Brief Summary of Findings on the Association Between Underlying COPD and Severe COVID-19 Outcomes

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Contents

Table of Tables	3
List of FiguresErro	r! Bookmark not defined.
A. Methods	6
A.1. Literature Search	6
A.2. Study Selection	6
A.3. Data Extraction and Synthesis	8
A.4. Internal Validity Assessment	8
A.5. Reviewing and Finalizing the Systematic Review	8
B. Systematic Literature Review Results	9
B.1. Search Strategies and Results	9
B.2. Study Inclusion and Exclusion Criteria	10
B.3. Evidence Review: COPD and Severe COVID-19	11
B.3.a. Strength & Direction of Evidence	11
Table 3. The Association between COPD Diagnosed Using Lung Function Tests and Severe COVID-19 Outcomes	16
Table 4. Severity of Underlying COPD Examined for Association with Severe COVID-19 Outcomes	
B.3.b. Extracted Evidence	24
B.3.c. Internal Validity Assessments of Extracted Studies	
C. References	
Table of Tables	

Table 1. Chronic Lung Disease search conducted December 3, 2021	9
Table 2. The Association between COPD and Severe COVID-19 Outcomes	11
Table 3. The Association between COPD Diagnosed Using Lung Function Tests and Severe COVID-19 Outcomes	16
Table 4. Severity of Underlying COPD Examined for Association with Severe COVID-19 Outcomes	18
Table 5. The Association between COPD and Risk Factors or Risk Markers and Severe COVID-19 Outcomes	20

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Table of Figures

ults of the Study Selection Process

Brief Summary of Findings on the Association Between COPD and Severe COVID-19 Outcomes

Overall, 89 studies were retrieved that report data on COPD and severe COVID-19 outcomes including mortality, intensive care unit (ICU) admission, intubation, ventilation, hospitalization, and readmission. All studies were rated as having a moderate to low threat to internal validity except for one study (Gottlieb 2020).

- <u>COPD</u>: Data indicate underlying COPD is associated with an increased risk of mortality,¹⁻⁶⁵ ICU admission,^{3-5,7-9,14,29,42,58,62,65-74} intubation,^{62,65,69,73,75} ventilation,^{42,73,76,77} hospitalization, ^{3,9,14,18,29,35,41,43,60,64,66,68,74,75,78-82} and readmission.⁸³
 - <u>COPD determined by lung function</u> test: A sub-analysis of three studies^{8,13,42} included in the primary analysis suggests that underlying COPD diagnosed using lung function test is associated with an increase in mortality, but the magnitude of association was smaller than what is seen in the primary analysis. Data were insufficient^{8,42} to determine an association between ICU admission or ventilation and COPD in COVID-19 patients.
- <u>Chronic bronchitis</u>: Data from one study³⁸ suggest chronic bronchitis may be associated with an increased risk of mortality; however, one study is insufficient to draw conclusions.
- <u>Emphysema</u>: Data from one study⁵ suggest emphysema may be associated with an increased risk of mortality and ICU admission; however, one study is insufficient to draw conclusions.
- <u>Severity</u>: Data from one study⁸⁴ suggest severe COPD is associated with an increased risk of ICU admission, ventilation, and hospitalization; however, one study is insufficient to draw conclusions. Data from three studies⁸⁴⁻⁸⁶ were inconsistent and inconclusive on the association between COPD severity and mortality. Moreover, each study defined severity differently.
- <u>Risk Markers</u>: Data from one study⁵² are insufficient to determine the impact of age on mortality among COVID-19 patients with underlying COPD. Data from five studies^{28,41,52,81,87} are inconclusive on the association between sex, race, or ethnicity and severe COVID-19 outcomes among persons with underlying COPD.
- <u>COPD Treatment</u>: Data from two studies^{13,84} suggest COPD treatment is associated with a decrease in mortality among COVID-19 patients with underlying COPD. Data from one study⁸⁴ suggest COPD treatment is associated with an increase in the outcomes of ICU admission, ventilation, and hospitalization among COVID-19 patients with underlying COPD; however, one study is insufficient to draw conclusions. These studies use inhaled corticosteroid (ICS) treatment as the exposure measure.

A. Methods

The aim of this review is to identify and synthesize the best available evidence to answer the question: "what is the association between COPD and severe COVID-19?" This evidence will be used to update the Centers for Disease Control and Prevention (CDC) website on underlying conditions and enable the creation of a provider-specific website with more rigorous information.

The methods for assessment of the association between underlying conditions or risk factors and severe COVID-19 are outlined in the webpage, https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/systematic-review-process.html. These methods were established in May 2021 and are used for conditions and risk factors where CDC conducted the review.

Below are methodologic highlights and additional methods unique to this review. For more information, please visit https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/systematic-review-process.html.

A.1. Literature Search

A list of search terms was developed to identify the literature most relevant to the population, exposure, comparator, and outcome (PECO) question. Clinical experts and library scientists were consulted to develop a robust list of search terms. These terms were then incorporated into search strategies, and these searches were performed in OVID using the COVID-19 filter from the end of the previous literature search (December 2020). The detailed search strategies for identifying primary literature and the search results are provided in the Appendix. Subject matter experts supplemented the literature search results by recommending relevant references published before December 2020. References were included if retrieved by the chronic lung disease literature search and reported exposures and outcomes relevant to this review.

A.2. Study Selection

Titles and abstracts from references were screened by dual review (M.C., A.H., J.H., J.K.K., M.M., C.O., D.O.S., K.T.R., T.R., C.N.S., E.C.S., or M.W.).

Full-text articles were retrieved if they were:

- 1. Relevant to the PECO question;
- 2. Primary research, and
- 3. Written in English.

Part B presents the full list of exclusion criteria. The full texts of selected articles were then screened by two independent reviewers, and disagreements were resolved by discussion (M.C., J.H., J.K.K., C.O., D.O.S., T.R., C.N.S., E.C.S., or M.W.).

After the full-text screening was complete, a bibliography of the articles selected for inclusion was vetted with subject matter experts (D.W., J.M., G.S., and K.D.). Additional studies suggested by the subject matter experts were screened for inclusion as described above. The results of the study selection process are depicted in Figure 1.





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A.3. Data Extraction and Synthesis

Methodologic data and results pertaining to relevant outcomes from the studies meeting inclusion criteria were extracted into standardized evidence tables. Data and analyses were extracted as presented in the studies. For the purposes of this review:

- Confidence intervals were defined as "wide" if they were within the upper tertile of the range of confidence interval widths.
- Any determination of association based on measures of association was made based on the following rule of thumb:
 - Measures of association greater than 1.1 were defined as "suggestive" or "indicative" of an increase in risk, regardless of confidence interval or statistical significance.
 - Measures of association between 0.9 and 1.1 were defined as "suggestive" or "indicative" of no difference, and confidence intervals must have crossed the null
 - Measures of association less than 0.9 were defined as "suggestive" or "indicative" of a decrease in risk, regardless of confidence interval or statistical significance
 - If the overall direction of evidence was consistent, a Bayesian approach was taken to aggregating the evidence and determining the strength of association.
- Statistical significance was defined as $p \le 0.05$.

A.4. Internal Validity Assessment

The internal validity associated with each study was assessed using scales developed by the Division of Healthcare Quality Promotion and scores were recorded in the evidence tables. Part B includes the questions used to assess the quality of each study design. The strength, magnitude, precision, consistency, and applicability of results were assessed for all comparators. The overall confidence in the evidence base is reported in the aggregation tables in Part B.

A.5. Reviewing and Finalizing the Systematic Review

Draft findings, aggregation tables, and evidence tables, were presented to CDC subject matter experts for review and input. Following further revisions, the summary will be published on the CDC website.

B. Systematic Literature Review Results

B.1. Search Strategies and Results

 Table 1. Chronic Lung Disease search conducted December 3, 2021

#	Search History
1	chronic lung disease
2	respiratory system disease*
3	reactive airway disease*
4	emphysema
5	chronic bronchitis
6	COPD
7	Chronic obstructive pulmonary disease
8	Asthma *
9	allergic asthma
10	irritant asthma
11	Interstitial lung disease
12	Pulmonary fibrosis
13	idiopathic pulmonary fibrosis
14	nonspecific interstitial pneumonitis
15	hypersensitivity pneumonitis
16	sarcoidosis
17	pneumoconiosis
18	asbestosis
19	coal workers pneumoconiosis
20	silicosis
21	bronchiectasis
22	cystic fibrosis
23	pulmonary vascular disease
24	pulmonary hypertension
25	bronchopulmonary dysplasia
26	bronchiolitis obliterans
27	asthma*
28	reactive airway disease*

#	Search History
29	CF
30	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or
	27 or 28 or 29
31	Limit 30 to covid-19
32	(202012* or 2021*).dt
33	(202012* or 2021*).dc
34	32 or 33
35	31 and 34
36	Deduplicate

B.2. Study Inclusion and Exclusion Criteria

Inclusion Criteria: Studies were included at the title and abstract screen if they:

- were relevant to the key question "what is the association between chronic lung disease and severe COVID-19?";
 - Studies deemed not relevant included those that reported autopsy results, and examined lung transplant, cancer, or immunocompromised populations;
- were primary research;
- were written in English (can be seen as [language] in title); and
- examined humans only.

Exclusion Criteria: Studies were excluded at full text review if they:

- did not answer the key question "what is the association between COPD and severe COVID-19?";
- were not available as full-text;
- were not available in English;
- were not primary research articles that underwent the peer-review process including
 - conference abstracts, posters, letters to the editor, or reply letters;
 - systematic reviews, narrative reviews, or meta-analyses;
- reported only composite outcome measures for "severe COVID-19"; and
- did not report an adjusted results; and
- reported data from the same population as examined in another study (in these cases, the study with the larger study population or longer study period was maintained in the analysis).

B.3. Evidence Review: COPD and Severe COVID-19

B.3.a. Strength & Direction of Evidence

Table 2. The Association between COPD and Severe COVID-19 Outcomes

Outcome	Results
Mortality	The evidence from sixty-five studies ¹⁻⁶⁵ indicates that COPD is associated with an increase in mortality in COVID-19 patients. All sixty-
	five studies ¹⁻⁶⁵ were found to have a moderate threat to internal validity .
	• Strength of Association: Sixty-three studies reported adjusted measures of association ranging from aHR 0.167 (95% CI: NR)
	to aHR 16.58 (95% CI: 3.1-88.7).
	Precision of Association: Of the sixty-one studies reporting confidence intervals, twenty-two studies reported confidence
	intervals that included the null.
	 Consistency of Association: The evidence is consistent in the direction of increased mortality.
	Applicability of Association: The populations and settings were directly applicable to the question.
	Summary of Evidence:
	• Fifty-two studies (N=16,906,657) [forty-five cohort studies, ^{3-5,8,9,12,14,16,19,21-31,33,34,37-40,44,46-55,57,59-64} four case-control
	studies, ^{1,7,13,35} one case series study, ⁶⁵ one cross-sectional study, ⁵⁶ and one modeling study] ²⁰ indicate or suggest that
	underlying COPD or chronic bronchitis is associated with an increase in mortality in patients with COVID-19 and report
	adjusted measures of association ranging from aOR 1.11 (95% CI: 0.73-1.69) to aHR 16.58 (95% CI: 3.1-88.7). One
	cohort study ³⁸ (N=1,075) reported an increase in the adjusted hazard of underlying chronic bronchitis among COVID-
	19 patients who died compared to those who survived [aHR: 2.19 (95% CI: 1.53-3.15), p=0.03].
	 Nineteen studies^{7,8,13,19,20,25,27,33,35,39,40,47,48,50,56,57,59,61,64} reported wide confidence intervals and eleven
	studies ^{8,14,16,24,34,50,59,61,62,64,65} reported confidence intervals that included the null. One cohort study ³⁸ reported a low
	number of patients with chronic bronchitis and four studies ^{25,33,39,64} reported a low number of patients with COPD.
	• Eight studies (N=1,150,927), seven cohort studies ^{2,17,18,36,41,42} and one ecological study, ⁴⁵ reported adjusted measures of
	association ranging from aOR 0.92 (95% CI: 0.8-1.04) to aOR 1.09 (95% CI: 0.86-1.38), suggesting no association
	between underlying COPD and mortality in patients with COVID-19 and one cohort study ⁵ suggested no association
	between underlying emphysema and mortality in patients with COVID-19 [aOR: 1.01 (95% CI: 0.83-1.22), p=NR]. One
	ecological study ⁴⁵ reported no association between US county-level COVID-19 case fatality rates and county-level, age
	adjusted mortality due to COPD
	 Six studies^{2,5,36,41,42,45} reported confidence intervals that included the null, and one study² reported a wide confidence interval.

Outcome	Results
	 Six studies (N=9,107), three cohort studies,^{6,15,58} one case-control study,¹⁰ one cross-sectional study,⁴³ and one modeling study,³² reported adjusted measures of association ranging from aHR 0.17 (95% CI: NR) to aHR 0.85 (95% CI: 0.43-1.67), suggesting a protective association between underlying COPD and mortality in patients with COVID-19. All these studies reported confidence intervals that include the null, and one study⁴³ reported a wide confidence interval. One study⁶ did not report a confidence interval and one study¹⁵ only included patients living in nursing homes, further decreasing confidence in these results. One modeling study³² reported that the multivariate model explained 38% of the variability in mortality; however, COPD's association with mortality was counterintuitively negative and the confidence interval was wide.
ICU Admission	 The evidence from twenty-one studies^{3-5,7-9,14,29,42,58,62,65-74} is inconsistent and inconclusive on the association between ICU admission and COPD in COVID-19 patients. Twenty studies^{3-5,7-9,14,29,42,58,62,65-67,69-74} were found to have a moderate threat to internal validity, and one study⁶⁸) was found to have a high threat to internal validity. Strength of Association: Twenty-one studies reported adjusted measures of association ranging from aOR 0.22 (95% CI: 0.03-1.67) to aOR 31.8 (95% CI: 2.21-457.65). Precision of Association: Of the twenty-one studies reporting confidence intervals, eight were wide, and thirteen studies reported confidence intervals that include the null. Consistency of Association: The evidence is inconsistent in the direction of increased ICU admission. Applicability of Association: The populations and settings were directly applicable to the question. Summary of Evidence: Thirteen studies (N=755,719), nine cohort studies, ^{5,9,29,42,62,69,70,72,74} three case-control studies, ^{7,66,68} and one case series study, ⁶⁵ reported adjusted measures of association ranging from aOR 1.12 (95% CI: 0.94-1.34) to aOR 31.8 (95% CI: 2.21-457.7), suggesting that underlying COPD is associated with an increase in ICU admission in patients with COVID-19, and one cohort study^{4,5} also suggested no association between underlying cOPD is associated with an increase in ICU admission in patients with COVID-19 reported an increased odds remained after adjustment for covariates. One cohort study⁵ (N=89,530) reporting an odds ratio suggesting that underlying emphysema is associated with an increase in ICU admission in patients with COVID-19 reported an increased association remained after adjustment for obsity, diabetes, hypertension, heart failure, atherosclerotic heart disease, sex, and age as a continuous variable [aOR: 1.83 (95% CI: 1.56-2.16), p=NR]. Six studies^{7,62,68,70,72,74} reported wide
	that include the null, decreasing confidence in these results. One study (Hu 2020) reported a low number of patients with COPD.

Outcome	Results
	 Two cohort studies^{4,8} (N=4,682) reported no association between ICU admission and underlying COPD among COVID-19 patients.
	 One study⁴ (N=4,086) reported an adjusted measure of association suggesting no association between underlying COPD and ICU admission among COVID-19 patients when adjusting for age group, sex, and comorbidities [aOR: 1.1 (95%CI: 0.78-1.65), p=not significant].
	 One study⁸ (N=596) reported an adjusted measure of association suggesting no association between underlying COPD and the odds of ICU admission in patients with COVID-19 after adjusting for age, sex, asthma, and obesity [aOR: 0.94 (95% CI: 0.39-2.2), p=0.89].
	 Six cohort studies^{3,14,58,67,71,73} (N=8,282,419) reported adjusted measures of association ranging from aOR 0.22 (95% CI: 0.03-1.67) to aHR 0.89 (95% CI: 0.68-1.17), suggesting a protective association between underlying COPD and ICU admission in patients with COVID-19.
	• Five studies ^{3,14,58,67,71} reported confidence intervals that include the null and one study (Fayol 2021) reported a wide
	confidence interval and a low number of patients with COPD, decreasing confidence in these results.
Intubation	The evidence from five studies ^{62,65,69,73,75} indicates that COPD is associated with an increase in intubation in COVID-19 patients. All
	five studies ^{62,65,69,73,75} were found to have a moderate threat to internal validity.
	 Strength of Association: Five studies reported adjusted measures of association ranging from aOR 0.61 (95% CI: 0.47-0.81) to aOR 2.21 (95% CI: 1.75-2.78).
	 Precision of Association: Of the five studies reporting confidence intervals, one study reported a wide confidence interval and one study reported a confidence interval that includes the null.
	 Consistency of Association: The evidence is consistent in the direction of increased intubation.
	Applicability of Association: The populations and settings were directly applicable to the question.
	Summary of Evidence:
	 Four studies (N=218,777), three cohort studies^{62,69,75} and one case series,⁶⁵ reported adjusted measures of association ranging from aOR 1.12 (95% CI: 0.96-1.31) to aOR 2.21 (95% CI: 1.75-2.78), suggesting that underlying COPD is associated with an increase in intubation in patients with COVID-19. One cohort study⁶⁹ (N=39,420) reported an odds ratio suggesting that underlying COPD is associated with an increase in intubation in patients with an increase in intubation in patients with COVID-19. One cohort study⁶⁹ (N=39,420) reported an odds ratio suggesting that underlying COPD is associated with an increase in intubation in patients with COVID-19 and noted that an increased association remained after adjustment for age, sex, and other systemic comorbidities. One study⁶² reported a wide confidence interval, and one study⁷⁵ reported a confidence interval that includes the null.
	 One cohort study^{'3} (N=17,122) suggests that underlying COPD is associated with a decrease in intubation among COVID-19 patients.

Outcome	Results
	 One study⁷³ (N=17,122) reporting an adjusted measures of association suggesting that underlying COPD is associated
	with a decrease in intubation in patients with COVID-19 reported a decreased association remained after adjustment for
	variables with a significance of <0.1 in the univariate analyses, age, and sex [aOR: 0.61 (95% CI: 0.47-0.81), p=0.001].
Ventilation	The evidence from four studies ^{42,73,76,77} indicates that COPD is associated with an increase in ventilation in COVID-19 patients. All
	four studies ^{42,73,76,77} were found to have a moderate threat to internal validity.
	• Strength of Association: Four studies reported adjusted measures of association ranging from aOR 1.26 (95% CI: 1.04-1.53)
	to aOR 1.9 (95% CI: NR).
	Precision of Association: Of the four studies reporting confidence intervals, two were wide, and one study reported a
	confidence interval that includes the null.
	 Consistency of Association: The evidence is consistent in the direction of increased ventilation.
	Applicability of Association: The populations and settings were directly applicable to the question.
	Summary of Evidence:
	• Four studies (N=20,946), three cohort studies ^{42,73,77} and one cross-sectional study, ⁷⁶ reported adjusted measures of
	association ranging from aOR 1.26 (95% CI: 1.04-1.53) to aOR 1.9 (95% CI: NR), suggesting that underlying COPD is
	associated with an increase in ventilation in patients with COVID-19. Three studies ^{42,73,76} (N=2,863) reporting odds ratios
	suggesting that underlying COPD is associated with an increase in ventilation in patients with COVID-19 reported an
	increased association remained after adjustment for covariates.
	• One study ⁷⁶ did not report confidence intervals, two studies ^{42,77} reported wide confidence intervals, and one study ⁴²
	reported a confidence interval that includes the null. Three studies (Jacobs, Marron, Song) defined ventilation as
	mechanical ventilation, while the other ⁷³ included high-flow nasal cannula in addition to noninvasive mechanical ventilation.
Hospitalization	The evidence from nineteen studies ^{3,9,14,18,29,35,41,43,60,64,66,68,74,75,78-82} indicates that COPD is associated with an increase in
	hospitalization in COVID-19 patients. Eighteen studies ^{3,9,14,18,29,35,41,43,60,64,66,74,75,78-82} were found to have a moderate threat to internal
	validity and one ⁶⁸ had a high threat to internal validity.
	• Strength of Association: Nineteen studies reported adjusted measures of association ranging from aRR 0.9 (95% CI: 0.7-1.4)
	to aOR 2.71 (95% CI: 2.49-2.94).
	Precision of Association: Of the nineteen studies reporting confidence intervals, seven studies reported wide confidence
	intervals and eight studies reported confidence intervals that include the null.
	Consistency of Association: The evidence is consistent in the direction of increased hospitalization.
	 Applicability of Association: The populations and settings were directly applicable to the question.

Outcome	Results
	 Summary of Evidence: Seventeen studies (N=10,326,048), twelve cohort studies, ^{3,9,14,18,29,41,60,74,75,79,81,82} one cross-sectional study, ⁴³ and one modeling study, ⁷⁸ reported adjusted measures of association ranging from aOR 1.19 (95% CI: 1.17-1.21) to aOR 2.71 (95% CI: 2.49-2.94), suggesting that underlying COPD is associated with an increase in hospitalization in patients with COVID-19. Three studies ^{3,35,82} (N=8,466,520) reporting odds or hazard ratios suggesting that underlying COPD is associated with an increase in hospitalization in patients with COVID-19 reported an increased association remained after adjustment for covariates. Six studies^{35,43,68,74,79,81} reported wide confidence intervals and six studies^{60,74} reported confidence intervals that include the null, decreasing confidence in these results. Two cohort studies^{64,80} (N=6,302) reported adjusted measures of association suggesting no association between underlying COPD and hospitalization among COVID-19 patients. One study⁸⁰ (N=5,416) reported no association between underlying COPD and hospitalization among COVID-19 patients when adjusting for age, sex, and race/ethnicity [aRR: 0.9 (95% CI: 0.7-1.4), p=NR]. The study reported a confidence interval that included the null, decreasing confidence in the findings. One study⁸⁴ (N=886) reported no association between underlying COPD and hospitalization among COVID-19 patients when adjusting for time from local outbreak, state, date of infection diagnosis, age, sex, comorbidities, and nursing home residency [aOR: 0.973 (95% CI: 0.145-6.548), p=NR]. The study reported a wide confidence interval that included the null and a low number of patients with COPD, decreasing confidence in the findings.
Non-Elective Readmission	 The evidence is inconclusive on the association between non-elective readmission and underlying COPD among COVID-19 patients. Aggregation indices cannot be measured with only one study which was found to have a moderate threat to internal validity. One cohort study⁸³ (N=7,137) suggests COPD is associated with an increase in non-elective readmission among COVID-19 patients. One cohort study⁸³ (N=7,137) reported an adjusted measure of association suggesting that underlying COPD is associated with an increase in non-elective readmission for age, Charlson Comorbidity Index score, diabetes, COPD, asthma, solid neoplasia, hypertension, dementia, duration of symptoms before admission, hemoglobin level and platelet count at admission, ground-glass infiltrate at admission, acute cardiac injury, acute kidney failure, and glucocorticoid treatment [aOR: 1.84 (95% CI: 1.26-2.69), p=0.002]. The study reported a wide confidence interval, decreasing confidence in the findings.

Outcome	Results
Mortality	 The evidence from three studies^{8,13,42}) is inconsistent and inconclusive on the association between mortality and underlying COPD among COVID-19 patients. All three studies^{8,13,42} were found to have a moderate threat to internal validity. Strength of Association: Three studies reported adjusted measures of association ranging from aHR 1 (95% CI: 0.5-2.1) to aOR 2.8 (95% CI: 1.5-5.3). Precision of Association: Two studies reported wide confidence intervals and two studies reported confidence intervals that include the null. Consistency of Association: Results are inconsistent. Applicability of Association: The populations and settings were directly applicable to the question.
	 Summary of Evidence: Three cohort studies^{8,13,42} (N=2,373) reported data that were inconsistent and inconclusive on the association between underlying COPD and mortality among COVID-19 patients. One cohort study⁸ (N=596) used lung function tests to ascertain COPD and reported an adjusted measure of association suggesting an increased association between underlying COPD and the odds of mortality among COVID-19 patients after adjusting for age, sex, asthma, cardiopathy, and immunosuppressive disease. This study reported a wide confidence interval that included the null, decreasing confidence in these results. One cohort study¹³ (N=1,200) used lung function tests to ascertain COPD and reported an adjusted measure of association suggesting an increased association between underlying COPD and the odds of mortality among COVID-19 patients after adjusting for age, sex, and other comorbidities. This study reported a wide confidence interval, decreasing confidence in these results. One cohort study⁴² (N=577) used lung function tests to ascertain COPD and reported an adjusted measure of association suggesting no association between underlying COPD and the ported an adjusted measure of association suggesting no association between underlying COPD and reported a wide confidence interval, decreasing confidence in these results. One cohort study⁴² (N=577) used lung function tests to ascertain COPD and reported an adjusted measure of association suggesting no association between underlying COPD and the hazard of mortality in patients with COVID-19 after adjusting for age, chronic kidney disease, malignancy, oxygen support via low-flow nasal cannula, oxygen support via high-flow nasal cannula. This study reported a confidence interval that includes the null, decreasing confidence in these results.
ICU Admission	The evidence from two studies ^{8,42} is inconsistent and inconclusive on the association between ICU admission and underlying COPD among COVID-19 patients. Both studies ^{8,42} were found to have a moderate threat to internal validity.

Table 3. The Association between COPD Diagnosed Using Lung Function Tests and Severe COVID-19 Outcomes

Outcome	Results
	 Strength of Association: Two studies reported adjusted measures of association aOR 0.94 (95% CI: 0.39-2.2) and aHR 1.39 (95% CI: 0.86-2.25). Precision of Association: Of the two studies reporting confidence intervals, both reported confidence intervals that include the null. Consistency of Association: Results are inconsistent.
	Applicability of Association: The populations and settings were directly applicable to the question.
	Summary of Evidence:
	• Two cohort studies ^{8,42} (N=1,173) reported data that were inconsistent and inconclusive on the association underlying COPD and ICU admission among COVID-19 patients.
	 One study⁴² (N=577) used lung function tests to ascertain COPD and reported an adjusted measure of association suggesting an increased association between underlying COPD and the odds of ICU admission in patients with COVID-19 after adjusting for age, serum Cr, ALC<1.0 K/mm3, coronary artery disease, congestive heart failure, and hypertension. This study reported a confidence interval that includes the null, decreasing confidence in the results. One study⁸ (N=596) used lung function tests to ascertain COPD and reported an adjusted measure of association suggesting no association between underlying COPD and the odds of ICU admission in patients with COVID-19 after adjusting for age, sex, asthma, and obesity. This study reported a confidence interval that includes the null, decreasing confidence in the results.
Ventilation	The evidence is inconclusive on the association between underlying COPD and ventilation among COVID-19 patients. Aggregation indices cannot be measured with only one study which was found to have a moderate threat to internal validity.
	 One cohort study⁴² (N=577) suggested COPD is associated with an increase in ventilation among COVID-19 patients. One study⁴² (N=577) used lung function tests to ascertain COPD and reported an adjusted measure of association suggesting an increased association between underlying COPD and the hazard of mechanical ventilation in patients with COVID-19 after adjusting for age, oxygen support, active smoking, former smoking, coronary artery disease, congestive heart failure, and hypertension. This study reported a confidence interval that includes the null, decreasing confidence in the results.

Outcome	Results				
Mortality	 The evidence from three studies⁸⁴⁻⁸⁶ is inconsistent and inconclusive on the association between mortality and severity of underlying COPD among COVID-19 patients. All three studies⁸⁴⁻⁸⁶ were found to have a moderate threat to internal validity. Strength of Association: Three studies reported adjusted measures of association ranging from aOR 0.69 (95% CI: 0.33-1.5) to aOR 3.06 (95% CI: 1.14-8.2). Precision of Association: Of the three studies reporting confidence intervals, two studies reported wide confidence intervals and all three studies reported confidence intervals that include the null. Consistency of Association: Results are inconsistent. Applicability of Association: The populations and settings were directly applicable to the question. 				
	 Summary of Evidence: One cohort study⁸⁵ (N=4,066) reported an adjusted measure of association suggesting that severe COPD is associated with an increased odds of mortality among COVID-19 patients compared to COVID-19 patients without COPD. One study⁸⁵ (N=4,066) reported an increase in the adjusted odds of mortality among those with severe COPD compared with no COPD [aOR: 3.06 (95% CI: 1.14-8.2), p=0.026], and no association among those with mild COPD compared to no COPD [aOR: 1.1 (95% CI: 0.42-2.89), p=0.851] when adjusting for age, sex, income, obesity, smoking, alcohol consumption, systolic blood pressure, diastolic blood pressure, fasting blood glucose, total cholesterol, CCI scores, number of NSAIDs used, number of steroids used, hypertension, and asthma. Severe COPD was defined as having a history of systemic corticosteroid use within the previous two years and mild COPD was defined as no history of systemic corticosteroid use within the previous two years. This study reported a wide confidence interval. Two cohort studies^{84,86} (N=5,898) reported adjusted measures of association suggesting a decrease in mortality among patients with severe COPD and COVID-19. One study⁸⁶ (N=4,610), which defined severe COPD as two or more COPD exacerbations and prescription of ICS, LABA, and LAMA, PDE-4 inhibitors, or low-dose macrolides during the study period, reported a decreased odds of mortality when comparing patients with severe COPD to patients with non-severe COPD after adjustment for age, sex, severity of COPD, medication possesion ratio, and number of exacerbations [aOR: 0.82 (95% CI: 0.19-3.39), p=NR]; however, this study reported a wide confidence interval that included the null. One study⁸⁴ (N=1,288), which defined severe COPD as oral corticosteroid use in the prior year and non-severe COPD as no oral corticosteroid use in the prior year, reported a decreased odds of mortality when comparing patients with severe COPD as oral corticosteroid use in				

Table 4. Severity of Underlying COPD Examined for Association with Severe COVID-19 Outcomes

Outcome	Results				
	and month of COVID positivity [aOR: 0.69 (95% CI: 0.33-1.5), p=NR]; however, this study reported a confidence interval that included the null.				
ICU Admission	The evidence is inconclusive on the association between ICU admission and severe COPD among COVID-19 patients. Aggregation indices cannot be measured with only one study which was found to have a moderate threat to internal validity.				
	 One cohort study⁸⁴ (N=1,288) reported an adjusted measure of association suggesting that severe COPD is associated with an increased odds of ICU admission among COVID-19 patients compared to COVID-19 patients with non-severe COPD. One cohort study⁸⁴ (N=1,288), which defined severe COPD as oral corticosteroid use in the prior year and non-severe COPD as no oral corticosteroid use in the prior year, reported an increased odds of ICU admission when comparing patients with severe COPD to patients with non-severe COPD after adjustment for sex, race, age, smoking status, comorbidities, and month of COVID positivity [aOR: 1.52 (95% CI: 0.92-2.64), p=NR]. However, the study reported a confidence interval that included the null. 				
Ventilation	 The evidence is inconclusive on the association between ventilation and severe COPD among COVID-19 patients. Aggregation indices cannot be measured with only one study which was found to have a moderate threat to internal validity. One cohort study⁸⁴ (N=1,288) reported an adjusted measure of association suggesting that severe COPD is associated with an increased odds of mechanical ventilation among COVID-19 patients compared to COVID-19 patients with non-severe COPD. One cohort study⁸⁴ (N=1,288), which defined severe COPD as oral corticosteroid use in the prior year and non-severe COPD as no oral corticosteroid use in the prior year, reported an increased odds of mechanical ventilation when comparing patients with severe COPD to patients with non-severe COPD after adjustment for sex, race, age, smoking status, comorbidities, and month of COVID positivity [aOR: 2.1 (95% CI: 0.91-5.77), p=NR]. However, the confidence intervals were wide and included the null, decreasing confidence in these results. 				
Hospitalization	 The evidence is inconclusive on the association between hospitalization and severe COPD among COVID-19 patients. Aggregation indices cannot be measured with only one study which was found to have a moderate threat to internal validity. One cohort study⁸⁴ (N=1,288) reported an adjusted measure of association suggesting that severe COPD is associated with an increased odds of hospitalization among COVID-19 patients compared to COVID-19 patients with non-severe COPD. One cohort study⁸⁴ (N=1,288), which defined severe COPD as oral corticosteroid use in the prior year and non-severe COPD as no oral corticosteroid use in the prior year, reported an increased odds of hospitalization when comparing 				

Outcome	Results
	patients with severe COPD to patients with non-severe COPD adjustment for sex, race, age, smoking status, comorbidities, and month of COVID positivity [aOR: 1.54 (95% CI: 1.1-2.19), p=NR].

Table 5. The Association between COPD Risk Factors or Risk Markers and Severe COVID-19 Outcomes

Outcome	Results					
Mortality	The evidence from two studies is suggestive of a higher risk of mortality among females with COPD than males with COPD ^{28,52} among					
	COVID-19 patients with underlying COPD. The evidence from one study is insufficient to determine an association between mortality					
	and age ⁵² or race or ethnicity ⁴¹ among COVID-19 patients with underlying COPD. All three studies ^{28,41,52} were found to have a					
	moderate threat to internal validity.					
	 Strength of Association: Three studies reported adjusted measures of association ranging from aOR 0.85 (95% CI: 0.43-1.59) to aOR 5.74 (95% CI: 5.09-6.49). 					
	• Precision of Association: Of the three studies reporting confidence intervals, one study reported wide confidence intervals					
	and one study reported confidence intervals that include the null.					
	Consistency of Association: The evidence is consistent for sex.					
	• Applicability of Association: The populations and settings were directly applicable to the question.					
	Summary of Evidence:					
	 One cohort study⁵² (N=31,526) reported data suggesting an increase in mortality with increasing age among COVID-19 patients with underlying COPD. 					
	 One cohort study⁵² (N=31,526) reported an increased adjusted odds of mortality among COVID-19 patients aged 65-79 years with underlying COPD compared to patients aged 40-69 years [aOR: 2.44 (95% CI: 2.19-2.71), p<0.0001]. This study reported the adjusted odds of mortality more than doubled when comparing patients aged ≥ 80 years to patients 40-64 years, suggesting an increase in mortality with increasing age among COVID-19 patients with underlying COPD [aOR: 5.74 (95% CI: 5.09-6.49), p<0.0001]. This study excluded patients under 40 years old. 					
	 Two cohort studies^{28,52} (N=6,983,966) reported data suggesting an increase in mortality among female COVID-19 patients with underlying COPD when compared to male COVID-19 patients with underlying COPD. 					
	 One cohort study²⁸ (N=6,952,440) reported data suggesting COPD is associated with a slightly greater adjusted hazard of mortality among female COVID-19 patients [aHR: 1.31 (95% CI: 1.19-1.44), p=NR] than among male COVID-19 patients [aHR: 1.22 (95% CI: 1.12-1.33), p=NR] when adjusting for race/ethnicity, age, body mass index, and other comorbidities 					
	in unvaccinated patients with a SARS-COV-2 positive test.					

Outcome	Results
	 One cohort study⁵² (N=31,526) reported data suggesting COPD is associated with an increased adjusted odds of mortality among female COVID-19 patients with COPD [aOR 1.62 (95% CI 1.36 – 1.95), p = NR] but not male patients with COPD [aOR 1.14 (95% CI 0.97 – 1.34) p = NR]. This study adjusted for unclear clinical and demographic factors and excluded patients under 40 years old. One cohort study⁴¹ (N=11,930) was insufficient to determine an association between mortality and ethnicity in patients with COPD and COVID-19. One study⁴¹ (N=11,930) reported data suggesting the adjusted odds of mortality was greatest for non-Hispanic-Asian COVID-19 patients with underlying COPD [aOR: 1.45 (95% CI: 0.66-3.1), p=0.348]; however, this study reported wide, overlapping confidence intervals that included the null, reducing confidence in these results and suggesting no conclusion on the association between mortality and ethnicity.
ICU Admission	 The evidence is inconclusive on the association between ICU admission and race or ethnicity among COVID-19 patients with underlying COPD. Aggregation indices cannot be measured with only one study which was found to have a moderate threat to internal validity. One cohort study⁸⁷ (N=5,190) was insufficient to determine an association between mortality and ethnicity in patients with COPD and COVID-19. One cohort study⁸⁷ (N=5,190) reported data suggesting a decrease in the odds of ICU admission for Latinx [aOR: 0.31 (95% CI: 0.13-0.73), p=statistically significant] and Black [aOR: 0.83 (95% CI: 0.28-2.42), p=NR] COVID-19 patients with COPD when adjusting for age, sex, baseline comorbidities, and socioeconomic status. This study also reported data suggesting for age, sex, baseline comorbidities, and socioeconomic status. This study also reported data suggesting for age, sex, baseline comorbidities, and socioeconomic status. This study also reported data suggesting for age, sex, baseline comorbidities, and socioeconomic status. This study also reported data suggesting for age, sex, baseline comorbidities, and socioeconomic status. This study also reported data suggesting for age, sex, baseline comorbidities, and socioeconomic status. This study also reported data suggesting for age, sex, baseline comorbidities, and socioeconomic status. This study also reported data suggesting for age, sex, baseline comorbidities, and socioeconomic status. The study reported a wide confidence interval that included the null, decreasing confidence in the data.
Hospitalization	 The evidence from four studies^{28,41,81,87} is inconsistent and inconclusive on the association between hospitalization and race or ethnicity among COVID-19 patients with COPD. All four studies^{28,41,81,87} were found to have a moderate threat to internal validity. Strength of Association: Four studies reported adjusted measures of association ranging from aOR 0.59 (95% CI: 0.28-1.28) to aOR 4.34 (95% CI: 2.42-7.77). Precision of Association: Of the four studies reporting confidence intervals, two studies reported wide confidence intervals and two studies reported confidence intervals that include the null. Consistency of Association: The evidence is inconsistent. Applicability of Association: The populations and settings were directly applicable to the question.

Outcome	Results
	 Two cohort studies^{28,81} (N=6,958,152) examining hospitalization, reported the adjusted measures of association for underlying COPD in women is greater than the adjusted measure of association among men or the general population. One cohort study⁸¹ (N=5,712) reported an adjusted measure of association suggesting COPD is associated with an increased hazard of hospitalization among female COVID-19 patients when adjusting for age and race/ethnicity [aOR: 4.34 (95% CI: 2.42-7.77), n<0.001] This measure of association is higher than what is seen in the overall population.
	[aOR: 2.59 (95% CI: 1.67-4.02), p≤0.001].
	 One cohort study²⁸ (N=6,952,440) reported data suggesting COPD is associated with a slightly greater adjusted hazard of hospitalization among female COVID-19 patients [aHR: 1.24 (95% CI: 1.10-1.40), p=NR] than among male COVID-19 patients [aHR: 1.18 (95% CI: 1.06-1.33), p=NR] when adjusting for race/ethnicity, age, body mass index, and other
	comorbidities in unvaccinated patients with a SARS-CoV-2 positive test.
	 Three cohort studies^{41,81,87} (N=22,832) reported data that were inconsistent and inconclusive on the association between hospitalization and ethnicity among COVID-19 people with underlying COPD.
	 One cohort study⁸⁷ (N=5,190) reported data suggesting the adjusted odds of hospitalization was higher for White COVID-19 people [aOR1: 1.20 (95% CI: 0.86-1.67), p=NR] than for Black [aOR1: 1.05 (95% CI: 0.55-1.99), p=NR]; or Latinx people [aOR1: 1.06 (95% CI: 0.65-1.73), p=NR] when adjusting for age, sex, baseline comorbidities, racial and ethnic background, and socioeconomic status. However, this study reported wide, overlapping confidence intervals that included the null, reducing confidence in these results.
	 One cohort study⁸¹ (N=5,712) reported data suggesting the adjusted odds of hospitalization was similar in magnitude for Black [aOR: 2.53 (95% CI: 1.24-5.16), p≤ 0.05] and White [aOR: 2.49 (95% CI: 1.38-4.49), p≤0.05] people with COVID-19 and underlying COPD; however, this study reported wide, overlapping confidence intervals, reducing confidence in these results.
	 One cohort study⁴¹ (N=11,930) reported data on people with COVID-19 and COPD suggesting the adjusted odds of hospitalization was higher for non-Hispanic-Asian people [aOR: 3 (95% CI: 0.55-26.6), p=0.26] than it was for non- Hispanic-Black [aOR: 1.89 (95% CI: 0.77-4.74), p=0.17], non-Hispanic-White [aOR: 2.7 (95% CI: 1.28-5.71), p=0.009], or
	Hispanic [aOR: 0.59 (95% CI: 0.28-1.28), p=0.17] people when adjusting for age, sex, race/ethnicity, clinical characteristics, BMI, smoking status, neighborhood deprivation index, hospital site, and insurance type. This study reported wide, overlapping confidence intervals that included the null, reducing confidence in these results.

