aliarzadeh B, Sharma D, Bernard S, et al. Agreement between hospital and primary care on diagnostic labeling for COPD and heart failure in Toronto, Canada: a cross-sectional observational study. *npj Primary Care Respiratory Medicine* 2018 12;28(1):9-9.
- (59) Gulati S, Zouk AN, Kalehoff JP, Wren CS, Davison PN, Kirkpatrick DP, et al. The use of a standardized order set reduces systemic corticosteroid dose and length of stay for individuals hospitalized with acute exacerbations of COPD: A cohort study. *International Journal of COPD* 2018;13:2147-2156.
- (60) Hamad GA, Cheung W, Crooks MG, Morice AH. Eosinophils in COPD: How many swallows make a summer? *European Respiratory Journal* 2018;51(1).
- (61) Heintzman J, Kaufmann J, Ezekiel-Herrera D, Bailey SR, Cornell A, Ukhanova M, et al. Asthma/COPD Disparities in Diagnosis and Basic Care Utilization Among Low-Income Primary Care Patients. *Journal of Immigrant and Minority Health* 2019 /6;21(3):659-663.
- (62) Hirayama A, Goto T, Shimada YJ, Faridi MK, Camargo CA, Hasegawa K. Acute Exacerbation of Chronic Obstructive Pulmonary Disease and Subsequent Risk of Emergency Department Visits and Hospitalizations for Atrial Fibrillation. *Circulation. Arrhythmia and electrophysiology* 2018 /9;11(9):e006322-e006322.
- (63) Ho TW, Ruan SY, Huang CT, Tsai YJ, Lai F, Yu CJ. Validity of ICD9-CM codes to diagnose chronic obstructive pulmonary disease from National Health Insurance claim data in Taiwan. *International Journal of COPD* 2018;13:3055-3063.
- (64) Hong S, Park EC, Kim TH, Kwon JA, Yoo KB, Han KT, et al. Effect of pre existing respiratory conditions on survival of lung cancer patients: A nationwide population-based cohort study. *Asia-Pacific Journal of Clinical Oncology* 2018 /4;14(2):e71-e80.
- (65) Hopke PK, Croft D, Zhang W, Lin S, Masiol M, Squizzato S, et al. Changes in the acute response of respiratory diseases to PM 2.5 in New York State from 2005 to 2016. *Sci Total Environ* 2019 /8;677:328-339.
- (66) Hsu IL, Lu CL, Li CC, Tsai SH, Chen CZ, Hu SC, et al. Population-based cohort study suggesting a significantly increased risk of developing chronic obstructive pulmonary disease in people with type 2 diabetes mellitus. *Diabetes Res Clin Pract* 2018 /4;138:66-74.
- (67) Hu WS, Lin CL. CHA 2 DS 2 -VASc score for ischaemic stroke risk stratification in patients with chronic obstructive pulmonary disease with and without atrial fibrillation: A nationwide cohort study. *Europace* 2018 /4;20(4):575-581.
- (68) Huang HH, Chen SJ, Chao TF, Liu CJ, Chen TJ, Chou P, et al. Influenza vaccination and risk of respiratory failure in patients with chronic obstructive pulmonary disease: A nationwide population-based case-cohort study. *Journal of Microbiology, Immunology and Infection* 2019 /2;52(1):22-29.
- (69) Humenberger M, Horner A, Labek A, Kaiser B, Frechinger R, Brock C, et al. Adherence to inhaled therapy and its impact on chronic obstructive pulmonary disease (COPD) 11



Medical and Health Sciences 1102 Cardiorespiratory Medicine and Haematology. BMC Pulmonary Medicine 2018 10;18(1).

(70) Hurst JR, Dilleen M, Morris K, Hills S, Emir B, Jones R. Factors influencing treatment escalation from long-acting muscarinic antagonist monotherapy to triple therapy in patients with COPD: A retrospective thin-database analysis. *International Journal of COPD* 2018 /3;13:781-792.

(71) Inabnit LS, Blanchette C, Ruban C. Comorbidities and length of stay in chronic obstructive pulmonary disease patients. *COPD: Journal of Chronic Obstructive Pulmonary Disease* 2018 /7;15(4):355-360.