Table 6. Treatment for Underlying COPD Examined for Association with Severe COVID-19 Outcomes

Health Condition	Results				
Mortality	The evidence from two studies ^{13,84} suggests that inhaled corticosteroid (ICS) treatment may be associated with a decrease in mortality among COVID-19 patients with underlying COPD. Both studies ^{13,84} were found to have a moderate threat to internal validity.				
	 Strength of Association: Two studies reported adjusted measures of association aOR 0.75 (95% CI: 0.24-2.33) and aOR 0.8 (95% CI: 0.43-1.49). 				
	 Precision of Association: Of the two studies reporting confidence intervals, one study reported a wide confidence interval and both studies reported confidence intervals that include the null. 				
	 Consistency of Association: The evidence is consistent in the direction of decreased mortality. Applicability of Association: The populations and settings were directly applicable to the question. 				
	 Summary of Evidence: Two cohort studies^{13,84} (N=2,488) reported adjusted measures of association suggesting that ICS treatment for COPD is associated with a decrease in the odds of mortality among COVID-19 patients with underlying COPD 				
	 One cohort study⁸⁴ (N=1,288) suggested no association between ICS treatment and the odds of mortality among COVID-19 patients with underlying COPD. However, after adjustment for sex, race, age, smoking status, comorbidities, and month of COVID-19 positivity, the study suggested a decrease in the odds of mortality [aOR: 0.8 (95% CI: 0.43-1.49), p=NR]. The confidence interval included the null, decreasing confidence in these results. 				
	 One cohort study¹³ (N=1,200) reported an adjusted measure of association suggesting that ICS treatment for COPD is associated with a decrease in the odds of mortality among COVID-19 patients with underlying COPD after adjustment for age, sex, and other comorbidities [aOR: 0.75 (95% CI: 0.24-2.33), p=0.619]. However, this study reported a wide confidence interval that included the null. 				
ICU Admission	The evidence is inconclusive on the association between ICU admission and ICS treatment among COVID-19 patients with underlying COPD. Aggregation indices cannot be measured with only one study which was found to have a moderate threat to internal validity.				
	 One cohort study⁸⁴ (N=1,288) suggests ICS treatment is associated with an increase in ICU admission among COVID-19 patients with underlying COPD. One cohort study⁸⁴ (N=1,288) reported that ICS treatment is associated with an increase in the odds of ICU admission among COVID-19 patients with underlying COPD after adjustment for sex, race, age, smoking status, comorbidities, and month of COVID-19 positivity [aOR: 1.31 (95% CI: 0.82-2.1), p=NR]. However, the confidence intervals included the null decreasing confidence in these results. 				

Health Condition	Results
Ventilation	The evidence is inconclusive on the association between ventilation and ICS treatment among COVID-19 patients with underlying COPD. Aggregation indices cannot be measured with only one study which was found to have a moderate threat to internal validity.
	 One cohort study⁸⁴ (N=1,288) suggests ICS treatment is associated with an increase in mechanical ventilation among COVID-19 patients with underlying COPD.
	 One cohort study⁸⁴ (N=1,288) reported data suggesting that ICS treatment is associated with an increase in the odds of mechanical ventilation among COVID-19 patients with underlying COPD after adjustment for sex, race, age, smoking status, comorbidities, and month of COVID-19 positivity [aOR: 1.65 (95% CI: 0.69-4.02), p=NR]. However, the confidence intervals were wide and included the null, decreasing confidence in these results.
Hospitalization	The evidence is inconclusive on the association between hospitalization and ICS treatment among COVID-19 patients with underlying COPD. Aggregation indices cannot be measured with only one study which was found to have a moderate threat to internal validity.
	 One cohort study⁸⁴ (N=1,288) suggests ICS treatment is associated with an increase in hospitalization among COVID-19 patients with underlying COPD.
	 One cohort study⁸⁴ (N=1,288) reported data suggesting that ICS treatment is associated with an increase in the odds of hospitalization among COVID-19 patients with underlying COPD after adjustment for sex, race, age, smoking status, comorbidities, and month of COVID-19 positivity [aOR: 1.12 (95% CI: 0.9-1.38), p=NR]. However, the confidence intervals included the null, decreasing confidence in these results.

B.3.b. Extracted Evidence

Table 7. Extracted Studies Reporting the Association between COPD and Severe COVID-19 Outcomes

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
Author: Ahlstrom ¹	Population: N=990	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
	5n=1981 patients	COPD: 75/1981 (3.8%)	COPD: ICD-10 code J41.x-J44.x reported	aHR: Adjusted Hazard Ratio for combined
Year: 2021	N=7924 age and		in medical record in preceding 5 years	comorbidities and medications model
	sex matched	Control/Comparison group, n/N (%):	unless stated otherwise	aOR: Multivariable Logistic Regression for combined
Data Extractor: DOS	controls	For mortality outcomes:		comorbidities and medications model
		No COPD: 1906/1981 (96.2%)	Severity Measure(s): NR	
Reviewer: CS	Setting: ICU			Mortality, n/N (%):
	-	For ICU admission outcomes:	Clinical marker: NR	COPD:

Study	Population and Setting	Intervention	Definitions	Outcomes
Study design: Case- control Study Objective: To explore the role of relevant comorbidities and medications in relation to the risk of ICU admission and mortality. IVA Score: 25 (moderate)	Location: Sweden Study dates: March 6 - May 27, 2020 Inclusion criteria: All Swedish general ICUs report ICU cases to the Swedish Intensive Care Registry (SIR) and all coronavirus infected ICU patients to the SIRs sub registry, the Influenza and Virus Infection Registry (SIRI). The reporting of COVID-19 mandates a positive PCR test to SARS-CoV-2. Cases had at least one COVID-19 registration in the SIRI until data acquisition on May 27, 2020. Four age- and sex- matched controls per patient were drawn from the Population Statistics. Age matching was performed as close to ICU admission	No COPD: 146/7924 (1.8%)	Treatment/ Associated Therapy: NR Outcome Definitions: Mortality: died in ICU ICU admission: COVID-19 patients admitted to ICU Intubation: NR Ventilation: NR Hospitalization: NR Non-elective readmissions: NR Comments: None	 aHR: 1.74 (95% CI: 1.05-2.88), p=0.032 Died: 19/346 (5.5%) Alive: 37/1198 (3.1%) p=0.048 <i>ICU admission:</i> COPD: aOR: 1.32 (95% CI: 0.96-1.82), p=0.091 Severity of Condition: NR Duration of Condition: NR Treatment/ Associated Therapy: NR Comorbid Conditions: NR Risk Markers: NR Long-term Sequelae: NR

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
	as possible, based			
	on the participants			
	age on January 31,			
	2020. Cases could			
	not become			
	controls and			
	controls could not			
	be selected twice.			
	Exclusion criteria:			
	Aged <18 years or			
	the absence of a			
	Swedish personal			
	identification			
	number.			
Author: Arslan ²	Population: N=767	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
		Chronic obstructive pulmonary disease	COPD: ND	aOR: Multivariable Logistic Regression; model
Year: 2021	Setting: Covid	(COPD): 43/767 (5.6%)		included: NR
	clinics of a training		Severity Measure(s): NR	
Data Extractor: MW	and research	Control/Comparison group, n/N (%):		Mortality, n/N (%):
	hospital	No COPD: 724/767 (94.4%)	Clinical marker: NR	COPD:
Reviewer: CNS				• aOR: 0.972 (95% CI: 0.32-3.03); p=0.972
	Location: Turkey		Treatment/ Associated Therapy: NR	 Non-survived: 12/59 (20.3%)
Study Design: Cohort				• Survived: 31/708 (4.4%)
	Study dates:		Outcome Definitions:	• p<0.001
Study Objective: To	March 18 – May		Mortality: ND	
investigate the broad	15, 2020		ICU admission: NR	Severity of Condition: NR
range of factors related to			Intubation: NR	
fatality rate in COVID-19	Inclusion criteria:		Ventilation: NR	Duration of Condition: NR
cases.	All the patients		Hospitalization: NR	
	referred for		Non-elective readmissions: NR	Treatment/ Associated Therapy: NR
IVA Score: 23 (Moderate)	COVID-19 disease		Commenter Name	
	(verified by KI-PCR		comments: None	Comorbid Conditions: NR
	or naving relevant			
	anamnesis, clinical			Risk Markers: NR
	symptoms and			
	signs of typical			Long-term Sequelae: NR
	pulmonary CI			
	imaging even if RI-			

Study	Population and Setting	Intervention	Definitions	Outcomes
	PCR is negative) and hospitalized in the Covid Clinics of the study hospital.			
	Exclusion criteria: NR			
Author:	Population: N=	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
Avevard ³ ENREE 1	8,256,161	COPD: 193,520/8,256,161 (2.3%)	COPD: ND	aHR: Adjusted Hazard Ratio for all other respiratory
				diseases, ethnicity, socioeconomic status, region of
Noor: 2021	Setting: 1.205	Control/Comparison group, n/N (%):	Severity Measure(s): NR	England, body-mass index, smoking status, non-
Tear. 2021	general practices	COPD: 8.062.641/8.256.161 (97.7%)		smokina-related illness (hypertension, type 1 diabetes,
Data Extractory TD	Serier ar braceroco		Clinical marker: NR	chronic liver disease, chronic neurological disease) and
Data Extractor: TR	Location: England			smoking-related illness (coronary heart disease, stroke
			Treatment/Associated Therapy: NR	atrial fibrillation type 2 diabetes chronic kidney
Reviewer: DOS	OK		meatmenty Associated merapy. NK	disagea)
	Ctudu datası		Outcome Definitions	USEUSE)
Study design:	Study dates:		Outcome Definitions:	
Retrospective cohort	January 24, 2020-		COVID 10 (ICD 10 and an IVO7 1 and	Adaptality of AL (0)
study	April 30, 2020		COVID-19 (ICD-10 codes 007.1 and	Mortality, n/N (%):
			007.2) on the death certificate,	COPD:
Study Objective: To	Inclusion criteria:		including deaths in and out of hospital	• aHR: 1.54 (95% CI: 1.42-1.67)
assess whether chronic	All patients aged		ICU admission: admission to an ICU	• HR: 6.66 (95% CI: 6.19-7.18)
lung disease or use of	20 years and older		with severe COVID-19 (ICD-10 code	 COPD: 811/193,520 (0.4%)
inhaled corticosteroids	registered with		U07.1 or U07.2) in Intensive Care	
(ICS) affects the risk of	one of the 1,205		National Audit and Research Centre	ICU admission, n/N (%):
contracting severe COVID-	general practices		(ICNARC) records	COPD:
19.	in England		Intubation: NR	 aHR: 0.89 (95% CI: 0.68-1.17)
	contributing to the		Ventilation: NR	• HR: 1.68 (95% CI: 1.29-2.18)
IVA Score: 23 (moderate)	QResearch		Hospitalization: positive test for SARS-	• COPD: 59/193,520 (<0.1%)
	database (version		CoV-2 and appearing in the Hospital	
	44, uploaded		Episode Statistics dataset as an in-	Hospitalization. n/N (%):
	March 23, 2020)		patient within 30 days of that test or	COPD:
	were included in		having an International Classification of	• aHR: 1.54 (95% CI: 1.45-1.63)
	this population		Diseases (ICD)-10 code U07.1 for	• HR: 5 09 (95% CI: 4 83-5 36)
	cohort study. Data		confirmed COVID-19 or U07.2 for	• COPD: 1 555/193 520 (0.8%)
	were linked to		suspected COVID-19	- COF D. 1,000 190,020 (0.0/0)
	Public Health		Non-elective readmissions: NR	Soverity of Condition: NP
	England's			Sevency of condition. NR
	database of SARS-		Comments: None	Duration of Condition: NR

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
	English hospital			Treatment/Associated Therapy: NR
	admissions, ICU			
	admissions, and			Comorbid Conditions: NR
	deaths for COVID-			
	19.			Risk Markers: NA
	Exclusion criteria:			Long-term Sequelae: NR
	NR			
Author: Beatty4	Population:	Medical Condition n/N (%):	Medical Condition(s):	Severe COVID-19
Addion Beatty	N=4.086	COPD: 338/4.086 (8.3%)	COPD: ICD-10 codes J44.1-J44.9	aOR: Multivariable Logistic Regression: adjusted for
Year: 2021	,			age group, sex, and comorbidities
	Setting: All public	Control/Comparison group, n/N (%):	Severity Measure(s): NR	
Data Extractor: JKK	acute hospitals	No COPD: 3,748/4,086 (91.7%)		Mortality, n/N (%):
			Clinical marker: NR	COPD
Reviewer: CNS	Location: Ireland			 aOR: 1.5 (95% CI: 1.16-2.01), p=0.002
			Treatment/ Associated Therapy: NR	
Study Design: Cohort	Study dates:			ICU Admission, n/N (%):
Shards Objection To	February 29 – July		Outcome Definitions:	COPD
study Objective: 10	31, 2020		Mortality: In hospital mortality	• aOR: 1.1 (95% CI: 0.78-1.65), p=not significant
enidemiology of COVID-19	Inclusion criteria:		Intubation: NR	Soverity of Condition: NP
hospitalized patients in	Hospital Inpatient		Ventilation: NR	Sevency of condition. NR
wave 1 of the COVID-19	Enquiry (HIPE)		Hospitalization: NR	Duration of Condition: NR
pandemic in Ireland and	record national		Non-elective readmissions: NR	
identify factors	dataset, including			Treatment/ Associated Therapy: NR
independently associated	COVID-19		Comments: None	
with adverse outcomes,	discharge episodes			Comorbid Conditions: NR
specifically long length of	admitted during			
stay, ICU admission and in	the study dates;			Risk Markers: NR
hospital mortality.	discharge were			
IVA Score:	defined by the			Long-term Sequelae: NR
COPD: 23 (moderate)	presence of ICD-			
	10-AM codes			
	U07.1, B34.2, or			
	B97.2.			

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
	Exclusion criteria:			
	Records with			
	admission dates			
	prior to the date of			
	Ireland's first			
	confirmed case of			
	COVID-19			
	(February 29,			
	2020) and records			
	with an admission			
	date between July			
	31 and August 10,			
	2020.			
Author: Beltramo ⁵	Population:	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
	N= 89,530 COVID-	Chronic obstructive pulmonary disease	<i>COPD</i> : ICD-10 J40, J41, J42, J44	aOR: Adjusted odds ratio; adjusted for obesity,
Year: 2021	19 patients	(COPD): 4866/89,530 (5.44%)	Emphysema: ICD-10 J43, J982	diabetes, hypertension, heart failure, atherosclerotic
		Emphysema: 1426/89,530 (1.59%)		heart disease, sex, and age as a continuous variable
Data Extractor: MC	Setting: Public and		Severity Measure(s): NR	OR: Odds ratio
	private hospitals	Control/Comparison group, n/N (%):		
Reviewer: DOS		No CRD: 75179/89530 (84.0%)	Clinical marker: NR	Mortality, n/N (%):
	Location: France			COPD:
Study design:			Treatment/ Associated Therapy, n/N	• aOR: 1.14 (95% CI: 1.06-1.22)
Retrospective cohort	Study dates:		(%): NR	• OR: 1.72 (95% CI: 1.61-1.84)
	COVID-19 cohort:			• COPD: 1229/4886 (25.3%)
Study Objective: To	March 1 - April 30,		Outcome Definitions:	• No CRD: 11222/75179 (14.93%)
describe and compare	2020		Mortality: in-hospital mortality during	• p<0.05
chronic respiratory			hospitalization	Emphysema:
diseases (CRD) in	Inclusion criteria:		ICU admission: ND	• aOR: 1.01 (95% CI: 0.83-1.22)
hospitalized patients	For the COVID-19		Intubation: NR	• OR: 1.18 (95% CI: 0.99-1.42)
suffering from COVID-19	cohort, all patients		Ventilation: NR	• Emphysema: 312/1426 (21.8%)
or influenza (2018-2019	hospitalized for		Hospitalization: NR	• No CRD: 11222/75179 (14.93%)
season), and to describe	COVID-19 during		Non-elective readmissions: NR	
and compare respiratory	the study dates			ICU admission, n/N (%):
complications for COVID-	were included and		Comments: none	COPD:
19 patients with CRD to	identified by the			• aOR: 1.16 (95% CI: 1.07-1.26)
COVID-19 patients	primary, related or			• OR: 1.47 (95% CI: 1.37-1.58)
without CRD and to	associated			• COPD: 986/4866 (20.6%)
influenza patients.	diagnoses by the			• No CRD: 12119/75179 (16 12%)
	ICD-10 codes			·

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
IVA Score: 23	00/10, 00/11,			• p<0.05
(moderate)	00712, 00714 or			Emphysema:
	00715, regardless			• aOR: 1.83 (95% CI: 1.56-2.16)
	of their age. Data			• OR: 2.09 (95% CI: 1.78-2.45)
	notional			• Emphysema: 405/1426 (28.4%)
	Programmo do			• No CRD: 12119/75179 (16.12%)
	Medicalisation des			• p<0.05
	Systemes			
	d'Information			Severity of Condition: NR
	(PMSI) database			
	(i wisi) autobuse.			Duration of Condition: NR
	Exclusion criteria:			Treatment/ Associated Therapy: NR
	NR			
				Risk Markers: NR
				Long-term Sequelae: NR
Author: Bergman ⁶⁶	Population: N=502	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
	,656	Chronic obstructive pulmonary disease	COPD: ICD9/10 J20, J40-J44, 491, 492	aHR: Adjusted hazard ratio; cox regression; model
Year: 2021		(COPD): 2,168/68,575 (3.2%)		included demographic variables, comorbidities, and
	Setting: Nationwid		Severity Measure(s): NR	prescription medications: Adjusted hazard ratio; cox
Data Extractor: DOS	e registries	Control/Comparison group, n/N (%):		regression; model included demographic variables,
		COPD: 13,133/434,081 (3.0%)	Clinical marker: NR	comorbidities, and prescription medications
Reviewer: CS	Location: Sweden			HR: Unadjusted hazard ratio
			Treatment/ Associated Therapy: NR	aOR: Adjusted odds ratio; multinomial logistic
Study design: Case-	Study dates: Up to			regression; model included demographic variables,
control	mid-September		Outcome Definitions:	comorbidities, and prescription medications: Adjusted
	2020		Mortality: All-cause mortality until	odds ratio; multinomial logistic regression; model
Study Objective: To			October 1, 2020	included demographic variables, comorbidities, and
investigate the	Inclusion criteria:		<i>ICU admission:</i> ICU hospitalization for	prescription medications
importance of potential	All cases of COVID-		confirmed COVID-19 (ICD-10 00/1)	OR: Unadjusted odds ratio; univariable logistic
medical and demographic	19 confirmed in		Intubation: NK	regression
risk factors for COVID-19	Sweden until mid-		ventilation: NK	(C) advision $n(b)(0())$
diagnosis, nospitalization	September 2020.		Hospitalization: non-ICU nospitalization	CORD:
	Reporting			
aumission), and	confirmed cases to		UU/1) Non elective readmissions: ND	• aUK: 1.12 (95% CI: 0.94-1.34)
subsequent all-cause	is required by law.		Non-elective readmissions: NR	• UR: 2.33 (95% CI: 1.99-2.73)
	Control population			 ICU admission: 169/2494 (6.8%)

Study	Population and	Intervention	Definitions	Outcomes
mortality during the first	setting		Comments: None	
wave of COVID-19	random sample of		comments. None	Hospitalization $n/N/(\%)$
wave of covid-19.	5 non-diagnosed			
IVA Score: 25 (moderate)	individuals for			• a0R: 1 37 (95% (1: 1 28-1 47)
	each COVID-19			• OB: 4 21 (95% CI: 3 98-4 45)
	case. Each control			Hosnitalized: 1 578/13 589 (11 6%)
	was residing in			• hospitalized: 1,576/15,565 (11.676)
	Sweden on			Severity of Condition: NR
	January 1, 2020,			
	and was alive on			Duration of Condition: NR
	January 31, 2020.			
				Treatment/ Associated Therapy: NR
	Persons were			Comorbid Conditions, ND
	evoluded if they			Comorbid Conditions: NR
	had missing data			Rick Markers: NR
	on at least one of			
	the included			Long-term Sequelae: NR
	variables.			
Author: Boari ⁶	Population: N=258	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
		Chronic obstructive pulmonary disease	COPD: ND	aHR: Multivariable Cox proportional hazard model;
Year: 2020	Setting: Tertiary	(COPD): 35/258 (13.6%)		model included age, COPD, previous treatment with
	health-care center		Severity Measure(s): NR	ACE inhibitors, and previous treatment with steroids
Data Extractor: DOS	designated as a	Control/Comparison group, n/N (%):		
	COVID-19 hub by	No COPD: 223/258 (86.4%)	Clinical marker: NR	Mortality, n/N (%):
Reviewer: MW	health authorities			COPD:
			Treatment/ Associated Therapy: NR	• aHR: 0.167; p=0.003
Study design:	Location: Italy			• Dead: 15/65 (23.1%)
Retrospective design	Study		Outcome Definitions:	• Alive: 20/193 (10.4%)
	dates: February 28		Mortality: death	• p<0.001
Study Objective: To	- April 3, 2020		ICU admission: NR	• Kaplan-Meier Log Rank: p=0.004
simultaneously assess			Intubation: NR	
several potential	All surviving		Ventilation: NR	Severity of Condition: NR
predictors of outcome	patients were re-		Hospitalization: NR	
(comorbidity, previous	evaluated after		Non-elective readmissions: NR	Duration of Condition: NR
and in-hospital	discharge in July-			
treatment, Brixia score) in	August 2020		Comments:	Treatment/ Associated Therapy: NR
a relatively large			Authors note: majority of patients	
population of patients	Inclusion criteria:		admitted underwent standard therapy	Comorbid Conditions: NR

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
with interstitial	Patients		(hydroxychloroquine 400 mg daily,	
pneumonia and	consecutively		lopinavir 800 mg daily plus ritonavir 200	Risk Markers: NR
respiratory failure due to	admitted to the		mg per day).	
SARS-CoV-2 related	Medicine ward			Long-term Sequelae: NR
infection. Brixia score) in a	during study			
relatively large population	period meeting			
of patients with	the following			
interstitial pneumonia	criteria: 1)			
and respiratory failure	confirmed COVID-			
due to SARS-CoV-2	19 infection as			
related infection.	determined by a			
	positive RT-PCR			
IVA Score: 23 (moderate)	assay of a			
	specimen			
	collected on a			
	nasopharyngeal			
	swab; 2) bilateral			
	pulmonary			
	interstitial			
	opacities on chest			
	imaging that were			
	not fully explained			
	by congestive			
	heart failure or			
	other forms of			
	volume overload;			
	and an acute			
	respiratory			
	distress syndrome,			
	showing at least			
	one of the			
	following			
	conditions:			
	respiratory rate			
	≥30 breaths min,			
	SpO₂ ≤93% while			
	breathing ambient			
	air, or			
	PaO ₂ /FiO ₂ ≤300			
	mmHg.			

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
	Fuchation			
	EXClusion			
	with critical			
	with critical			
	respiratory			
	syndrome			
	mochanical			
	ventilation at			
	admission to			
	Medical ward			
Author: Caliskan ⁷	Population:	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
	N= 813	Chronic obstructive pulmonary disease	COPD: ND	aOR: Multivariable Logistic Regression
Year: 2020	n= 565 COVID-19+	(COPD): 37/565 (6.5%)		
	n= 248 COVID-19-		Severity Measure(s):	Mortality, n/N (%):
Data Extractor: MW		Control/Comparison group, n/N (%):	NR	COPD
	Setting: Research	No COPD: 528/565 (93.4%)		• aOR: 3.213 (95% CI: 1.224-8.431), p=0.018
Reviewer: CS	hospital		Clinical marker: NR	• Non-survivors: 25/75 (33.3%)
				• Survivors: 12/490 (2.4%)
Study design: Case-	Location: Turkey		Treatment/ Associated Therapy: NR	• p<0.0001
control				p 0.000_
	Study		Outcome Definitions:	ICU Admission. n/N (%):
Study Objective: To	dates: March 15-		Mortality: ND	COPD
explore the prevalence of	May 10, 2020		ICU admission: ND	• aOR: 2.775 (95% CI: 1.128-6.829), p=0.026
smoking rates and			Intubation: NR	• ICU: 25/91 (27.5%)
comorbidities and	Inclusion		Ventilation: NR	• Clinic: 12/474 (2.5%)
evaluate the relationship	criteria: Adult		Hospitalization: NR	• p<0.0001
between them and	patients (≥18 years		Non-elective readmissions: NR	F
disease severity and	old) diagnosed			Severity of Condition: NR
mortality in inpatients	with COVID-19 by		Comments: None	
with COVID-19.	polymerase chain			Duration of Condition: NR
	reaction (PCR) and			
IVA Score: 23 (moderate)	whose COVID-19			Treatment/ Associated Therapy: NR
	diagnosis was			
	based on clinical,			Comorbid Conditions: NR
	laboratory, and			
	radiological			Risk Markers: NR
	Tindings, especially			
	with chest			Long-term Sequelae: NR

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
	computed			
	tomography			
	findings, despite			
	COVID-19 PCR			
	negativity. Non-			
	COVID-19 patients			
	who were			
	hospitalized in the			
	department of			
	pulmonology due			
	to diseases other			
	than COVID-19			
	were included as			
	the control group.			
	Exclusion			
	criteria: NR			
Author: Calmes ⁸	Population:	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
	N=596	COPD: 46/596 (7.7%)	COPD: Diagnosis was done by a	aOR1: Multivariable Logistic Regression (model
Year: 2021			pulmonologist according to lung	included: age, sex, asthma, COPD, cardiopathy,
	Setting: University	Control/Comparison group, n/N (%):	function tests, bronchodilation test,	and immunosuppressive disease)
Data Extractor: MW	hospital	No history of obstructive pulmonary	and methacholine concentration	aOR2: Multivariable Logistic Regression (model
		disease: 493/596 (82.7%)	provoking a 20% fall in FEV1 if	included: age, sex, asthma, COPD, obesity) aOR3:
Reviewer: JH/CNS	Location: Belgium		necessary	Multivariable Logistic Regression (model included:
				age and sex)
Study Design: Cohort	Study dates:		Severity Measure(s): NR	OR: Univariable (Univariate) Logistic Regression
	March 18 – April			
Study Objective: To	17, 2020		Clinical marker: NR	Mortality, n/N (%):
determine if patients with				COPD:
asthma or chronic	Inclusion criteria:		Treatment/ Associated Therapy: NR	• aOR1: 1.6 (95% CI: 0.80-3.3), p=0.18
obstructive pulmonary	Adult patients who			 aOR3: 1.9 (95% CI: 0.95-3.8), p=0.071
disease (COPD) are at risk	were hospitalized		Outcome Definitions:	• OR: 3.6 (95% CI: 1.9-6.9), p<0.0001
of experiencing an ICU	between the study		Mortality: amongst hospitalized	• COPD: 16/46 (34.8%)
admission and death as	dates for COVID-		patients	 No obstruction: 67/493 (13.6%)
compared with	19 which was		ICU admission: amongst hospitalized	
nonobstructive patients.	confirmed by		patients	ICU admission, n/N (%)
	nasopharyngeal		Intubation: NR	COPD:
IVA Score:	swab RT-PCR test,		Ventilation: NR	• aOR2: 0.94 (95% CI: 0.39-2.2), p=0.89
COPD: 24 (Moderate)	who had asthma,		Hospitalization: NR	• aOR3: 1.1 (95% CI: 0.52-2.5), p=0.74
	COPD, or no		Non-elective readmissions: NR	• OR: 1.4 (95% CI: 0.67-3.1), p=0.34

Study	Population and	Intervention	Definitions	Outcomes
	obstruction present before COVID-19		Comments: None	 COPD: 9/46 (19.6%) No obstruction: 69/493 (14.0%)
	diagnosis.			Severity of Condition: NR
	Exclusion criteria:			Duration of Condition: NR
				Treatment/ Associated Therapy: NR
				Comorbid Conditions: NR
				Risk Markers: NR
				Long-term Sequelae: NR
Author: Castilla ⁹	Population:	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
Year: 2021	N = 643,757 COVID-19+ = 35.387	Chronic obstructive pulmonary disease (COPD): 1404/35,387 (4.0%)	Asthma: ND COPD: ND	aRR1: Fully adjusted Relative Risk (model included sex, age, nursing home resident, healthcare worker, place of birth. place of residence. income level, smoking
Data Extractor: MW	Setting:	Control/Comparison group, n/N (%): No COPD: 33,983/35,387 (96.0%)	Severity Measure(s): NR	status, hospitalization in prior year, and comorbid conditions)
Reviewer: DOS	Community		Clinical marker: NR	aRR2: Relative Risk adjusted for age and sex
Study Design: Cohort	Location: Spain		Treatment/ Associated Therapy: NR	Mortality, n/N (%): COPD:
Study Objective: To	Study dates: July –		Outcome Definitions:	 aRR1: 1.47 (95%CI: 1.12–1.91); p=0.005
evaluate	December 2020		Mortality: Deaths from SARS-CoV-2	• aRR2: 1.58 (95%Cl: 1.22–2.05); p=0.001
sociodemographic	Inclusion critoria		Infection during follow-up period of 30	• COPD: 69/1404 (4.9%)
conditions and health-	People covered by		ICLI admission: ND	• No COPD: 397/33,983 (1.2%)
related variables as	the Navarre Health		Intubation: NR	ICI admission n/N (%):
independent risk factors	Service at least		Ventilation: NR	COPD:
for confirmed infection,	from July 2019, as		Hospitalization: Hospitalizations from	• aRR1: 1.22 (95%CI: 0.78–1.92); p=0.386
hospitalization, intensive	well as children		SARS-CoV-2 infection during follow-up	• aRR2: 1.14 (95%Cl: 0.73–1.78); p=0.559
care unit admission, and	born in Navarre		period of 30 days after diagnosis	• COPD: 22/1404 (1.6%)
death from SARS-CoV-2 in	after this date.		Non-elective readmissions: NR	• No COPD: 224/33,983 (0.6%)
the second epidemic	Confirmed COVID-			
surge.	19 cases were		Comments: None	Hospitalization, n/N (%):
N/A Coores	defined as patients			COPD:
IVA Score:	who tested			

Study	Population and	Intervention	Definitions	Outcomes
COPD: 23 (Moderate)	positive for SARS-			• aBB1: 1.30 (95%CI: 1.11–1.51): p=0.001
,	CoV-2 by real-time			• aBB2: 1.29 (95%CI: 1.11–1.50): p=0.001
	RT-PCR or antigen			• COPD: 195/1404 (13.9%)
	test in a			• No COPD: 1 885/33 983 (5 5%)
	respiratory tract			
	sample.			Severity of Condition: NR
	Exclusion criteria:			Duration of Condition: NR
	People who had			
	been confirmed			Treatment/Associated Therany: NR
	for SARS-CoV-2			
	infection before			Comorbid Conditions: NR
	July 2020, not			
	covered by the			Risk Markers: NR
	health service, and			
	were residing in			Long-term Sequelae: NR
	the region <12			
	months.			
Author: Choi ¹⁰	Population:	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
	N=7,341	COPD: 678/7,341 (9.2%)	COPD: diagnostic codes J41-J44 and the	aOR1: Multivariate Logistic Regression; adjusted for
Year: 2020			presence of at least one drug treatment	age, sex, region, Charlson Comorbidity Index, hospital
	Setting:	Control/Comparison group, n/N (%):	for respiratory disease or oral	type, conventional oxygen therapy, and high flow
Data Extractor: JKK	Nationwide	No COPD: 6,663/7,341 (90.8%)	corticosteroid (OCS) treatment for ≥30	nasal cannula
	records for		days within 1 year before the index	aOR2: Multivariate Logistic Regression; adjusted for
Reviewer: JH	individuals in the		date; patients who fulfilled criteria for	age, sex, region, Charlson Comorbidity Index, and
	Korean Health		both COPD and asthma were classified	hospital type
Study Design: Case-	Insurance Review		as COPD cases	OR: Univariable (Univariate) Logistic Regression
control	and Assessment			
	(HIRA) database		Severity Measure(s): NR	Mortality, n/N (%):
Study Objective: To				COPD
evaluate the potential	Location: Korea		Clinical marker: NR	• aOR1: 0.83 (95% CI: 0.55-1.26), p=0.39
benefits and harms				• aOR2: 0.95 (95% CI: 0.65-1.39), p=0.78
associated with the use of	Study dates:		Treatment/ Associated Therapy:	• OR: 3.78 (95% CI: 2.78-5.13), p<0.001
inhaled corticosteroids	January 2017 –		Inhaled Corticosteroids (ICS): users were	• Deceased: 60/678 (8.8%)
(ICS) or other drugs for	May 15, 2020		defined as individuals with continued	• Survived: 618/678 (91.2%)
respiratory diseases			arug use for \geq 30 days during the 1-year	
among a large sample of	Inclusion criteria:		period before index date; nonusers	Severity of Condition: NR
individuals with and	All individuals ≥18		were defined as individuals who had	
without COVID-19 who	years old and		never received drugs or had received	Duration of Condition: NR
had detailed information	identified as		them for <30 days during the 1-year	
Study	Population and Setting	Intervention	Definitions	Outcomes
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regarding comorbidities	confirmed COVID-		period before the index date; all doses	Treatment/ Associated Therapy: NA
and prior medication	19 cases based on		for ICS were converted to fluticasone	
exposures.	positive		equivalents and the cumulative ICS	Comorbid Conditions: NR
	nasopharyngeal		dose was calculated during the 1-year	
IVA Score:	swab specimens		period before the index date; all	Risk Markers: NR
COPD: 23 (moderate)	that were tested		prescribed and dispensed medications	
	using real-time RT-		were identified using Anatomical	Long-term Sequelae: NR
	PCR assays.		Therapeutic Chemical codes and HIRA	
			general name codes	
	Exclusion criteria:			
	NR		Outcome Definitions:	
			Mortality: ND	
			ICU admission: NR	
			Intubation: ECMO	
			Ventilation: mechanical ventilation;	
			high flow nasal cannula; conventional	
			oxygen therapy	
			Hospitalization: ND	
			Non-elective readmissions: NR	
			Comments: None	
Author: Ciardullo ¹¹	Population:	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
	N=373	Chronic obstructive pulmonary disease	COPD: ND	aRR1: adjusted relative risk (model included age,
Year: 2021		(COPD): 39/373 (10.5%)		sex, comorbidities, and laboratory exams)
	Setting:		Severity Measure(s): NR	aRR2: adjusted relative risk (model included age,
Data Extractor: MW	Community based	Control/Comparison group, n/N (%):		sex, and comorbidities)
	hospital	No COPD: 334/373 (89.5%)	Clinical marker: NR	
Reviewer: DOS	designated to treat			Mortality, n/N (%):
	patients with		Treatment/ Associated Therapy: NR	COPD:
Study Design: Cohort	COVID-19			 aRR1: 1.82 (95%CI: 1.13–2.35); p=0.019
			Outcome Definitions:	 aRR2: 1.45 (95%CI: 0.94–1.95); p=0.084
Study Objective: To	Location: Italy		Mortality: In-hospital death during	• Deceased: 24/142 (16.9%)
evaluate the impact of			study period	 Discharged: 15/231 (6.5%)
pre-existing diabetes on	Study dates:		ICU admission: NR	• p=0.001
in-hospital mortality in	February 22 – May		Intubation: NR	
patients admitted for	15, 2020		Ventilation: NR	Severity of Condition: NR
COVID-19.			Hospitalization: NR	
	Inclusion criteria:		Non-elective readmissions: NR	Duration of Condition: NR
IVA Score: 23 (Moderate)	All patients aged ≥			
	18 years who were			Treatment/ Associated Therapy: NR

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
	admitted within		Comments: Percentages reported in	
	the study dates		Table 1 are incorrect and were	Comorbid Conditions: NR
	and experienced		recalculated by review team.	
	either in-hospital			Risk Markers: NR
	death or			
	discharge. COVID-			Long-term Sequelae: NR
	19 cases were			
	defined according			
	to a positive result			
	on real-time			
	RT_PCR of			
	nasopharyngeal or			
	oropharyngeal			
	swab specimens			
	and/or clinically by			
	the presence of			
	typical signs and			
	symptoms,			
	exposure to			
	known affective			
	individuals, and			
	radiographic			
	findings consistent			
	with interstitial			
	pneumonia.			
	Exclusion criteria:			
	NR			
Author: Corradini ¹²	Population:	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
	N= 3,044	COPD: 155/1,505 (10.3%)	COPD: ND	aOR: adjusted odds ratio (model included
Year: 2021				cerebrovascular disease, cardiovascular disease,
	Setting: IMUs at	Control/Comparison group, n/N (%):	Severity Measure(s): NR	chronic heart failure, atrial fibrillation, hyperlipidemia,
Data Extractor: JH	41 large tertiary	No COPD: 1,350/1,505 (89.7%)		COPD, chronic kidney disease, dementia, and in-
	referral hospital		Clinical marker: NR	hospital mortality)
Reviewer: DOS				OR: Univariate Logistic Regression
	Location: Italy		Treatment/ Associated Therapy: NR	
Study Design: Cohort				Mortality, n/N (%):
	Study dates:		Outcome Definitions:	COPD:
			Mortality: in-hospital death	• aOR (95% Cl): 1.17 (1.04-1.98), p=0.048

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
Study Objective: To	February 3 – May		ICU admission: NR	• OR (95% Cl): 1.23 (0.964-1.76), p=0.81
examine demographics,	8, 2020		Intubation: NR	
comorbidities, organ			Ventilation: NR	Severity of Condition: NR
dysfunction, treatment,	Inclusion criteria:		Hospitalization: NR	
and outcomes in patients	Adults ≥ 18 years		Non-elective readmissions: NR	Duration of Condition: NR
with COVID-19 admitted	with detection of			
to and managed in	SARS-CoV-2		Comments: None	Treatment/ Associated Therapy: NR
Internal Medicine Units	nucleic acid by RT-			
(IMUs).	PCR test via			Comorbid Conditions: NR
	nasopharyngeal			
IVA Score: 20 (Moderate)	swab/ other			Risk Markers: NR
	biological			
	specimens or an			Long-term Sequelae: NR
	epidemiological			
	diagnosis of			
	COVID-19, based			
	on typical clinical			
	features of SARS-			
	CoV-2 infection			
	(cough, fever,			
	shortness of			
	breath, sudden			
	onset of anosmia/			
	ageusia/			
	dysgeusia) in			
	association with a			
	positive serological			
	test for SARS-CoV-			
	2 or features			
	compatible with			
	COVID-19 at chest			
	imaging			
	(computed			
	tomography,			
	ultrasonography or			
	radiography) who			
	were admitted to			
	participating IMU			
	at referral			