(72) Jacobs DM, Noyes K, Zhao J, Gibson W, Murphy TF, Sethi S, et al. Early hospital readmissions after an acute exacerbation of chronic obstructive pulmonary disease in the nationwide readmissions database. *Annals of the American Thoracic Society* 2018 /7;15(7):837-845.

(73) Janson C, Johansson G, Ställberg B, Lisspers K, Olsson P, Keininger DL, et al. Identifying the associated risks of pneumonia in COPD patients: ARCTIC an observational study. *Respiratory research* 2018 /9;19(1):172-172.

(74) Januszek R, Siudak Z, Dziewierz A, Rakowski T, Dudek D, Bartus S. Chronic obstructive pulmonary disease affects the angiographic presentation and outcomes of patients with coronary artery disease treated with percutaneous coronary interventions. *Polish Archives of Internal Medicine* 2018;128(1):915-925.

(75) Jiang X, Xiao H, Segal R, Mobley WC, Park H. Trends in Readmission Rates, Hospital Charges, and Mortality for Patients With Chronic Obstructive Pulmonary Disease (COPD) in Florida From 2009 to 2014. *Clin Ther* 2018 /4;40(4):613-626.e1.

(76) Jo YS, Lim MN, Han YJ, Kim WJ. Epidemiological study of PM<sub>2.5</sub> and risk of COPD-related hospital visits in association with particle constituents in Chuncheon, Korea. *International Journal of COPD* 2018 /1;13:299-307.

(77) Kang HR, Hong SH, Ha SY, Kim TB, Lee EK. Differences in the risk of mood disorders in patients with asthma-COPD overlap and in patients with COPD alone: A nationwide population-based retrospective cohort study in Korea. *Respiratory Research* 2019 /4;20(1).

(78) Kim JA, Lim MK, Kim K, Park JH, Rhee CK. Adherence to Inhaled Medications and its Effect on Healthcare Utilization and Costs Among High-Grade Chronic Obstructive Pulmonary Disease Patients. *Clinical Drug Investigation* 2018 /4;38(4):333-340.

(79) Kridin K, Comaneshter D, Batat E, Cohen AD. COPD and lung cancer in patients with pemphigus- a population based study. *Respir Med* 2018 /3;136:93-97.

(80) Lai CC, Wang YH, Wang CY, Wang HC, Yu CJ, Chen L. Comparative effects of angiotensin-converting enzyme inhibitors and angiotensin ii receptor blockers on the risk of pneumonia and severe exacerbations in patients with COPD. *International Journal of COPD* 2018 /3;13:867-874.

(81) Lai CC, Wu CH, Wang YH, Wang CY, Wu VC, Chen L. The association between COPD and outcomes of patients with advanced chronic kidney disease. *International Journal of COPD* 2018;13:2899-2905.

(82) Lai SW, Lin CL. Association between ankylosing spondylitis and chronic obstructive pulmonary disease in Taiwan. *Eur J Intern Med* 2018 11;57:e28-e29.

(83) Landis S, Suruki R, Maskell J, Bonar K, Hilton E, Compton C. Demographic and Clinical Characteristics of COPD Patients at Different Blood Eosinophil Levels in the UK Clinical Practice Research Datalink. *COPD: Journal of Chronic Obstructive Pulmonary Disease* 2018 /3;15(2):177-184.

(84) Lane DC, Stemkowski S, Stanford RH, Tao Z. Initiation of triple therapy with multiple inhalers in chronic obstructive pulmonary disease: An analysis of treatment patterns from a U.S. retrospective database study. *Journal of Managed Care and Specialty Pharmacy* 2018 11;24(11):1165-1172.

(85) Larsson K, Janson C, Ställberg B, Lisspers K, Olsson P, Kostikas K, et al. Impact of COPD diagnosis timing on clinical and economic outcomes: The ARCTIC observational cohort study. *International Journal of COPD* 2019;14:995-1008.

(86) Lavergne MR, Law MR, Peterson S, Garrison S, Hurley J, Cheng L, et al. Effect of incentive payments on chronic disease management and health services use in British Columbia, Canada: Interrupted time series analysis. *Health Policy* 2018 /2;122(2):157-164.

(87) Lawson CA, Mamas MA, Jones PW, Teece L, McCann G, Khunti K, et al. Association of Medication Intensity and Stages of Airflow Limitation With the Risk of Hospitalization or Death in Patients With Heart Failure and Chronic Obstructive Pulmonary Disease. *JAMA network open* 2018 12;1(8):e185489-e185489.

(88) Lee KC, Wu YT, Chen L, Shen C, Chung C, Chien W, et al. Chronic obstructive pulmonary disease combined with vertebral compression fracture increases the risk of temporomandibular disorder: A population-based cohort study. *Medicine (Baltimore)* 2019;98(37).

(89) Lee R, Lee D, Mamidi IS, Probasco WV, Heyer JH, Pandarinath R. Patients with Chronic Obstructive Pulmonary Disease Are at Higher Risk for Pneumonia, Septic Shock, and Blood Transfusions after Total Shoulder Arthroplasty. *Clin Orthop* 2019 /2;477(2):416-423.

(90) Lee YM, Kim SJ, Lee JH, Ha E. Inhaled corticosteroids in COPD and the risk of lung cancer. *International Journal of Cancer* 2018 11;143(9):2311-2318.

(91) Li M, Wang F, Chen R, Liang Z, Zhou Y, Yang Y, et al. Factors contributing to hospitalization costs for patients with COPD in China: A retrospective analysis of medical record data. *International Journal of COPD* 2018;13:3349-3357.

(92) Li Q, Larivée P, Courteau J, Couillard S, Poder TG, Carrier N, et al. Greater eosinophil counts at first COPD hospitalization are associated with more readmissions and fewer deaths. *International Journal of COPD* 2019;14:331-341.

- (93) Liao KM, Chen YC, Cheng KC, Wang JJ, Ho CH. Trends in intensive care unit admissions of COPD patients from 2003 to 2013 in Taiwan. *International Journal of COPD* 2018 /6;13:2007-2012.
- (94) Liao KM, Tseng CJ, Chen YC, Wang JJ, Ho CH. Outcomes of laparoscopic cholecystectomy in patients with and without COPD. *International Journal of COPD* 2019;14:1159-1165.
- (95) Lim R, Kerr M, Roughead EE. Use of medicines and health services for chronic obstructive pulmonary disease among a cohort of Australians over 50 years. *International Journal of COPD* 2018;13:3085-3093.
- (96) Lin CS, Chen CY, Yeh CC, Chung CL, Chen TL, Liao CC. Defining risk of general surgery in patients with chronic obstructive pulmonary diseases. *QJM* 2019 /2;112(2):107-113.
- (97) Lin HW, Lin LF, Chen HC, Liou TH, Huang SW. Chronic obstructive pulmonary disease with short-acting inhaled pharmacotherapy increases the risk of prostate cancer: A two-stage database approach. *PLoS ONE* 2018 /9;13(9).
- (98) Lin S, Zhang Q, Chen F, Luo L, Chen L, Zhang W. Smooth Bayesian network model for the prediction of future high-cost patients with COPD. *Int J Med Inf* 2019 /6;126:147-155.
- (99) Lin WC, Chen CW, Lu CL, Lai WW, Huang MH, Tsai LM, et al. The association between recent hospitalized COPD exacerbations and adverse outcomes after percutaneous coronary intervention: A nationwide cohort study. *International Journal of COPD* 2019;14:169-179.
- (100) Liou JT, Lin CW, Tsai CL, Wang YH, Lai JH, Hsu YJ, et al. Risk of Severe Cardiovascular Events From Add-On Tiotropium in Chronic Obstructive Pulmonary Disease. *Mayo Clin Proc* 2018 10;93(10):1462-1473.
- (101) Lisspers K, Larsson K, Johansson G, Janson C, Costa-Scharplatz M, Gruenberger JB, et al. Economic burden of COPD in a Swedish cohort: The ARCTIC study. *International Journal of COPD* 2018 /1;13:275-285.
- (102) Lu HY, Liao KM. Risk of empyema in patients with COPD. *International Journal of COPD* 2018 /1;13:317-324.
- (103) Mahta A, Merkler AE, Reznik ME, Burch JE, Yaghi S, Sellke FW, et al. Emphysema: A Potential Risk Factor for Subarachnoid Hemorrhage and Ruptured Aortic Aneurysm. *Stroke* 2019 /4;50(4):992-994.
- (104) Maitre T, Cottinet J, Beltramo G, Georges M, Blot M, Piroth L, et al. Increasing burden of noninfectious lung disease in persons living with HIV: A 7-year study using the French nationwide hospital administrative database. *European Respiratory Journal* 2018;52(3).