Study	Population and	Intervention	Definitions	Outcomes
Author: Cosio ¹³	hospitals between study dates. Exclusion criteria: Patients with incomplete records after quality checks or missing data were excluded from the analysis. Population:	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
Year: 2021 Data Extractor: MW	N=2,101 N=1,200 COVID- 19+ Setting: Four	COPD: 52/1,200 (4.3%) Control/Comparison group, n/N (%): No COPD: 1,148/1,200 (95.7%)	COPD: Diagnosed according to GOLD criteria that was confirmed by postbronchodilator airflow limitation (FEV1/FVC <0.7) using forced spirometry testing	aOR: Multivariable Logistic Regression model included age, sex, and other comorbidities Mortality: COPD
Reviewer: CNS Study Design: Case- control Study Objective: To investigate the clinical characteristics and the role of therapies in consecutive patients with COPD with a respiratory- related hospital admission in Spain during the first outbreak wave of the COVID-19 pandemic and to evaluate the presence of COVID19 as a risk factor of mortality in this cohort. IVA Score: 24 (Moderate)	teaching hospitals Location: Spain Study dates: March 15 - April 30, 2020 Inclusion criteria: All cases who were admitted to hospital due to any respiratory worsening; COVID- 19 was identified using a polymerase chain reaction test for SARS-CoV-2 in nasopharynx samples.		Severity Measure(s): NR Clinical marker: NR Treatment/ Associated Therapy: Inhaled corticosteroids: ND Outcome Definitions: Mortality: 30-day in-hospital mortality ICU admission: NR Intubation: NR Ventilation: NR Hospitalization: NR Non-elective readmissions: NR Comments: None	 aOR: 2.8 (95%CI: 1.5–5.3); p=0.002 Severity of Condition: NR Duration of Condition: NR Treatment/ Associated Therapy: Mortality: Inhaled corticosteroids aOR: 0.75 (95%CI: 0.24-2.33); p=0.619 Comorbid Conditions: NR Risk Markers: NR Long-term Sequelae: NR

Study	Population and	Intervention	Definitions	Outcomes
	Exclusion criteria:			
	NR			
Author: Cummins ¹⁴	Population:	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
	N=1781	Chronic obstructive pulmonary disease	COPD: ND	aOR: Adjusted odds ratio; multivariable
Year: 2021		(COPD): 145/1781 (8.1%)		logistic regression; included model
	Setting: Hospital		Severity Measure(s): NR	variables: demographic and socioeconomic factors as
Data Extractor: CS		Control/Comparison group, n/N (%):		well as obesity, smoking status and the 17 individual
	Data	No COPD: 1636/1781 (91.9%)	Clinical marker: NR	clinical factors as covariates
Reviewer: MW	source: Secondary			
	Uses Service		Treatment/ Associated Therapy: NR	Mortality, n/N (%):
Study design: Cohort	hospital inpatient			COPD:
study	data		Outcome Definitions:	 aOR: 1.11 (95%CI: 0.73-1.69); p=0.632
			Mortality: ND	• Died: 57/400 (14.2%)
Study Objective: To	Location: England		ICU admission: ND	
identify risk factors			Intubation: NR	ICU Admission, n/N (%):
associated with increased	Study		Ventilation: NR	COPD:
risk of hospitalization,	dates: February 1-		Hospitalization: ND	 aOR: 0.65 (95%CI: 0.27-1.60); p=0.351
intensive care unit (ICU)	June 30, 2020		Non-elective readmissions: NR	• ICU: 6/152 (3.9%)
admission and mortality				
in inner Northeast London	Inclusion		Comments: None	Hospitalization, n/N (%):
(NEL) during the first UK	criteria: Patients ≥			COPD:
COVID-19 wave.	16years			 aOR: 1.35 (95%CI: 0.85-2.15); p=0.209
	old registered with			 Hospitalized: 114/1195 (9.5%)
IVA Score: 23 (moderate)	a GP practice in			
	the North East			Severity of Condition: NR
	London			
	area (Newham,			Duration of Condition: NR
	Tower Hamlets			
	and City and			Treatment/ Associated Therapy: NR
	Hackney) with a			
	confirmed			Comorbid Conditions: ND
	diagnosis of			
	COVID-19			Risk Markers: ND
	Exclusion			Long-term Sequelae: NR
Authors Do Mt 15	criteria: NK			
Author: De Vito15	Population: N=	iviedical Condition, n/N (%):	iviedical Condition(s):	Severe COVID-19:
Noor: 2021	382;	COPD: 57/264 (21.9%)	COPD: ND	анк: Aajustea Hazara Katio, model included male
Year: 2021	COVID-19+,			sex, nypertension, diabetes, COPD, neurological
	N=264	Control/Comparison group, n/N (%):	Severity Measure(s): NR	

Study	Population and	Intervention	Definitions	Outcomes
Data Extractor: MC	Setting	No COPD: 207/264 (78.4%)		syndrome hynokinetic disease autonomy fever +
Data Extractor. Wie	Setting: 63	10 207 204 (78.4%)	Clinical marker: NR	dyspnea Low Molecular Weight Hengrin
Reviewer: 1H/M/M	retirement nursing			HR: Hazard Ratio
	homes		Treatment/Associated Therapy: NB	
Study Design: Cohort	nomes		Treatmenty Associated merapy. With	Mortality n/N (%):
Study Design. Conort	Location: Italy		Outcome Definitions:	
Study Objective: To	Location. Italy		Mortality: Death from SARS-CoV-2	• 24P: 0.85 (05% CI: 0.42 1.67) p=0.621
evaluate the spread of	Study dates: April		infection	• arr. 0.85 (55% Ci. 0.45-1.07), $p=0.051$
SAPS CoV/ 2 in all pooplo	9 May 21 2020		ICLI admission: NP	• HR: 1.81 (95% CI: 1.0-3.27), p=0.051
living in Italian rotiromont	9 - Way 51, 2020		Intubation: NP	• Died: 18/56 (32.1%)
nursing homos and	Inclusion critoria:		Ventilation: NR	• Survived: 39/208 (18.7%)
identify the	Deeple living in		Hospitalization: NR	• p=0.031
rick factor for infaction	People living in		Non elective readmissions: NP	
	mursing nomes		Non-elective redumissions. NR	Severity of Condition: NR
development and death	SARE Cov 2		Commenter None	
development, and death.	SARS- COV-2		comments: None	Duration of Condition: NR
N/A Coore: 22 (Madarata)	mected person			
IVA Score: 22 (Woderate)	was ulagnosed			Treatment/ Associated Therapy: NR
	with real-time PCR			
	on a			Comorbid Conditions: NR
	nasopnaryngeai			
	swab who require			Risk Markers: NR
	low-level support,			
	support in some			Long-term Sequelae: NR
	activities, or with			
	high dependence			
	degree.			
	Exclusion criteria:			
	NR			
Author: Eshrati ¹⁶	Population: 3188	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
	Patients	Chronic pulmonary disease (COPD):	COPD: ND	aHR: Adjusted hazard ratio; multivariable cox
Year: 2020		90/3188 (2.8%)		regression [HR] (95% CI)
	Setting: hospitals		Severity Measure(s): NR	
Data Extractor: CS	and medical	Control/Comparison group, n/N (%):		Mortality, n/N (%):
	centers under the	COPD: 3098/3188 (97.2%)	Clinical marker: NR	COPD:
Reviewer: DOS	supervision of the			• aHR: 1.51 (95% CI: 0.93-2.44), p=0.088
	health department		Treatment/ Associated Therapy: NR	• COPD: 18/90 (20.0%)
Study	of Iran University			• No COPD: 311/3098 (10.0%)
design: Retrospective	of Medical		Outcome Definitions:	• p=0.002
cohort study	Sciences		Mortality: ND	

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
			ICU admission: NR	Severity of Condition: NR
Study Objective: to	Location: Iran		Intubation: NR	
determine the factors			Ventilation: NR	Duration of Condition: NR
affecting the survival rate	Study		Hospitalization: NR	
and risk of death in	dates: February		Non-elective readmissions: NR	Treatment/ Associated Therapy: NR
Iranian patients with	22-April 19, 2020			
COVID-19			Comments: None	Comorbid Conditions: NR
	Inclusion criteria:			
IVA Score: 23 (moderate)	consecutive			Risk Markers: NR
	hospitalized			
	patients with RT-			Long-term Sequelae: NR
	PCR positive or			
	lung CT scan			
	confirmed COVID-			
	19 from February			
	, 22- March 25,			
	2020			
	Exclusion criteria			
	incomplete			
	nersonal data			
	such as failure to			
	disclose the date			
	of discharge or			
	bosnitalization or			
	nospitalization or			
	other information			
Author: Estis:17	Depulation: N. 107	Madical Condition = (N1 (0())	Madical Condition(-):	
Author: Estiri+'	Population: N=16/	Change a condition, n/N (%):		Severe COVID-19:
No 2021	09	Corpole obstructive pulmonary disease	<i>COPD:</i> 1CD9 434.x, 436, 437.x, 438.x;	aOR: Adjusted baas ratio from GLIVI boosting model;
Year: 2021		(COPD): 910/16/09 (5.4%)	ICD10 163.X, 169.X, G46.X	mealan over 10 model iterations; model included age,
	Setting: Medical			history of pneumonia, type 2 diabetes mellitus with
Data Extractor: DOS	system consisting	Control/Comparison group, n/N (%):	Severity Measure(s): NR	complications, heart failure, chronic kidney disease,
	of 10 hospital	No COPD: 15799/16709 (94.6%)		interstitial pulmonary disease, chronic obstructive
Reviewer: MW			Clinical marker: NR	pulmonary disease, pulmonary embolism, benign
	Location: MA, US			prostate hypertrophy, atrial fibrillation and flutter,
Study design: Prospective			Treatment/ Associated Therapy: NR	hypertensive urgency or emergency, coronary artery
cohort	Study			disease, gout, lung neoplasm, history of a
	dates: March 3 -		Outcome Definitions:	cerebrovascular accident, abdominal aortic aneurysm,
Study Objective: To	November 10,			cardiomegaly, and female: Adjusted odds ratio from
predict risk of mortality	2020			GLM boosting model; median over 10 model

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
and study risk factors for			Mortality: from various data sources	iterations; model included age, history of pneumonia,
death across different age	Inclusion criteria:		and included mortality unrelated to	type 2 diabetes mellitus with complications, heart
groups.	EHR data from		visit	failure, chronic kidney disease, interstitial pulmonary
	patients with a		ICU admission: NR	disease, chronic obstructive pulmonary disease,
IVA Score: 24 (moderate)	confirmed case for		Intubation: NR	pulmonary embolism, benign prostate hypertrophy,
	COVID-19		Ventilation: NR	atrial fibrillation and flutter, hypertensive urgency or
	(confirmed PCR		Hospitalization: NR	emergency, coronary artery disease, gout, lung
	test) who had at		Non-elective readmissions: NR	neoplasm, history of a cerebrovascular accident,
	least 1 year of			abdominal aortic aneurysm, cardiomegaly, and female
	medical history		Comments: None	RR: Univariate relative risk
	(i.e., a 1-year time			OR: Univariate odds ratio
	difference			
	between the first			Mortality, n/N (%):
	and last medical			COPD:
	record before the			• aOR: 1.024 (IQR: 0.021): 1.024 (IQR: 0.021)
	COVID-19 positive			• RR: 4.77 (95% CI: 4.10-5.55)
	PCR test) with			• OR: 5.70 (95% CI: 4.74-6.82)
	medical system.			 Non-survivors: 179/830 (21.6%)
	Included data from			• Survivors: 731/15,879 (4.6%)
	beginning of			• p<0.001
	electronic record			
	(as far back as			Severity of Condition: NR
	January 1, 2020)			
	up to 14 days prior			Duration of Condition: NR
	to the positive			
	COVID-19 PCR test			Treatment/ Associated Therapy: NR
	date.			
				Comorbid Conditions: NR
	Exclusion criteria:			
	NR			Risk Markers: NR
				Long town Convolute ND
Author: Exporton ¹⁸	Population	Madical Condition r /N (%)	Modical Condition(c):	
Author: experion		$COPC \cdot 241 478 / 1 030 893 (23.4%)$	COPD: CMS code COPD_EVER	aOR1: Multivariable Logistic Regression including
Year: 2021	14-1,000,000			FSRD North American native age prior
1001.2021	Setting: NR	Control/Comparison group n/N (%):	Severity Measure(s): NR	hospitalization race sex comorbidities income
Data Extractor: IKK	Jetting. Wit	No COPD: 789 415/1 030 893 (76 6%)		housing dual Medicare-Medicaid treatment and drug
Data Extractor. JAK			Clinical marker: NB	use excluded history of colorectal and endometrial
Reviewer: MW				cancer acute MI between July and December 2010
				ischemic heart disease hypertension residence in zin
Author: Experton ¹⁸ Year: 2021 Data Extractor: JKK Reviewer: MW	PCR test) with medical system. Included data from beginning of electronic record (as far back as January 1, 2020) up to 14 days prior to the positive COVID-19 PCR test date. Exclusion criteria: NR Population: N=1,030,893 Setting: NR Location: US	Medical Condition, n/N (%): COPD: 241,478/1,030,893 (23.4%) Control/Comparison group, n/N (%): No COPD: 789,415/1,030,893 (76.6%)	Medical Condition(s): <i>COPD</i> : CMS code COPD_EVER Severity Measure(s): NR Clinical marker: NR Treatment/ Associated Therapy: NR	 OR: 5.70 (95% CI: 4.74-6.82) Non-survivors: 179/830 (21.6%) Survivors: 731/15,879 (4.6%) p<0.001 Severity of Condition: NR Duration of Condition: NR Treatment/ Associated Therapy: NR Comorbid Conditions: NR Risk Markers: NR Long-term Sequelae: NR Severe COVID-19: aOR1: Multivariable Logistic Regression including ESRD, North American native, age, prior hospitalization, race, sex, comorbidities, income, housing, dual Medicare-Medicaid, treatment, and drug use; excluded history of colorectal and endometrial cancer, acute MI between July and December 2019, ischemic heart disease, hypertension, residence in zip

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
Study Design: Cohort	Study dates:			codes in top quartile of crowded/multiunit housing,
	October 1, 2019 –		Outcome Definitions:	and prescriptions for opioid drugs
Study Objective: To	November 22,		Mortality: cases who died of SARS-CoV-	aOR2: Multivariable Logistic Regression including
develop a model to	2020		2 infection during COVID-19	ESRD, North American native, age, prior
predict COVID-19			hospitalization or within 60 days of	hospitalization, race, sex, comorbidities, income,
hospitalization and death	Inclusion criteria:		COVID-19 diagnosis	housing, dual Medicare-Medicaid, treatment, and drug
for Medicare beneficiaries	Medicare fee-for-		ICU admission: NR	use; excluded history of breast cancer in second half of
using de-identified	service (FFS)		Intubation: NR	2019, prescriptions for immunosuppressive and
Medicare claims to	beneficiaries who		Ventilation: NR	corticosteroid drugs overlapping COVID-19 diagnosis
optimize COVID-19	since January 1,		Hospitalization: requiring inpatient	date, hypertension, and pneumococcal vaccinations
vaccine allocation in the	2020 either had a		admission for management of COVID-	
higher-risk Medicare	COVID-19 test or a		19	Mortality, n/N (%):
population.	COVID-19		Non-elective readmissions: NR	COPD
	diagnosis			 aOR1: 1.09 (95% CI: 1.06-1.12), p=NR
IVA Score:	(identified by ICD-		Comments: None	
COPD: 23 (moderate)	10 code U071 after			Hospitalization, n/N (%):
	April 1 st), or for			COPD
	any medical			• aOR2: 1.19 (95% CI: 1.17-1.21), p=NR
	reason were			
	hospitalized or had			Severity of Condition: NR
	an emergency			······
	department.			Duration of Condition: NR
	urgent care, or			
	telehealth visit.			Treatment/ Associated Therapy: NR
	Exclusion criteria:			Comorbid Conditions: NP
	NR			
				Risk Markers: NR
				Long-term Sequelae: NR
Author: Fayol ⁶⁷	Population: N=253	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
		COPD, 9/253 (3.6%)	Asthma: ND	aOR: Adjusted odds ratio; multivariable logistic
Year: 2021	Setting: Tertiary		COPD: ND	regression model included sex and age
	hospital	Control/Comparison group, n/N (%):		
Data Extractor: JH		No COPD, 244/253 (96.4%)	Severity Measure(s): NR	ICU admission, n/N (%)
	Location: France			COPD
Reviewer: CNS			Clinical marker: NR	• aOR: 0.31 (95% CI: 0.04 – 2.57), p=0.28
	Study dates:			• ICU: 1/82 (1.2%)
Study Design: Cohort			Treatment/ Associated Therapy: NR	• Non-ICU: 8/171 (4.7%)

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
	March 12 – April 1,			
Study Objective: To	2020		Outcome Definitions:	Severity of Condition: NR
compare the			Mortality: NR	
characteristics and	Inclusion criteria:		ICU admission: patients with acute	Duration of Condition: NR
prognoses of patients	Patients \geq 18 years		respiratory distress syndrome (ARDS)	
hospitalized for COVID-19	admitted with		and requiring high-flow nasal oxygen	Treatment/ Associated Therapy: NR
in 2020 with patients	laboratory-		therapy, non-invasive mechanical	
hospitalized for influenza	confirmed COVID-		ventilation, or invasive mechanical	Comorbid Conditions: NR
during the 2018-2019	19 infection by RI-		ventilation; Direct ICU admission:	
season.	PCR on		requiring immediate transfer or	RISK Markers: NR
	nasopnaryngeal or		transfer within 24 n to an ICU;	
IVA Score:	oropharyngeai		secondary ICU admission: requiring ICU	Long-term Sequelae: NR
COPD: 22 (Moderate)	swaps,		admission > 24 fi after their initial	
	hronchial aspiratos		Ventilation: NR	
	and further		Hospitalization: natients requiring only	
	hospitalized for		nasal low-flow oxygen administration	
	more than 24h		and standard medical monitoring	
	owing to severe or		ONon-elective readmissions: NR	
	critical pneumonia			
	(hypoxia with an		Comments: None	
	SpO2 ≤ 94%).			
	Exclusion			
	criteria: NR			
Author: Ferastraoaru ¹⁹	Population: N=455	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
	8	Chronic obstructive pulmonary disease	COPD: ICD9/10 J44, J44.0, J44.1	aOR: Adjusted odds ratio; multivariable logistic
Year: 2021	N=2496 admitted	(COPD): 350/4558 (7.7%)		regression adjusting for age, race, sex, and
	patients		Severity Measure(s): NR	smoking status adjusting for age, race, sex, and
Data Extractor: DOS		Control/Comparison group, n/N (%):		smoking status
	Setting: Academic	No COPD: 4208/4558 (92.3%)	Clinical Marker: NR	
Reviewer: CS	tertiary care			Mortality, n/N (%):
	hospital		Treatment/ Associated Therapy: NR	
Study design:			Outrouve Definition	• aUR: 2.08 (95% CI: 1.01-4.28), p=0.04
Retrospective cohort	Location: NY, US		Outcome Definitions:	• COPD, no asthma: n=NR/N=NR (48.3%)
Chudu Obio atives Te	Church		<i>iviortality:</i> mortality risk in admitted	• No asthma or COPD: n=NR/N=NR (26.5%)
Study Ubjective: 10	Study		patients	• p=0.2
analyze the relationship	uates: Iviarch 14 -		ICU udmission: NK	
between astrima and	April 27, 2020			Severity of Condition: NR

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
COVID-19 by identifying				
the factors predisposing	Inclusion criteria:		Hospitalization: admission from the	Clinical Marker: NR
to inpatient admission in	All adult patients		emergency department	
our asthmatic population,	(≥18 years old)		Non-elective readmissions: NR	Duration of Condition: NR
and by comparing the	who tested			
mortality risk among	positive for SARS-		Comments: None	Treatment/ Associated Therapy: NR
admitted patients with	CoV-2 infection by			
only asthma and those	PCR at study			Comorbid Conditions: NR
with other coexistent	institution during			
chronic conditions, which	study dates were			Risk Markers: NR
have been shown to be	identified by a			
unique risk factors for	software			Long-term Sequelae: NR
severe complications of	application that			
COVID-19.	stores EHR data.			
	All patients who			
IVA Score: 23 (moderate)	presented to the			
	emergency			
	department for			
	COVID-19			
	symptoms and			
	who had also been			
	seen at least once			
	in the study			
	healthcare system			
	within previous 10			
	years were			
	included in			
	analysis.			
	Exclusion			
	criteria: NR			
Author: Fisman ²⁰	Population:	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
	21,922 patients	COPD: 267/21,922 (1%)	COPD: ND	OR: Univariable logistic regression [OR] (95% Cl), p-
Year: 2020				value
	Setting: 34 public	Control/Comparison group, n/N (%):	Severity Measure(s): NR	aOR: Multivariable logistic regression [OR] (95% CI),
Data Extractor: CS	nealth units using	Calculated by ERT:		logit
	provincial public	No COPD: 21,655/21,922 (98.8%)	Clinical marker: NR	
Reviewer: DOS	health case			Mortality, n/N (%):
	management data		Treatment/ Associated Therapy: NR	COPD:
Study design:	system			• OR: 11.22 (95% CI: 8.14–15.44), p<0.001

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
Prediction modeling			Outcome Definitions:	• aOR: 3.26 (95% CI: 1.15–9.26)
study	Location: Canada		Mortality: ND	
			ICU admission: NR	Severity of Condition: NR
Study Objective: to	Study		Intubation: NR	
develop and validate	dates: January 23-		Ventilation: NR	Duration of Condition: NR
parsimonious, sensitive,	May 15, 2020		Hospitalization: NR	
and specific prediction			Non-elective readmissions: NR	Treatment/ Associated Therapy: NR
rules for infection-related	Inclusion			
death in individuals with	criteria: patients			Comorbid Conditions: NR
COVID-19 in Ontario	within the public		Comments: none	
	health case			Risk Markers:
IVA Score: 24 (moderate)	management			
	system with			Long-term Sequelae: NR
	laboratory-			
	confirmed SARS-			
	CoV-2 infection via			
	validated nucleic			
	acid amplification			
	test, including RT-			
	PCR and nucleic			
	acid sequencing			
	Exclusion			
	criteria: NR			
Author: Gao ⁷⁸	Population:	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
	N=8191	COVID-NET:	<i>COPD:</i> ND	RR1: Estimated median risk ratio and central 95%
Year: 2021	COVID-NET,	COPD: 266/2491 (10.7%)		Bayesian credible interval of hospitalization for COVID-
	N=2491		Severity Measure(s): NR	19 patients using data from COVID-NET; used data
Data Extractor: DOS	NY dataset,	NY dataset:		from the CDC to estimate prevalence of comorbidities
	N=5700	COPD: 287/5700 (5.0%)	Clinical marker: NR	in the general US adult population
Reviewer: CNS				RR2: Estimated median risk ratio and central 95%
	Setting: Two large-	Control/Comparison group, n/N (%):	Treatment/ Associated Therapy: NR	Bayesian credible interval of hospitalization for COVID-
Study Design: Bayesian	scale datasets	COVID-NET:		19 patients using data from the NY dataset
model	(COVID-NET and a	No COPD: 2225/2491 (89.3%)	Outcome Definitions:	
	NY dataset)		Mortality: NR	Hospitalization:
Study Objective: To	collecting data	NY dataset:	ICU admission: NR	COPD:
overcome limitations of	from 166	No COPD: 5413/5700 (95.0%)	Intubation: NR	 aRR1: 2.58 (95% CI: 2.08-3.19); p=NR
traditional biostatistical	hospitals		Ventilation: NR	 aRR2: 1.69 (95% CI: 1.39-2.05); p=NR
methods by developing a			Hospitalization: ND	
Bayesian approach to	Location: US		Non-elective readmissions: NR	Severity of Condition: NR

Study	Population and Setting	Intervention	Definitions	Outcomes
estimate the risk ratio of hospitalization for COVID- 19 patients with comorbidities.	Study dates: March 1 - May 2, 2020		Comments: None	Duration of Condition: NR Treatment/ Associated Therapy: NR
IVA Score:	Inclusion criteria:			Comorbid Conditions: NR
COPD: 21 (moderate)	from two datasets,			Risk Markers: NR
	COVID-NET and a NY dataset. COVID-NET collected data			Long-term Sequelae: NR
	from 154 acute care hospitals in			
	states in the US. The NY dataset			
	dataset that			
	collected data from 12 hospitals			
	in New York.			
	Exclusion criteria: NR			
Author: Garcia-Posada ⁷⁹	Population:	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
Year: 2021	N=205	(COPD): 29/209 (13.9%)		adjusted for NR
Data Extractor: MW	Setting: Private third-level clinic	Control/Comparison group, n/N (%):	Severity Measure(s): NR	Mortality, n/N (%)
Reviewer: CNS	Location: Colombia	NO COPD. 180/209 (80.1%)	Treatment/ Associated Therapy: NR	 Deceased: 17/107 (15.9%) Alive: 12/102 (11.8%)
Study Design: Cohort				• p=0.21
Study Objective: To describe the	Study dates: May – August 2020		Outcome Definitions: Mortality: ND ICU admission: NR	Hospitalization: COPD:
characteristics and clinical	Inclusion criteria:		Intubation: NR	• aOR: 2.1 (95% CI: 0.57–7.6), p=0.27
management of a group of hospitalized patients	Patients had to be admitted to the		Ventilation: NR Hospitalization: ND	Severity of Condition: NR

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
with SARS-CoV-2 infection	hospital ward and		Non-elective readmissions: NR	
in a private clinic in	meet the criteria			Duration of Condition: NR
Colombia.	for COVID-19		Comments: None	
	disease classified			Treatment/ Associated Therapy: NR
IVA Score:	as moderate,			
COPD: 23 (Moderate)	severe, or critical.			Comorbid Conditions: NR
	The moderate			
	disease was one			Risk Markers: NR
	with clinical or			
	radiological			Long-term Sequelae: NR
	evidence of			
	pneumonia with			
	clinical of			
	pneumonia (fever,			
	cough, dyspnea,			
	tachypnea)			
	without signs of			
	severe pneumonia,			
	with SpO2 \ge 90%			
	in room air. Severe			
	disease was one			
	that demonstrated			
	clinical evidence of			
	pneumonia, plus			
	one of the			
	following findings:			
	respiratory rate			
	>30 breaths/min;			
	severe shortness			
	of breath; o SpO2			
	< 90% in ambient			
	air. The critical			
	disease was			
	considered if it			
	met acute			
	respiratory			
	distress syndrome			
	(ARDS) criteria,			
	sepsis, or septic			
	shock.			

Study	Population and Setting	Intervention	Definitions	Outcomes
	Exclusion criteria: Patients' clinical history with the loss of clinical and demographic information more significant than 10%. Patients with a mild diagnosis of Covid-19 disease. Symptomatic patients based on the COVID-19 case definition criteria without evidence of viral pneumonia or hypoxia. Patients admitted to hospital for the treatment of diseases other than Covid-19.			
Author : Ge ²¹ Year: 2021	Population: N=167,500	Medical Condition, n/N (%): COPD: 9,716/167,500 (5.8%)	Medical Condition(s): COPD: ND	Severe COVID-19: aHR: Adjusted Hazard Ratio; model included age, sex, income quantile, rural and long-term care resident
Data Extractor: DOS	Setting: Public health insurance network	Control/Comparison group, n/N (%): No COPD: 157,784/167,500 (94.2%)	Severity Measure(s): NR Clinical marker: NR	Mortality, n/N (%): COPD:
Reviewer: JH Study Design: Cohort	Location: Canada		Treatment/ Associated Therapy: NR	 aHR: 1.19 (95% CI: 1.12-1.26); p<0.001 COPD: 1,403/9,716 (14.4%) No COPD: 3 344/157 784 (2 1%)
Study Objective: To examine the associations of comorbidities with mortality and disease severity in individuals	Study dates: January 15 - December 31, 2020		Outcome Definitions: Mortality: deceased within 30 days after first positive COVID-19 test ICU admission: NR Intubation: NR Ventilation: NR	• p<0.001 Severity of Condition: NR Duration of Condition: NR

Study	Population and Setting	Intervention	Definitions	Outcomes
with COVID-19 diagnosed in 2020. IVA Score: COPD: 24 (moderate)	Inclusion criteria: Individuals diagnosed with COVID-19 based on SARS-CoV-2 PCR test reported through the Ontario Laboratories Information System during the study period. Exclusion criteria: Individuals not eligible for the Ontario Health Insurance Plan and those who were not residents of Ontario at the beginning of the study period.		Hospitalization: NR Non-elective readmissions: NR Comments: None	Treatment/ Associated Therapy: NR Comorbid Conditions: NR Risk Markers: NR Long-term Sequelae: NR
Author: Girardin ²² Year: 2021	Population: N=4,210	Medical Condition, n/N (%): Chronic obstructive pulmonary disease (COPD): 329/4210 (7.8%)	Medical Condition(s): <i>COPD:</i> presence of chronic bronchitis or emphysema	Severe COVID-19: aHR: Adjusted Hazard Ratio: Adjusted Hazard Ratio
Data Extractor: CS	Setting: Quaternary academic health	Control/Comparison group, n/N (%): No COPD: 3881/4210 (92.2%)	Severity Measure(s): NR	Mortality, n/N (%): COPD • aHR: 1.27 (95% CI: 1.02-1.58), p=0.04
Reviewer: MW	network		Clinical marker: NR	 COPD: 107/329 (32.5%) No COPD: 852/3881 (22.0%)
Study design: Cohort study	Location: NY, US		Treatment/ Associated Therapy: NR	• p=0.001
Study Objective: To assess the relative contribution of common upper and lower airway	Study dates: March 2-May 24, 2020		Outcome Definitions: Mortality: ND ICU admission: NR Intubation: NR	Severity of Condition: NR Duration of Condition: NR
pulmonary diseases			Ventilation: NR	Treatment/ Associated Therapy: NR

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
(COPD, asthma and sleep	Inclusion criteria:		Hospitalization: NR	
apnea) in assessing	Patients with a		Non-elective readmissions: NR	Comorbid Conditions: NR
likelihood of COVID-19 -	prior visit and			
related mortality	presenting to the		Comments: None	Risk Markers: NR
independent of other	emergency			
medical conditions, health	department with			Long-term Sequelae: NR
risks, and	COVID-19			
sociodemographic factors.	complaints or as			
	clinically indicated,			
IVA Score: 24 (moderate)	who tested			
	positive for COVID-			
	19, and had age,			
	sex, race, and			
	ethnicity reported			
	were included in			
	the study. Only			
	patients who had			
	been discharged			
	alive or dead were			
	included.			
	Exclusion criteria:			
	Hospitalized			
	patients with			
	unknown state			
	(alive or dead)			
	information were			
	excluded.			
Author: Gottlieb ⁶⁸	Population: N=8,6	Medical Condition:	Medical Condition(s):	Severe COVID-19, n/N (%):
	73 patients	Chronic Obstructive Pulmonary	COPD: ND	aOR: adjusted odds ratio; multivariable logistic
Year: 2020		Disease (COPD): 117/8,673 (1.3%)		regression odds ratio
	Setting: One		Severity Measure(s): NR	5
Data Extractor: CO	university hospital	Control/Comparison group:	, .,	ICU Admission, n/N (%):
	, ,	No COPD: 8.556/8.673 (98.7%)	Clinical marker: NR	COPD
Reviewer: ES/DOS	Location: Chicago.			• aOR: 1.50 (95% CI: 0.87–2.58)
	IL, USA		Treatment/ Associated Therapy: ND	
Study	,			Hospitalization, n/N (%):
design: Retrospective	Study		Outcome Definitions:	COPD:
Case-control	dates: March 4		Mortality: ND	• aOR: 1 62 (0 93–2 82)
	,		ICU admission: ND	• Hospitalized: 84/1.483 (5.7%)

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
Study Objective: to	2020-June 21,		Intubation: NR	 No hospitalization: 33/7,190 (0.5%)
present	2020		Ventilation: NR	
clinical and demographic			Hospitalization: NR	Severity of Condition: NR
features of patients with	Inclusion		Non-elective readmissions: NR	
laboratory-confirmed	criteria: all			Duration of Condition: NR
COVID-19	patients			
as of June 21, 2020;	presenting to			Treatment/ Associated Therapy: NR
secondary outcome was	university hospital			
to identify risk factors	with COVID-19			Comorbid Conditions: NR
associated with				
hospitalization and critical	Exclusion criteria:			Risk Markers: NR
illness	patients who			
	were transferred			Long-term Sequelae: NR
IVA Score: 16 (High)	from other			
	inpatient hospitals			
Author: Grasselli ²³	Population: N=398	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
	8	Chronic obstructive pulmonary disease	COPD: medical exemptions in last 10	aHR: Adjusted hazard ratio; multivariable cox
Year: 2020		(COPD): 93/3988 (2.3%)	years (code 057), hospitalization in last	proportional hazards regression analysis; model
	Setting: ICUs		5 years with IC9 code 491, 492, 494,	includes age in years, sex, respiratory support,
Data Extractor: DOS		Control/Comparison group, n/N (%):	496 diagnosis; medications prescribed	hypertension, hypercholesterolemia, heart disease,
	Location: Italy	No comorbidities: 1302/3988 (32.6%)	during last year with ATC code R03*	type 2 diabetes, malignancy, COPD, ACE inhibitor
Reviewer: MW			(DDD>30%) for patients ≥45 years old	therapy, ARB therapy, statin, diuretic, PEEP at
	Study dates:			admission, FiO_2 at admission, PaO_2/FiO_2 at admission
Study Design:	February 20 - May		Severity Measure(s): NR	HR: Univariate hazard ratio
Retrospective cohort	30, 2020			
			Clinical marker: NR	Mortality, n/N (%):
Study Objective: To	Inclusion			COPD:
describe the baseline	criteria: All consec		Treatment/ Associated Therapy: NR	 aHR: 1.68 (95% CI: 1.28-2.19), p<0.001
characteristics of the	utive patients with			• HR: 2.03 (95% CI: 1.59-2.59), p<0.001
patients, comorbidities,	confirmed SARS-		Outcome Definitions:	• COPD: 67/93 (72.0%)
concomitant treatments	CoV-2 infection		Mortality: ND	 No comorbidities: 490/1302 (37.6%)
at the time of hospital	admitted to one of		ICU admission: NR	
admission, mode and	the network		Intubation: NR	Severity of Condition: NR
setting of ventilatory	ICUs from		Ventilation: NR	
support, and the	February 20 to		Hospitalization: NR	Duration of Condition: NR
association of these	April 22, 2020.		Non-elective readmissions: NR	
characteristics with time	Laboratory			Treatment/ Associated Therapy: NR
to death.	confirmation of		Comments: None	
	SARS-CoV-2 was			Comorbid Conditions: NR
IVA Score: 23 (moderate)	defined as a			

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
	positive result of			Risk Markers: NR
	real-time RT-PCR			
	assay of nasal and			Long-term Sequelae: NR
	pharyngeal swabs			
	and, in selected			
	cases,			
	confirmation with			
	RT-PCR assay from			
	lower respiratory			
	tract aspirates.			
	Exclusion criteria:			
	Patients with			
	negative findings			
	or missing results			
	for RT-PCR for			
	SARS-CoV-2.			
Author: Guan ⁶⁹	Population: N=39,	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
	420	COPD: 636/39,420 (1.6%)	COPD: physician diagnosis at hospital	aOR: Adjusted odds ratio;
Year: 2021		Bronchiectasis: 313/39,420 (0.8%)	admission or discharge from hospital	multivariable logistic regression adjusting for age, sex,
	Setting: National C		was extracted with computer software	and other systemic comorbidities
Data Extractor: DOS	OVID-19 reporting	Control/Comparison group, n/N (%):	based on ICD-10 codes from EMR; all	OR: Odds ratio; univariable logistic regression
	system	No COPD: 38,784/39,420 (98.4%)	diagnoses made based on either past	
Reviewer: MW		No bronchiectasis: 39,107/39,420	history documents in clinical charts or	Mortality, n/N (%):
	Location: China	(99.2%)	the clinical manifestations consisted	COPD:
Study			with global guidelines (Global initiatives	 aOR: 1.01 (95% CI: 0.80-1.27), p=0.956
design: Retrospective	Study dates:		for Obstructive Lung Disease)	• OR: 3.26 (95% CI: 2.61-4.08)
cohort	December 2019 -		Bronchiectasis: physician	• COPD: 94/636 (14.8%)
	May 6, 2020		diagnosis (radiological with or without	• No COPD: 1959/38784 (5.1%)
Study Objective: To			clinical bronchiectasis) at hospital	
explore the association	Inclusion		admission or discharge from hospital	ICU admission, n/N (%):
between chronic	criteria: All		was extracted with computer software	COPD:
respiratory diseases (CRD)	hospitalized		based on ICD-10 codes from EMR; all	• aOR: 1.59 (95% CI: 1.29-1.96), p<0.001
and the clinical outcomes	patients had to		diagnoses made based on either past	• OR: 2.29 (95% CI: 1.87-2.81)
of COVID-19.	have a diagnosis of		history documents in clinical charts or	• COPD: 115/636 (18.1%)
	laboratory-		the clinical manifestations consisted	• No COPD: 3404/38784 (8.8%)
IVA Score: 23 (moderate)	confirmed COVID-		with global guidelines	
	19. All patients			Invasive ventilation. n/N (%):
	had established		Severity Measure(s): NR	COPD:
	CRD before			• aOR: 2.21 (95% CI: 1.75-2.78). p<0.001
cohort Study Objective: To explore the association between chronic respiratory diseases (CRD) and the clinical outcomes of COVID-19. IVA Score: 23 (moderate)	December 2019 - May 6, 2020 Inclusion criteria: All hospitalized patients had to have a diagnosis of laboratory- confirmed COVID- 19. All patients had established CRD before		Bronchiectasis: physician diagnosis (radiological with or without clinical bronchiectasis) at hospital admission or discharge from hospital was extracted with computer software based on ICD-10 codes from EMR; all diagnoses made based on either past history documents in clinical charts or the clinical manifestations consisted with global guidelines Severity Measure(s): NR	 COPD: 94/636 (14.8%) No COPD: 1959/38784 (5.1%) <i>ICU admission, n/N (%):</i> COPD: aOR: 1.59 (95% CI: 1.29-1.96), p<0.001 OR: 2.29 (95% CI: 1.87-2.81) COPD: 115/636 (18.1%) No COPD: 3404/38784 (8.8%) <i>Invasive ventilation, n/N (%):</i> COPD: aOR: 2.21 (95% CI: 1.75-2.78), p<0.001