- (105) Major JM, Zhou EH, Ding Y, Ly T, Li J, Pinheiro SP, et al. The effect of FDA drug safety communications on patterns of tiotropium dispensing: A U.S. Health Plan Claims Database study. *Journal of Managed Care and Specialty Pharmacy* 2018 /7;24(7):700-709.
- (106) Mcguire K, Aviña-Zubieta JA, Esdaile JM, Sadatsafavi M, Sayre EC, Abrahamowicz M, et al. Risk of Incident Chronic Obstructive Pulmonary Disease in Rheumatoid Arthritis: A Population-Based Cohort Study. *Arthritis Care and Research* 2019 /5;71(5):602-610.
- (107) Meeraus W, Wood R, Jakubanis R, Holbrook T, Bizouard G, Despres J, et al. COPD treatment pathways in france: a retrospective analysis of electronic medical record data from general practitioners. *International Journal of COPD* 2019;14:51-63.
- (108) Morales DR, Flynn R, Zhang J, Trucco E, Quint JK, Zutis K. External validation of ADO, DOSE, COTE and CODEX at predicting death in primary care patients with COPD using standard and machine learning approaches. *Respir Med* 2018 /5;138:150-155.
- (109) Mueller S, Gottschalk F, Groth A, Meeraus W, Driessen M, Kohlmann T, et al. Primary data, claims data, and linked data in observational research: The case of COPD in Germany. *Respiratory Research* 2018 /8;19(1).
- (110) Müllerová H, Hahn B, Simard EP, Mu G, Hatipoğlu U. Exacerbations and health care resource use among patients with COPD in relation to blood eosinophil counts. *International Journal of COPD* 2019;14:683-692.
- (111) Müllerová H, Meeraus WH, Galkin DV, Albers FC, Landis SH. Clinical burden of illness among patients with severe eosinophilic COPD. *International Journal of COPD* 2019;14:741-755.
- (112) Muñoz-Quiles C, López-Lacort M, Díez-Domingo J. Risk and impact of herpes zoster among COPD patients: A population-based study, 2009-2014. *BMC Infectious Diseases* 2018 /5;18(1).
- (113) Nagar S, Patel J, Stanford R. Characteristics and health care resource use of subjects with COPD in the year before initiating LAMA monotherapy or LAMA+LABA combination therapy: A U.S. database study. *Manag Care* 2018;27(5):40-47.
- (114) Nissen F, Morales DR, Mullerova H, Smeeth L, Douglas IJ, Quint JK. Concomitant diagnosis of asthma and COPD: A quantitative study in UK primary care. *British Journal of General Practice* 2018 11;68(676):e775-e782.
- (115) Niyonsenga T, Coffee NT, Del Fante P, Høj SB, Daniel M. Practical utility of general practice data capture and spatial analysis for understanding COPD and asthma. *BMC Health Services Research* 2018 11;18(1).
- (116) Obi J, Mehari A, Gillum R. Mortality Related to Chronic Obstructive Pulmonary Disease and Co-morbidities in the United States, A Multiple Causes of Death Analysis. *COPD: Journal of Chronic Obstructive Pulmonary Disease* 2018 /3;15(2):200-205.
- (117) Ohar JA, Loh CH, Lenoir KM, Wells BJ, Peters SP. A comprehensive care plan that reduces readmissions after acute exacerbations of COPD. *Respir Med* 2018 /8;141:20-25.