Setting Individual Clinical marker: NR OR: 4.69 (5% C1: 3.75 - 5.86) derived from platform of In- patient LMR authorized by National Health Commission. Since the initial outbreak, submission of EMR from individual hospitalis Clinical marker: NR - OR: 4.69 (5% C1: 3.75 - 5.86) Outcome Definitions: Moratory: death within 30 days after hospitalisation (Cd offmission: admission to the intensive care unit intoxibition; NR Severity of condition: NR Moratorized by the admission of EMR sequence by the National health Commission. Comments: NR Comments: NR Comments: None Comments: None OR: 049 (5% C1: 0.27-23), p=0.505 Combit Conditions: with COVID-19 was requested by the National health Commission. Comments: None Comments: None Comments: None Corrol & 2.01, p=0.706 06: 15.1%) (CDP & bronchiectasis: 3/35 (8,6%) (COP & bronchiectasis: 1/35 (2,9%) (COP & bronchiectasis: 1/35 (2,9%) (Nosize ecolution, n/N (%): (COP & bronchiectasis: 1/35 (2,9%) (Nosize ecolution), n/N (%): (COP & bronchiectasis: 1/35 (2,9%) (Nosize ecolution), n/N (%): (COP & bronchiectasis: 1/35 (2,9%) (Nosize ecolution), n/N (%): (COP & bronchiectasis: 1/35 (2,9%) (Nosize ecoluticasis: 1/35 (2,9%) (Nosize ecoluticasis: 1/35 (2,9%) (Nosize ecolu	Study	Population and	Intervention	Definitions	Outcomes
admission. Data clinical marker: NR • OR: 4.69 (95% Cl: 3.75-5.80) platform of in- patient EMR authorized by National Health Commission. Since the initial outbraak submission of BMR from individual hospitals • OR: 4.69 (95% Cl: 3.75-5.80) Moratolity: death within 30 days after hospitalization • OR: 4.69 (95% Cl: 3.75-5.80) Nation: Since the initial outbraak submission of BMR from individual hospitals • Outcome Definitions: Moratolity: death within 30 days after hospitalization: nonivasive ventilation; invasive ventilation; invasive ve	,	Setting			
derived from inpatient EMR authorized by National Health Commission. Since the initial commission. Since the initial submission of EMR from individual hospitals designated for admission from since serve unit in introduction, invasive methanical ventilitation, and (%): COPD & bronchietatis: 100, 500, 500, 500, 500, 500, 500, 500,		admission. Data		Clinical marker: NR	• OR: 4.69 (95% CI: 3.75-5.86)
platform of in- putform of in- putform of in- thein tEMR authorized by National Health Commission. Since the initial outbreak, submission of EMR from individual hospital signated for admitting patients with COUD-19 was requested by the National health Commission. Since throm individual hospitals designated for admitting patients with COUD-19 was were fourtier in the initial outbreak, submission of EMR from individual hospitals designated for admitting patients with COUD-19 was were commission. Since throm individual hospitals designated for admitting patients were commission. Non-elective readmissions: NR Non-elective readmission NN (Ng): COPD & bronchiectasis: 513/51(143) <br< td=""><td></td><td>derived from</td><td></td><td></td><td>• COPD: 96/636 (15.1%)</td></br<>		derived from			• COPD: 96/636 (15.1%)
patient EMR authorized by National Health Commission. Since the initial outbreak, submission 6EMR from individual hospitals designated for admitting patients with COVID-19 was requested by the National health Commission. Outcome Definitions: Mortality, r/dwith within 30 days after houtbreak, submission fEMR from individual hospitals designated for admitting patients with COVID-19 was requested by the National health Commission. Severity of Condition: NR Exclusion comorbidities, clinic cal outcomes, age or sex data, discharge records, or admission date. For admitsion, r/N (%): Comments: None Treatment/ Associated Therapy: NR Author: Gupta ²⁴ Population: N Mortality, r/M (%): Comments: None Comorbid conditions: Non-elective readmissions: NR Comorbid conditions: Non-elective readmissions: NR Exclusion comorbidities, clinic cal outcomes, age or sex data, discharge records, or admission date. For admitsion, n/N (%): Codp & bronchiectasis: s13/5 (14.3%) Non COP & bronchiectasis: s13/5 (14.3%) Author: Gupta ²⁴ Population: N Redical Condition, n/N (%): Codp & bronchiectasis: s1/2 (195% Cl: 0.05-2.75), pc.0.335 on: 0.7 (195% C		platform of in-		Treatment/ Associated Therapy: NR	• No COPD: 1417/38784 (3.7%)
Number of the problem of the proble		patient EMR			
National Health outbreak, submission. Since the initial outbreak, submission of EMR from individual hospitals designated for admitting patients with COVID-19 was requested by the National health Comments: None Duration of Condition: NR Treatment/Associated Therapy: NR Exclusion crifteria: Patients with COVID-19 was requested by the National health Comments: None Comobile Conditions: Nortality, n/N (%): COPD & bronchiectasis: 0.0PD & bronchiectasi		authorized by		Outcome Definitions:	Severity of Condition: NR
Author: Gupta ²⁴ Commission . Since the initial outbrack, submission of EMR from individual designated for admitting patients with COVID-19 was broachiettasis hospitalization intrubation: NR Duration of Condition: NR Ventilation, invasive ventilation, invasive designated for admitting patients with COVID-19 was mequested by the National health Commission. Non-elective readmissions: NR Treatment/ Associated Therapy: NR Exclusion criteria: Patients without any information on comorbidities, clini control contines, clinic or admission date. Non-elective readmissions: NR Combision. Exclusion criteria: Patients without any information on comorbidities, clini corror skitles, clini corror skitles, clinic or admission date. Kernel Submission date. Non-elective readmission: NR Invasive without any information on comorbidities, clinic corres data, disharge records, or admission date. Non-elective readmission: NR Invasive without any information on comorbidities, clinic corres data, disharge records, or admission date. Non-elective readmission without any information on comorbidities, clinic corres data, disharge records, or admission date. Non-elective readmission without any information on comorbidities, clinic corres data, disharge records, or admission date. Notali N (NS): COPD & bronchietasis: 1/35 (2.9%) Author: Gupta ²⁴ Population: N= 2.215 Medical Condition, n/N (%): COPD: 173/2.215 (7.8%) Medical Condition(s): COPD: Par chart review Severe COVID-19: and X: Adjusted Odds Ratio; model included age, sev, roce, hypertension, diabetes, body mass index,		National Health		Mortality: death within 30 days after	
the initial outbreak, submission of EMR from individual hospitals Intubation: NR Ventiliation, invasive ventilation, invasive ventilation, invasive ventilation, invasive ventilation, invasive mechanical ventilation, invasive ventilation, invasive mechanical ventilation, invasive ventilation, invasive mechanical ventilation, invasive mechanical ventilation, invasive ventilation, invasive mechanical ventilation, invasive ventilation, invasive mechanical ventilation, invasive mechanical ventilation, invasive mechanical ventilation, invasive mechanical ventilation, invasive methanical ventinvasive methanical ventilation, invasive methanical ve		Commission. Since		hospitalization	Duration of Condition: NR
outbreak, submission of EMR from individual hospitals designated for admitting patients with COVID-19 was requested by the National health Commission. intensive are unit intubation: NR Ventilation; invasive mechanical vential ion, ECMO Comorbid Conditions: Mortally, n/N (%): COPD & bronchiectasis: - 0.0R: 0.66 (95% CI: 0.2-2.21), p=0.505 Exclusion criteria: Patients without any Without any Without commission date. Exclusion criteria: Patients without comorbidities, clini cal outcomes, age or sex data, discharge records, or admission date. Exclusion criteria: Patients without any Without		the initial		ICU admission: admission to the	
submission of EMR from individual hospitals designated for admitting patients with CVDID-19 was requested by the National health Commission. Intutive mechanical ventilation ion, ICMO Comorbid Conditions: Mortelity, n/W (%): COPD & bronchiectasis: - 007: 0.56 (555 CI: 0.2-2.22), p=0.505 Exclusion criteria: Patients with coursion. Comments: None Comments: None Exclusion criteria: Patients without any information on comorbidities, clini caloutcomes, age or sex data, discharge records, or admission date. Exclusion criteria: Patients without any information on criteria: Patients Exclusion criteria: Patients without any information on criteria: Patients Exclusion criteria: Patients Intervention patients without any information on criteria: Patients Medical Condition, n/N (%): COPD & bronchiectasis: 5/35 (14.3%) Intervention patients Author: Gupta ²⁴ Population: Na cord: 2, 215 Medical Condition, n/N (%): COPD & bronchiectasis: 13/2 (2.5%) Medical Condition, n/N (%): COPD & bronchiectasis: 13/2 (2.5%) Year: 2020 Population: Na factoria Medical Condition, n/N (%): COPD & bronchiectasis: 13/2 (2.5%) Severe CoVID-19: a0R: 3.4 (justed 0.4ds Ratio; model included age, sex, race, hypertension, diabetes, body moss index,		outbreak,		intensive care unit	Treatment/ Associated Therapy: NR
from individual hospitals designated for admitting patients with COVID-19 was requested by the National health Commission. Ventilation, invasive mechanical ventilation ion, ECMO Comothie Cassis: Hospitalization: NR Non-elective readmissions: NR COPD & bronchie ctasis: - aOR: 1.0 (5% CI: 0.22-2.21), p=0.505 Exclusion criteria: Patients without any information on comorbidities, clini cal outcomes, age or sex data, discharge records, or admission date. Exclusion cometation on comorbidities, clini cal outcomes, age or sex data, discharge records, or admission date. Exclusion Redical Condition, n/N (%): COPD & bronchiectasis: 13/5 (14.3%) Author: Gupta ²⁴ Population: N= 2,215 Medical Condition, n/N (%): COPD & bronchiectasis: 13/5 (12.9%) Invasive ventilation, n/N (%): COPD & bronchiectasis: - aOR: 1.2 (95% CI: 0.46-3.11), p=0.706 Author: Gupta ²⁴ Population: N= 2,215 Medical Condition, n/N (%): COPD & bronchiectasis: - aOR: 1.0 (95% CI: 0.05-7.75), p=0.335 Year: 2020 Population: N= 2,215 Medical Condition, n/N (%): COPD & bronchiectasis: - aOR: 1.2 (95% CI: 0.05-7.75), p=0.335		submission of EMR		Intubation: NR	
hospitals designated for admitting patients with COVID-19 was requested by the National health Commission. with COVID-19 was requested by the National health Commission. More-lective readmissions: NR Non-elective readmissions: NR More float (5,5%,5) Exclusion criteria: Patients without any information on comorbidities, clini cal outcomes, age or sex data, discharge records, or admission date. Exclusion criteria: Patients without any information on comorbidities, clini cal outcomes, age or admission date. Kedical Condition, n/N (%): CoPD & bronchiectasis: 5/35 (14.3%) • No COPD & bronchiectasis: 1/3/39385 (8.9%) Author: Gupta ²⁴ Population: N= 2,215 Medical Condition, n/N (%): COPD: 173/2,215 (7.8%) Medical Condition(s): COPD P: Per chart review Severe COVID-19: core, hypertension, diabetes, body mass index,		from individual		Ventilation: noninvasive	Comorbid Conditions:
designated for admitting patients with COVID-19 was requested by the National health Commission. ion, ECMO Hospitalization: NR Non-elective readmissions: NR cOPP & bronchiectasis: 0.06: (0.57. (0.52-2.5.5) Exclusion criteria: Patients without any information on comorbidities, clini cal outcomes, age or sex data, discharge records, or admission date. Exclusion criteria: Patients without any information on comorbidities, clini cal outcomes, age or sex data, discharge records, or admission date. Exclusion criteria: Patients without any information on comorbidities, clini cal outcomes, age or sex data, discharge records, or admission date. Exclusion criteria: Patients without any information on comorbidities, clini cal outcomes, age or sex data, discharge records, or admission date. Wedical Condition, n/N (%): compa & bronchiectasis: 1/35 (2.9%) COPD & bronchiectasis: - aOR: 0.28 (9% Cl: 0.05-2.75), p=0.335 - OR: 0.74 (95% Cl: 0.05-2.75), p=0.335		hospitals		ventilation, invasive mechanical ventilat	Mortality, n/N (%):
admitting patients Hospitalization: NR - aOR: 0.66 (95% CI: 0.22-22), p=0.505 viit COVID-19 was requested by the National health Commission. Non-elective readmissions: NR - OR: 1.71 (95% CI: 0.25-25.9) Exclusion criteria: Patients without any information on comorbidities, clini cal outcomes, age or sex data, discharge records, or admission date. - Section - CUP & bronchiectasis: 2050/39385 (5.2%) Author: Gupta ²⁻⁴ Population: N= 2,115 Medical Condition, n/N (%): COPD & bronchiectasis: - aOR: 1.71 (95% CI: 0.46-3.11), p=0.706 Year: 2020 Berneric Componenties (Circulation) - Author: Supta ²⁻⁴ Population: N= 2,115 Medical Condition, n/N (%): COPD & bronchiectasis: 1/35 (2.9%) Year: 2020 Population: N= 2,115 Medical Condition, n/N (%): COPD: 173/2,215 (7.8%) Medical Condition(s): COPD: Per chart review Severe COVID-19: 2007: 173/2,215 (7.8%)		designated for		ion, ECMO	COPD & bronchiectasis:
with COVID-19 was requested by the National health Commission. Non-elective readmissions: NR • OR: 1.71 (95% CI: 0.52-5.59) • COPD & bronchiectasis: 3/35 (8.6%) Exclusion criteria: Patients without any information on comorbidities, clini cal outcomes, age or sex data, discharge records, or admission date. Exclusion criteria: Patients ICU admission, n/N (%): COPD & bronchiectasis: • aOR: 1.2 (95% CI: 0.46-3.11), p=0.706 Invasive ventilation, n/N (%): cal outcomes, age or sex data, discharge records, or admission date. Invasive ventilation, n/N (%): COPD & bronchiectasis: 5/35 (14.3%) Author: Gupta ²⁴ Population: N= 2.215 Medical Condition, n/N (%): COPD: Per chart review Medical Condition(s): COPD: Per chart review Severe COVID-19: aoR: 0.34 (Justed Odds Ratio; model included age, sex, race, hypertension, diabetes, body mass index,		admitting patients		Hospitalization: NR	 aOR: 0.66 (95% CI: 0.2-2.22), p=0.505
requested by the National health Commission. - COPD & bronchiectasis: 3/35 (8.6%) - No COPD & bronchiectasis: 2050/39385 (5.2%) Exclusion criteria: Patients without any information on comorbidities, clini cal outcomes, age or sex data, discharge records, or admission date. - Exclusion criteria: Patients without any information on comorbidities, clini cal outcomes, age or sex data, discharge records, or admission date. - Weight and the second sec		with COVID-19 was		Non-elective readmissions: NR	• OR: 1.71 (95% CI: 0.52-5.59)
National health commission.Comments: None• No COPD & bronchiectasis: 2050/39385 (5.2%)Exclusion criteria: Patients without any information on comorbidities, clini cal outcomes, age or sex data, discharge records, or admission date No COPD & bronchiectasis: • aOR: 1.2 (95% CI: 0.46-3.11), p=0.706 • OR: 1.70 (95% CI: 0.46-3.13), p=0.706 • OR: 1.70 (95% CI: 0.46-3.14), p=0.706 • OR: 1.70 (95% CI: 0.46-3.14), p=0.706 • OR: 1.70 (95% CI: 0.46-3.13), p=0.706 • OR: 1.70 (95% CI: 0.46-3.14) • No COPD & bronchiectasis: 5/35 (14.3%) • No COPD & bronchiectasis: 1/39385 (8.9%)Author: Gupta ²⁴ Population: N= 2,215Medical Condition, n/N (%): COPD: 173/2,215 (7.8%)Medical Condition(s): COPD Per chart reviewSevere COVID-19: ace, hypertension, diabetes, body mass index,		requested by the			 COPD & bronchiectasis: 3/35 (8.6%)
Commission. Exclusion ICU admission, n/N (%): criteria: Patients commission on composition on without any information on comorbidities, clini cal outcomes, age or sex data, discharge records, or admission date. No COPD & bronchiectasis: or admission date. vithout any information on composition on comorbidities, clini cal outcomes, age or sex data, discharge records, or or admission date. or admission date. vithout any No COPD & bronchiectasis: 308 (5% Cl: 0.05-2.75), p=0.335 o Risk Markers: NR coPD & bronchiectasis: 1/35 (2.9%) No COPD & bronchiectasis: 1/35 (2.9%) Author: Gupta ²⁴ Population: N= Medical Condition, n/N (%): COPD: 1/3/2,215 (7.8%) Year: 2020 CoPD: 1/3/2,215 (7.8%) COPD: Per chart review aoR1: Adjusted Odds Ratio; model included age, sex, roce, hypertension, diabetes, body mass index,		National health		Comments: None	 No COPD & bronchiectasis: 2050/39385 (5.2%)
Exclusion criteria: Patients without any information on comorbidities, clini cal outcomes, age or sex data, discharge records, or admission date.ICU admission, n/N (%): COPD & bronchiectasis: • aOR: 1.2 (95% Cl: 0.66-4.38) • COPD & bronchiectasis: 5/35 (14.3%) • No COPD & bronchiectasis: 5/35 (14.3%) • No COPD & bronchiectasis: 3514/39385 (8.9%)Author: Gupta ²⁴ Population: N= 2,215Medical Condition, n/N (%): COPD: 173/2,215 (7.8%)Medical Condition(s): COPD: Per chart reviewGUP: Per chart reviewVear: 20202,215COPD: 173/2,215 (7.8%)Medical Condition(s): COPD: Per chart reviewSevere COVID-19: anditable		Commission.			
Exclusion criteria: Patients without any information on comorbidities, clini cal outcomes, age or admission date.COPD & bronchiectasis: • aOR: 1.2 (95% Cl: 0.46-3.11), p=0.706 • OR: 1.70 (95% Cl: 0.66-4.38) • COPD & bronchiectasis: 5/35 (14.3%) • No COPD & bronchiectasis: 5/35 (14.3%) • No COPD & bronchiectasis: 3514/39385 (8.9%) • No COPD & bronchiectasis: 3514/39385 (8.9%) • No COPD & bronchiectasis: 1512/39385 (8.9%)Author: Gupta ²⁴ Population: N= 2,215Medical Condition, n/N (%): COPD: 173/2,215 (7.8%)Medical Condition(s): COPD: Per chart reviewSevere COVID-19: a ORI: 4012/10000000000000000000000000000000000					ICU admission, n/N (%):
criteria: Patients without any information on comorbidities, clini cal outcomes, age or sex data, discharge records, or admission date.+ aOR: 1.2 (95% CI: 0.46-3.11), p=0.706 • OR: 1.70 (95% CI: 0.46-3.48) • COPD & bronchiectasis: 5/35 (14.3%) • No COPD & bronchiectasis: 3/35 (14.3%) • No COPD & bronchiectasis: 3/34 (39385 (8.9%))Author: Gupta ²⁴ Population: N= 2,215Medical Condition, n/N (%): COPD: 173/2,215 (7.8%)Medical Condition(s): COPD: Per chart reviewSevere COVID-19: a OR: 1.2 (95% CI: 0.46-3.11), p=0.706 • OR: 1.70 (95% CI: 0.46-3.48) • COPD & bronchiectasis: 3/35 (14.3%) • No COPD & bronchiectasis: 3/34 (39385 (8.9%))Hurdsive ventilation, n/N (%): COPD & bronchiectasis:Invasive ventilation, n/N (%): • COPD & bronchiectasis:Invasive ventilation, n/N (%): • COPD & bronchiectasis:Author: Gupta ²⁴ Population: N= 2,215Medical Condition, n/N (%): COPD: 173/2,215 (7.8%)Medical Condition(s): COPD: Per chart reviewSevere COVID-19: a ORI: Adjusted Odds Ratio; model included age, sex, race, hypertension, diabetes, body mass index,		Exclusion			COPD & bronchiectasis:
without any information on comorbidities, clini cal outcomes, age or sex data, discharge records, or admission date.• OR: 1.70 (95% CI: 0.66-4.38) • COPD & bronchiectasis: 5/35 (14.3%) • No COPD & bronchiectasis: 5/35 (14.3%) • No COPD & bronchiectasis: 3514/39385 (8.9%) Invasive ventilation, n/N (%): COPD & bronchiectasis: • aOR: 0.38 (95% CI: 0.05-2.75), p=0.335 • OR: 0.74 (95% CI: 0.10-5.41) • COPD & bronchiectasis: 1/35 (2.9%) • No COPD & bronchiectasis: 1/		criteria: Patients			 aOR: 1.2 (95% CI: 0.46-3.11), p=0.706
Information on cal outcomes, age or sex data, discharge records, or admission date.Medical Condition, n/N (%): Log LogCOPD & bronchiectasis: 3514/39385 (8.9%) No COPD & bronchiectasis: 0 Rischarge records, or admission date.Author: Gupta ²⁴ Population: N= 2,215Medical Condition, n/N (%): COPD: 173/2,215 (7.8%)Medical Condition(s): COPD: Per chart reviewSevere COVID-19: a OR1: Adjusted Odds Ratio; model included age, sex, race, hypertension, diabetes, body mass index,		without any			• OR: 1.70 (95% CI: 0.66-4.38)
Comorbidities, clini cal outcomes, age or sex data, discharge records, or admission date.• No COPD & bronchiectasis: 3514/39385 (8.9%)Invasive ventilation, n/N (%): COPD & bronchiectasis: o admission date.Invasive ventilation, n/N (%): COPD & bronchiectasis: o aOR: 0.38 (95% Cl: 0.05-2.75), p=0.335 o OR: 0.74 (95% Cl: 0.10-5.41) o COPD & bronchiectasis: 1/35 (2.9%) o No COPD & bronchiectasis: 1/35 (2.9%) <br< td=""><td></td><td>information on</td><td></td><td></td><td> COPD & bronchiectasis: 5/35 (14.3%) </td></br<>		information on			 COPD & bronchiectasis: 5/35 (14.3%)
Cal outcomes, age or sex data, discharge records, or admission date.Invasive ventilation, n/N (%): COPD & bronchiectasis: • aOR: 0.38 (95% Cl: 0.05-2.75), p=0.335 • OR: 0.74 (95% Cl: 0.10-5.41) • COPD & bronchiectasis: 1/35 (2.9%) • No COPD & bronchiectasis: 1/35 (2.9%) <br< td=""><td></td><td>comorbidities, clini</td><td></td><td></td><td>• No COPD & bronchiectasis: 3514/39385 (8.9%)</td></br<>		comorbidities, clini			• No COPD & bronchiectasis: 3514/39385 (8.9%)
or sex data, discharge records, or admission date.or sex data, discharge records, or admission date.Invasive ventilation, n/N (%): COPD & bronchiectasis: • aOR: 0.38 (95% CI: 0.05-2.75), p=0.335 • OR: 0.74 (95% CI: 0.10-5.41) • COPD & bronchiectasis: 1/35 (2.9%) • No COPD & bronchiectasis: 1/35 (2.9%) <b< td=""><td></td><td>cal outcomes, age</td><td></td><td></td><td></td></b<>		cal outcomes, age			
discharge records, or admission date.COPD & bronchiectasis: • aOR: 0.38 (95% CI: 0.05-2.75), p=0.335 • OR: 0.74 (95% CI: 0.10-5.41) • COPD & bronchiectasis: 1/35 (2.9%) • No COPD & bronchiectasis:		or sex data,			Invasive ventilation, n/N (%):
or admission date.or admission date.• aOR: 0.38 (95% CI: 0.05-2.75), p=0.335 • OR: 0.74 (95% CI: 0.10-5.41) • COPD & bronchiectasis: 1/35 (2.9%) • No COPD & bronchiectasis: 1/35 (2.9%) • No COPD & bronchiectasis: 1512/39385 (3.8%)Author: Gupta ²⁴ Population: N= 2,215Medical Condition, n/N (%): COPD: 173/2,215 (7.8%)Medical Condition(s): COPD: Per chart reviewSevere COVID-19: aOR1: Adjusted Odds Ratio; model included age, sex, race, hypertension, diabetes, body mass index,		discharge records,			COPD & bronchiectasis:
Author: Gupta ²⁴ Population: N= Medical Condition, n/N (%): Medical Condition(s): COPD: 173/2,215 (7.8%) Medical Condition(s): Severe COVID-19: Year: 2020 OPD: 173/2,215 (7.8%) Medical Condition(s): COPD: Per chart review aOR1: Adjusted Odds Ratio; model included age, sex, race, hypertension, diabetes, body mass index,		or admission date.			 aOR: 0.38 (95% CI: 0.05-2.75), p=0.335
Author: Gupta ²⁴ Population: N= Medical Condition, n/N (%): Medical Condition, s/N (%): Medical Condition(s): Severe COVID-19: Year: 2020 COPD: 173/2,215 (7.8%) Medical Condition(s): COPD: Per chart review aOR1: Adjusted Odds Ratio; model included age, sex, race, hypertension, diabetes, body mass index,					• OR: 0.74 (95% CI: 0.10-5.41)
Author: Gupta ²⁴ Population: N= Medical Condition, n/N (%): Medical Condition(s): Severe COVID-19: Year: 2020 COPD: 173/2,215 (7.8%) COPD: Per chart review aOR1: Adjusted Odds Ratio; model included age, sex, race, hypertension, diabetes, body mass index,					 COPD & bronchiectasis: 1/35 (2.9%)
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Author: Gupta ²⁴ Population: N= Medical Condition, n/N (%): Medical Condition(s): Severe COVID-19: Year: 2020 COPD: 173/2,215 (7.8%) COPD: Per chart review aOR1: Adjusted Odds Ratio; model included age, sex, race, hypertension, diabetes, body mass index,					
Author: Gupta ²⁴ Population: N= 2,215 Medical Condition, n/N (%): COPD: 173/2,215 (7.8%) Medical Condition(s): COPD: Per chart review Severe COVID-19: a OR1: Adjusted Odds Ratio; model included age, sex, race, hypertension, diabetes, body mass index,					Risk Markers: NR
Author: Gupta ²⁴ Population: N= Medical Condition, n/N (%): Medical Condition(s): Severe COVID-19: 2,215 COPD: 173/2,215 (7.8%) COPD: Per chart review aOR1: Adjusted Odds Ratio; model included age, sex, race, hypertension, diabetes, body mass index,					Long-term Sequelae: NR
Year: 2020 COPD: 173/2,215 (7.8%) COPD: Per chart review aOR1: Adjusted Odds Ratio; model included age, sex, race, hypertension, diabetes, body mass index,	Author: Gupta ²⁴	Population: N=	Medical Condition, n/N (%)	Medical Condition(s):	Severe COVID-19:
Year: 2020 Cor D: 1/3/2,213 (7.0/6) Cor D: 1/3/2,213 (7.0/6)		2 215	COPD: 173/2 215 (7 8%)	COPD: Per chart review	aOR1: Adjusted Odds Ratio: model included age sev
	Year: 2020	2,223			race, hypertension, diabetes, hody mass index
Control/Comparison group. n/N (%): coronary artery disease, condestive heart failure.			Control/Comparison group, n/N (%):		coronary artery disease, congestive heart failure.

Study	Population and Setting	Intervention	Definitions	Outcomes
Data Extractor: MC	Setting: ICUs at 65	No COPD: 2,042/2,215 (92.2%)	Severity Measure(s): NR	chronic obstructive pulmonary disease, current
	hospitals			smoking status, active cancer, duration of symptoms
Reviewer: JH/MW			Clinical marker: NR	before ICU admission, and covariates assessed at ICU
	Location: US			admission
Study Design: Cohort			Treatment/ Associated Therapy: NR	aOR2: Adjusted Odds Ratio in mechanically ventilated
	Study dates:			patients, model restricted to 1494 patients; model
Study Objective: To	March 4 - June 4,		Outcome Definitions:	included age, sex, race, hypertension, diabetes, body
assess factors associated	2020		Mortality: Death within 28 days of ICU	mass index, coronary artery disease, congestive heart
with death and to			admission	failure, chronic obstructive pulmonary disease, current
examine interhospital	Inclusion criteria:		ICU admission: NR	smoking status, active cancer, duration of symptoms
variation in	Adult patients (≥18		Intubation: NR	before ICU admission, and covariates assessed at ICU
treatment and outcomes	years of age) with		Ventilation: NR	admission
for patients with COVID-	laboratory-		Hospitalization: NR	aHR: Hazard Ratio; model included age, sex, race,
19.	confirmed COVID-		Non-elective readmissions: NR	hypertension, diabetes, body mass index, coronary
	19 (detected by			artery disease, congestive heart failure, chronic
IVA Score: 23 (Moderate)	nasopharyngeal		Comments: None	obstructive pulmonary disease, current smoking
	or oropharyngeal			status, active cancer, duration of symptoms before ICU
	swab) admitted to			admission, and covariates assessed at ICU admission
	a participating ICU			
	for illness related			Mortality, n/N (%):
	to COVID-19			COPD:
	between March 4			• aOR1: 1.39 (95% CI: 0.95-2.04), p=NR
	and April 4, 2020,			• aOR2: 1.69 (95% CI: 1.03-2.78), p=NR
	Patients were			• aHR: 1.17 (95% CI: 0.93-1.48), p=NR
	considered to have			• Dead: 87/784 (11.1%)
	been admitted to			• Alive: 86/1,431 (6.0%)
	an ICU if they were			
	admitted to a			Severity of Condition: NR
	regular ICU or if			
	they were in a			Duration of Condition: NR
	non-ICU room that			
	was functioning as			Treatment/ Associated Therapy: NR
	an ICU room for			
	surge capacity.			Comorbid Conditions: NR
	Exclusion criteria:			Risk Markers: NR
	NR			
				Long-term Sequelae: NR
Author: Haki ²⁵	Population: N= 29	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
	0		COPD: ND	

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
Year: 2021		Chronic obstructive pulmonary disease		aOR: Multivariable Logistic Regression; model included
	Setting: Hospital	(COPD): 17/290 (5.86%)	Severity Measure(s): NR	neurological disease, sex, heart disease, COPD,
Data Extractor: MC	Less Maria Tradició			platelet, C-reactive protein, and D-dimer
Bardan DOG	Location: Turkey	Control/Comparison group, n/N (%):	Clinical marker: NR	
Reviewer: DOS	Church	NO COPD: 273/290 (94.14%)1	Treatment (Accession of Thereman ND	Nortality, n/N (%):
Study Designs	Study		Treatment/ Associated Therapy: NR	
Study Design:	May 22, 2020		Quitagene Definitions	• aUR: 14.35 (95% CI: 2.03-101.42), p=0.008
Retrospective conort	Way 22, 2020		Outcome Definitions:	• Died: 7/25 (28.00%)
Study Objective: To	Inclusion		admitted to the ICU and diad	• Survived: 10/265 (3.77%)
ovaluate the neurological	critoria: Dationts		ICU admission: Hospitalized patients	• p=NR
signs and symptoms and	older than 18		discharged from or died in the ICU	
accompanying comorbid	vears of age who		Intubation: NR	Severity of Condition: NR
neurological diseases of	were admitted to		Ventilation: NR	Duration of Condition: NP
natients who were	study hospital		Hospitalization: NR	Duration of Condition. NR
hospitalized in wards or	during study		Non-elective readmissions: NR	Treatment / Associated Therapy: NR
ICUs with a diagnosis of	period and had			Treatmenty Associated Therapy. NA
COVID-19.	been diagnosed		Comments: None	Comorbid Conditions: NB
	with COVID-19 by			
IVA Score: 22 (Moderate)	RT-PCR.			Risk Markers: NR
	Exclusion criteria:			Long-term Sequelae: NR
	Patients younger			
	than 18 years,			
	those that were			
	asymptomatic or			
	had mild disease,			
	individuals			
	followed as			
	outpatients, and			
	cases with			
	incomplete data.			
Author: Hansen ²⁶	Population:	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
	N=5104	Chronic obstructive pulmonary disease	COPD: ICD-10 code J43-44 or patients	aHR: Adjusted Hazard Ratio; Cox proportional hazards
Year: 2021		(COPD): 432/5104 (8.5%)	were defined as having COPD if they	model adjusted for age, sex, education level, and a
	Setting:		had filled a minimum of two	combined covariate for cardiac disease (heart failure,
Data Extractor: CS	Nationwide	Control/Comparison group, n/N (%):	prescriptions of long-acting g β-agonists	atrial fibrillation or flutter, or ischaemic heart
	healthcare	No asthma/COPD: 4318/5104 (84.6%)	or long-acting muscarinergic	disease)a combined covariate for cardiac disease
Reviewer: DOS	registries		antagonists without concurrent use of	

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
			inhaled corticosteroids within the last	(heart failure, atrial fibrillation or flutter, or ischaemic
Study design:	Location: Denmark		12 months; patients over 60 years with	heart disease)
Retrospective cohort			use of long-acting β-agonists in	Risk difference
study	Study dates:		combination with inhaled	Age standardized risk estimates
	February 1-July 10,		corticosteroids were considered as	
Study Objective: To	2020		having COPD; patients diagnosed with	Mortality, n/N (%):
determine the risk of			both COPD and asthma were	COPD
severe outcomes of	Inclusion criteria:		considered as having COPD	 aHR: 1.25 (95% CI: 1.02-1.51), p=0.028
COVID-19 among patients	All patients with a			 Risk difference: 1.9% (95% CI: 0.1-3.6), p=0.035
with asthma and COPD.	COVID-19		Severity Measure(s): NR	• COPD: 141/432 (32.6%)
To investigate whether	diagnosis (ICD-10			 No asthma/COPD: 419/4318 (9.7%)
eosinophilic inflammation	codes B342A,		Clinical marker: NR	
was associated with	B972, and B972A)			ICU admission, n/N (%):
frequency of severe	registered in the		Treatment/ Associated Therapy: NR	COPD
outcomes of COVID-19.	Danish registers			• aHR: 1.05 (95% CI: 0.76-1.46), p=0.75
	were included.		Outcome Definitions:	• Risk difference: no differences in risk of admission
IVA Score: 24 (moderate)			<i>Mortality:</i> death within the first 30 days	to ICU compared to those without asthma or
	Exclusion criteria:		ICU admission: admission to ICU within	COPD
	NR		the first 30 days	 No asthma/COPD: 252/4318 (5.8%)
			Intubation: NR	
			Ventilation: NR	Severity of Condition: NR
			Hospitalization: NR	
			Non-elective readmissions: NR	Duration of Condition: NR
			Comments: None	Treatment/ Associated Therapy: NR
				Comorbid Conditions: NR
				Risk Markers: NR
				Long-term Sequelae: NR
Author: He ²⁷	Population: N=304	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
		COPD: 21/304 (6.9%)	COPD: ND	aHR: Adjusted Hazard Ratio; model included age, sex,
Year: 2021	Setting: University			pre-existing comorbidities, high-sensitivity troponin I,
	hospital	Control/Comparison group, n/N (%):	Severity Measure(s): NR	CRP levels, N-terminal pro-B-type natriuretic peptide
Data Extractor: JH		No COPD: 283/304 (93.1%)		on admission, procalcitonin, D-dimer levels, and novel
	Location: China		Clinical marker: NR	coronary pneumonia types
Reviewer: DOS				HR: Hazard Ratio
			Treatment/ Associated Therapy: NR	
Study Design: Cohort				Mortality:

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
	Study		Outcome Definitions:	COPD:
Study Objective: To	dates: January 11		Mortality: in-patient COVID-19	 aHR: 2.43 (95% CI: 1.11-5.31); p=0.027
comprehensively define	– March 25, 2020		associated mortality	• HR: 2.95 (95% CI: 1.64 – 5.32); p <0.001
clinical characteristics,			ICU admission: NR	
laboratory results,	Inclusion criteria:		Intubation: NR	Severity of Condition: NR
outcomes, and	COVID-19 patients		Ventilation: NR	
management strategies of	confirmed by RT-		Hospitalization: NR	Duration of Condition: NR
COVID-19 patients, then	PCR using nasal		Non-elective readmissions: NR	
to find whether there is	and pharyngeal			Treatment/Associated Therapy: NR
an association of	swab specimens or		Comments: None	
myocardial injury and	by anti-SARS-CoV-			Comorbid Conditions: NR
other biomarkers with	, 2 antibody assay			
mortality	who were			Risk Markers: NR
	admitted to			
IVA Score: 23 (Moderate)	university hospital			Long-term Sequelae: NR
	during study			
	period.			
	period.			
	Exclusion			
	criteria: Cases			
	without significant			
	hiomarkers			
	including Hs-Th			
	and creatine			
	kinaso myocardial			
	hand (CK MP)			
	levels.			
Author: Hippislev-Cox ²⁸	Population:	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
	N=6,952,440	COPD: 199,780/6,952,440 (2.9%)	COPD: ND	aHR1: Adjusted Cox Proportional Hazard Ratio for
Year: 2021	COVID-19+, N = NR	Asthma: NR	Asthma: ND	COVID-19 related death in those with a SARS-CoV-2
				positive test: model mutually adjusted and included
Data Extractor: CNS	Setting: 1336	Control/Comparison group, n/N (%):	Severity Measure(s): NR	fractional polynomial terms for age, body mass index
	practices	No COPD: 6.752.660/6.952.440 (97.1%)		vaccination dose, and backaround infection rate at
Reviewer: DOS		Asthma: NR	Clinical marker: NR	time of vaccination
	Location: England			aHR2: Adjusted Cox Proportional Hazard Ratio for
Study Design: Cohort			Treatment/Associated Therapy: NR	COVID-19 related death/hospitalization in
ctury besign conort	Study dates:		reaction Associated merupy. With	unvaccinated natients with a SARS-CoV-2 nositive test
Study Objective: To	Sentember 1		Outcome Definitions:	model mutually adjusted and included fractional
develop and validate two			Mortality:	nolynomial terms for age and hody mass index
develop and validate two			Mortality:	polynomial terms for age and body mass index

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
new QCovid risk	2020-June 15,		 Time to COVID-19 related death in 	
algorithms, based on data	2021		or out of hospital as recorded on	Mortality:
from the second			the death certification 14 days or	COPD:
pandemic wave in	Inclusion criteria:		more after vaccination, or death	• aHR1: 1.40 (95% CI: 1.22-1.61), p=NR
England, to identify those	All adults aged 19-		within 28 days of a SARS-CoV-2	
groups at highest risk of	100 years in the		infection confirmed by RT-PCR	Severity of Condition: NR
severe covid-19	QResearch		 COVID-19 related death in 	
outcomes: QCovid2	database who had		unvaccinated patients with a SARS-	Duration of Condition: NR
(based on unvaccinated	one or two doses		CoV-2 positive test	
patients) and QCovid3	of the ChAdOx1		ICU admission: NR	Treatment/ Associated Therapy: NR
(based on vaccinated	nCoV-19 (Oxford-		Intubation: NR	
patients).	AstraZeneca) or		Ventilation: NR	Comorbid Conditions: NR
	BNT162b2 (Pfizer-		Hospitalization: hospital admission with	
IVA Score:	BioNTech) vaccine		confirmed or suspected covid-19 on	Risk Markers:
Asthma: 22 (moderate)	between		ICD-10 codes U071 and U072, or new	Mortality:
COPD: 23 (moderate)	December 8, 2020		hospital admission associated with a	
	- June 15, 2021.		confirmed SARS-CoV-2 infection in the	Men:
	Individuals were		preceding 14 days in unvaccinated	COPD
	followed from 14		patients with a SARS-CoV-2 positive	• aHR2: 1.22 (95% CI: 1.12-1.33); p=NR
	days after		test	Women:
	receiving each		Non-elective readmissions: NR	COPD
	vaccine dose until			• aHR2: 1.31 (95% CI: 1.19-1.44), p=NR
	they had the		Comments: None	
	outcome of			Asthma:
	interest, died, or			Men:
	reached the end of			• aHR2: 0.89 (95% CI: 0.82-0.97), p=NR
	the study period.			Women:
	The unvaccinated			• aHR: 0.98 (95% CI: 0.91-1.07), p=NR
	cohort included			
	people aged 19-			Hospitalization, n/N (%):
	100 years and			COPD:
	observed between			Men:
	September 1, 2020			• aHR2: 1.18 (95% CI: 1.06-1.33), p=NR
	- May 31, 2021,			Women:
	but people who			• aHR2: 1.24 (95% CI: 1.10-1.40). p=NR
	were subsequently			
	vaccinated were			Asthma:
	censored on the			Men:
	date of their first			• aHR2; 0.91 (95% CI; 0.85-0.98). p=NR
	vaccination.			Women:

Study	Population and	Intervention	Definitions	Outcomes
-	Setting			
				• aHR2: 1.08 (95% CI: 1.01-1.16), p=NR
	Exclusion criteria:			
	Patients that had a			Long-term Sequelae: NR
	covid-19			
	associated hospital			
	admission before			
	their start of			
	follow-up (14 days			
	after the first or			
	second dose of			
	vaccination).			
Author: Hu ⁷⁰	Population: N=213	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
		Chronic obstructive pulmonary disease	COPD: ND	aOR: Multivariable Logistic Regression: Multivariable
Year: 2020	Setting: Two	(COPD): 4/213 (1.9%)		Logistic Regression
	medical centers		Severity Measure(s): NR	OR: Univariable Logistic Regression
Data Extractor: CS	that were the	Control/Comparison group, n/N (%):		
	main treatment	No COPD: 199/213 (98.1%)	Clinical marker: NR	ICU admission, n/N (%), or Median (IQR):
Reviewer: MW	centers for COVID-			COPD
	19 in Hunan		Treatment/ Associated Therapy: NR	 aOR: 31.8 (95% CI: 2.21-457.65), p=0.011
Study design:	Province			 OR: 10.61 (95% CI: 1.41-78.88), p=0.022
Retrospective cohort			Outcome Definitions:	• ICU: 2/20 (10.0%)
study	Location: China		Mortality: NR	 Non-ICU: 2/193 (1.0%)
			ICU admission: ND	• p=0.045
Study Objective: To	Study dates:		Intubation: NR	
investigate clinical	January 24-March		Ventilation: NR	Severity of Condition: NR
characteristics and	15, 2020		Hospitalization: NR	
identify risk factors for			Non-elective readmissions: NR	Duration of Condition: NR
severity of coronavirus	Inclusion criteria:		Comments: None	
disease 2019 (COVID-19)	Inpatients with			Treatment/Associated Therapy: NR
pneumonia outside of	laboratory			······································
Wuhan, China.	confirmed COVID-			Comorbid Conditions: NR
IVA Score: 23 (moderate)	19 by RT-PCR,			
	nucleic-acid-			Risk Markers: NR
	positive test of			
	respiratory or			Long-term Sequelae: NR
	blood specimens			
	and high-			
	throughput gene			
	sequencing with			
	available			

Study	Population and	Intervention	Definitions	Outcomes
	epidemiological, clinical, and outcome data were included.			
	Exclusion criteria: NR			
Author: Huang ²⁹	Population:	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
Year: 2021	Setting: Large	(COPD): 820/61,338 (1.3%)	defined as having COPD if they had at least 1 inpatient/emergency	age group, sex, race/ethnicity, income, college education, Medicaid insurance status, BMI category,
Data Extractor: MC	integrated health care system	Control/Comparison group, n/N (%): No asthma or COPD: 54,992/61,338	department code or at least 2 outpatient codes for COPD prior to	smoking, and modified Charlson comorbidity score; COPD models run among individuals aged 35 and older
Reviewer: DOS	Location: Southern	(89.7%)	COVID-19 diagnosis date; COPD history was only assessed for individuals aged	aHR: Cox regression hazard ratio; COPD models run among individuals aged 35 years and older
Study Design: Cohort	California, US		35 years and older; individuals who had both asthma and COPD were included	Mortality, n/N (%):
Study Objective: To	Study dates:		in COPD group	COPD:
conduct a population-	March 1 - August		Asthma: ICD-10 J45; patients were	
based study to assess	31, 2020		defined as having asthma if they had at	 aOR: 1.67 (95% CI: 1.37-2.03)
asthma disease status and			least 1 inpatient/emergency	• COPD: 144/820 (17.6%)
chronic obstructive	Inclusion criteria:		department code or at least 2	 No asthma or COPD: 757/54,992 (1.4%)
pulmonary disease	All adult Kaiser		outpatient codes for asthma prior to	
(COPD) in relation to	Permanente		COVID-19 diagnosis date	ICU admission, n/N (%):
COVID-19 severity.	Southern			COPD:
	California (KPSC)		Severity Measure(s):	 aOR: 1.21 (95% CI: 0.87-1.68)
IVA Score:	patients with a		Active asthma: Patients with any	• COPD: 49/820 (6%)
COPD: 23 (Moderate)	confirmed COVID-		scheduled or unscheduled clinical visit	 No asthma or COPD: 796/54,992 (1.4%)
	19 diagnosis within		with an asthma diagnosis code in the 12	
	study dates.		months prior to COVID-19 diagnosis	Ventilation (IRS), n/N (%):
	Patients were		Inactive asthma: Patients with no	COPD:
	defined as COVID-		scheduled or unscheduled clinical visit	 aOR: 1.49 (95% CI: 1.16-1.92)
	19 cases if they		with an asthma diagnosis code in the 12	• COPD: 118/820 (4.3%)
	SARS-CoV-2 PCR		months prior to COVID-19 diagnosis	 No asthma or COPD: 1,242/54,992 (2.3%)
	laboratory test or		Clinical marker: NR	
	a diagnosis code			Hospitalization, n/N (%):
	for COVID-19.		Treatment/ Associated Therapy:	
				• aUR: 1.27 (95% CI: 1.05-1.53)
				• COPD: 194/820 (23.7%)

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
	Exclusion criteria:		Medication use: Patients with and	 No asthma or COPD: 3,404/54,992 (6.2%)
	Patients who had		without medication use in the past 12	
	asymptomatic		months	Severity of Condition: NR
	COVID-19			
	diagnosis codes		Outcome Definitions:	Duration of Condition: NR
	and negative		Mortality: Death within 60 days of	
	laboratory test		COVID-19 diagnosis	Treatment/ Associated Therapy: NR
	results within two		ICU admission: ICU admission within 30	
	weeks after the		days of COVID-19 diagnosis	Comorbid Conditions: NR
	diagnosis. Patients		Intubation: NR	
	were also excluded		Ventilation: Intensive respiratory	Risk Markers: NR
	if they were		support, which included invasive	
	nonmembers or		mechanical ventilation, noninvasive	Long-term Sequelae: NR
	members for less		ventilation, high-flow mask, or high-	
	than 1 year and		flow nasal cannula, within 30 days of	
	thus had		COVID-19 diagnosis	
	incomplete		Hospitalization: hospitalization within	
	medical data or		30 days of COVID-19 diagnosis	
	had		Non-elective readmissions: NR	
	other/unknown			
	sex.		Comments: None	
Author: Jaccarino ³⁰	Population:	Medical Condition %	Medical Condition(s):	Severe COVID-19
Addion	N=1 591			aOR: Multivariable Logistic Regression: model included
Vear: 2021	N-1,331	COP D. 7.776	COPD. ND	divident and the construction of the second se
1001.2021	Setting.	Control/Comparison group %:	Severity Measure(s): NR	inhibitors heart failure coronary artery disease
Data Extractor: DOS	Emergency rooms		Sevency measure(s). MA	chronic kidney disease COPD diabetes hypertension
	regular wards and	NO COPD. 32.370	Clinical marker: NR	car and
Reviewer: MC	intensive care			Scx, uge
Neviewer: Me	wards in 26		Treatment/Associated Therany: NR	Mortality n/N (%):
Study Design: Cohort	hospitals and		freutinenty Associated merupy. Mix	• 20R: 1 93 (95% CI: NR) n=0.011
Study Design conort	centers		Outcome Definitions:	• Non-survivors: 14 9%
Study Objective: To	Centers		Mortality: exitus (death)	• Sunvivors: 6 7%
explore the influence of	Location: Italy		ICU admission: NR	• n=0.0001
hypertension, as well as			Intubation: NR	• h-0.0001
treatment and	Study dates:		Ventilation: NR	Severity of Condition: NR
comorbidities on death or	March 9 - April 9.		Hospitalization: NR	Sevency of condition. Mix
survival of patients	2020		Non-elective readmissions: NR	Duration of Condition: NR
admitted to the hospital	•			
	Inclusion criteria:			Treatment/Associated Therapy: NR
	Inclusion criteria:			Treatment/ Associated Therapy: NR

Study	Population and	Intervention	Definitions	Outcomes
with a cortified diagnosis	Setting		Commonter Table 2 miclabels	
of COVID-19	to 101 years with		exponentiated B-coefficients as B	Comorbid Conditions: NR
	confirmed COVID-		however these values align with the	
IVA Score: 22 (moderate)	19 by RT-PCR		odds ratios in Figure 2A.	Risk Markers: NR
, , ,	performed on		5	
	throat swab			Long-term Sequelae: NR
	samples.			
	Exclusion criteria:			
	Patients with			
	incomplete data.			
Author: Izzy ⁸⁷	Population:	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
Noor: 2020	N=5,190	COPD: 624/5,190 (12.0%)	COPD: ND	aUR1: Multivariable Logistic Regression including age,
Year: 2020	Catting Not for	Control/Comparison group, n/N/(%)	Severity Messure(a): ND	sex, baseline comorbiaities, racial and ethnic
Data Extractor: IKK	profit health care		Sevency measure(s). NR	buckground, and socioeconomic status (medium
Data Extractor. JAK	system comprised	10 201 0. 4,300/3,130 (88.0%)	Clinical marker: NB	aOR2: Multivariable Logistic Regression including age
Reviewer: MW	of 12 hospitals			sex haseline comorbidities and racial and ethnic
	across eastern		Treatment/ Associated Therapy: NR	backaround
Study Design: Cohort	Massachusetts		······································	OR: Univariable (Univariate) Logistic Regression
			Outcome Definitions:	
Study Objective: To	Location:		<i>Mortality:</i> NR	Hospitalization, n/N (%):
examine the association	Massachusetts,		ICU admission: admission to an ICU at	COPD
between age, race and	US		any time during hospitalization	 Hospitalized: 225/1,489 (15.1%)
ethnicity, reported			Intubation: NR	 Not Hospitalized: 399/3,701 (10.8%)
preexisting comorbidities,	Study dates:		Ventilation: NR	• p<0.001
and the need for	February 1 – April		Hospitalization: hospitalization at any	
hospitalization and ICU	25, 2020		time during the course of the illness	Severity of Condition: NR
admission in a large study	Inclusion critoria		Non-elective reddmissions: NR	
population of COVID-19-	All patients 18		Comments: Batients who were	Duration of Condition: NR
medical records from the	All patients to		discharged home initially but admitted	
largest not-for-profit	tested positive for		later were categorized as hospitalized	Treatment/ Associated Therapy: NR
health care system in	COVID-19 during		patients.	Comorbid Conditions: NR
Massachusetts.	an inpatient,			
	outpatient, or			Risk Markers:
IVA Score: 23 (moderate)	emergency room			ICU Admission (among hospitalized), n/N (%):
	visit during the			COPD
	study dates;			White
	patients were			• aOR1: 1.03 (95% CI: 0.61-1.75), p=NR

Study	Population and	Intervention	Definitions	Outcomes
·	Setting			
	diagnosed as			• aOR2: 0.94 (95% CI: 0.58-1.53), p=NR
	infected with			 ICU Admission: 41/184 (22.3%)
	COVID-19 if SARS-			 No ICU Admission: 83/436 (19.0%)
	CoV-2 RNA was			Latinx
	detected in upper			 aOR1: 0.31 (95% CI: 0.13-0.73), p=statistically
	or lower			significant
	respiratory			 aOR2: 0.35 (95% CI: 0.15-0.81), p=statistically
	specimens by			significant
	nucleic acid testing			 ICU Admission: 12/182 (6.6%)
	(NAT) assays.			 No ICU Admission: 37/288 (12.8%)
				African American
	Exclusion criteria:			 aOR1: 0.83 (95% CI: 0.28-2.42), p=NR
	NR			 aOR2: 0.72 (95% CI: 0.25-2.05), p=NR
				 ICU Admission: 8/68 (11.8%)
				 No ICU Admission: 24/141 (17.0%)
				Hospitalization, n/N (%):
				COPD
				White
				 aOR1: 1.20 (95% CI: 0.86-1.67), p=NR
				 aOR2: 1.30 (95% CI: 0.95-1.76), p=NR
				 OR: 1.73 (95% CI: 1.36-2.20), p=statistically significant
				 Hospitalized: 124/620 (20.0%)
				 Not Hospitalized: 225/1,784 (12.6%)
				Latinx
				• aOR1: 1.06 (95% CI: 0.65-1.73), p=NR
				 aOR2: 1.06 (95% CI: 0.65-1.71), p=NR
				• OR: 0.95 (95% Cl: 0.65-1.36), p=NR
				• Hospitalized: 49/470 (10.4%)
				 Not Hospitalized: 92/839 (11.0%)
				African American
				 aOR1: 1.05 (95% CI: 0.55-1.99), p=NR
				• aOR2: 1.01 (95% CI: 0.55-1.85), p=NR
				• OR: 1.44 (95% CI: 0.89-2.28), p=NR
				• Hospitalized: 32/209 (15.3%)
				 Not Hospitalized: 57/510 (11.2%)
				Long-term Sequelae: NR

Study	Population and	Intervention	Definitions	Outcomes
Author: Jacobs ⁷⁶	Population:	Medical Condition n/N (%):	Medical Condition(s):	Severe COVID-19
Aution. Jacobs	N-1/ 171.	(OPD: 168/2, 286 (7, 3%))	CORD: ICD-10 code	aOB: Multivariable Logistic Regression Model: model
Vear: 2021	$(0)/(D_{-}10+$	COPD: 100/2,280 (7.370)	COFD. 1CD-10 COde	included sex race/ethnicity and age
1641.2021	N-2 286	Control/Comparison group n/N (%):	Severity Measure(s): NR	OR: Universable (Universite) Logistic Regression
Data Extractor: MW	N-2,200	No COPD: 2,118/2,286 (92.7%)	Sevency Measure(s). MA	ON. Oniversitie (Oniversite) Logistic Regression
	Setting: Private		Clinical marker: NR	Ventilation:
Reviewer: CNS	safety-net health			COPD:
	system including a		Treatment/ Associated Therapy: NR	 aOR: 1.9 (95% CI: NR); p=0.001
Study Design: Cross-	community			• OR: 2.5 (95% CI: NR); p<0.001
sectional	teaching		Outcome Definitions:	
	hospital/level 1		<i>Mortality:</i> NR	Severity of Condition: NR
Study Objective: To	trauma center,		ICU admission: NR	,
assess the relationship	community		Intubation: NR	Duration of Condition: NR
between patient	hospital,		Ventilation: COVID-related mechanical	
demographic	rehabilitation		ventilation ordered by a physician in	Treatment/ Associated Therapy: NR
characteristics and	hospital, and 14		the electronic medical records	
COVID-19 positivity, as	clinics		Hospitalization: NR	Comorbid Conditions: NR
well as the relationship			Non-elective readmissions: NR	
between underlying	Location: IL, US			Risk Markers: NR
comorbidities and severe			Comments: None	
COVID-19 illness in an	Study dates:			Long-term Sequelae: NR
urban safety-net hospital	March 1, 2020 –			
with a primarily	January 31, 2021			
racial/ethnic minority	· ·			
patient population.	Inclusion criteria:			
	All patients 18			
IVA Score: 23 (Moderate)	years of age and			
	older who were			
	tested for COVID-			
	19 by PCR, rapid,			
	or IgG qualitative			
	tests between the			
	study dates in			
	inpatient and			
	outpatient			
	locations, as well			
	as the emergency			
	department.			

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
	Exclusion criteria:			
	NR			
Author: Jiang ³¹	Population:	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
	N=1717 derivation	COPD: 104/1717 (6.1%)	COPD: ND	aHR: Adjusted hazard ratio; Cox proportional hazards
Year: 2021	cohort			regression model included age, sex, COPD, AST, hs-
	N=188 validation	Control/Comparison group, n/N (%):	Severity Measure(s): NR	CRP, hs-Tnl, white blood cell count, lymphocyte count,
Data Extractor: DOS	cohort	No COPD: 1613/1717 (93.9%)		D-dimer, and procalcitonin in the derivation cohort
			Clinical marker: NR	HR: Univariate hazard ratio in the derivation cohort
Reviewer: MW	Setting: Largest			
	teaching center in		Treatment/ Associated Therapy: NR	Mortality, n/N (%):
Study	province that is			COPD:
design: Retrospective	one of the		Outcome Definitions:	• aHR: 1.58 (95% CI: 1.04-2.41), p=0.034
cohort	designated		Mortality: ND	• HR: 2.71 (95% CI: 1.81-4.07), p<0.001
	hospitals for		ICU admission: NR	• Dead: 27/201 (13.4%)
Study Objective: To	severely or		Intubation: NR	• Alive: 77/1516 (5.1%)
define the prognostic	critically ill COVID-		Ventilation: NR	• p<0.001
factors associated with	19 cases		Hospitalization: NR	p 0.002
mortality in hospitalized			Non-elective readmissions: NR	Severity of Condition: NR
patients with COVID-19	Location: China			
and create a biomarker-			Comments:	Duration of Condition: NR
based risk score for	Study		Validated prediction model performanc	
patients' stratification and	dates: January 1 -		e using independent cohort of 188	Treatment/Associated Therapy: NR
clinical decision-making.	April 10, 2020		patients. Model performed well on	
_			validation cohort.	Comorbid Conditions: NR
IVA Score: 23	Inclusion criteria:			
(moderate)	Hospitalized adult			Risk Markers: NR
	patients (≥18 years			
	old) who had been			Long-term Sequelae: NR
	diagnosed with			
	COVID-19			
	according to WHO			
	interim guidance.			
	A confirmed case			
	of COVID-19 was			
	defined as a			
	positive result on			
	RT-PCR of nasal			
	and pharyngeal			
	swab specimens.			
	Only laboratory-			

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
	confirmed patients			
	were included in			
	the final			
	analysis. An			
	independent			
	cohort of patients			
	with the same			
	clinical			
	characteristics at			
	another			
	designated			
	hospital for			
	COVID-19 formed			
	the external			
	validation cohort.			
	Exclusion			
	criteria: NR			
Author: Jung ⁸⁵	Population: N=	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
_	4066	COPD: 164/4066 (4.0%)	COPD: Patients with unspecified chronic	aOR1: adjusted odds ratio (model included age, sex,
Year: 2021		 Mild: 101/4066 (2.5%) 	bronchitis (J42), emphysema (J43),	income, obesity, smoking, alcohol consumption,
	Setting: Hospital/	• Severe: 63/4066 (1.6%)	other COPD (J44) (except MacLeod	systolic blood pressure, diastolic blood pressure,
Data Extractor: JH	residential center		syndrome (J430)) with COPD-related	fasting blood glucose, total cholesterol, CCI scores,
		Control/Comparison group, n/N (%):	medications	number of NSAIDs used, number of steroids used,
Reviewer: DOS	Location: Korea	No COPD: 3902/4066 (96.0%)		hypertension, asthma, and COPD)
			Severity Measure(s):	aOR2: adjusted odds ratio (model included age, sex,
Study Design: Cohort	Study		Mild-asthma: not using ICSs/LABAs +	income, obesity, smoking, alcohol consumption.
,	dates: January 1 –		long-acting muscarinic antagonists	systolic blood pressure, diastolic blood pressure.
Study Objective: To	June 4. 2020		(LAMAs), ICSs/LABAs + LTRAs,	fastina blood alucose, total cholesterol, CCI scores.
evaluate and estimate the	,		ICSs/LABAs + xanthine, nor	number of NSAIDs used, number of steroids used, and
association between	Inclusion criteria:		corticosteroids for over 90 days	hypertension)
previous asthma/COPD	Patients with		medications within previous two years	,, ,
and the susceptibility of	confirmed COVID-		, , ,	Severity of Condition:
patients to COVID-19 in a	19 via RT-PCR of		Severe-asthma: using ICSs/LABAs +	Mortality, n/N (%)
nationwide cohort and	nasal or		long-acting muscarinic antagonists	Mild-COPD
the severity and mortality	pharyngeal swabs		(LAMAs), ICSs/LABAs + LTRAs,	• aOR1: 1.10 (0.42-2.89), p=0.851
of COVID-19.	during the study		ICSs/LABAs + xanthine, or	• aOR2: 0.99 (0.40-2.49), p=0.989
	dates with		corticosteroids for over 90 days	• OB: 3 28 (95%CI: 1 61-6 67) n=0.001
IVA Score:	previously		medications within previous two years	• Mild_COPD: 0/101 (8 9%)
COPD: 23 (Moderate)				• Non COPD: 112/2002 (2.0%)
				• Non-COPD: 113/3902 (2.9%)

Study	Population and	Intervention	Definitions	Outcomes
	diagnosod		Mild CORD: no history of using systemic	
	asthma/COPD		corticosteroids within previous two	Severe-COPD
	astinna, cor D.		vears	• aOR1: 3.06 (1.14-8.20) n=0.026
	Exclusion		Severe-COPD: history of using systemic	• 20P2: 2 79 (1 09-7 17) p=0.020
	criteria: NR		corticosteroids within previous two	• OP: 6 22 (05%CI: 2 14 12 76) p<0.001
			vears	• OR. 0.33 (35%CI. 3.14-12.70), p<0.001
			years	• Severe-COPD: 10/05 (15.5%)
			Clinical marker: NR	• NOII-COPD. 115/5902 (2.9%)
				Duration of Condition: ND
			Treatment/Associated Therapy: NR	Duration of Condition: NR
				Treatment (Accessized Thereasy ND
			Outcome Definitions:	Treatment, Associated Therapy. NR
			Mortality: ND	Comorbid Conditioner ND
			ICU admission: NR	
			Intubation: NR	Piek Merkere ND
			Ventilation: NR	
			Hospitalization: NR	Long torm Sequeles: NP
			ONon-elective readmissions: NR	Long-term Sequence. WK
			Comments: None	
Author: Kandula ³²	Population: N= NA	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
	, population-level	Chronic obstructive pulmonary disease	COPD: Proportion of residents 18+	Multivariable linear regression model adjusting for
Year: 2021	analysis; study size	(COPD): NR	years of age who report being told by a	county COVID-19 case rates
	determined by		doctor/nurse/other health professional	Univariate model with county-level COVID-19 mortality
Data Extractor: MC	infections	Control/Comparison group, n/N (%):	that they have COPD, emphysema, or	as outcome, adjusting for county COVID-19 case rates
		No COPD: NR	chronic bronchitis; Behavioral Risk	
Reviewer: DOS	Setting: Nationwid		Factor Surveillance System	Mortality, n/N (%):
	е			 Multivariate model: -4.681 (95% CI: -6.64, -2.72),
Study Design: Ecological;			Severity Measure(s): NR	p<0.001
spatial simultaneous	Location: US			 Univariate model: 4.4 (95% CI: 3-5.8), p<0.001
autoregressive model			Clinical marker: NR	
	Study dates:			COPD explains 24.6% of the variability in mortality in
Study Objective: To	Through		Treatment/ Associated Therapy: NR	the univariate model, adjusting for case rates.
evaluate strategies for	December 31,			Following variable pruning to correct for collinearity,
optimal geographical	2020		Outcome Definitions:	the multivariate model explained 38% of the
allocation of COVID-19			Mortality: Cumulative COVID-19	variability in mortality, however COPD's association
vaccines and to determine	Inclusion criteria:		confirmed and probable deaths through	with mortality is counterintuitively negative. The
whether health and	Both confirmed		December 31, 2020; per thousand	negative association is also observed in the spatial
socioeconomic indicators	and probable		residents increase in mortality per	models.
of a location can be used	cases and deaths			

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
to model differential risk	at the US county		thousand residents for every 1%	Severity of Condition: NR
of COVID-19 mortality,	level based on		increase in prevalence of COPD.	
and, hence, inform	Times' monitoring		ICU admission: NR	Duration of Condition: NR
vaccine prioritization	and analyses of		Intubation: NR	
strategies.	news conferences,		Ventilation: NR	Treatment/ Associated Therapy: NR
	data releases, and		Hospitalization: NR	
IVA Score: 20 (Moderate)	communications		Non-elective readmissions: NR	Comorbid Conditions: NR
	with public			
	officials.		Comments: None	Risk Markers: NR
	Determination of			
	confirmed or			Long-term Sequelae: NR
	probable was			
	made per			
	definitions by the			
	Council of State			
	and Territorial			
	Epidemiologists.			
	County population			
	estimates are from			
	the American			
	Community Survey			
	2014-2018.			
	Exclusion criteria:			
	NR			
Author: Kang ³³	Population: N=118	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
		Chronic obstructive lung disease (COPD):	COPD: ND	aHR: Adjusted Hazard Ratio; Cox proportional hazard
Year: 2020	Setting: single	8/118 (6.8%)		regression analysis; Cox proportional hazard
	tertiary care		Severity Measure(s): NR	regression analysis
Data Extractor: CS	hospital	Control/Comparison group, n/N (%):		HR: Hazard Ratio; Cox proportional hazard regression
		No COPD: 110/118 (93.2%)	Clinical marker: NR	
Reviewer: MW	Location: South			Mortality, n/N (%):
	Korea		Treatment/ Associated Therapy: NR	COPD:
Study design:				 aHR: 16.58 (95% CI: 3.10-88.70), p=0.010
Retrospective cohort	Study dates:		Outcome Definitions:	• HR: p<0.001
study	February 20-April		Mortality: ND	
	15, 2020		ICU admission: NR	Severity of Condition: NR
Study Objective: To			Intubation: NR	
investigate the	Inclusion criteria:		Ventilation: NR	Duration of Condition: NR
prevalence, baseline	Patients >19 years		Hospitalization: NR	

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
clinical characteristics,	old admitted to		Non-elective readmissions: NR	Treatment/ Associated Therapy: NR
therapy, and clinical	the hospital and			
outcomes, including	diagnosed with		Comments: None	Comorbid Conditions: NR
mortality, of COVID-19	COVID-19 by RT-			
patients in Daegu who	PCR from			Risk Markers: NR
were classified according	nasopharyngeal			
to the presence or	and/or			Long-term Sequelae: NR
absence of diarrhea.	oropharyngeal			
Additionally, to evaluate	swabs were			
the prognostic factors and	included. Sputum			
whether diarrhea could	and/or			
be a predictor of severe	endobronchial			
disease or mortality for	aspirate were used			
COVID-19.	for patients with			
	severe respiratory			
IVA Score: 23 (moderate)	disease.			
	Exclusion criteria:			
	NR			
Author: Khose ⁸⁸	Population: N=	Medical Condition, mean prevalence	Medical Condition(s):	Severe COVID-19: NR
	1,052 counties	(standard deviation):	COPD: ND	
Year: 2020		Chronic obstructive pulmonary disease		Severity of Condition: NR
	Setting: Nationwid	(COPD): 12.3% (3.1)	Severity Measure(s): NR	
Data Extractor: MC	e			Duration of Condition: NR
		Control/Comparison group: NR	Clinical marker: NR	
Reviewer: DOS	Location: Multiple			Treatment/ Associated Therapy: NR
	locations, USA		Treatment/ Associated Therapy, n/N	
Study design: Ecological			(%): NR	Comorbid Conditions: NR
study	Study dates: June			
	1 - June 29, 2020		Outcome Definitions:	Risk Markers:
Study Objective: To			Mortality: Case fatality risk (ratio of	aOR: Adjusted odds ratio; multinomial logistic
determine county level	Inclusion criteria:		number of new deaths and new	regression using quartiles of case fatality risk as a
variations in initial COVID-	Data obtained		confirmed cases, expressed as a	dependent variable; 1 st quartile is reference category
19 incidence and case	from the COVID19		percentage)	
fatality risk indexed to the	Data Repository by		ICU admission: NR	Mortality, Case fatality risk:
start of epidemic in each	the Center for		Intubation: NR	СОРД:
county, and to identify	Systems Science		Ventilation: NR	• 2 nd Quartile, aOR: 0.94 (95% CI: 0.87-1.01)
the predictors for county	and Engineering at		Hospitalization: NR	• 3 rd Quartile, aOR: 0.95: (95% CI: 0.88-1.03)
level variations in initial	Johns Hopkins		Non-elective readmissions: NR	 4th Quartile, aOR: 0.95 (95% CI: 0.91-1.06)
	University.			
Study	Population and Setting	Intervention	Definitions	Outcomes
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incidence and case fatality risk of COVID-19.	Counties with at least 100 cases on June 1, 2020 to		Comments: Author's note: Asthma, COPD, and CKD data obtained from Medicare	Long-term Sequelae: NR
IVA Score: 23 (moderate)	allow for 4-week period before we obtained the data.		beneficiary data and is not generalizable to general population.	
	Exclusion criteria: NR			
Author: Kim E ³⁴	Population: N=7,5	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
Year: 2021	Setting: Hospitals	Control/Comparison group n/N (%):	127.9, J40.x, J67.x, J68.4, J70.1, J70.3	socioeconomic status, hypertension and diabetes
Data Extractor: JH	Location: Koroa	No COPD: 5,778/7,590 (76.1%)	diagnosis of COVID-19	HR: Hazard Ratio
Reviewer: CNS	Study		Severity Measure(s): NR	<i>Mortality, n/N (%):</i> COPD:
Study Design: Cohort	dates: January 20- May 15, 2020		Clinical marker: NR	 aHR: 1.27 (95% CI: 0.97-1.67); p=NR HR: 4.56 (95% CI: 3.49-5.95); p <0.0001
Study Objective: To investigate whether	Inclusion criteria:		Treatment/ Associated Therapy: NR	 COPD: 132/1,812 (7.3%) No COPD: 93/5,778 (1.6%)
underlying diseases and taking ACEi/ARBs, affect	Patients within the		Outcome Definitions:	
the duration of	International		infection	Severity of Condition: NR
hospitalization and mortality in patients with	Cooperation Research project		ICU admission: NR Intubation: NR	Duration of Condition: NR
confirmed COVID-19.	for the past three years. Health		Ventilation: NR Hospitalization: NR	Treatment/ Associated Therapy: NR
IVA Score: 23 (Moderate)	Insurance		Non-elective readmissions: NR	Comorbid Conditions: NR
	Assessment Service, and		Comments: None	Risk Markers: NR
	national health			Long-term Sequelae: NR
	insurance system claims database			
	for the past three			
	years who were			
	COVID-19 based			
	on RT-PCR testing			

Study	Population and	Intervention	Definitions	Outcomes
	at the Korea CDC by end of study period. Exclusion criteria: Mortality cases excluded when patient died after COVID-19 infection was cleared up.			
Author: Kim Y ⁷¹	Population: N=6,520	Medical Condition, n/N (%): COPD: 35/6,520 (0.5%)	Medical Condition(s): $COPD$: patients aged \geq 40 years with at least one laterational Classification of	Severe COVID-19: aOR: Multivariable Logistic Regression; model included
Data Extractor: CNS	Setting: Hospitals and residential treatment centers	Control/Comparison group, n/N (%): No COPD: 6,485/6,520 (99.5%)	Disease–Tenth Revision (ICD-10) diagnosis code for COPD or emphysema (J43.0x–J44.x. except J43.0 as a primary	ages, sex, mCCI, socioeconomic status, and COPD OR: Univariable (Univariate) Logistic Regression Mortality. n/N (%):
Reviewer: MC	Location: South		or secondary [within four positions]	• aOR: 1.73 (95% CI: 0.67-4.47), p=0.259
Study Design: Cohort	Korea		one of the following COPD medications at least twice per year: long-acting	• COPD: 8/35 (22.9%)
Study Objective: To examine the prognosis of	Study dates: January 20, 2019-		muscarinic antagonist (LAMA), long- acting β 2 agonist (LABA), inhaled	• p<0.001
COVID-19 according to the underlying chronic	May 15, 2020		corticosteroid plus LABA (ICS + LABA), LABA + LAMA, short-acting muscarinic	ICU admission, n/N (%): • aOR: 0.22 (95% CI: 0.03-1.67), p=0.142
disease (COPD).	Patients who had		antagonist (SAMA), short-acting β2 agonist (SABA), SAMA + SABA,	 OR: 0.90 (95% CI: 0.12-6.58); p=0.915 COPD: 1/35 (2.9%)
IVA Score: 23 (moderate)	19 or had confirmed COVID-		methylxanthine, or oral beta-adrenergic agonist; ICD-10 codes 127.8, 127.9,	 No COPD: 206/6,485 (3.2%) p=0.914
	19 infection based on nucleic acid		J40.x–J42.x, J45.x-J47.x, J60.x–J67.x, J68.4, J70.1, J70.3	Severity of Condition: NR
	testing by RT-PCR of nasopharyngeal		Severity Measure(s): NR	Duration of Condition: NR
	and oropharyngeal swabs and sputum		Clinical marker: NR	Treatment/ Associated Therapy: NR
	who were at least 19 years old and		Treatment/ Associated Therapy: NR	Comorbid Conditions: NR
	had medical claims data obtained in		Outcome Definitions:	Risk Markers: NR

Study	Population and	Intervention	Definitions	Outcomes
•	Setting			
	the year before		Mortality: ND	
	the COVID-19		ICU admission: ND	Long-term Sequelae: NR
	diagnosis.		Intubation: NR	
			Ventilation: NR	
	Exclusion criteria:		Hospitalization: NR	
	Patients younger		Non-elective readmissions: NR	
	than 40 years, had			
	no linked medical		Comments: None	
	claims data for			
	confirmed or			
	deceased cases,			
	and had no			
	medical claims			
	data for the year			
	from the date of			
	COVID-19			
	diagnosis.			
Author: Ko ⁸⁰	Population:	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
	N=5,416	COVID-NET patients:	COPD: ND; collected from medical	aRR: Adjusted rate ratio; Generalized Poisson
Year: 2021		COPD: 328/5,416 (6%)	record for COVID-NET patients; self-	Regression Model; model included age, sex, and
	Setting: Hospitals		reported based on answer to question	race/ethnicity
Data Extractor: DOS		Control/Comparison group, n/N (%):	"Has a doctor, nurse, or other health	RR: Rate ratio
	Location:	BRFSS estimates:	professional ever told you that you had	
Reviewer: CNS	California,	COPD: n/N = NR (5%)	COPD, emphysema, or chronic	Hospitalization, n/N (%):
	Colorado,		bronchitis?" for BRFSS patients	COPD:
Study Design: Cohort	Connecticut,			• aRR: 0.9 (95% CI: 0.7-1.4); p=NR
	Georgia,		Severity Measure(s): NR	• RR: 1.2 (95% CI: 0.4-3.8); p=NR
Study Objective: To	Maryland,			
better understand the	Michigan,		Clinical marker: NR	Severity of Condition: NR
independent association	Minnesota, New			
of age, sex, race/ethnicity,	Mexico, New York,		Treatment/ Associated Therapy: NR	Duration of Condition: NR
and underlying medical	Oregon,			
conditions with COVID-19-	Tennessee, and		Outcome Definitions:	Treatment/ Associated Therapy: NR
associated hospitalization	Utah, US		Mortality: NR	
relative to the non-			ICU admission: NR	Comorbid Conditions: NR
hospitalized community-	Study dates:		Intubation: NR	
dwelling population.	March 1 - June 23,		Ventilation: NR	Risk Markers: NR
	2020		Hospitalization: laboratory-confirmed	
IVA Score:			COVID-19-associated hospitalization	Long-term Sequelae: NR
COPD: 22 (moderate)			Non-elective readmissions: NR	

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
	Inclusion criteria:			
	Adults with		Comments: None	
	laboratory-			
	confirmed COVID-			
	19-associated			
	hospitalizations			
	from 70 counties			
	in 12 states			
	participating in			
	COVID-NET.			
	COVID-NET is a			
	population-based			
	surveillance			
	system capturing			
	patients with a			
	positive SARS-CoV-			
	2 test no more			
	than 14 days			
	before admission			
	or during			
	hospitalization			
	who were a			
	resident of the			
	preidentified			
	surveillance			
	catchment area			
	and were admitted			
	to a hospital			
	where residents of			
	the surveillance			
	catchment area			
	receive care.			
	Behavioral Risk			
	Factor Surveillance			
	System (BRFSS)			
	data were used to			
	estimate			
	community-			
	dwelling adults			
	≥18 identified			

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
	from COVID-NET			
	catchment area.			
	Exclusion criteria:			
	Adults whose			
	primary residence			
	was a facility,			
	home with			
	services, hospice,			
	homeless/shelter,			
	corrections facility,			
	other or unknown			
	residence. Adults			
	with primary			
	residence			
	information and			
	underlying medical			
	condition data yet			
	to be abstracted.			
	Adults with			
	missing data on all			
	the underlying			
	medical			
	conditions.			
Author: Kridin ³⁵	Population:	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
	N=3618	Chronic obstructive pulmonary disease	COPD: ND; retrieved from the chronic	aOR1: Multivariable Logistic Regression (model
Year: 2021		(COPD): 55/3618 (1.5%)	diseases register of the CHS	included age, AD duration, extended systemic
	Setting: General			corticosteroids, cardiovascular diseases, metabolic
Data Extractor: MW	community clinics,	Control/Comparison group, n/N (%):	Severity Measure(s): NR	syndrome, COPD, smoking, chronic renal failure,
	primary care,	No COPD: 3563/3618 (98.5%)		malignancy, depression)
Reviewer: DOS	referral centers,		Clinical marker: NR	aOR2: Multivariable Logistic Regression (model
	hospitalized care			included age, AD duration, sex, Arab ethnicity,
Study Design: Nested	facilities; data		Treatment/ Associated Therapy: NR	socioeconomic status, adult-onset AD, AD severity,
case-control	retrieved from			extended systemic corticosteroids, cardiovascular
	Clalit Health		Outcome Definitions:	diseases, metabolic syndrome, COPD, smoking, chronic
Study Objective: To	Services (CHS)		Mortality: Patients whose cause of	renal failure, malignancy, depression)
characterize a large			death was attributed to COVID-19 or its	OR: Univariable (Univariate) Logistic Regression
cohort of adult patients	Location: Israel		complications	
with atopic dermatitis			ICU admission: NR	Mortality, n/N (%):

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
(AD) who tested positive	Study dates:		Intubation: NR	COPD:
for COVID-19 and to	February 27, 2020		Ventilation: NR	 aOR1: 6.47 (95% CI: 2.34-17.91), p<0.001
identify predictors of	- January 6, 2021		Hospitalization: Patients admitted to	• OR: 30.47 (95% CI: 14.32-64.82), p<0.001
COVID-19–associated			intensive care units, internal medicine	• Death: 11/40 (27.5%)
hospitalization and	Inclusion criteria:		wards, or COVID-19–specific respiratory	• No death: 44/3578 (1.2%)
mortality.	All alive adult		inpatient wards	
	patients with AD		Non-elective readmissions: NR	Hospitalization, n/N (%):
IVA Score: 23 (Moderate)	who tested			COPD:
	positive for COVID-		Comments: None	• aOR2: 2.47 (95% CI: 1.26-4.86), p=0.009
	19 within the			• OR: 11.43 (95% CI: 6.60-19.81), p<0.001
	study dates using			• Hospitalized: 24/250 (9.6%)
	molecular tests.			 Not hospitalized: 21/236 (3:070) Not hospitalized: 31/3368 (0.9%)
	Patients had AD			• Not nospitalized. 51/3506 (0.576)
	compatible			Severity of Condition: NB
	diagnostic code			Sevency of condition. MA
	documented by a			Duration of Condition: NR
	board-certified			
	dermatologist or in			Treatment/Associated Therany: NR
	discharge letter			
	from			Comorbid Conditions: NR
	dermatological			
	wards and were			Risk Markers: NR
	older than 18			
	years at the onset			Long-term Sequelae: NR
	of the pandemic in			
	Israel which was			
	defined as the			
	date of the first			
	confirmed case of			
	COVID-19 on			
	February 27,			
	2020.			
	Exclusion criteria:			
	NR			
Author: Lacedonia ³⁶	Population:	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
	N=521	СОРD: 72/521 (13.8%)	COPD: ND	aHR: Adjusted Hazard Ratio; Cox proportional
Year: 2021				hazard model including age, sex, smoking, and
	Setting: 4	Control/Comparison group, n/N (%):	Severity Measure(s): NR	neurological, kidney, and heart diseases
Data Extractor: JKK	inpatient	No COPD: 449/521 (86.2%)		HR: Hazard Ratio; Kaplan-Meier method

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
	intermediate		Clinical marker: NR	*Numerator calculated by ERT; n/N (%)
Reviewer: MW	Respiratory			
	Intensive Care		Treatment/ Associated Therapy: NR	Mortality, n/N (%):
Study Design: Cohort	Units (RICUs)			COPD:
			Outcome Definitions:	 aHR: 1.0 (95% CI: 0.63-1.60), p=NR
Study Objective:	Location: Italy		Mortality: in-hospital 30-day all-cause	• HR: 2.92 (95% CI: 2.00-4.27), p<0.01
To analyze the prevalence			mortality	• *COPD: 37/72 (52%)
of COPD and the	Study dates:		ICU admission: NR	• *No COPD: 95/449 (21%)
prognosis of COPD	March 5 – May 31,		Intubation: NR	• p<0.0001
patients in a selected and	2020		Ventilation: NR	- p 0.0001
homogenous cohort of			Hospitalization: NR	Severity of Condition: NR
patients with acute	Inclusion criteria:		Non-elective readmissions: NR	
respiratory failure due to	Hospitalized adult			Duration of Condition: NR
COVID-19-related	patients with		Comments: None	
pneumonia and admitted	SARS-CoV-2			Treatment/Associated Therapy: NR
to intermediate	pneumonia			
Respiratory Intensive Care	confirmed by RT-			Comorbid Conditions: NR
Units (RICUs), a model of	PCR tests on			
care designed for	nasopharyngeal			Risk Markers: NA
monitoring and treating	swab and by chest			
respiratory patients	X-ray or chest CT			Long-term Sequelae: NR
whose illness is at a level	performed in			
of severity that is	Emergency rooms.			
intermediate between				
that which requires	Exclusion criteria:			
intensive care unit (ICU)	NR			
facilities and that which				
can be managed on a				
conventional ward; and to				
examine the prevalence				
of smokers and the				
association of tobacco				
smoking with				
sociodemographic and				
clinical features during				
the clinical course of				
these hospitalized				
patients.				
IVA Score: 24 (moderate)				

Study	Population and Setting	Intervention	Definitions	Outcomes
Author: Lazcano ³⁷	Population:	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
Year: 2021	N=91,629	COPD: 2,794/91,629 (3.0%)	COPD: ICD-10 code J44.xx	aHR1: Adjusted Hazard Ratio model including all comorbidities and individual socioeconomic status
Data Extractor: MW	Setting: Community	Control/Comparison group, n/N (%): No COPD: 88,835/91,629 (97.0%)	Severity Measure(s): NR	aHR2: Adjusted Hazard Ratio model including time of previous stroke
Deviewer WK	setting		Clinical marker: NR	·
Reviewer: JKK	Location: Spain		Treatment/ Associated Therapy: NR	COPD:
Study Design: Cohort	Ctudu dotoo		Outcome Definitioner	• aHR1: 1.20 (95% CI: 1.12-1.29), p<0.001
Study Objective: To	February 1 –		Mortality: Any death (including hospital	 Deceased: 1,072/9,512 (11.3%) Survived: 1,722/82,117 (2.1%)
determine if a previous	December 31,		and nonhospital deaths) occurring after	• p<0.0001
risk factor for mortality	2020		ICU admission: NR	Severity of Condition: NR
after COVID-19, and to	Inclusion criteria:		Intubation: NR	
association is maintained	(symptomatic and		Hospitalization: NR	Duration of Condition: NR
within the different sexes,	asymptomatic)		Non-elective readmissions: NR	Treatment/ Associated Therapy: NR
subtypes, which include	severity		Comments: None	Comorbid Conditions: NR
transient ischemic attack	(ambulatory and			
hemorrhagic stroke, and	registered in the			Risk Markers: NR
spontaneous	Catalan Service of			Long-term Sequelae: NR
subarachnoid hemorrhage	Surveillance			
(SAH).	(regional			
IVA Score: 23 (Moderate)	surveillance			
	registry for SARS-			
	CoV-2 infection in Catalonia) which			
	had tested positive			
	for COVID-19 within the study			
	dates using all			
	types of tests			
	(polymerase chain			

Study	Population and	Intervention	Definitions	Outcomes
	reaction, antibody test, ELISA, and epidemiological confirmation by chest imaging information). Exclusion criteria: Cases aged under 18 years and missing or incomplete			
	information.			
Author: Lee ⁸⁶ Year: 2021 Data Extractor: MW Reviewer: DOS Study design: Retrospective cohort Study Objective: To analyze the impact of COPD on the risks of disease progression and mortality among COVID- 19 patients in South Korea	Population: N=4,610 Setting: Nationwide Location: South Korea Study dates: January 20-May 27, 2020 Inclusion criteria: Data from national database of the Health Insurance Paview and	Medical Condition, n/N (%): Chronic obstructive pulmonary disease (COPD): 141/4610 (3.1%) Control/Comparison group, n/N (%): No COPD: 4469/4610 (97.0%)	Medical Condition(s): <i>COPD</i> : defined by the prescription of COPD medication(s) at least two times per year with a diagnosis of COPD (ICD- 10 code: J43 and J44 except J43.0) during the enrollment period (January 1, 2017 - December 31, 2018), medications included long-acting muscarinic antagonists (LAMA), long- acting beta-2 agonists (LAMA), long- acting beta-2 agonists (LABA), combination LAMA/LABA, combination inhaled corticosteroid (ICS) and LABA, short-acting muscarinic antagonists (SAMAs), short-acting beta-2 agonists (SABAs), phosphodiesterase-4 (PDE-4) inhibitors, systemic beta agonists, and methylxanthine	Severe COVID-19: aOR1: Adjusted odds ratio; multivariable logistic regression model includes age, sex, CCI, and COPD Mortality, n/N (%): COPD: • $aOR1: 1.80 (95% CI: 1.11-2.93)• COPD: 27/141 (19.2\%)• No COPD: 199/4469 (4.5\%)• p<0.001Severity of Condition:aOR2: Adjusted odds ratio; multivariate logistic regression analysis in patients with COPD; model includes age, sex, severity of COPD, medication possession ratio (partial/complete vs. low), and number of exacerbations (0 vs. \geq 1)$
IVA Score: 24 (Moderate)	Assessment Service (HIRA). Patients aged 40 years or older who were confirmed to be infected with COVID-19 by a RT- PCR test for SARS- CoV-2 using		Severity Measure(s): Severe COPD: COPD patients who had experienced exacerbations two or more times and those who had been prescribed triple therapy (ICS, LABA, and LAMA), PDE-4 inhibitors, or low- dose macrolides; severity assessed during measurement period (January 1 – December 31, 2019)	Mortality, n/N (%): Severe COPD: • aOR2: 0.82 (95% CI: 0.19–3.39) • Severe COPD: 5/27 (18.5%) • Non-severe COPD: 22/114 (19.3%) • p=0.926 Duration of Condition: NR

Study	Population and	Intervention	Definitions	Outcomes
	Setting nasopharyngeal swab or sputum specimens. Exclusion criteria: NR		Clinical marker: NR Treatment/ Associated Therapy: NR Outcome Definitions: Mortality: All-cause mortality ICU admission: ND Intubation: NR Ventilation: Invasive and noninvasive mechanical ventilation and extracorporeal membrane oxygenation (ECMO) Hospitalization: ND Non-elective readmissions: NR Comments: None	Treatment/ Associated Therapy: NR Comorbid Conditions: NR Risk Markers: NR Long-term Sequelae: NR
Author: Li ³⁸	Population:	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
Noor: 2020	N=1,075 patients	Chronic bronchitis: 16/399 (4%)	Chronic bronchitis: ND	aHR: Multivariable Cox Regression/proportional
Year: 2020	Setting:	COPD: 11/399 (3%)	COPD: ND	HR: Univariable (Univariate) Cox
Data Extractor: CO	hospitals	Control/Comparison group, n/N (%): No Chronic bronchitis: 383/399 (96%)	Severity Measure(s): NR	Regression/proportional hazard ratio *Odds ratio [OR] (95% CI) calculated by ERT; n/N (%)
Reviewer: ECS/MW/DOS	Location: China,	No COPD: 388/399 (97%)	Clinical marker: NR	
Study design:	European regions, and North America		Treatment/Associated Therany: NR	Mortality, n/N (%): Chronic bronchitis
Retrospective cohort	and North America		freatmenty Associated merapy. We	• *HR: 1.76 (1.25-2.48); p=0.10
	Study dates:		Outcome Definitions:	• Non-survivor: 9/157 (6%)
Study Objective: to	January-April 2020		Mortality: ND	• Survivor: 7/242 (3%)
explore risk factors that	In the stars with a star		ICU admission: NR	• OR: 2.04 (0.74-5.59)
drive mortality in patients	COVID 19 patients		Intubation: NR Ventilation: NR	COPD
dexamethasone nor	recorded during		Hospitalization: NR	• aHR: 2.19 (1.53-3.15), p=0.03
remdesivir)	study dates		Non-elective readmissions: NR	• HR: 3.45 (2.44-4.88), p=3.6X10 ⁻⁴
,	,			 OR. 7.29 (1.55-54.25) Non-survivor: 9/157 (6%)
IVA Score: 20 (moderate)	Exclusion criteria:		Comments: none	• Survivor: 2/242 (1%)
	patients who received either			Severity of Condition: NR
	remdesivir or			
	dexamethasone,			Duration of Condition:

Study	Population and Setting	Intervention	Definitions	Outcomes
	were hospitalized after May 1 and had missing data of therapy, or were from			Treatment/ Associated Therapy: NR Comorbid Conditions: NR
	countries with limited online data			Risk Markers: NR
Author: Lim ³⁹	Population: N=146	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
		Chronic obstructive pulmonary disease	COPD: ND	aOR: Multivariable Logistic Regression; model adjusted
Year: 2021		(COPD): 8/146 (5.5%)		for variables with p values <0.1 in the univariate
	Setting: Four		Severity Measure(s):	analysis
Data Extractor: MC	tertiary referral hospitals	Control/Comparison group, n/N (%): No COPD: 138/146 (94.5%)	<i>Emphysema:</i> a chest radiologist blinded to the patients' data evaluated chest CT	OR: Univariable (Univariate) Logistic Regression
Reviewer: CNS			images by automatically segmenting	Mortality, n/N (%):
	Location: South		whole-lung parenchyma after removing	COPD:
Study Design: Cohort	Korea		the chest wall, mediastinum,	• aOR: 8.07 (95% CI: 1.20-54.49), p=0.032
			diaphragm, and airway; using	• OR: 12.80 (95% CI: 2.78-59.00), p=0.001
Study Objective: To	Study		segmentation software, emphysema	• COPD: 4/8 (50.0%)
examine whether	dates: February 18		percentage score was calculated by	• No COPD: 10/140 (7.1%)
computed tomography	– March 25, 2020		determining the percentage of lung	• p=0.003
(CT)-quantified			voxels between -1000 and -950	
emphysema score is	Inclusion criteria:		Hounsfield units for whole-lung voxels;	Severity of Condition: NA
associated with a worse	Patients with		patients were divided into three groups	
clinical outcome in	COVID-19 who		according to emphysema score	Duration of Condition: NR
patients with COVID-19.	were admitted to		(emphysema score ≤1%, 1%<	
	the study hospitals		emphysema score ≤5%, and	Treatment/ Associated Therapy: NR
IVA Score: 23	between the study		emphysema score >5%)	
(Moderate)	dates and			Comorbid Conditions: NR
	underwent chest		Clinical marker: NR	
	CT within five days			Risk Markers: NR
	of		Treatment/ Associated Therapy: NR	
	admission. COVID-		Outran Definitions	Long-term Sequelae: NR
	19 diagnosis was		Outcome Definitions:	
	confirmed using		Mortality: in-hospital mortality	
	the real-time			
	reverse-		Intubation: NK	
	transcriptase		ventilation: NK	
	polymerase chain		Hospitalization: NR	
	reaction test for		Non-elective readmissions: NR	

Study	Population and	Intervention	Definitions	Outcomes
	SARS-CoV-2 based on nasopharyngeal swabs.		Comments: None	
	Exclusion criteria: NR			
Author: Lobelo ⁸¹	Population: N=5.712	Medical Condition, n/N (%): COPD: 153/5.712 (2.7%)	Medical Condition(s): COPD: ICD-10 codes	Severe COVID-19: aOR: adjusted odds ratio (model included age, sex and
Year: 2021	Sotting: Integrate	Control (Comparison group n (N (%)))		race/ethnicity)
Data Extractor: JH	d healthcare	No COPD: 5,559/5,712 (97.3%)	Clinical marker: NR	Hospitalization: COPD:
Reviewer: DOS	, Location: Georgia		Treatment / Associated Therany: NR	• aOR: 2.59 (95%Cl: 1.67-4.02); p≤0.001
Study Design: Cohort	US		Outcome Definitions:	Severity of Condition: NR
Study Objective: To identify	Study dates: March 3 –		Mortality: NR ICU admission: NR	Duration of Condition: NR
sociodemographic, clinical and behavioral drivers of	October 29, 2020		Intubation: NR Ventilation: NR	Treatment/ Associated Therapy: NR
racial disparities and their association with clinical	Inclusion criteria:		Hospitalization: ND Non-elective readmissions: NR	Comorbid Conditions: NR
outcomes among members with COVID-19	Any Kaiser Permanente		Comments: None	Risk Markers: Hospitalization:
(hospitalization, intensive	Georgia member			COPD among Black patients:
length of stay, mechanical	documented			• aOR: 2.53 (95% CI: 1.24-5.16); $p \le 0.05$ COPD among White patients:
ventilation, readmission and mortality).	diagnosis and/or laboratory-			 aOR: 2.49 (95% CI: 1.38-4.49); p≤0.05 COPD among female patients:
IVA Score: 23 (Moderate)	confirmed COVID-			• aOR: 4.34 (95% Cl: 2.42-7.77); p≤0.001
	Electronic Health			Long-term Sequelae: NR
	the start of the			
	epidemic, testing was prioritized			
	among			
	healthcare			

Study	Population and	Intervention	Definitions	Outcomes
	workers and			
	patients requiring			
	hospital			
	admission. In mid-			
	April testing was			
	progressively			
	expanded to high-			
	risk symptomatic			
	patients and			
	symptomatic			
	patients with			
	public health			
	implications.			
	Evolucion			
	criteria: NR			
	cincenta. Nix			
Author: Machado-Alba ⁷²	Population: N=780	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
		COPD: 75/780 (9.6%)	COPD: ND	aOR: Adjusted Odds Ratio; model included sex, age,
Year: 2021				city of residence, health related profession, obesity,
	Setting: Four	Control/Comparison group, n/N (%):	Severity Measure(s): NR	ischemic heart disease, diabetes mellitus, chronic
Data Extractor: JH	tertiary care	No COPD: 705/780 (90.4%)		kidney disease, COPD, arterial hypertension, non-
	clinics		Clinical marker: NR	opioid analgesics, severe pneumonia, and NEWS2
Reviewer: CNS				score
	Location: Colombi		Treatment/ Associated Therapy: NR	
Study Design: Cohort	а			ICU Admission
			Outcome Definitions:	COPD
Study Objective: To	Study		Mortality: ND	• aOR: 2.07 (95% CI: 1.09-3.90); p=0.026
identify the factors	dates: March 6 –		ICU admission: ND	
associated with admission	August 31, 2020		Intubation: NR	Severity of Condition: NR
to intensive care units			Ventilation: NR	
(ICUs) and mortality in	Inclusion criteria:		Hospitalization: NR	Duration of Condition: NR
patients with COVID-19	Patients with		Non-elective readmissions: NR	
trom 4 clinics in	COVID-19,			Treatment/ Associated Therapy: NR
Colombia.	confirmed by RT-		Comments: None	
	PCR, of any age,			Comorbid Conditions: NR
IVA Score: 23 (Moderate)	sex and city of			
	residence who			Risk Markers: NR
	were treated for			
	COVID-19 at an			Long-term Sequelae: NR

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
	affiliated clinic			
	during the study			
	period.			
	Evolucion			
	critoria: Dationts			
	with incomplete			
	modical records or			
	incomplete follow-			
	up by			
	teleconsultation			
	and those			
	diagnosed by			
	screening were			
	excluded.			
Author: Maestre-Muñiz ⁴⁰	Population: N=444	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
		Chronic obstructive pulmonary disease	COPD: ND	aOR: Multivariable Logistic Regression: Multivariable
Year: 2021	Setting:	(COPD): 97/444 (21.8%)		Logistic Regression
	Community		Severity Measure(s): NR	
Data Extractor: MW	medical center	Control/Comparison group, n/N (%):		Mortality, n/N (%)
		No COPD: 347/444 (78.2%)	Clinical marker: NR	COPD:
Reviewer: CS	Location: Spain			 aOR: 2.01 (95% CI: 1.01–4.02), p=0.048:
			Treatment/ Associated Therapy: NR	• With COPD: 39/97 (40.2%)
Study design:	Study dates:			 Without COPD: 103/347 (29.7%)
Retrospective cohort	February 26 – May		Outcome Definitions:	• p=0.049
	31, 2020		Mortality: In-hospital mortality	
Study Objective: To			ICU admission: NR	Severity of Condition: NR
identify risk factors for	Inclusion criteria:		Intubation: NR	
death from the COVID-19	Adult inpatients		Ventilation: NR	Duration of Condition: NR
infection among subjects	who were		Hospitalization: NR	
admitted to a hospital in	confirmed COVID-		Non-elective readmissions: NR	Treatment/ Associated Therapy: NR
central Spain, and to	19 positive either			
analyze factors that may	руа		comments: None	Comorbid Conditions: NR
contribute to mortality.	nasopharyngeal			
IVA Coores 22 (Moderate)	swab test using			Risk Markers: NR
IVA Score: 23 (Moderate)	transprinterse			
	transcriptase-			Long-term Sequelae: NR
	polymerase-chain-			
	reaction (KT-PCK)			

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
	IgG/IgM lateral			
	flow immunoassay			
	chromatography			
	rapid testing and			
	who were			
	admitted to			
	hospital due to			
	respiratory failure			
	during the study			
	dates were			
	included.			
	Exclusion criteria:			
	NR			
Author: Manohar ⁴¹	Population:	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
	N=11.930	COPD: 536/11.930 (4.49%)	COPD: ICD-10 J44	aOR: Multivariable Loaistic Rearession: model includes
Year: 2021	,			age, sex, race/ethnicity, clinical characteristics, BMI,
	Setting: Academic	Control/Comparison group, n/N (%):	Severity Measure(s): NR	smoking status, neighborhood deprivation index,
Data Extractor: DOS	medical center	No COPD: 11,394/11,930 (95.51%)	, .,	hospital site, and insurance type
			Clinical marker: NR	
Reviewer: JKK	Location: New			Mortality, n/N (%):
	York, US		Treatment/ Associated Therapy: NR	COPD:
Study Design: Cohort				 aOR: 1.09 (95% CI: 0.86-1.38); p=0.486
	Study dates:		Outcome Definitions:	• Died: 131/1,654 (7.92%)
Study Objective: To use	March - August		Mortality: death following a COVID-19	 Survived: 405/10,276 (3.94%)
real-world healthcare	2020		diagnosis, without regard to	
data to quantify the			hospitalization	Hospitalization, n/N (%):
impact of demographic,	Inclusion criteria:		ICU admission: NR	COPD:
clinical, and social	Patients that had		Intubation: NR	• aOR: 1.49 (95% CI: 1.01-2.2); p=0.045
determinants associated	nasopharyngeal		Ventilation: NR	 Hospitalized: 324/4,895 (6.62%)
with adverse COVID-19	swab PCK testing		Hospitalization: ND	 Not hospitalized: 212/7,035 (3.01%)
bigh rick scoparios and	"Detected" results		Non-elective redumissions: NK	
dynamics of risk among	or those who		Comments: None	Severity of Condition: NR
racial and ethnic groups			Comments. None	
raciai anu etimit groups.				Duration of Condition: NR
IVA Score:	diagnosis			
COPD: 24 (moderate)	a.a.b.10313.			Ireatment/ Associated Inerapy: NR

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
	Exclusion criteria:			Comorbid Conditions: NR
	Patients who			
	received a COVID-			Risk Markers:
	19 ICD-10			Mortality:
	diagnosis that was			COPD among non-Hispanic-White:
	also confirmed as			 aOR: 1.29 (95% CI: 0.85-1.95); p=0.226
	"Not Detected" by			COPD among non-Hispanic-Black:
	PCR assay.			 aOR: 0.85 (95% CI: 0.43-1.59); p=0.622
				COPD among non-Hispanic-Asian:
				 aOR: 1.45 (95% CI: 0.66-3.1); p=0.348
				COPD among Hispanic:
				• aOR: 1.37 (95% CI: 0.85-2.17); p=0.183
				Hospitalization:
				COPD among non-Hispanic-White:
				• aOR: 2.7 (95% CI: 1.28-5.71); p=0.009
				COPD among non-Hispanic-Black:
				• aOR: 1.89 (95% CI: 0.77-4.74); p=0.169
				COPD among non-Hispanic-Asian:
				• aOR: 3 (95% CI: 0.55-26.6); p=0.255
				COPD among Hispanic:
				• aOR: 0.59 (95% CI: 0.28-1.28); p=0.172
				Long-term Sequelae: NR
Author: Marron ⁴²	Population:	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
	N=5//	COPD and or emphysema: 103/5/7	COPD: patients with available	aHR: Multivariable Logistic Regression; model included
Year: 2021	• ··· ·· ·· ·	(17.9%)	spirometry showing irreversible airflow	age, chronic kidney disease, malignancy, oxygen
	Setting: Hospital		obstruction or a history of cigarette	support via low-flow nasal cannula, oxygen support via
Data Extractor: CNS	referral center for	Control/Comparison group, n/N (%):	smoking with outpatient use of an	high-flow nasal cannula, coronary artery disease,
	patients with	No COPD or emphysema: 474/577	inhaled bronchodilator	congestive neart failure, hypertension
Reviewer: JH	COPD	(82.1%)	<i>Emphysema:</i> findings of emphysema on	aOR1: Multivariable Logistic Regression model
			CI as interpreted by a board-certified	included age, serum Cr, ALC<1.0 K/mm3, coronary
Study Design: Cohort	Location: PA, US		radiologist.	artery disease, congestive heart failure, hypertension
	Church and a transmission			aUK2: Multivariable Logistic Regression; model
Study Objective: 10	Study dates:		Severity Measure(s): NR	incluaea age, oxygen support via low-flow nasal
determine if patients	iviarch 18-May 4,			cannula, oxygen support via high-flow nasal cannula,
admitted with a clinical	2020		Clinical marker: NR	active smoking, former smoking, coronary artery
nistory of COPD and/or	In the stars without		The standard Accession of The same state	aisease, congestive neart failure, hypertension
radiographic diagnosis of	inclusion criteria:		reatment/ Associated Therapy: NR	HK: Hazara Katio
emphysema have worse	Patients 18 years			OR: Univariable (Univariate) Logistic Regression

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
outcomes associated with	or older diagnosed		Outcome Definitions:	
COVID-19 pneumonia as	with COVID-19		Mortality: ND	Mortality, n/N (%):
compared to patients	pneumonia based		ICU admission: ND	COPD:
without COPD/	on symptoms,		Intubation: NR	 aHR: 1.0 (95% CI: 0.5-2.1), p=0.956
emphysema.	presence of		Ventilation: mechanical ventilation	• HR: 1.01 (95% CI: 0.6-2.2); p=0.680
	infiltrates on chest		Hospitalization: NR	• Deceased: 13/52 (25.0%)
IVA Score: 24 (moderate)	X-ray or high-		Non-elective readmissions: NR	 Survived: 90/525 (17.1%)
	resolution CT scan,			
	and a positive RT-		Comments: None	ICU admission, n/N (%):
	PCR			COPD:
	nasopharyngeal			• aOR1: 1.39 (95% CI: 0.86-2.25), p=0.174
	swab. All patients			• OR: 1.62 (95% CI: 1.03-2.56); p=0.038
	included in the			• ICU admission: 36/154 (23.4%)
	COPD/emphysema			 No ICU admission: 67/423 (15.8%)
	cohort had either			
	available			Ventilation, n/N (%):
	spirometry			COPD:
	showing			• aOR2: 1.53 (95% CI: 0.75-3.13), p=0.247
	irreversible airflow			• OR: 2.03 (95% CI: 1.17-3.51); p=0.011
	obstruction or a			• Ventilation: 22/78 (28.2%)
	history of cigarette			• No ventilation: 81/499 (16.2%)
	smoking with			
	outpatient use of			Severity of Condition: NR
	an innaled			
	bronchodilator,			Duration of Condition: NR
	and/or findings of			
	emphysema on CI			Treatment/ Associated Therapy: NR
	as interpreted by a			
	board-certified			Comorbid Conditions: NR
	radiologist.			
				Risk Markers: NR
	Pationts with a			
	negative RT_DCP			Long-term Sequelae: NR
	test for COVID 10			
	1251 101 COVID-19.			
Author: Merzon ⁴³	Population:	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
	N=10,477;	COPD: 54/662 (8.16%)	COPD: ICD-9 codes	
Year: 2021				

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
	COVID-19+,	Control/Comparison group, n/N (%):	Severity Measure(s): NR	aOR1: Multivariable Logistic Regression; model
Data Extractor: DOS	N=662	No COPD: 608/662 (91.84%)		adjusted for sex, age, smoking status, medication use,
			Clinical marker: NR	hypertension, diabetes mellitus, and obesity
Reviewer: JH	Setting:			aOR2: Multivariable Logistic Regression; model
	Nationwide		Treatment/ Associated Therapy: NR	adjusted for sex and age
Study Design:				
Cross-sectional	Location: Israel		Outcome Definitions:	Mortality, n/N (%):
			Mortality: deaths among hospitalized	COPD:
Study Objective: To	Study dates:		patients	• aOR1: 0.56 (95% Cl: 0.02-16.06), p=0.343
analyze the prevalence of	February 1 - June		ICU admission: NR	 aOR2: 0.68 (95% CI: 0.65-7.09), p=0.749
low-dose aspirin therapy	30, 2020		Intubation: NR	• Died: 1/7 (14.29%)
and clinical characteristics			Ventilation: NR	 Survived: 14/105 (13.33%)
in a large cohort of	Inclusion criteria:		Hospitalization: hospital-treated	• p=0.94
consecutive outpatients	All consecutive		COVID-19 positive patients	
who tested positive in an	patients aged ≥ 40		Non-elective readmissions: NR	Hospitalization, n/N (%):
RI-PCR assay designed to	years from a			COPD:
detect infection with	nationwide health		Comments: None	 aOR1: 1.80 (95% CI: 0.80-4.08), p=0.154
COVID-19.	maintenance			 aOR2: 1.79 (95% CI: 0.94-3.44), p=0.075
	organization who			 Hospitalized: 15/112 (13.39%)
IVA Score: 23 (moderate)	had been tested			 Not Hospitalized: 39/550 (7.09%)
	for COVID-19			• p=0.026
	auring the study			
	PT DCP testing of			Severity of Condition: NR
	naconharungoal			
	swahe camples			Duration of Condition: NR
	was performed			
	upon physician			Treatment/ Associated Therapy: NR
	referral according			
	to Israel Ministry			Comorbid Conditions: NR
	of Health criteria			
	for COVID-19			Risk Markers: NR
	testing, which			
	includes direct			Long-term Sequelae: NR
	exposure to a			
	confirmed COVID-			
	19 patient and/or			
	presentation of			
	symptoms			
	suggesting COVID-			

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
	19 (essentially, a			
	of broath or any			
	of Diedui of dily			
	sumptom with			
	symptom, with			
	lever).			
	Exclusion criteria:			
	Individuals who			
	had been			
	diagnosed with			
	coronary artery			
	disease,			
	cerebrovascular			
	disease, and/or			
	peripheral vascular			
	disease were			
	classified as taking			
	aspirin for			
	secondary			
	prevention.			
Author: Meza ⁴⁴	Population:	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
	N=3,453,825;	COPD: 7,449/387,008 (2.0%)	COPD: ICD-9/10 diagnoses	aOR: Multivariable Logistic Regression including age,
Year: 2021	COVID-19+			male sex, diabetes mellitus, hypertension, chronic
	n=387,008	Control/Comparison group, n/N (%):	Severity Measure(s): NR	kidney disease, and obesity
Data Extractor: JKK		No COPD: 273,963/387,008 (70.8%)		OR: Univariable (Univariate) Logistic Regression
	Setting: 81		Clinical marker: NR	
Reviewer: JH	academic hubs			Mortality, n/N (%):
	part of the		Treatment/ Associated Therapy: NR	• aOR: 2.07 (95% CI: 1.93-2.22), p<0.001
Study Design: Cohort	National COVID			• OR: 6.19 (95% CI: 5.79-6.62), p<0.001
	Cohort		Outcome Definitions:	• COPD: 1,107/7,449 (14.9%)
Study Objective: To	Collaboration		Mortality: COVID-19 related deaths	 No COPD: 10,126/273,963 (3.7%)
assess the risk of			ICU admission: NR	• p<0.001
mortality following	Location: US		Intubation: NR	
COVID-19 diagnosis in			Ventilation: NR	Severity of Condition: NR
patients with COPD	Study dates: NR –		Hospitalization: ND	
compared with patients	February 16, 2021		Non-elective readmissions: NR	Duration of Condition: NR
without COPD.				
	Inclusion criteria:			Treatment/ Associated Therapy: NR
IVA Score: 22 (moderate)	Patients over the			

Study	Population and Setting	Intervention	Definitions	Outcomes
	age of 35 with a positive COVID-19 PCR test.		Comments: Proportions reported in the text and tables/figures did not align; table/figure data was reported.	Comorbid Conditions: NR Risk Markers: NR
	Exclusion criteria: NR			Long-term Sequelae: NR
Author: Mollalo ⁴⁵	Setting: nationwide	Medical Condition: COPD: NR	Medical Condition(s): COPD: ND	Severe COVID-19: Mixed-effects multinomial logistic regression model
Year: 2021	Location: US	High-high (HH): counties with high	Severity Measure(s): NR	odds ratio [OR] (95% CI) for association between
Data Extractor: DOS	Charles de terre	COVID-19 mortality surrounded by		of other diseases:
Reviewer: CS	January 22 –	counties with high COVID-19 mortailties		COPD:
Study design: mixed-	November 22, 2020	19 mortality surrounded by counties	Treatment/ Associated Therapy: NR	 HH: 0.996 (95% CI: 0.976-1.016), p=0.705 LL: 1.028 (95% CI: 1.010-1.046), p=0.002
logistic regression model	Inclusion criteria:	Control (Composition group)	COVID-19 case fatality ratio (CFR):	Severity of Condition: NR
Study Objective: to apply	19 cases and	Non-significant (NS): non-significant	confirmed cases	Duration of Condition: NR
analysis to better	from USAFacts;		<i>COVID-19 Mortality rate (MR):</i> mean	Treatment/ Associated Therapy: NR
distributions of the COVID-19 mortality rate	mortality rates of 20 covariates		individuals	Comorbid Conditions: NR
(MR) and case fatality rate (CFR) in US	collected from University of		Comments: none	Risk Markers: NR
IVA Score: 21 (moderate)	Washington Global Health Data			Long-term Sequelae: NR
	Exchange			
	Exclusion criteria: counties with less			
	than 16 reported deaths were			
	excluded from			
	analyses			
Author: Momeni- Boroujeni ⁴⁶	Population: N=553	Medical Condition, n/N (%): COPD: 25/553 (4.5%)	Medical Condition(s): COPD: ND	Severe COVID-19:

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
		Asthma: 24/553 (4.3%)	Asthma: ND	aOR1: Multivariable Logistic Regression including age,
Year: 2021	Setting: Medical			sex, ethnicity, day of hospital admission, recorded
	Center	Control/Comparison group, n/N (%):	Severity Measure(s): NR	comorbidities, initial measurements for each patient
Data Extractor: MW		No COPD: 528/553 (95.5%)		for each of the 28 included clinical tests, and percent
	Location: NY, US	No asthma: 529/553 (95.7%)	Clinical marker: NR	changes in each clinical test measurement from the
Reviewer: JKK				initial values for each patient using the last recorded
	Study dates:		Treatment/ Associated Therapy: NR	measurement for each patient
Study Design: Cohort	February – March			aOR2: Markov model including age, sex, ethnicity, day
	2020		Outcome Definitions:	of hospital admission, recorded comorbidities, initial
Study Objective: To			Mortality: COVID-19 related mortality	measurements for each patient for each of the 28
develop a prognostic	Inclusion criteria:		ICU admission: NR	included clinical tests, and percent changes in each
Markov model for	Patients admitted		Intubation: NR	clinical test measurement from the initial values for
hospitalized COVID-19	with COVID-19-		Ventilation: NR	each patient using the last recorded measurement for
patients which	related symptoms		Hospitalization: NR	each patient
incorporates dynamic	and confirmed		Non-elective readmissions: NR	HR: Hazard Ratio; Univariable (Univariate) Survival
laboratory value data	Polymerase Chain			Analysis
along with patients'	Reaction (PCR)-		Comments: Univariate survival analysis	OR: Univariable (Univariate) Logistic Regression
admission profiles, to	positive between		is reported as an odds ratio in the	
identify key determinants	the study dates.		study; ERT relabeled as hazard ratio.	Mortality:
of risk.				COPD:
	Exclusion criteria:			• aOR1: 1.17 (95% CI: NR), p=NR
IVA Score:	Patients whose			• aOR2: 2.19 (95% CI: NR), p<0.05
COPD: 24 (Moderate)	outcome was			• HB: 0.95 (95% CI: NB) n=0.866
Asthma: 25 (Moderate)	unknown or who			• OB: 1 26 (95% CI: NB) n=NB
	were missing			• on: 1.20 (33% cl. http://p-htt
	data.			Severity of Condition: NR
				Duration of Condition: NR
				Treatment/ Associated Therapy: NR
				Comorbid Conditions: NR
				Risk Markers: NR
				Long-term Sequelae: NR
Author: Morales-	Population:	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
Romero ⁷⁵	N=178,306		COPD: ND	

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
		Chronic obstructive pulmonary disease		aOR1: Multivariable Logistic Regression including
Year: 2021	Setting: nation-	(COPD): 3,019/178,306 (1.7%)	Severity Measure(s): NR	asthma, diabetes, systemic arterial hypertension,
	wide medical units			obesity, COPD, immunosuppression, cardiovascular
Data Extractor: CNS	at the first,	Control/Comparison group, n/N (%):	Clinical marker: NR	disease, chronic kidney disease, current smoking
	second, and third	No COPD: 175,287/178,306 (98.3%)		status, age, sex, indigenous language, pneumonia, and
Reviewer: DOS	level of care;		Treatment/ Associated Therapy: NR	endotracheal intubation
	Mexican			aOR2: Multivariable Logistic Regression including
Study Design: Conort	Epidemiological		Outcome Definitions:	asthma, diabetes, systemic arterial hypertension,
	Surveillance		Mortality: death among outpatients	obesity, COPD, immunosuppression, cardiovascular
Study Objective: 10	System for Viral		and hospitalized patients	disease, chronic kidney disease, current smoking
assess whether	Respiratory		<i>ICU admission:</i> ICU admission among	status, indigenous languages, age, and sex
susceptibility to COVID-19	Diseases database		those nospitalized	KK: KEIATIVE TISK
pneumonia,			Intubation: Endotracheal Intubation	laturation of AL (0/).
nospitalization, or severity	Location: IVIEXICO			
are altered in Mexican	Chudu dataa		Ventilation: NR	
people with asthma.	Study dates:		Hospitalization: ND	• aUR2: 1.12 (95% CI: 0.96-1.31), p=0.156
IV/A Secret	repruary 27- Julie		Non-elective redumissions: NR	lippitalization (AL (0/))
IVA Score:	21, 2020		Commenter Nene	Hospitalization, n/N (%):
COPD: 24 (Moderate)	Inclusion critoria		comments: None	
				• aOR2: 2.71 (95% CI: 2.49-2.94), p<0.0001
	confirmed cases of			Sourceiter of Condition: ND
	COVID-19 by RT-			Sevency of Condition: NR
	PCR assay of nasal			Duration of Condition: NR
	and nharyngeal			Duration of Condition. NR
	swah specimens			Treatment / Associated Therapy: NP
	followed by a			Treatmenty Associated Therapy. NK
	nationwide			Comorbid Conditions: NR
	sentinel			
	surveillance			Risk Markers: NR
	model, which			
	collects samples			Long-term Sequelae: NR
	from 10% of the			0
	acute respiratory			
	ambulatory cases.			
	severe cases, and			
	associated deaths.			
	Exclusion criteria:			
	Those with			

Study	Population and Setting	Intervention	Definitions	Outcomes
	negative RT-PCR			
	PCR test results.			
	incomplete			
	data/mistakes in			
	codification, or			
	were foreigners.			
Author: Mushtaq47	Population: N=697	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
No 2024	Catting Tartian	Chronic obstructive pulmonary disease	COPD: ND	aHR: Adjusted Hazard Ratio (Computed using a
Year: 2021	Setting: Tertiary	(COPD): 34/697 (4.9%)		multivariate Cox regression model, including terms for
Data Extractor: M/M/	bosnital	Control/Comparison group n/N (%):	Sevenity measure(s): NR	Sex, uge, una comorbialles): Aujustea Hazara Ratio 2 (Computed using a multivariate Cox regression model
	nospital	No COPD: 663/697 (95.1%)	Clinical marker: NR	including terms for sex, age, and comorbidities)
Reviewer: CS	Location: Italy			
Study design:	Study dates:		Treatment/ Associated Therapy: NR	Mortality, n/N (%):
Retrospective cohort	February 25 - April		Outcome Definitions:	• aHB: 2 29 (95% CI: 1 38–3 80) n=0 001
	9, 2020		Mortality: ND	
Study Objective: To	,		ICU admission: NR	Severity of Condition: NR
evaluate whether the	Inclusion criteria:		Intubation: NR	
initial chest X-ray (CXR)	All consecutive		Ventilation: NR	Duration of Condition: NR
severity assessed by an AI	patients aged ≥ 18		Hospitalization: NR	
system may have	years, admitted to		Non-elective readmissions: NR	Treatment/ Associated Therapy: NR
prognostic utility in	the Institution's		Commente: None	Comorbid Conditioner ND
patients with COVID-19.	Department (FD)		comments. None	
IVA Score: 23 (Moderate)	with a positive RT-			Risk Markers: NR
,	PCR			
	nasopharyngeal			Long-term Sequelae: NR
	swab between			
	February 25 and			
	May 5, 2020 and			
	patients with a			
	CXR obtained on			
	included			
	included.			
	Exclusion criteria:			
	Patients who			
	acquired infection			