- (118) Ortega H, Llanos JP, Lafeuille MH, Germain G, Duh MS, Bell CF, et al. Burden of disease associated with a COPD eosinophilic phenotype. *International Journal of COPD* 2018;13:2425-2433.
- (119) Oshagbemi OA, Keene SJ, Driessen JHM, Jordan R, Wouters EFM, de Boer A, et al. Trends in moderate and severe exacerbations among COPD patients in the UK from 2005 to 2013. *Respir Med* 2018 11;144:1-6.
- (120) Pacileo G, Tozzi VD, Sotgiu G, Aliberti S, Morando V, Blasi F. Administrative databases and clinical governance: The case of COPD. *Int J Health Plann Manage* 2019 /1;34(1):177-186.
- (121) Park SC, Kim YS, Kang YA, Park EC, Shin CS, Kim DW, et al. Hemoglobin and mortality in patients with COPD: A nationwide population-based cohort study. *International Journal of COPD* 2018 /5;13:1599-1605.
- (122) Parkin L, Khuu W, Stanbrook MB, Tadrous M, Martins D, Gomes T. Trends in the utilisation of COPD therapeutic regimens before and after the introduction of LAMA/LABA combination products: A population-based study. *Respir Med* 2018 10;143:1-7.
- (123) Patel JG, Coutinho AD, Lunacsek OE, Dalal AA. COPD affects worker productivity and health care costs. *International Journal of COPD* 2018;13:2301-2311.
- (124) Paul MC, Dik JWH, Hoekstra T, Van Dijk CE. Admissions for ambulatory care sensitive conditions: A national observational study in the general and COPD population. *Eur J Public Health* 2019 /4;29(2):213-219.
- (125) Pendharkar SR, Ospina MB, Southern DA, Hirani N, Graham J, Faris P, et al. Effectiveness of a standardized electronic admission order set for acute exacerbation of chronic obstructive pulmonary disease. *BMC Pulmonary Medicine* 2018 /5;18(1).
- (126) Petite SE. Characterization of chronic obstructive pulmonary disease prescribing patterns in the United States. *Pulmonary Pharmacology and Therapeutics* 2018 /4;49:119-122.
- (127) Pikoula M, Quint JK, Nissen F, Hemingway H, Smeeth L, Denaxas S. Identifying clinically important COPD sub-types using data-driven approaches in primary care population based electronic health records. *BMC Medical Informatics and Decision Making* 2019 /4;19(1).
- (128) Qiu H, Tan K, Long F, Wang L, Yu H, Deng R, et al. The burden of COPD morbidity attributable to the interaction between ambient air pollution and temperature in Chengdu, China. *International Journal of Environmental Research and Public Health* 2018 /3;15(3).
- (129) Ran J, Sun S, Yang A, Yang L, Han L, Mason TG, et al. Effects of ambient benzene and toluene on emergency COPD hospitalizations: A time series study in Hong Kong. *Sci Total Environ* 2019 /3;657:28-35.

- (130) Rayner LH, McGovern AP, Sherlock J, Gatenby P, Correa A, Creagh-Brown B, et al. Type 2 diabetes: A protective factor for COPD? *Primary Care Diabetes* 2018 10;12(5):438-444.
- (131) Reid CE, Considine EM, Watson GL, Telesca D, Pfister GG, Jerrett M. Associations between respiratory health and ozone and fine particulate matter during a wildfire event. *Environ Int* 2019 /8;129:291-298.
- (132) Rezaei SS, Rinner C, Ratajczak P, Grossmann W, Gall W, Wolzt M. Use of beta-blocker is associated with lower mortality in patients with coronary artery disease with or without COPD. *Clinical Respiratory Journal* 2018 12;12(12):2627-2634.
- (133) Riisgaard H, Le JV, Søndergaard J, Munch M, Ledderer L, Pedersen LB. Associations between degrees of task delegation and adherence to COPD guidelines on spirometry testing in general practice - A national cross-sectional study. *BMC Health Services Research* 2019 /7;19(1).
- (134) Rothnie KJ, Connell O, Müllerová H, Smeeth L, Pearce N, Douglas I, et al. Myocardial infarction and ischemic stroke after exacerbations of chronic obstructive pulmonary disease. *Annals of the American Thoracic Society* 2018 /8;15(8):935-946.
- (135) Russell REK, Beer S, Pavord ID, Pullinger R, Bafadhel M. The acute wheezy adult with airways disease in the emergency department: A retrospective case-note review of exacerbations of COPD. *International Journal of COPD* 2019;14:971-977.
- (136) Salimi F, Morgan G, Rolfe M, Samoli E, Cowie CT, Hanigan I, et al. Long-term exposure to low concentrations of air pollutants and hospitalisation for respiratory diseases: A prospective cohort study in Australia. *Environ Int* 2018 12;121:415-420.
- (137) Samp JC, Joo MJ, Schumock GT, Calip GS, Pickard AS, Lee TA. Predicting acute exacerbations in chronic obstructive pulmonary disease. *Journal of Managed Care and Specialty Pharmacy* 2018 /3;24(3):265-279.
- (138) Sandelin M, Mindus S, Thuresson M, Lisspers K, Ställberg B, Johansson G, et al. Factors associated with lung cancer in COPD patients. *International Journal of COPD* 2018 /6;13:1833-1839.
- (139) Sansgiry SS, Bhansali A, Serna O, Kamdar M, Fleming M, Abughosh S, et al. Effect of coverage gap on healthcare utilization among Medicare beneficiaries with chronic obstructive pulmonary disorder. *Curr Med Res Opin* 2019 /2;35(2):321-328.
- (140) Scrutinio D, Guida P, Passantino A, Ammirati E, Oliva F, Lagioia R, et al. Acutely decompensated heart failure with chronic obstructive pulmonary disease: Clinical characteristics and long-term survival. *Eur J Intern Med* 2019 /2;60:31-38.
- (141) Serra-Picamal X, Roman R, Escarrabill J, García-Altés A, Argimón JM, Soler N, et al. Hospitalizations due to exacerbations of COPD: A big data perspective. *Respir Med* 2018 12;145:219-225.