Study	Population and	Intervention	Definitions	Outcomes
	during			
	hospitalization			
	those transferred			
	to the institution			
	from other			
	hospitals or later			
	transferred to			
	other hospitals,			
	those with positive			
	RT-PCR as			
	outpatients, those			
	with no available			
	initial CXR, and			
	patients with a			
	history of			
	pneumonectomy			
	were excluded.			
Author: Naqvi ⁴⁸	Population: N=	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
	261	Chronic obstructive pulmonary disease	COPD: ND	aOR: Multivariable Logistic Regression; models
Year: 2021		(COPD): 31/261 (11.9%)		adjusted for NR
	Setting: COVID-19		Severity Measure(s): NR	OR: Univariate Logistic Regression
Data Extractor: MC	intensive care unit	Control/Comparison group, n/N (%):		
	(ICU) at a	No COPD: 230/261 (88.1%)	Clinical marker: NR	Mortality, n/N (%):
Reviewer: CNS/MW	university hospital		Treatment (Associated Thereman ND	
Church - Designer Due and attive	Leastien, Delvister		Treatment/ Associated Therapy: NR	• aOR: 10.357 (95% CI: 2.491-43.060), p = 0.001
Study Design: Prospective	Location: Pakistan		Quitagene Definitions	• OR: 2.531 (95% CI: 1.118-5.732), p=0.026
conort	Study datas		Mortality ND	• Deceased: 22/135 (16.3%)
Study Objective: Describe	Sontombor 1 -		ICLI admission: NP	• Survived: 9/126 (7.1%)
various patterns of	November 30		Intubation: NR	• p=0.022
coagulonathy (CAC) and	2020		Ventilation: NR	
thromboembolism	2020		Hospitalization: NR	Severity of Condition: NR
in severely ill patients	Inclusion criteria:		Non-elective readmissions: NR	Duration of Condition: ND
with COVID-19 and to	All confirmed			
evaluate CAC.	severe COVID-19		Comments: None	Treatment / Associated Therapy: NP
thromboembolism, and	patients aged ≥18			Treatmenty Associated Therapy. NA
various comorbidities	years that were			Comorbid Conditions: NR
as predictors of mortality	admitted to the			
among severely ill	COVID-19 ICU			Risk Markers: NR
				NISK WIDTKETS: NK

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
COVID-19 patients.	during the study			
	period who gave			Long-term Sequelae: NR
IVA Score:	consent. Patients			
COPD: 23 (Moderate)	were confirmed in			
	accordance with			
	WHO guidance			
	where RNA of			
	SARS-CoV-2 was			
	detected by RT-			
	PCR.			
	Exclusion criteria:			
	All patients having			
	known coagulation			
	disorders like			
	protein C. S			
	deficiency.			
	parahaemophilia.			
	malignancy, and			
	patients having a			
	history of			
	thromboembolism			
	and already on			
	anticoagulation			
Author: Ob ⁴⁹	Bonulation:	Modical Condition n/N/(%):	Modical Condition(s):	Sovere COVID 19:
Addior. On a		Chronic obstructivo pulmonary disoaso	COPO(127.8, 127.9, 140.8, 147.8, 160.8)	aOP: Multivariable Logistic Pearession: Multivariable
Noor: 2021	N-122,040		COPD. 127.8, 127.9, 140.8 - 147.8, 100.8 -	Lagistic Regression
Year: 2021	* 7 700 COVID 10	(COPD): 4488/122,040 (3.6%)	J67.X, J68.4, J70.1, J70.3	Logistic Regression
Data Futura at a w MMM	n=7,780 COVID-19	Control (Companiant many m (N) (0/);		Λ (a stality, α (Λ) (α).
	+	No COPD: 117,552/122,040 (96.3%)	Severity Measure(s): NR	COPD:
Reviewer: CS	Setting: National		Clinical marker: NR	• aOR: 1.56 (95% CI: 1.06-2.2), p=0.024
	Health Insurance			
Study design:	Service database		Treatment/ Associated Therapy: NR	Severity of Condition: NR
Retrospective cohort				
	Location: South		Outcome Definitions:	Duration of Condition: NR
Study Objective: To	Korea		Mortality: ND	
investigate various			ICU admission: NR	Treatment/ Associated Therapy: NR
chronic respiratory	Study dates:		Intubation: NR	,
diseases (CRDs) that	January 1-June 26.		Ventilation: NR	Comorbid Conditions: NR
affect the risk of COVID-	2020		Hospitalization: NR	

Study	Population and Setting	Intervention	Definitions	Outcomes
19 among the general	Inclusion criteria:		Non-elective readmissions: NR	Risk Markers: NR
population in South	Individuals ≥20			
Korea, and to examine the	vears old, had a		Comments: None	Long-term Sequelae: NR
effect of different CRDs	respiratory disease			
on hospital mortality	diagnosis by the			
among patients with	International			
COVID-19 in South Korea.	Classification of			
	Diseases codes,			
IVA Score: 24 (Moderate)	and prescription			
	information			
	concerning drugs			
	and/or procedures			
	from 2015-2020			
	were included.			
	COVID-19 negative			
	individuals were			
	extracted from the			
	national database			
	using stratification			
	methods with			
	regard to age, sex,			
	and residence in			
	February 2020.			
	Exclusion criteria:			
	NR			
Author: Parlak ⁵⁰	Population: N=343	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
		Chronic obstructive pulmonary disease	COPD: ND	aOR: Multivariable Logistic Regression: Multivariable
Year: 2021	Setting: Hospital	(COPD): 20/343 (5.8%)		Logistic Regression
			Severity Measure(s): NR	OR: Univariable (Univariate) Logistic Regression
Data Extractor: MW	Location: Turkey	Control/Comparison group, n/N (%):		
		No COPD: 323/343 (94.2%)	Clinical marker: NR	Mortality, n/N (%)
Reviewer: CS	Study dates:			COPD:
	March 15 - April		Treatment/ Associated Therapy: NR	• aOR: 1.177 (95% CI: 0.225-6.168), p=0.847
Study design:	30, 2020			• OR: 3.176 (95% CI: 0.848-11.902), p=0.086
Retrospective cohort			Outcome Definitions:	• Died: 3/20 (15.0%)
	Inclusion criteria:		Mortality: ND	 Survived: 17/323 (5.3%)
Study Objective: To	COVID-19		ICU admission: ND	• p=0.071
retrospectively evaluate	suspected patients		Intubation: NR	

Study	Population and Setting	Intervention	Definitions	Outcomes
the chest CT of PCR-	with chest CT		Ventilation: NR	Severity of Condition: NR
confirmed COVID19 cases	examinations		Hospitalization: NR	
and classify lung	admitted to the		Non-elective readmissions: NR	Duration of Condition: NR
involvement by location,	emergency			
extension, and type, and	department were		Comments: None	Treatment/ Associated Therapy: NR
to investigate the	included.			
relationship between this				Comorbid Conditions: NR
classification and whether	Exclusion criteria:			
the patient had steatosis	Patients under the			Risk Markers: NR
or not.	age of 18 years,			
	those with image			Long-term Sequelae: NR
IVA Score: 23 (Moderate)	artifacts, those			
	that received an			
	intravenous			
	contrast agent for			
	examinations, such			
	as CI angiography,			
	and those with			
	chronic liver			
	uisease were			
	excluded.			
Author: Parra-	Population:	Medical Condition. n/N (%):	Medical Condition(s):	Severe COVID-19:
Bracamonte ⁵¹	N= 331.298	Chronic pulmonary obstructive disease	COPD: characterized by respiratory	aOR: Multivariable Loaistic Regression
		(COPD): 5458/331.298 (1.6%)	symptoms and persistent limitation of	OR: Univariable (Univariate) Logistic Rearession
Year: 2020	Setting: Database		aerial flux related to a constant	
	including	Control/Comparison group, n/N (%):	exposure to particles and harmful gases	Mortality, n/N (%)
Data Extractor: MC	information from	No COPD:	(i.e., smoking, biomass)	COPD:
	475 monitoring	325,840/331,298(98.4%)		• aOR: 1.261 (95% CI: 1.150-1.383), p<0.0001
Reviewer: DOS	units from public		Severity Measure(s): NR	• OR: 4.047 (95% CI: 3.822-4.285)
	and private health			• Died: 1839/38.310 (4.8%)
Study design:	sectors		Clinical marker: NR	• Survived: 3619/292,988 (1.2%)
Retrospective cohort				
	Location: Mexico		Treatment/ Associated Therapy: NR	Severity of Condition: NR
Study Objective:				
To identify characteristics	Study dates:		Outcome Definitions:	Duration of Condition: NR
of patients who are	January 13 - July		Mortality: ND	
current positive cases of	17, 2020 (database		ICU admission: NR	Treatment/ Associated Therapy: NR
COVID-19 in Mexico and	accessed July 18,		Intubation: NR	
	2020)		Ventilation: NR	Comorbid Conditions: NR

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
assess risk factors for			Hospitalization: NR	
mortality.	Inclusion criteria:		Non-elective readmissions: NR	Risk Markers: NR
	Patients diagnosed			
IVA Score: 24 (moderate)	positively to		Comments: None	Long-term Sequelae: NR
	COVID-19 included			
	in the			
	Epidemiologic			
	Surveillance			
	Source of			
	Respiratory Viral			
	Diseases (Sistema			
	de Vigilancia			
	Epidemiologica de			
	Enfermedades			
	Respiratorias			
	Virales). All			
	positive cases to			
	COVID-19 were			
	diagnosed using			
	real-time PCR and			
	were officialized			
	by the National			
	Network for			
	Epidemiologic			
	Surveillance (Red			
	Nacional de			
	Laboratorios de			
	Vigilancia			
	Epidemiologica).			
	Exclusion criteria:			
	NR			
Author: Puebla Neira52	Population: N=31,	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
	526	COPD: 4,758/31,526 (15.1%)	COPD: Having experienced \geq 1 inpatient	aOR: Adjusted Odds Ratio; Multivariate Logistic
Year: 2021			or ≥2 outpatient visits for COPD in the 1	Regression; model included clinical and demographic
	Setting: Multiple	Control/Comparison group, n/N (%):	year before the COVID-19 diagnosis	factors
Data Extractor: JH	hospital networks	No COPD: 26,768/31,526 (84.9%)	using ICD-10-CM codes: J41.8, J42,	OR: Odds Ratio
			J43.0, J43.1, J43.2, J43.8, J43.9, J44.0,	
Reviewer: CNS	Location: US		J44.1, J44.9	Mortality, n/N (%):
				COPD:

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
Study Design: Cohort	Study		Severity Measure(s): NR	 aOR: 1.33 (95% CI: 1.18-1.50), p<0.0001
	dates: February 10			• OR: 1.68 (95% CI: 1.54-1.84), p=NR
Study Objective: To	– November 10,		Clinical marker: NR	• COPD: 667/4,758 (14.0%)
assess whether COPD	2020			 No COPD: 2,363/26,768 (8.8%)
increased the risk of			Treatment/ Associated Therapy: NR	• p<0.0001
mortality among patients	Inclusion criteria:			F
hospitalized for COVID-	Patients with		Outcome Definitions:	Severity of Condition: NR
19.	complete		Mortality: inpatient mortality among	
	demographic data		patients with COVID-19-associated	Duration of Condition: NR
IVA Score: 23 (Moderate)	in the OPTUM EHR		hospitalization	
	database and		ICU admission: ND	Treatment/Associated Therapy: NR
	Integrated		Intubation: NR	······································
	Delivery Network		Ventilation: ND	Comorbid Conditions: NR
	during the study		Hospitalization: NR	
	dates who were ≥		Non-elective readmissions: NR	Risk Markers:
	40 years of age			Mortality, n/N (%):
	with COVID-19		Comments: None	Sex. Male
	identified by a			COPD
	positive laboratory			• aOR 1 14 (95% CI 0 97 – 1 34) n = NR
	test for SARS-CoV-			Sex Female
	2 or International			СОРП
	Classification for			$a_{2}OP: 1.62 (1.26 - 1.95): n = NP$
	Diseases, 10 th			4000.1.02(1.00 - 1.00), p = 0.000
	revision, Clinical			Age 05-75 (compared to $40-04$) $\sim OP(2, 2, 44/0EV/Cl; 2, 10, 2, 71)$ $\sim OOOO1$
	Modification (ICD-			• $aOR. 2.44 (55\% Cl. 2.15-2.71), p<0.0001$
	10-CM) diagnosis			Age ≥ 80 (compared to 40-04)
	code U07.1 and			• aOR: 5.74 (95% CI: 5.09-6.49), p<0.0001
	hospitalized within			Long term Conveloor ND
	14 days of			Long-term Sequelae: NR
	diagnosis.			
	Exclusion			
	criteria: Patients			
	younger than 40			
	years at the time			
	of diagnosis.			
Author: Purrov ⁵³	Population:	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
	N=1,737	COPD: 119/1,737 (6.9%)	COPD: based on ICD-10	
Year: 2021				

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
	Setting: 16	Control/Comparison group, n/N (%):	Severity Measure(s): NR	aOR1: Multivariable Logistic Regression; model
Data Extractor: CNS	hospitals	No COPD: 1,618/1,737 (93.1%)		included demographic characteristics, clinical
			Clinical marker: NR	characteristics, and vital signs
Reviewer: JH	Location: Spain			aOR2: Multivariable Logistic Regression; model
			Treatment/ Associated Therapy: NR	included demographic and clinical characteristics
Study Design: Cohort	Study dates:			
	March 1-April 20,		Outcome Definitions:	Mortality, n/N (%):
Study Objective: 10	2020		Mortality: In-hospital death	
describe the rate of	to deal and an and a star		ICU admission: NR	• aOR1: 1.81 (95% CI: 1.00-3.27), p=0.049
thromboembolism event	Inclusion criteria:		Intubation: NR	• aOR2: 1.61 (95% CI: 1.03-2.53); p=0.039
(TEE) complications and	All patients with		Ventilation: NR	• Dead: 43/276 (15.6%)
its influence in the	COVID-19		Hospitalization: NR	• Alive: 76/1461 (5.2%)
prognosis of hospitalized	DCB test or		Non-elective redumissions. NR	• p<0.001
after a cross sectional	nasonharvngoal or		Comments: None	
study	oronharyngeal		comments. None	Severity of Condition: NR
study.	swah or sputum			Departies of Care distance ND
IVA Score: 23 (moderate)	snecimen			Duration of Condition: NR
	specificiti			Treatment (Associated Therease ND
	Exclusion criteria:			Treatment/ Associated Therapy: NR
	Patients under 18			Comorbid Conditions: NP
	vears old or			
	missing ICD-10			Rick Markers: NR
	codification.			Nisk Warkers. WA
				Long-term Sequelae: NR
Author: Ramos-	Population:	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
Martinez ⁸³	N=7,137	Chronic obstructive pulmonary disease	COPD: ND	aOR: Multivariable Logistic Regression included
		(COPD): 406/7,137 (5.7%)		variables Age, Charlson Comorbidity Index score,
Year: 2021	Setting: 147		Severity Measure(s): NR	diabetes, COPD, asthma, solid neoplasia, hypertension,
	hospitals; SEMI-	Control/Comparison group, n/N (%):		dementia, duration of symptoms before admission,
Data Extractor: CNS	COVID-19 Network	No COPD: 6,731/7,137 (94.3%)	Clinical marker: NR	hemoglobin level and platelets count at admission,
	Registry collects			ground-glass infiltrate at admission, acute cardiac
Reviewer: MW	data on 10% of		Treatment/ Associated Therapy: NR	injury, acute kidney failure and glucocorticoid
	admitted patients			treatment
Study Design: Cohort			Outcome Definitions:	
	Location: Spain		Mortality: NR	Severity of Condition: NR
Study Objective: To			ICU admission: NR	
analyze the clinical			Intubation: NR	Duration of Condition: NR
characteristics of patients			Ventilation: NR	

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
with COVID-19 who were	Study dates:		Hospitalization: NR	Treatment/ Associated Therapy: NR
readmitted to the hospital	March 1-April 30,		Non-elective readmissions: patients	
during the first 30 days	2020		with COVID-19 who were readmitted to	Comorbid Conditions: NR
after being discharged,			the hospital during the first 30 days	
determine the proportion	Inclusion criteria:		after being discharged. Patients who	Risk Markers: NR
of COVID-19 patients who	All consecutive		were attended in the emergency	
were readmitted after	patients admitted		department after hospital discharge but	Long-term Sequelae:
discharge, the causes of	to hospitals and		not admitted, were not considered	Non-elective readmissions
readmission, and factors	discharged with		readmitted patients.	COPD:
associated with this poor	confirmed COVID-			 aOR: 1.84 (95% CI: 1.26-2.69), p=0.002
outcome.	19 disease by RT-		Comments: None.	 Readmission: 42/298 (14.1%)
	PCR of a			 No readmission: 364/6,839 (5.3%)
IVA Score:	nasopharyngeal or			• P<0.001
COPD: 23 (moderate)	sputum sample			
	and were included			
	in the SEMI-			
	COVID-19 Registry			
	during the study			
	dates.			
	Exclusion criteria:			
	Missing data or			
	death during initial			
	hospital			
	admission.			
Author: Rezaei ⁵⁴	Population:	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
	N=270,949	COPD: NR	COPD: ND	aOR: Multivariable Logistic Regression including age,
Year: 2021				sex, ICU admitting, ventilator aid
	Setting: Hospitals	Control/Comparison group, n/N (%):	Severity Measure(s): NR	OR: Univariable (Univariate) Logistic Regression
Data Extractor: JKK	from 31 provinces	No COPD: NR		
	in the ministry of		Clinical marker: NR	Mortality, n/N (%):
Reviewer: CNS	health registry of			COPD:
	Iran		Treatment/ Associated Therapy: NR	• aOR: 1.48 (95% CI: 1.40-1.57), p<0.001
Study Design: Cohort				• OR: 2.05 (95% CI: 1.94-2.17), p<0.001
	Location: Iran		Outcome Definitions:	
Study Objective: To			Mortality: ND	Severity of Condition: NR
determine the clinical and	Study dates:		ICU admission: NR	
epidemiological	February 18 –		Intubation: NR	Duration of Condition: NR
characteristics as well as	December 22,		Ventilation: NR	
the risk factors associated	2020		Hospitalization: NR	Treatment/ Associated Therapy: NR

Study	Population and Setting	Intervention	Definitions	Outcomes
Study with the mortality of COVID-19 in diabetic patients in Iran and the impact of prescribed antiviral and antibiotic on patients' mortality. IVA Score: 21 (moderate)	Population and Setting Inclusion criteria: Hospitalized patients in a national registry with Severe Acute Respiratory Syndrome (SARS) symptoms who are diagnosed with diabetes including patients with confirmed COVID- 19; SARS cases were defined as diabetic patients with fever, respiratory symptoms, radiographic evidence of pneumonia, low or normal white-cell count with low lymphocyte count; with a history of travel to contaminated cities or direct contact with patients who have a fever or respiratory symptoms within 14 days before illness; COVID-19 confirmed cases are defined as a		Definitions Non-elective readmissions: NR Comments: None	Outcomes Comorbid Conditions: NR Risk Markers: NR Long-term Sequelae: NR
	laboratory tests			

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
	for the COVID-19			
	from the			
	respiratory			
	specimens by the			
	Real-Time Reverse			
	Transcription			
	Polymerase Chain			
	Reaction (RT-PCR)			
	assay.			
	Exclusion criteria:			
	NR			
Author: Rubio-Rivas ⁷³	Population:	Medical Condition p/N (%):	Medical Condition(s):	Severe COVID-19
Addio 1. Rubio Rivas	N-17 122	Chronic obstructive nulmonary disease	Asthma: ND	aOR: Multivariable Logistic Regression: adjusted for
Vear: 2021	11-17,122	$(COPD) \cdot 1.155/17.122 (6.7\%)$		variables with a significance of < 0.10 in the univariate
1001.2021	Setting: 150			analyses are and sev
Data Extractor: IKK	bosnitals	Control/Comparison group n/N (%):	Severity Measure(s): NR	OP: Univariate Logistic Regression
Data Extractor. JAK	nationwide	No COPD: 15 967/17 122 (93 3%)	Sevency measure(s). Mix	ON. Onivariate Logistic Regression
Reviewer: MW	nationwide	NO COPD. 13,907 17,122 (93.376)	Clinical marker: NB	Mortality
	Location: Spain			
Study Design: Cohort	Location. Spann		Treatment/Associated Therany: NR	\bullet OP: 2.53 (95% CI: 2.24-2.87) pc0.001
Study Design. Conort	Study dates:		Treatmenty Associated merupy. NA	• OK. 2.33 (33% Cl. 2.24-2.87), p<0.001
Study Objective: To	March 1 – July 31,		Outcome Definitions:	ICU Admission:
identify three risk	2020		Mortality: in-hospital mortality	COPD
categories for the			ICU admission: ND	• aOR: 0.63 (95% CI: 0.49-0.82), p<0.001
requirement of high flow	Inclusion criteria:		Intubation: invasive mechanical	• OR: 0.75 (95% CI: 0.59-0.94), p=0.013
nasal cannula, mechanical	Hospitalized		ventilation	
ventilation, ICU	patients included		Ventilation: high flow nasal cannula	Intubation:
admission, and in-hospital	in the Spanish		(HFNC); non-invasive mechanical	COPD
mortality based on	SEMI-COVID-19		ventilation (NIMV)	• aOR: 0.61 (95% CI: 0.47-0.81), p=0.001
lymphopenia and	registry and		Hospitalization: NR	• OR: 0.69 (95% CI: 0.53-0.90), p=0.006
inflammatory parameters	diagnosed with		Non-elective readmissions: NR	
on admission.	COVID-19 by PCR			Ventilation:
	test taken from		Comments: None	HFNC:
IVA Score:	nasopharyngeal			COPD
COPD: 24 (moderate)	sample, sputum,			• aOR: 1.26 (95% CI: 1.04-1.53), p=0.017
	or bronchoalveolar			• OB: 1 62 (95% CI: 1 35-1 95) n<0.001
	lavage.			NIMV:
				COPD

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
	Exclusion criteria:			• aUK: 1.52 (95% CI: 1.23-1.88), p<0.001
				• OR: 2.28 (95% CI: 1.87-2.78), p<0.001
				Severity of Condition: NR
				Duration of Condition: NR
				Treatment/ Associated Therapy: NR
				Comorbid Conditions: NR
				Risk Markers: NR
				Long-term Sequelae: NR
Author: Rubio-Rivas55	Population:	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
	N=12,066	Chronic obstructive pulmonary disease	COPD: ND	aOR1: Adjusted odds ratio; multivariable logistic
Year: 2020		(COPD): 786/12066 (6.5%)		regression; model includes all variables
	Setting: 109		Severity Measure(s): NR	aOR2: Multivariable Logistic Regression; model
Data Extractor: MW	hospitals	Control/Comparison group, n/N (%):		includes variables with p<0.10 in the univariate
Devision DOC	Level and Constant	No COPD: 11280/12066 (93.5%)	Clinical marker: NR	analysis OB- University Industria December 1
Reviewer: DUS	Location: Spain		Treatment (Associated Theremy ND	OR: Univariable Logistic Regression
Study design: Cohort	Study dates:		Treatment/ Associated Therapy: NK	Mortality n/N (%):
study	March 1 - July 31.		Outcome Definitions:	COPD:
	2020		Mortality: In-hospital mortality	• aOR1: 1.36 (95% CI: 1.21–1.53), p<0.001
Study Objective: To			ICU admission: NR	• aOR2: 1.36 (95% CI: 1.04–1.78), p=0.024
identify clinical	Inclusion criteria:		Intubation: NR	• OR: 2.82 (95% CI: 2.43–3.27), p<0.001
phenotypes by cluster	Consecutive,		Ventilation: Mechanical ventilation	
analysis in a large	hospitalized		Hospitalization: NR	Ventilation, n/N (%):
nationwide series of	patients providing		Non-elective readmissions: NR	COPD:
COVID-19 illness and to	data of symptoms			• aOR1: 1.50 (95% CI: 1.30-1.72), p<0.001
create a predictive model	of COVID-19 upon		Comments: None	• aOR2: 1.47 (95% CI: 1.07-2.03), p=0.017
related to poor outcome.	admission were			
IVA Score: 22 (Madarata)	Included in the			Severity of Condition: NR
iva score: 23 (iviouerate)	SEMI_COVID_19			
	All natients were			Duration of Condition: NR
	diagnosed by PCR			Treatment / Associated Theremy ND
	test taken from a			Treatment/ Associated Therapy: NK
	nasopharyngeal			Comorbid Conditions: NR

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
	bronchoalveolar			Rick Markers: NR
	lavage			
	lavage.			Long-term Sequelae: NR
	Exclusion criteria:			
	NR			
Author: Sahin ⁵⁶	Population:	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
	N=675	COPD: 55/675 (8.1%)	COPD: NR	aOR: Multivariable Logistic Regression; model included
Year: 2021				age, malignancy, and COPD
	Setting: Multiple	Control/Comparison group, n/N (%):	Severity Measure(s): NR	OR: Univariable (Univariate) Logistic Regression
Data Extractor: DOS	hospitals	No COPD: 620/675 (91.9%)		
			Clinical marker: NR	Mortality:
Reviewer: MW	Location: Turkey			COPD:
			Treatment/ Associated Therapy: NR	• aOR: 3.08 (95% CI: 1.19-7.97); p=0.021
Study Design: Cross-	Study dates:			• OR: 4.70 (95% CI: 2.15-10.28); p<0.001
sectional	March - August		Outcome Definitions:	
	2020		Mortality: ND	Severity of Condition: NR
Study Objective: To			ICU admission: Hospitalization in the	
describe the predictors of	Inclusion criteria:		ICU	Duration of Condition: NR
mortality related to	COVID-19 patients		Intubation: Invasive mechanical	
COVID-19 infection and to	over 18 years of		ventilation	Treatment/ Associated Therapy: NR
evaluate the association	age with at least		Ventilation: Noninvasive mechanical	
between overweight,	one positive SARS-		ventilation	Comorbid Conditions: NR
obesity, and clinical	CoV-2 RT-PCR		Hospitalization: NR	
outcomes of COVID-19.	examination who		Non-elective readmissions: NR	Risk Markers: NR
	were admitted to			
IVA Score: 22 (moderate)	COVID-19		Comments: None	Long-term Sequelae: NR
	outpatient clinics			
	at study nospitals.			
	Patients, with			
	unstable vital signs			
	involvement were			
	hospitalized while			
	nospitalized wille			
	normal vital signs			
	and no nulmonary			
	involvement were			
	followed on an			
	outpatient basis			
Author: Sahin ⁵⁶ Year: 2021 Data Extractor: DOS Reviewer: MW Study Design: Cross- sectional Study Objective: To describe the predictors of mortality related to COVID-19 infection and to evaluate the association between overweight, obesity, and clinical outcomes of COVID-19. IVA Score: 22 (moderate)	NRPopulation:N=675Setting: MultiplehospitalsLocation: TurkeyStudy dates:March - August2020Inclusion criteria:COVID-19 patientsover 18 years ofage with at leastone positive SARS-COV-2 RT-PCRexamination whowere admitted toCOVID-19outpatient clinicsat study hospitals.Patients, withunstable vital signsand/or lunginvolvement werehospitalized whilepatients withnormal vital signsand no pulmonaryinvolvement werefollowed on anoutpatient basis.	Medical Condition, n/N (%): COPD: 55/675 (8.1%) Control/Comparison group, n/N (%): No COPD: 620/675 (91.9%)	Medical Condition(s): COPD: NR Severity Measure(s): NR Clinical marker: NR Treatment/ Associated Therapy: NR Outcome Definitions: Mortality: ND ICU admission: Hospitalization in the ICU Intubation: Invasive mechanical ventilation Ventilation: Noninvasive mechanical ventilation Hospitalization: NR Non-elective readmissions: NR Comments: None	Severe COVID-19: aOR: Multivariable Logistic Regression; model inclu age, malignancy, and COPD OR: Univariable (Univariate) Logistic Regression Mortality: COPD: • aOR: 3.08 (95% CI: 1.19-7.97); p=0.021 • OR: 4.70 (95% CI: 2.15-10.28); p<0.001 Severity of Condition: NR Duration of Condition: NR Treatment/ Associated Therapy: NR Comorbid Conditions: NR Risk Markers: NR Long-term Sequelae: NR

Setting Exclusion criteria: Patients without any positive RT- PCR examination and identified as "possible" or "probable" according to CDC. Medical Condition, n/N (%): COPD: ND Medical Condition(s): COPD: ND Severe COVID-19: aOR: Multivariable Logistic Regression; and age Author: Sami ⁵⁷ Population: N=408 Medical Condition, n/N (%): COPD: 43/408 (10.5%) Medical Condition(s): COPD: ND Severe COVID-19: aOR: Multivariable Logistic Regression; and age Year: 2021 Setting: 4 referral centers Control/Comparison group, n/N (%): No COPD: 365/408 (89.5%) Medical Condition(s): COPD: ND Severe COVID-19: aOR: Multivariable Logistic Regression; and age Reviewer: MC Location: Iran Control/Comparison group, n/N (%): No COPD: 365/408 (89.5%) Clinical marker: NR Mortality, n/N (%) • aOR: 5.36 (95% CI: 2.33-12.30), p<0.0 • Died: 31/136 (22.8%) • survived: 12/727 (4.4%) • p<0.001 Study Objective: To determine the potential risk factors that prediction Inclusion criteria: Inclusion criteria: Survived: 12/727 (4.4%) · p<0.001				
Exclusion criteria: Patients without any positive RT- PCR examination and identified as "possible" or "probable" according to CDC.Medical Condition, n/N (%): COPD: 43/408 (10.5%)Medical Condition(s): COPD: NDSevere COVID-19: aOR: Multivariable Logistic Regression; - and ageAuthor: Sami ⁵⁷ Population: N=408Medical Condition, n/N (%): COPD: 43/408 (10.5%)Medical Condition(s): COPD: NDSevere COVID-19: aOR: Multivariable Logistic Regression; - and ageYear: 2021Setting: 4 referral centersControl/Comparison group, n/N (%): No COPD: 365/408 (89.5%)Medical Condition(s): COPD: NDSeverity Measure(s): NROR: Univariable (Univariate) Logistic Regression; - and ageData Extractor: DOScentersControl/Comparison group, n/N (%): No COPD: 365/408 (89.5%)Severity Measure(s): NRMortality, n/N (%) - aOR: 5.36 (95% CI: 2.33-12.30), p<0.0Study Design: CohortStudy dates: February 24 - April 12, 2020February 24 - April 12, 2020Outcome Definitions: Mortality: in-hospital death caused by COVID-19Died: 31/136 (2.8%) - Survived: 12/727 (4.4%) - p<0.001Study Objective: To determine the potential risk factors that predictInclusion criteria:Died: 30/136 (2.28%) - Survived: 12/727 (4.4%)Severity of Condition: NR				
"probable" according to CDC.Medical Condition, n/N (%): COPD: 43/408 (10.5%)Medical Condition(s): COPD: NDSevere COVID-19: aOR: Multivariable Logistic Regression; mand ageYear: 2021Setting: 4 referral centersControl/Comparison group, n/N (%): No COPD: 365/408 (89.5%)Medical Condition(s): COPD: NDSevere COVID-19: aOR: Multivariable Logistic Regression; mand ageData Extractor: DOSSetting: 4 referral centersControl/Comparison group, n/N (%): No COPD: 365/408 (89.5%)Severity Measure(s): NRMortality, n/N (%) • aOR: 5.36 (95% CI: 2.33-12.30), p<0.4 • OR: 6.07 (95% CI: 3.01-12.26), p<0.00 • Died: 31/136 (22.8%)Study Objective: To determine the potential risk factors that predictStudy or retria:Outcome Definitions: Mortality: in-hospital death caused by COVID-19Severity of Condition: NR				
according to CDC.Medical Condition, n/N (%): COPD: Sami ⁵⁷ Medical Condition, n/N (%): COPD: 43/408 (10.5%)Medical Condition(s): COPD: NDSevere COVID-19: aOR: Multivariable Logistic Regression; i and ageYear: 2021Setting: 4 referral centersControl/Comparison group, n/N (%): No COPD: 365/408 (89.5%)Medical Condition(s): COPD: NDSevere COVID-19: aOR: Multivariable Logistic Regression; i and ageData Extractor: DOSSetting: 4 referral centersControl/Comparison group, n/N (%): No COPD: 365/408 (89.5%)Severity Measure(s): NROR: Univariable (Univariate) Logistic Regression; i and ageReviewer: MCLocation: IranNo COPD: 365/408 (89.5%)Clinical marker: NR Treatment/ Associated Therapy: NRMortality, n/N (%) • aOR: 5.36 (95% CI: 2.33-12.30), p<0.4 • OR: 6.07 (95% CI: 3.01-12.26), p<0.00 • Died: 31/136 (22.8%)Study Objective: To determine the potential risk factors that predictInclusion criteria:Inclusion criteria:Inclusion criteria:Severity of Condition: NR				
Author: Sami ⁵⁷ Population: N=408Medical Condition, n/N (%): COPD: 43/408 (10.5%)Medical Condition(s): COPD: NDSevere COVID-19: aOR: Multivariable Logistic Regression; and age OR: Univariable (Univariate) Logistic Regression; and age 				
N=408COPD: 43/408 (10.5%)COPD: NDaOR: Multivariable Logistic Regression; and ageYear: 2021Setting: 4 referral centersControl/Comparison group, n/N (%): No COPD: 365/408 (89.5%)Severity Measure(s): NROR: Univariable (Univariate) Logistic Regression; and ageData Extractor: DOScentersNo COPD: 365/408 (89.5%)Clinical marker: NRMortality, n/N (%) • aOR: 5.36 (95% CI: 2.33-12.30), p<0.0				
Setting: 4 referral centersControl/Comparison group, n/N (%): centersSeverity Measure(s): NROR: Univariable (Univariable Logistic RegData Extractor: DOScentersNo COPD: 365/408 (89.5%)Clinical marker: NRMortality, n/N (%) • aOR: 5.36 (95% CI: 2.33-12.30), p<0.	adjusted by sex			
Reviewer: MCLocation: IranClinical marker: NRMortality, n/N (%)Study Design: CohortStudy dates: February 24 - April 12, 2020Treatment/ Associated Therapy: NR• aOR: 5.36 (95% CI: 2.33-12.30), p<0.	gression			
Study Design: Cohort Study dates: February 24 - April • OR: 6.07 (95% CI: 3.01-12.26), p<0.0	.001			
Study Objective: To determine the potential risk factors that predict 12, 2020 Mortality: in-hospital death caused by COVID-19 • p<0.001 Inclusion criteria: Inclusion criteria: Inclusion: NR Severity of Condition: NR)01			
risk factors that predict Inclusion criteria: ICU admission: NR Severity of Condition: NR				
COVID-19-related Patients ≥18 who Intubation: NR				
mortality concentrating on the initial recordeddied in the hospital due toVentilation: NR Hospitalization: NRDuration of Condition: NR				
laboratory tests based on the data of multi-centerCOVID-19 andNon-elective readmissions: NRTreatment/ Associated Therapy: NR				
population-based cohort study.inpatients who received care atComments: NoneComorbid Conditions: NR				
study referral Risk Markers: NR IVA Score: 20 (moderate) centers. Diagnosis				
of COVID-19 relied on positive RT- PCR.				
Exclusion criteria: NR				
Author: Santorelli ⁵⁸ Population: Medical Condition, n/N (%): Medical Condition(s): Severe COVID-19: N=582 COPD: 78/582 (13.4%) COPD: ND aHR1: Adjusted Hazard Ratio; model inclusion sex	cluded age			
Study	Population and	Intervention	Definitions	Outcomes
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	Setting			
	Setting: Three	Control/Comparison group, n/N (%):	Severity Measure(s): NR	English Indices of Multiple Deprivation quintiles, and
Data Extractor: DOS	acute hospitals	No COPD: 504/582 (86.6%)		pre-existing comorbidities (obesity, type 2 diabetes,
			Clinical marker: NR	hypertension, cardiovascular disease, asthma, COPD,
Reviewer: JH	Location: United			cancer, and renal disease)
	Kingdom		Treatment/ Associated Therapy: NR	aHR2: Adjusted Hazard Ratio; model included age and
Study Design: Cohort				sex
	Study dates:		Outcome Definitions:	
Study Objective: To	February 17-		Mortality: 30-day in-hospital mortality	aOR1: Adjusted Odds Ratio; model included age
examine the ethnic,	August 8, 2020		ICU admission: ICU admission at any	category on admission, sex, South Asian ethnicity,
demographic, socio-			time during inpatient stay	English Indices of Multiple Deprivation quintiles, and
economic and clinical risk	Inclusion criteria:		Intubation: NR	pre-existing comorbidities (obesity, type 2 diabetes,
factors associated with	All patients		Ventilation: NR	hypertension, cardiovascular disease, asthma, COPD,
outcomes of hospital	admitted to study		Hospitalization: NR	cancer, and renal disease)
Inpatients who tested	nospitals during		Non-elective redamissions: NR	aOR2: Aajustea Oaas Ratio; model includea age ana
positive for COVID-19.	study dates who		Commonster Name	Sex
N/A Sector	tested positive for		Comments: None	Mostality n/N/ (0/)
CORD: 22 (moderate)	SARS-COV-2 USINg			
COPD: 23 (moderate)	admission or			0 24P1: 0 75 (05% CI: 0 25 1 62); 2-NP
	during their stay			• afri. 0.75 (95% Cl. 0.55-1.02), p-NR
	during their stay.			• ankz. 0.96 (95% Cl. 0.54-1.57), p-lvk
	Exclusion criteria:			ICU admission. n/N (%):
	Patients with			COPD:
	missing ethnicity,			• aOR1: 0.67 (95% CI: 0.37-1.22): p=NR
	comorbidity, and			• aOR2: 0.55 (95% CI: 0.28-1.08); p=NR
	deprivation data			
	or those aged <18			Severity of Condition: NR
	years.			,
				Duration of Condition: NR
				Treatment/ Associated Therapy: NR
				Comorbid Conditions: NR
				Risk Markers: NR
Authous Cours	Denulation	Madical Condition (b) (0())		
Author: Senº4	Population:	Iviedical Condition, n/N (%):	iviedical Condition(s):	Severe COVID-19:
Noor: 2021	IN=27,810; COVID-	CUPD: 1,288/1,288(100%)		aUK1: Multivariable Logistic Regression including sex,
Year: 2021	19+ n=1,288			race, age, smoking status (current vs. former),

Setting	
Control/Comparison group, n/N (%): COPD: ICD-9 codes 491.x and ICD10 comorbidities (asthma, obesity, diabetes melli	tus,
Data Extractor: JKK Setting: Clinical No COPD: 0/1,288(0%) codes J41.0, J41.1, J41.8, J42, J43.1, congestive heart failure, hypertension), and m	onth of
facilities J43.2, J43.8, J43.9, J44.0, J44.1, J44.9 COVID positivity	
Reviewer: MC aOR2: Multivariable Logistic Regression include	ing
Location: Ohio, US Severity Measure(s): sex, race, and age	
Study Design: Cohort Oral Corticosteroids (OCS): prednisone, OR: Univariable (Univariate) Logistic Regressic	n
Study dates: prednisolone, or methylprednisolone;	
Study Objective: To March 8 – at least one course in the prior year Severity of Condition:	
investigate whether, September 20, (prior to registry enrollment); more Mortality (among hospitalized), n/N (%):	
amongst patients with 2020 severe than those who had not COPD:	
COPD who develop received OCS in the prior year OCS	
COVID-19, those who are Inclusion criteria: • aOR1: 0.69 (95% CI: 0.33-1.50), p=NR	
on inhaled corticosteroids Patients with • aOR2: 0.65 (95% CI: 0.33-1.32), p=NR	
• OR: 0.58 (95% CI: 0.31-1.10), p=NR	
similar inpatient tested for COVID- Treatment/ Associated Therapy: • OCS: 54/308 (17.5%)	
outcomes, mortality, and 19 and 35 years Inhaled Corticosteroid (ICS): ND • No OCS: 17/63 (27.0%)	
healthcare utilization as and older;	
those who are not on ICS. infection with Outcome Definitions:	
SARS-CoV-2 was Mortality: in-hospital mortality ICU Admission (among hospitalized), n/N (%):	
IVA Score: 25 (moderate) confirmed by ICU admission: ND COPD:	
laboratory testing Intubation: endotracheal intubation OCS	
using RT-PCR Ventilation: mechanical ventilation • aOR1: 1.52 (95% CI: 0.92-2.64), p=NR	
reaction SARS- Hospitalization: ND	
CoV-2 assay. Non-elective readmissions: NR OR: 1 60 (95% CI: 1 00-2 66), p=NR	
• OCS: 106/308 (34.4%)	
Exclusion criteria: Comments: Flow chart number of No OCS: 21/63 (33.3%)	
Patients with patients in study did not align with patients in study did not align with	
concurrent number reported in results section;	
diagnosis of extracted number reported in results	
asthma and less section.	
than a 10 pack	
year smoking	
history.	
• a0R2. 2.50 (95% Cl. 1.04-0.12), p-NR	
• UK. 2.18 (95% CI: 0.99-5.75), p=NK	
Homitalization - AH 10/1.	
по <i>с</i> рп.	