(142) Shah P, McWilliams A, Howard D, Roberge J. A comparison of methodologies for the real-time identification of hospitalized patients with acute exacerbations of COPD. *International Journal of COPD* 2019;14:693-698.

(143) Shah S, Blanchette CM, Coyle JC, Kowalkowski M, Arthur ST, Howden R. Survival associated with chronic obstructive pulmonary disease among SEER-medicare beneficiaries with non-small-cell lung cancer. *International Journal of COPD* 2019;14:893-903.

(144) Shah S, Blanchette CM, Coyle JC, Kowalkowski M, Arthur ST, Howden R. Healthcare utilization and costs associated with COPD among SEER-Medicare beneficiaries with NSCLC. *Journal of Medical Economics* 2018 /9;21(9):861-868.

(145) Shantakumar S, Pwu RF, D'Silva L, Wurst K, Kuo YW, Yang YY, et al. Burden of asthma and COPD overlap (ACO) in Taiwan: A nationwide population-based study. *BMC Pulmonary Medicine* 2018 /1;18(1).

(146) Sharif K, Watad A, Tiosano S, Yavne Y, Blokh Kerpel A, Comaneshter D, et al. The link between COPD and ankylosing spondylitis: A population based study. *Eur J Intern Med* 2018 /7;53:62-65.

(147) Shi M, Wang J, Zhang L, Yan Y, Miao Yd, Zhang X. Effects of Integrated Case Payment on Medical Expenditure and Readmission of Inpatients with Chronic Obstructive Pulmonary Disease: A Nonrandomized, Comparative Study in Xi County, China. *Current Medical Science* 2018 /6;38(3):558-566.

(148) Sikjær MG, Løkke A, Hilberg O. The influence of psychiatric disorders on the course of lung cancer, chronic obstructive pulmonary disease and tuberculosis. *Respir Med* 2018 /2;135:35-41.

(149) Slatore CG, Falvo MJ, Nugent S, Carlson K. Afghanistan and Iraq War Veterans: Mental health diagnoses are associated with respiratory disease diagnoses. *Mil Med* 2018 /5;183(5-6):e249-e257.

(150) Spila-Alegiani S, Trotta F, Da Cas R, Rossi M, Venegoni M, Traversa G. Comparative Effectiveness of Two Tiotropium Formulations: A Retrospective Cohort Study. *COPD: Journal of Chronic Obstructive Pulmonary Disease* 2018 /9;15(5):418-423.

(151) Ställberg B, Janson C, Larsson K, Johansson G, Kostikas K, Gruenberger JB, et al. Real-world retrospective cohort study ARCTIC shows burden of comorbidities in Swedish COPD versus non-COPD patients. *npj Primary Care Respiratory Medicine* 2018 12;28(1).

(152) Stanford RH, Lau MS, Li Y, Stemkowski S. External validation of a COPD risk measure in a commercial and Medicare population: The COPD treatment ratio. *Journal of Managed Care and Specialty Pharmacy* 2019 /1;25(1):58-65B.

(153) Stanford R, Nag A, Mapel D, Lee T, Rosiello R, Schatz M, et al. Claims-Based Risk Model for First Severe COPD Exacerbation. *Am J Manag Care* 2018;24(2):e45-e53.

- (154) Stephens AR, Wiener RS, Jeong MH. Comparison of Methods to Identify Advance Care Planning in Patients with Severe Chronic Obstructive Pulmonary Disease Exacerbation. *J Palliat Med* 2018 /3;21(3):284-289.
- (155) Su TH, Chang SH, Kuo CF, Liu PH, Chan YL. B-blockers after acute myocardial infarction in patients with chronic obstructive pulmonary disease: A nationwide population-based observational study. *PLoS ONE* 2019 /3;14(3).
- (156) Su VYF, Liao HF, Perng DW, Chou YC, Hsu CC, Chou CL, et al. Proton pump inhibitors use is associated with a lower risk of acute exacerbation and mortality in patients with coexistent COPD and GERD. *International Journal of COPD* 2018;13:2907-2915.
- (157) Su VYF, Yang KY, Yang YH, Tsai YH, Perng DW, Su WJ, et al. Use of ICS/LABA Combinations or LAMA Is Associated with a Lower Risk of Acute Exacerbation in Patients with Coexistent COPD and Asthma. *Journal of Allergy and Clinical Immunology: In Practice* 2018 11;6(6):1927-1935.e3.
- (158) Suissa S, Dell'Aniello S, Ernst P. Comparative effectiveness of LABA-ICS versus LAMA as initial treatment in COPD targeted by blood eosinophils: a population-based cohort study. *The Lancet Respiratory Medicine* 2018 11;6(11):855-862.
- (159) Sujatha-Bhaskar S, Alizadeh RF, Inaba CS, Koh CY, Jafari MD, Mills SD, et al. Respiratory complications after colonic procedures in chronic obstructive pulmonary disease: does laparoscopy offer a benefit? *Surg Endosc* 2018 /3;32(3):1280-1285.
- (160) Sun S, Cao W, Mason TG, Ran J, Qiu H, Li J, et al. Increased susceptibility to heat for respiratory hospitalizations in Hong Kong. *Sci Total Environ* 2019 /5;666:197-204.
- (161) Swanson JO, Vogt V, Sundmacher L, Hagen TP, Moger TA. Continuity of care and its effect on readmissions for COPD patients: A comparative study of Norway and Germany. *Health Policy* 2018 /7;122(7):737-745.
- (162) Szyszkowicz M, Kousha T, Castner J, Dales R. Air pollution and emergency department visits for respiratory diseases: A multi-city case crossover study. *Environ Res* 2018 /5;163:263-269.
- (163) Tian Y, Xiang X, Juan J, Song J, Cao Y, Huang C, et al. Short-term effects of ambient fine particulate matter pollution on hospital visits for chronic obstructive pulmonary disease in Beijing, China. *Environmental Health: A Global Access Science Source* 2018 /2;17(1).
- (164) To T, Zhu J, Gray N, Feldman LY, Villeneuve PJ, Lieskai C, et al. Asthma and chronic obstructive pulmonary disease overlap in women incidence and risk factors. *Annals of the American Thoracic Society* 2018 11;15(11):1304-1310.
- (165) Trantham L, Sikirica MV, Candrilli SD, Benson VS, Mohan D, Neil D, et al. Healthcare costs and utilization associated with muscle weakness diagnosis codes in patients with chronic obstructive pulmonary disease: a United States claims analysis. *Journal of Medical Economics* 2019 /4;22(4):319-327.



(166) Tsai CH, Liao LY, Lin CL, Chung WS. Inhaled corticosteroids and the risks of low-energy fractures in patients with chronic airway diseases: A propensity score matched study. *Clinical Respiratory Journal* 2018 /5;12(5):1830-1837.

(167) Tseng CH. Metformin and risk of chronic obstructive pulmonary disease in diabetes patients. *Diabetes and Metabolism* 2019 /4;45(2):184-190.

(168) van Buul AR, Wildschut TS, Bonten TN, Kasteleyn MJ, Slats AM, Chavannes NH, et al. A systematic diagnostic evaluation combined with an internet-based self-management support system for patients with asthma or COPD. *International Journal of COPD* 2018;13:3297-3306.

(169) Vazquez Guillamet R, Ursu O, Iwamoto G, Moseley PL, Oprea T. Chronic obstructive pulmonary disease phenotypes using cluster analysis of electronic medical records. *Health Informatics Journal* 2018 12;24(4):394-409.

(170) Vela E, Tényi Á, Cano I, Monterde D, Cleries M, Garcia-Altes A, et al. Population-based analysis of patients with COPD in Catalonia: A cohort study with implications for clinical management. *BMJ Open* 2018 /3;8(3).

(171) Voorham J, Roche N, Benhaddi H, Van Der Tol M, Carter V, Van Boven JFM, et al. Real-world effectiveness evaluation of budesonide/formoterol Spiromax for the management of asthma and chronic obstructive pulmonary disease in the UK. *BMJ Open* 2018;8(10).

(172) Vozoris NT, Wang X, Austin PC, O'Donnell DE, Aaron SD, To TM, et al. Incident diuretic drug use and adverse respiratory events among older adults with chronic obstructive pulmonary disease. *Br J Clin Pharmacol* 2018 /3;84(3):579-589.

(173) Vozoris NT, Wang X, Austin PC, Stephenson AL, O'Donnell DE, Gershon AS, et al. Serotonergic antidepressant use and morbidity and mortality among older adults with COPD. *European Respiratory Journal* 2018;52(1).

(174) Wallace AE, Shinde MU, Willey VJ, Singer JR, Kaila S, Bayer V, et al. Health care resource utilization and exacerbation rates in patients with COPD stratified by disease severity in a commercially insured population. *Journal of Managed Care and Specialty Pharmacy* 2019 /2;25(2):205-217.

(175) Association of cardiovascular risk with inhaled long-acting bronchodilators in patients with chronic obstructive pulmonary disease: A nested case-control study. ; /2; : American Medical Association; 2018.

(176) Wang WH, Cheng CC, Mar GY, Wei KC, Huang WC, Liu CP. Improving outcomes in chronic obstructive pulmonary disease by taking beta-blockers after acute myocardial infarction: a nationwide observational study. *Heart Vessels* 2019 /7;34(7):1158-1167.

(177) Whittaker HR, Müllerova H, Jarvis D, Barnes NC, Jones PW, Compton CH, et al. Inhaled corticosteroids, blood eosinophils, and fev1 decline in patients with COPD in a large UK primary health care setting. *International Journal of COPD* 2019;14:1063-1073.

- (178) Wittbrodt ET, Millette LA, Evans KA, Bonafede M, Tkacz J, Ferguson GT. Differences in health care outcomes between postdischarge COPD patients treated with inhaled corticosteroid/long-acting  $\beta$  2 -agonist via dry-powder inhalers and pressurized metered-dose inhalers. *International Journal of COPD* 2019;14:101-114.
- (179) Woodcock A, Boucot I, Leather DA, Crawford J, Collier S, Bakerly ND, et al. Effectiveness versus efficacy trials in COPD: How study design influences outcomes and applicability. *European Respiratory Journal* 2018;51(2).
- (180) Wu CX, Hwang CH, Tan WS, Tai KP, Kwek LSL, Chee TG, et al. Effectiveness of a chronic obstructive pulmonary disease integrated care pathway in a regional health system: A propensity score matched cohort study. *BMJ Open* 2018 /3;8(3).
- (181) Yakubek GA, Curtis GL, Khlopa A, Faour M, Klika AK, Mont MA, et al. Chronic Obstructive Pulmonary Disease Is Associated With Short-Term Complications Following Total Knee Arthroplasty. *J Arthroplasty* 2018 /8;33(8):2623-2626.
- (182) Yakubek GA, Curtis GL, Sodhi N, Faour M, Klika AK, Mont MA, et al. Chronic Obstructive Pulmonary Disease Is Associated With Short-Term Complications Following Total Hip Arthroplasty. *J Arthroplasty* 2018 /6;33(6):1926-1929.
- (183) Yen FS, Chen W, Wei JCC, Hsu CC, Hwu CM. Effects of metformin use on total mortality in patients with type 2 diabetes and chronic obstructive pulmonary disease: A matched subject design. *PLoS ONE* 2018 10;13(10).
- (184) Zeiger RS, Tran TN, Butler RK, Schatz M, Li Q, Khatry DB, et al. Relationship of Blood Eosinophil Count to Exacerbations in Chronic Obstructive Pulmonary Disease. *Journal of Allergy and Clinical Immunology: In Practice* 2018 /5;6(3):944-954.e5.
- (185) Zhang Z, Chai P, Wang J, Ye Z, Shen P, Lu H, et al. Association of particulate matter air pollution and hospital visits for respiratory diseases: a time-series study from China. *Environmental Science and Pollution Research* 2019 /4;26(12):12280-12287.