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
				 aOR2: 1.90 (95% CI: 1.39-2.63), p=NR
				• OR: 1.70 (95% CI: 1.26-2.33), p=NR
				• OCS: 308/988 (31.2%)
				• No OCS: 63/300 (21.0%)
				• p=0.001
				Duration of Condition: NR
				Treatment/Associated Therapy:
				Mortality (among hospitalized) n/N (%):
				COPD:
				ICS
				• aOR1: 0.80 (95% CI: 0.43-1.49) n=NR
				• aOB2: 0.94 (95% CI: 0.54-1.64) p=NR
				• OB: 0.90 (95% CI: 0.54-1.52), n=NR
				• ICS: 37/201 (18 4%)
				• No ICS: 34/170 (20.0%)
				n = 0.798
				φ=0.738
				ICU Admission (among hospitalized), n/N (%):
				COPD:
				ICS
				 aOR1: 1.31 (95% CI: 0.82-2.10), p=NR
				• aOR2: 1.38 (95% CI: 0.89-2.17), p=NR
				• OR: 1.29 (95% CI: 0.84-1.99), p=NR
				• ICS: 74/201 (36.8%)
				• No ICS: 53/170 (31.2%)
				• p=0.303
				Ventilation (among ICU admitted), n/N (%):
				COPD:
				ICS
				 aOR1: 1.65 (95% CI: 0.69-4.02), p=NR
				• aOR2: 1.37 (95% CI: 0.64-2.98), p=NR
				• OR: 1.61 (95% CI: 0.79-3.32), p=NR
				Hospitalization, n/N (%):
				COPD:
				ICS

Study	Population and	Intervention	Definitions	Outcomes
				 aOR1: 1.12 (95% CI: 0.90-1.38), p=NR aOR2: 1.26 (95% CI: 1.02-1.55), p=NR OR: 1.34 (95% CI: 1.09-1.65), p=NR Comorbid Conditions: NR Risk Markers: NR Long-term Sequelae: NR
Author: Shin ⁵⁹	Population:	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
	N=5,571	Chronic obstructive pulmonary disease	COPD: ND	aOR1: Multinomial logistic regression; model includes
Year: 2021		(COPD): 40/5,571 (0.7%)		age, sex, BMI, diabetes mellitus, hypertension, heart
Data Extractory DOC	Setting: Hospitals	Control (Composition group of (N) (%)	Severity Measure(s): NR	failure, cardiac conduction disease, COPD, asthma,
Data Extractor: DUS	Location: Korea	No COPD: 5 531/5 571 (99 3%)	Clinical marker: NR	disease rheumatic disease/autoimmune disorder and
Reviewer: MW		10 001 0. 3,331 3,371 (33.376)		dementia
	Study dates:		Treatment/ Associated Therapy: NR	aOR2: Multinomial logistic regression; model includes
Study Design: Cohort	January 21 - April			age, sex, and BMI
	30, 2020		Outcome Definitions:	
Study Objective: To			Mortality: ND	Mortality:
examine how	Inclusion criteria:		ICU admission: NR	COPD:
comorbidities and	All patients who		Intubation: NR	• aOR1: 1.39 (95% CI: 0.35-5.59); p=0.64
symptom networks were	were confirmed to		Ventilation: NR	• aOR2: 2.19 (95%Cl: 0.60-7.93); p=0.23
(illness soverity or death)	have COVID-19,		Hospitalization: NR	
(inness severity or death)	discharged during		Non-elective redumissions. NR	Severity of Condition: NR
natients with COVID-19	study dates Data		Comments: None	Duration of Condition: NR
	provided by the			
IVA Score:	National Medical			Treatment/ Associated Therapy: NR
COPD: 23 (moderate)	Center for the			
	Korea Disease			Comorbid Conditions: NR
	Control and			
	Prevention			Risk Markers: NR
	Agency.			
	Exclusion criteria:			Long-term Sequelae: NR
	Cases involving			
	nregnancy cases			
	with no clinical			

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
	severity reported,			
	and cases with			
	incomplete data.			
Author: Song ⁷⁷	Population: N-961	Medical Condition n/N (%):	Medical Condition(s):	
Aution. Song		COPD: 21/961 (2.2%)	COPD: Diagnosis based on Global	aOR: adjusted odds ratio (95% Cl). Multivariable
Year: 2020	Setting: Largest		Initiative for Chronic Obstructive Lung	loaistic rearession. adjusted for gae and sex:
	designated	Control/Comparison group, n/N (%):	Disease criterion and patient's self-	adjusted odds ratio (95% CI). Multivariable
Data Extractor: JKK	hospital to treat	No Asthma or COPD: 918/961 (95.5%)	report on admission	loaistic rearession, adjusted for age and sex
	patients with			
Reviewer: CS	COVID-19 in		Severity Measure(s): NR	Mechanical ventilation, n/N (%)
	Wuhan			COPD:
Study design:			Clinical marker: NR	• aOR: 1.59 (95% CI: 1.009-2.521), p=0.046
Retrospective cohort	Location: Wuhan.			• COPD: 10/21 (47.6%)
study	China		Treatment/Associated Therapy: NR	• No COPD or asthma: 1/1/918 (15.4%)
,				
Study Objective: To	Study dates:		Outcome Definitions:	Invasive mechanical ventilation. n/N (%):
explore the influence of	February 1-March		Mortality: ND	COPD:
asthma and chronic	6, 2020		ICU admission: NR	• COPD: 3/21 (14.3%)
obstructive pulmonary			Intubation: NR	• No COPD or asthma: 53/918 (5.8%)
disease (COPD)	Inclusion criteria:		Ventilation: invasive and noninvasive	
comorbidity on disease	Patients diagnosed		mechanical ventilation	Non-invasive mechanical ventilation. n/N (%):
expression and outcomes,	with SARS-CoV-2		Hospitalization: NR	COPD:
and the potential	by RT-PCR of		Non-elective readmissions: NR	• COPD: 7/21 (33.3%)
underlying mechanisms in	throat or			• No COPD or asthma: 88/918 (9.6%)
COVID-19 patients.	nasopharyngeal		Comments: None	
	swab specimens			Severity of Condition: NR
IVA Score: 22 (moderate)	and had definite			
	clinical outcomes			Duration of Condition: NR
	(discharge or			
	death) from			Treatment/ Associated Therapy: NR
	February 1 to			
	March 6, 2020, at			Comorbid Conditions: NR
	Tongji Hospital			
	were included.			Risk Markers: NR
	Fuchasian with the			
	Exclusion criteria:			Long-term Sequelae: NR
	Patients with			
	locally advanced			

Study	Population and Setting	Intervention	Definitions	Outcomes
	stage III lung cancer, received chemotherapy or radiotherapy before surgery, or have bronchiectasis, cystic fibrosis, or any other chronic diseases were excluded from the immunohistochem istry study.			
Author: Tang ⁶⁰	Population:	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
Year: 2020	N=1970; COVID+ n=752	COPD/Emphysema: 146/752 (19.4%) Control/Comparison group. n/N (%):	and J44	race, and facility
Data Extractor: JKK	Setting: 15 skilled nursing facilities	No COPD/Emphysema: 606/752 (80.6%)	Severity Measure(s): NR	<i>Mortality, n/N (%):</i> COPD/Emphysema:
Reviewer: CNS	Location: WA, US		Clinical marker: NR	• aRR: 1.55 (95% CI: 1.08-2.24), p<0.05
Study Design: Cohort	Study dates:		Treatment/ Associated Therapy: NR	Hospitalization, n/N (%): COPD/Emphysema:
Study Objective: To assess outcomes	March 1 – June 16, 2020		Outcome Definitions: Mortality: ND	• aRR: 1.31 (95% CI: 0.96-1.80), p=NR
associated with SARS- CoV-2 infection among	Inclusion criteria:		ICU admission: NR Intubation: NR	Severity of Condition: NR
residents who were tested for SARS-CoV-2	All residents from 15 skilled nursing		Ventilation: NR Hospitalization: ND	Duration of Condition: NR
RNA across one nursing home system with both	facilities who were universally tested		Non-elective readmissions: NR	Treatment/ Associated Therapy: NR
long-term and post-acute	for SARS-CoV-2 by RT-PCR using		Comments: None	Comorbid Conditions: NR
IVA Score:	nasopharyngeal or oropharyngeal			Risk Markers: NR
COPD: 23 (moderate)	swabs and had recorded test			Long-term Sequelae: NR

Study	Population and Setting	Intervention	Definitions	Outcomes
Study Author: Tessitore ⁶¹ Year: 2021 Data Extractor: MC Reviewer: DOS Study Design: Cohort study Study Objective: To examine whether patients with previous cardiovascular diseases (CVDs) have increased risk of death and major	Population and Setting results during the study dates. Exclusion criteria: NR Population: N= 83 9 Setting: University hospitals Location: Switzerla nd Study dates: February 26 - June 5, 2020 Inclusion criteria: All subjects ≥18 years who tested positive for SARS-	Intervention Medical Condition, n/N (%): Chronic obstructive pulmonary disease (COPD): 49/839 (6%) Control/Comparison group, n/N (%): No COPD: 790/839 (94%)	Definitions Medical Condition(s): COPD: ND Severity Measure(s): NR Clinical marker: NR Treatment/ Associated Therapy: NR Outcome Definitions: Mortality: in-hospital mortality ICU admission: NR Intubation: NR Ventilation: NR Hospitalization: NR Non-elective readmissions: NR	Outcomes Severe COVID-19: aOR: Multivariable Logistic Regression; model included age, sex, CT scan findings, hypertension, obesity, dyslipidemia, diabetes (type I or II), active smoking, COPD, obstructive sleep apnea, creatinine, C reactive protein, aspartate transaminase/alanine transaminase ratio, and anemia Mortality, n/N (%): • aOR: 2.0 (95% CI: 0.94-4.3) • OR: 3.1 (95% CI: 1.7-5.7) • Died: 19/152 (13%) • Survived: 30/687 (4%) • p=0.07 Severity of Condition: NR
of death and major adverse cardiovascular event (MACE) when hospitalized for COVID- 19.	coV-2 and exhibited COVID- 19 symptoms that required		Comments: None	Duration of Condition: NR Treatment/ Associated Therapy: NR
IVA Score: 24 (Moderate)	hospitalization between February 26 - April 26, 2020. The diagnostic tool to detect SARS- CoV-2 infection was a nasopharyngeal swab specimen (RT-PCR assay).			Comorbid Conditions: NR Risk Markers: NR Long-term Sequelae: NR

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
	Exclusion criteria:			
	All patients who			
	were found			
	positive for SARS-			
	CoV-2 without			
	COVID-19			
	symptoms who			
	were hospitalized			
	for other reasons			
	than COVID-19,			
	patients who were			
	still hospitalized			
	on June 5, 2020,			
	and patients that			
	were not able to			
	provide informed			
	consent.			
Author: Timberlake ⁶²	Population: N=275	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
		Chronic obstructive pulmonary disease	COPD: ND	aOR: Multivariable Logistic Regression: Multivariable
Year: 2021	Setting: 1 adult	(COPD): 62/275 (22.5%)		Logistic Regression
	and 1 pediatric		Severity Measure(s): NR	
Data Extractor: MW	tertiary referral	Control/Comparison group, n/N (%):		Mortality, n/N (%):
	center hospital	No COPD: 213/275 (77.4%)	Clinical marker: NR	COPD:
Reviewer: DOS				• aOR: 1.37 (95% CI: 0.65-2.90), p=0.41
	Location: OH, USA		Treatment/ Associated Therapy: NR	
Study design:				ICU admission, n/N (%):
Retrospective cohort	Study dates:		Outcome Definitions:	COPD:
	March 1 st - May		Mortality: in-hospital mortality	• aOR: 2.33 (95% CI: 1.19-4.55), p=0.01
Study Objective: To	5 th , 2020		ICU admission: admission to ICU	
determine the			Intubation: ND	Intubation, n/N (%):
relationship between	Inclusion criteria:		Ventilation: NR	COPD:
atopic disease (including	All patients		Hospitalization: NR	• aOR: 2.14 (95% CI: 1.11-4.14), p=0.02
asthma) and severity of	admitted for any		Non-elective readmissions: NR	
COVID-19 in hospitalized	reason and			Severity of Condition: NR
patients.	subsequently were		Comments: None	,
	found to have			Duration of Condition: NR
IVA Score: 23 (Moderate)	positive testing for			
. , ,	SARS-CoV-2 via RT-			Treatment/Associated Therapy: NR
	PCR during their			
	hospitalization.			Comorbid Conditions: NR
Study Objective: To determine the relationship between atopic disease (including asthma) and severity of COVID-19 in hospitalized patients. IVA Score: 23 (Moderate)	5 th , 2020 Inclusion criteria: All patients admitted for any reason and subsequently were found to have positive testing for SARS-CoV-2 via RT- PCR during their baseitalization		ICU admission: admission to ICU Intubation: ND Ventilation: NR Hospitalization: NR Non-elective readmissions: NR Comments: None	Intubation, n/N (%): COPD: • aOR: 2.14 (95% CI: 1.11-4.14), p=0.02 Severity of Condition: NR Duration of Condition: NR Treatment/ Associated Therapy: NR

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
	Both hospitals			
	initially only tested			Risk Markers: NR
	patients who were			
	symptomatic or			Long-term Sequelae: NR
	had known			
	contacts with			
	confirmed COVID-			
	19. On April 9,			
	2020 the children's			
	hospital began all			
	admitted patients.			
	Evolucion critorio.			
	Exclusion criteria:			
	Patients who ulu			
	CoV 2 testing had			
	COV-2 lesting, nau			
	CoV 2 tosting or			
	wore still admitted			
	on May 5, 2020			
Author: Tsai ⁶³	Population:	Medical Condition n/N (%):	Medical Condition(s):	Severe COVID-19:
Aution. Tsai	N=77 364	Chronic obstructive nulmonary disease	COPD: ICD-9 and ICD-10 codes for	aHR: Adjusted Cox Proportional Hazards Ratio: model
Vear: 2021	COVID + n = 8.308	(COPD): 624/8 308 (7 5%)	histoplasmosis (115) chronic bronchitis	included baseline confounders
1001.2021	00110111-0,000		or emplysema (190, 191, 192, 194, 140	
Data Extractor: CNS	Setting: VA	Control/Comparison group n/N (%):	141 143 144 147) and screening for	Mortality:
Data Extractor. CNS	hospitals and	No COPD: 7 684/8 308 (92 5%)	chronic bronchitis and emphysema	COPD.
Beviewer: MC	clinics	10 201 0. 7,00470,300 (32.370)	(V81.3) up to two years prior to the	• 3HP: 1.81 (95% CI: 1.08-3.06) n=statistically
neviewer. me	cinics		index date (COVID-19 test date)	cignificant
Study Design: Cohort	Location: US			Significant
ettady Designi conort			Severity Measure(s): NR	Severity of Condition: NR
Study Objective: To	Study dates:			
examine the effect of	February 24-		Clinical marker: NR	Duration of Condition: NR
COVID-19 on women	November 25.			
veterans, and specifically	2020		Treatment/ Associated Therapy: NR	Treatment/Associated Therapy: NR
minorities, because			· · · · · · · · · · · · · · · · · · ·	,
previous studies have	Inclusion criteria:		Outcome Definitions:	Comorbid Conditions: NR
demonstrated that	Women veterans		Mortality: 60-day all-cause mortality	
COVID-19 has affected	who were tested		among the SARS-CoV-2 positive group	Risk Markers: NR
veterans of racial and	for SARS-CoV-2		ICU admission: NR	
	infection at U.S.		Intubation: NR	Long-term Sequelae: NR

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
ethnic minorities	Veterans Affairs		Ventilation: NR	
disproportionately.	(VA) Health Care		Hospitalization: NR	
	during the study		Non-elective readmissions: NR	
IVA Score: 23 (moderate)	dates with			
	complete data		Comments: None	
	based on baseline			
	covariates and			
	outcomes (death			
	and cardiovascular			
	outcomes) in a VA			
	COVID-19 shared			
	data resource.			
	Exclusion criteria:			
	Non-veterans who			
	were not eligible			
	for VA health care,			
	patients with			
	missing data on			
	baseline			
	covariates, and			
	patients with			
	death/cardiovascul			
	ar event dates that			
	were earlier than			
	the COVID-19 test			
	date.			
Author: Valent ⁶⁴	Population:	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
	N=886	COPD: 13/886 (1.5%)	COPD: Identified through the Johns	aOR: Multinomial Logistic Regression including time
Year: 2021			Hopkins ACG System	from local outbreak state, date of infection diagnosis,
	Setting: COVID-19	Control/Comparison group, n/N (%):		age, sex, comorbidities, and nursing home residency;
Data Extractor: JKK	hospitals and	No COPD: 873/886 (98.5%)	Severity Measure(s): NR	significance level 0.3 was required to allow a variable
	nursing homes			into the model and significance level of 0.35 was
Reviewer: MW			Clinical marker: NR	required to stay in the model
	Location: Italy			
Study Design: Cohort			Treatment/ Associated Therapy: NR	Mortality, n/N (%):
			,	COPD:
			Outcome Definitions:	• aOR: 4.113 (95% CI: 0.829-20.404), p=NR

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
Study Objective: To	Study dates:		Mortality: ND	• COPD: 4/13 (30.8%)
assess the association of	March 1 – April 30,		ICU admission: hospitalization requiring	• No COPD: 66/873 (7.6%)
age and chronic	2020		an ICU stay with no death	• p=0.0221
comorbidities with			Intubation: NR	
different outcomes of	Inclusion criteria:		Ventilation: NR	Hospitalization, n/N (%):
SARS-CoV-2 infection,	People living in the		Hospitalization: hospitalization with no	COPD:
considering the potential	province of Udine		ICU stay or death	• aOR: 0.973 (95% CI: 0.145-6.548), p=NR
confounding effect of	who had at least		Non-elective readmissions: NR	• COPD: 2/13 (15.4%)
residing in a nursing	one positive RT-			• No COPD: 169/873 (19.4%)
home.	PCR test for SARS-		Comments: None	• n=NR
	CoV-2 during the			- p-141
IVA Score:	study dates.			Severity of Condition: NR
22 (moderate)				
	Exclusion criteria:			Duration of Condition: NR
	NR			
				Treatment/ Associated Therapy: NR
				Comorbid Conditions: NR
				Risk Markers: NR
				Long-term Sequelae: NR
Author: Vera-Zertuche ⁷⁴	Population:	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
	N=71,103;	COPD: 389/15,529 (2.5%)	COPD: ND	aHR: Adjusted Hazard Ratio; Cox-Proportional Hazards
Year: 2021	COVID+ n=15,529	Asthma: 542/15,529 (3.5%)	Asthma: ND	Ratio; model included sex, age, time from symptom
				onset to care, social lag index, ageing index, afro-
Data Extractor: MW	Setting: COVID-19-	Control/Comparison group, n/N (%):	Severity Measure(s): NR	descendant per 100 inhabitants, indigenous language-
	accredited medical	Without comorbidities: 8,422/15,529		speaking per 100 inhabitants, affiliation to health
Reviewer: JH/CNS	units	(54.2%)	Clinical marker: NR	services per 100 inhabitants, members per household,
				hospitals per 10 000 inhabitants, hospital beds per
Study Design: Cohort	Location: Mexico		Treatment/ Associated Therapy: NR	10,000 inhabitants
				aOR: Adjusted Odds Ratio; Logistic regression model;
Study Objective: To	Study dates:		Outcome Definitions:	model included sex, age, time from symptom onset to
elucidate if obesity is an	February 24 – April		Mortality: All-cause mortality up to 56	care, social lag index, ageing index, afro-descendant
independent risk factor	26, 2020		days after inclusion	per 100 inhabitants, indigenous language-speaking per
for short-term mortality			ICU admission: ND	100 inhabitants, affiliation to health services per 100
and other adverse	Inclusion criteria:		Intubation: Invasive mechanical	inhabitants, members per household, hospitals per 10
outcomes in patients with	National cohort of		ventilation	000 inhabitants, hospital beds per 10,000 inhabitants
obesity as their only	patients evaluated		Ventilation: NR	HR: Hazard Ratio
comorbidity and patients	for suspected		Hospitalization: ND	

With obesity plus one other comorbidity who were evaluated for suspected COVID-19 in the first 2-month particle between the study dates; patients were grouped according to SAR5- co2PD: 23 (Moderate) Non-elective readmissions: NR Mortality, n/N (%): COPD: and astmm were different in the supplementary material file than in the main paper (75 & 249 respectively) Host 295% CI: 1.05-2.84), p=NR IVA Score: Asthma: 24 (Moderate) corp: 12 (Moderate) Comments: Denominators for COPD and astmm were different in the supplementary material file than in the main paper (75 & 249 respectively) No. comorbidities: 370(8422 (4.4%) IVA Score: Asthma: 24 (Moderate) COPD: 12 (Moderate) COPD: 12 (1.05-2.84), p=NR COPD: 23 (Moderate) Source (1.05, 2.05, 2.04), p=NR No. comorbidities: 323(8422 (2.4%) VIA Score: Asthma: 24 (Moderate) Exclusion criteria: NR NR NR Exclusion criteria: NR NR Exclusion criteria: NR NR NR Exclusion criteria: NR NR NR COPD: (7.5 (8.0%)) No. comorbidities: 234(8422 (2.5%)) Mostionities: 234(8422 (2.7.3%)) Severity of Condition: NR COPD: (57.53, 3%) No. comorbidities: 234(8422 (2.7.3%)) Severity of Condition: NR Treatment/ Associated Therapy: NR Corpo: (57.57, 3%) No. comorbidities: NR Bisk Markers: NR Log-term Sequelae: NR NR Severe COVID:	Study	Population and	Intervention	Definitions	Outcomes
Author: Wei ⁸² Population: N= 20 Medical Condition. n/N (%): Medical Condition(s): Severe COVID-19:	Study with obesity plus one other comorbidity who were evaluated for suspected COVID-19 in both ambulatory units and hospitals in Mexico. IVA Score: Asthma: 24 (Moderate) COPD: 23 (Moderate)	Population and SettingCOVID-19 in the first 2-month period of the pandemic between the study dates; patients were grouped according to SARS- CoV-2 (RT-PCR) result into positive, negative or pending.Exclusion criteria: NR	Intervention	Definitions Non-elective readmissions: NR Comments: Denominators for COPD and asthma were different in the supplementary material file than in the main paper (75 & 249 respectively) Supplementary Non-elective readmissions: NR	Outcomes Mortality, n/N (%): COPD: a HR: 1.72 (95% CI: 1.05-2.84), p=NR HR: 5.92 (95% CI: 3.64-9.64), p=NR COPD: 17/75 (22.7%) No comorbidities: 370/8422 (4.4%) ICU Admission, n/N (%): COPD: a OR: 1.49 (95% CI: 0.65-3.40), p=NR COPD: a OR: 1.49 (95% CI: 0.65-3.40), p=NR COPD: 7/75 (9.3%) No comorbidities: 235/8422 (2.8%) Intubation, n/N (%): COPD: a OR: 1.06 (95% CI: 0.44-2.58), p=NR COPD: a OR: 1.06 (95% CI: 0.44-2.58), p=NR COPD: 6/75 (8.0%) No comorbidities: 214/8422 (2.5%) Hospitalization, n/N (%): COPD: a OR: 1.29 (95% CI: 0.78-2.13), p=NR COPD: a OR: 1.29 (95% CI: 0.78-2.13), p=NR COPD: 43/75 (57.3%) No comorbidities: 2296/8422 (27.3%) Severity of Condition: NR Duration of Condition: NR Treatment/ Associated Therapy: NR Comorbid Conditions: NR Risk Markers: NR
	Author: Wei ⁸²	Population: N= 20	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
Year: 2021				aHR: adjusted hazard ratio; model included
	Setting: Emergenc	Control/Comparison group, n/N (%):	Severity Measure(s): NR	demographics (age, sex, race/ethnicity, and
Data Extractor: JH	y room, urgent	No COPD: 197,906/206,741 (95.7%)		geographic region), BMI, comorbidities, smoking
	care, and other		Clinical marker: NR	status, location of first COVID-19 encounter, baseline
Reviewer: DOS	outpatient			period resource use (ER/UC hospitalization), and index
	settings		Treatment/ Associated Therapy: NR	month
Study Design: Cohort				HR: hazard ratio
	Location: US		Outcome Definitions:	
Study Objective: To			Mortality: NR	Hospitalization, %:
characterize US patients	Study dates: June		PICU admission: NR	COPD:
initially diagnosed with	1 - December 9,		Intubation: NR	• aHR: 1.25 (95% CI: 1.16-1.35), p=NR
COVID-19 in the	2020		Ventilation: NR	• HR: 3.48 (95% CI: 3.26-3.72), p=NR
outpatient setting and to			Hospitalization: COVID-19-related	• COPD: 11.7%
estimate the 30-day	Inclusion criteria:		hospitalizations within 30 days of an	• No COPD: 3.5%
incidence of and risk	Adult patients		outpatient COVID-19 diagnosis or	
factors for subsequent	(aged ≥ 18 years)		positive SARS-CoV-2 test	Severity of Condition: NR
COVID-19 related urgent	having their first		Non-elective readmissions: NR	
medical visits (UMVs)	confirmed COVID-			Duration of Condition: NR
using a large, national,	19 diagnosis (ICD-		Comments: None	
electronic health records	10 code U07.1) or			Treatment/ Associated Therapy: NR
(EHR) database.	positive SARS-CoV-			
	2 virus test in the			Comorbid Conditions: NR
IVA Score:	outpatient setting			
COPD: 24 (Moderate)	during the study			Risk Markers: NR
	period, were a			
	part of an			Long-term Sequelae: NR
	integrated delivery			
	network health			
	system and had ≥			
	1 health care			
	encounter within 2			
	years prior to			
	COVID-19			
	diagnosis for			
	assessment of			
	medical history.			
	Exclusion criteria:			
	Patients who were			
	hospitalized on the			

Study	Population and	Intervention	Definitions	Outcomes
	index date had a			
	prior COVID- 19/			
	coronavirus			
	diagnosis, or a			
	prior positive			
	SARS-CoV-2 virus			
	or antibody test			
	result before June			
	1, 2020.			
Author: Yoshida65	Population: N=776	Medical Condition, n/N (%):	Medical Condition(s):	Severe COVID-19:
		Chronic obstructive pulmonary disease	Chronic obstructive pulmonary disease	aOR: Multivariable Logistic Regression: Multivariable
Year: 2021	Setting: Two	(COPD): 140/776 (18.8%)	(COPD): Ascertained by codes in the	Logistic Regression
	tertiary care		International Classification of Diseases,	
Data Extractor: MW	academic hospitals	Control/Comparison group, n/N (%):	10th Revision [ICD-10] and physician	Mortality, n/N (%):
		Chronic obstructive pulmonary disease	notes 6 months prior to the admission	COPD:
Reviewer: CS	Location:	(COPD): 636/776 (82.0%)		• aOR: 1.13 (95% CI 0.69-1.85)
	Louisiana, USA		Severity Measure(s): NR	
Study design: Case series				ICU admission, n/N (%):
study	Study dates:		Clinical marker: NR	COPD:
	February 27 – July			 aOR: 1.86 (95% CI 1.25-2.78), p<0.05
Study Objective: To	23, 2020		Treatment/ Associated Therapy: NR	
determine if sex				IMV, n/N (%):
differences exist in clinical	Inclusion criteria:		Outcome Definitions:	COPD:
characteristics and	All consecutively		Mortality: In hospital mortality	• aOR: 1.68 (95% Cl 1.09-2.57), p<0.05
outcomes of adults	admitted adults (>		ICU admission: ND	
hospitalized for	18 years)		Intubation: NR	Severity of Condition: NR
coronavirus disease 2019	hospitalized from		Ventilation: Invasive mechanical	
(COVID-19) in a US	February 27-July		ventilation (IMV)	Duration of Condition: NR
healthcare system.	15, 2020 with		Hospitalization: NR	
	confirmed SARS-		Non-elective readmissions: NR	Treatment/ Associated Therapy: NR
IVA Score: 23 (moderate)	CoV-2 (by PCR of a			
	nasopharyngeal		Comments: None	Comorbid Conditions: NR
	sample) infection			
	on admission were			Risk Markers: NA
	Included			
	nasopharyngeal			Long-term Sequelae: NR
	sample) intection			
	included			
	menuueu.			

Study	Population and	Intervention	Definitions	Outcomes
	Setting			
	Exclusion criteria:			
	NR			

B.3.c. Internal Validity Assessments of Extracted Studies

Table 8. Internal Validity Assessments of Extracted Studies reporting the Association between COPD and Severe COVID-19 Outcomes

	Author Year	Ahlstrom 2020 ¹	Arslan 2021 ²	Aveyard 2021 ³	Beatty 2021 ⁴	Beltramo 2021 ⁵	Bergman 2021 ⁶⁶	Boari 2020 ⁶
	Outcome(s)	Mortality, ICU admission	Mortality	Mortality, ICU, Hospitalization	Mortality, ICU admission	Mortality, ICU admission	ICU admission, hospitalization	Mortality
Domain	Signaling question	National registries	All data have been regulated with the valid guides edited and updated by the Science Board of Turkish Republic Ministry of Health	data extracted from medical records	data from database	Hospital records	Registries	Clinical records
	Design appropriate to research question	1	1	1	1	1	1	1
	Well described population	1	1	1	1	1	1	1
	Well described setting	1	1	1	1	1	1	1
Study	Well described intervention/ exposure	1	1	1	1	1	1	1
Liements	Well described control/ comparator	1	1	1	1	1	1	1
	Well described outcome	1	1	1	1	1	1	1
	Clear timeline of exposures/ interventions and outcomes	1	1	1	1	0	1	1
Selection Bias: Sampling	Randomization appropriately performed	0	0	0	0	0	0	0

	Author Year	Ahlstrom 2020 ¹	Arslan 2021 ²	Aveyard 2021 ³	Beatty 2021 ⁴	Beltramo 2021 ⁵	Bergman 2021 ⁶⁶	Boari 2020 ⁶
	Outcome(s)	Mortality, ICU admission	Mortality	Mortality, ICU, Hospitalization	Mortality, ICU admission	Mortality, ICU admission	ICU admission, hospitalization	Mortality
Domain	Signaling question	National registries	All data have been regulated with the valid guides edited and updated by the Science Board of Turkish Republic Ministry of Health	data extracted from medical records	data from database	Hospital records	Registries	Clinical records
	Allocation adequately concealed	0	0	0	0	0	0	0
	Population sampling appropriate to study design	1	1	1	1	1	1	1
	Attrition not significantly different between groups	1	1	1	1	1	1	1
Selection Bias: Attrition	Attrition <10-15% of population	1	1	1	1	1	1	1
	Attrition appropriately analyzed	1	1	1	1	1	1	1
	Measure of intervention/ exposure is valid	0	0	0	0	0	0	0
Bias:	Measure of outcome is valid	1	1	1	1	1	1	1
Measurement and Misclassificatio	Fidelity to intervention is measured	0	0	0	0	0	0	0
	Fidelity to intervention is valid	0	0	0	0	0	0	0
	Prospective study	1	1	1	1	1	1	1

	Author Year	Ahlstrom 2020 ¹	Arslan 2021 ²	Aveyard 2021 ³	Beatty 2021 ⁴	Beltramo 2021 ⁵	Bergman 2021 ⁶⁶	Boari 2020 ⁶
	Outcome(s)	Mortality, ICU admission	Mortality	Mortality, ICU, Hospitalization	Mortality, ICU admission	Mortality, ICU admission	ICU admission, hospitalization	Mortality
Domain	Signaling question	National registries	All data have been regulated with the valid guides edited and updated by the Science Board of Turkish Republic Ministry of Health	data extracted from medical records	data from database	Hospital records	Registries	Clinical records
	Adequately powered to detect result	1	0	0	0	0	1	0
	Outcome assessor blinded	0	0	0	0	0	0	0
	Study participant blinded	0	0	0	0	0	0	0
Information	Investigator/ data analyst blinded	0	0	0	0	0	0	0
Performance & Detection	Data collection methods described in sufficient detail	1	1	1	1	1	1	1
	Data collection methods appropriate	1	1	1	1	1	1	1
	Sufficient follow up to detect outcome	1	1	1	1	1	1	1
Information Bias: Analytic	Appropriate statistical analyses for collected data	1	1	1	1	1	1	1
	Appropriate statistical analyses are conducted correctly	1	1	1	1	1	1	1
	Confidence interval is narrow	1	0	0	0	1	1	0

	Author Year	Ahlstrom 2020 ¹	Arslan 2021 ²	Aveyard 2021 ³	Beatty 2021 ⁴	Beltramo 2021 ⁵	Bergman 2021 ⁶⁶	Boari 2020 ⁶
	Outcome(s)	Mortality, ICU admission	Mortality	Mortality, ICU, Hospitalization	Mortality, ICU admission	Mortality, ICU admission	ICU admission, hospitalization	Mortality
Domain	Signaling question	National registries	All data have been regulated with the valid guides edited and updated by the Science Board of Turkish Republic Ministry of Health	data extracted from medical records	data from database	Hospital records	Registries	Clinical records
	Potential confounders identified	1	1	1	1	1	1	1
Confounding	Adjustment for confounders in study design phase	0	0	0	0	0	0	0
	Adjustment for confounders in data analysis phase	1	1	1	1	1	1	1
Reporting Bias	All pre-specified outcomes are adequately reported	1	1	1	1	1	1	1
Other Bias	No other sources of bias	1	1	1	1	1	1	1
СОІ	Funding sources disclosed and no obvious conflict of interest	1	1	1	1	1	1	1
SCORE	Threat to internal validity	25	23	23	23	23	25	23
	Low, Moderate, High	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate

Disclaimer: The findings and conclusions herein are draft and have not been formally disseminated by the Centers for Disease Control and Prevention and should not be construed to represent any agency determination or policy.

	Author Year	Caliskan 2020 ⁷	Calmes 2021 ⁸	Castilla 2021 ⁹	Choi 2020 ¹⁰	Ciardullo 2021 ¹¹	Corradini 2021 ¹²	Cosio 2021 ¹³
	Outcome(s)	Mortality, ICU admission	Mortality, ICU admission	Mortality, ICU admission, Hospitalization	Mortality, Intubation, Ventilation, Hospitalization	Mortality	Mortality	Mortality
Domain	Signaling question	data was extracted from medical records	data extracted from medical records	data extracted from medical records	data collected from nationwide database	Data extracted from medical records	data reported from electronic medical records	Data analyzed after hospital admission
	Design appropriate to research question	1	1	1	1	1	1	1
	Well described population	1	1	1	1	1	1	1
	Well described setting	1	1	1	1	1	1	1
Study	Well described intervention/ exposure	1	1	1	1	1	1	1
Elements	Well described control/ comparator	1	1	1	1	1	1	1
	Well described outcome	1	1	1	1	1	1	1
	Clear timeline of exposures/ interventions and outcomes	1	1	1	1	1	1	1
	Randomization appropriately performed	0	0	0	0	0	0	0
Selection Bias: Sampling	Allocation adequately concealed	0	0	0	0	0	0	0
	Population sampling appropriate to study design	1	1	1	1	1	1	1
Selection Bias:	Attrition not significantly different between groups	1	1	1	1	1	0	1
Attrition	Attrition <10-15% of population	1	1	1	1	1	0	1

	Author Year	Caliskan 2020 ⁷	Calmes 2021 ⁸	Castilla 2021 ⁹	Choi 2020 ¹⁰	Ciardullo 2021 ¹¹	Corradini 2021 ¹²	Cosio 2021 ¹³
	Outcome(s)	Mortality, ICU admission	Mortality, ICU admission	Mortality, ICU admission, Hospitalization	Mortality, Intubation, Ventilation, Hospitalization	Mortality	Mortality	Mortality
Domain	Signaling question	data was extracted from medical records	data extracted from medical records	data extracted from medical records	data collected from nationwide database	Data extracted from medical records	data reported from electronic medical records	Data analyzed after hospital admission
	Attrition appropriately analyzed	1	1	1	1	1	0	1
	Measure of intervention/ exposure is valid	0	1	0	0	0	0	1
Information	Measure of outcome is valid	1	1	1	1	1	1	1
Bias: Measurement and	Fidelity to intervention is measured	0	0	0	0	0	0	0
n	Fidelity to intervention is valid	0	0	0	0	0	0	0
	Prospective study	1	1	1	1	1	1	1
	Adequately powered to detect result	0	0	0	0	0	0	0
	Outcome assessor blinded	0	0	0	0	0	0	0
	Study participant blinded	0	0	0	0	0	0	0
Information	Investigator/ data analyst blinded	0	0	0	0	0	0	0
Bias: Performance & Detection	Data collection methods described in sufficient detail	1	1	1	1	1	1	1
	Data collection methods appropriate	1	1	1	1	1	1	1
	Sufficient follow up to detect outcome	1	1	1	1	1	1	1

	Author Year	Caliskan 2020 ⁷	Calmes 2021 ⁸	Castilla 2021 ⁹	Choi 2020 ¹⁰	Ciardullo 2021 ¹¹	Corradini 2021 ¹²	Cosio 2021 ¹³
	Outcome(s)	Mortality, ICU admission	Mortality, ICU admission	Mortality, ICU admission, Hospitalization	Mortality, Intubation, Ventilation, Hospitalization	Mortality	Mortality	Mortality
Domain	Signaling question	data was extracted from medical records	data extracted from medical records	data extracted from medical records	data collected from nationwide database	Data extracted from medical records	data reported from electronic medical records	Data analyzed after hospital admission
	Appropriate statistical analyses for collected data	1	1	1	1	1	1	1
Information Bias: Analytic	Appropriate statistical analyses are conducted correctly	1	1	1	1	1	1	1
	Confidence interval is narrow	0	0	0	0	0	0	0
	Potential confounders identified	1	1	1	1	1	1	1
Confounding	Adjustment for confounders in study design phase	0	0	0	0	0	0	0
	Adjustment for confounders in data analysis phase	1	1	1	1	1	1	1
Reporting Bias	All pre-specified outcomes are adequately reported	1	1	1	1	1	1	1
Other Bias	No other sources of bias	1	1	1	1	1	1	1
СОІ	Funding sources disclosed and no obvious conflict of interest	1	1	1	1	1	1	1
SCORE	Threat to internal validity	23	24	23	23	23	20	24
	Low, Moderate, High	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate

	Author Year	Cummins 2021 ¹⁴	De Vito 2021 ¹⁵	Eshrati 2020 ¹⁶	Estiri 2021 ¹⁷	Experton 2021 ¹⁸	Fayol 2021 ⁶⁷	Ferastraoaru 2021 ¹⁹
	Outcome(s)	Mortality, ICU Admission, Hospitalization	Mortality	Mortality	Hospitalization	Mortality, Hospitalization	ICU admission, hospitalization	Mortality
Domain	Signaling question		Data was extracted from medical records	data retrieved from medical records	medical records	Data extracted from database	data extracted from electronic health records	electronic health records
	Design appropriate to research question	1	1	1	1	1	1	1
	Well described population	1	1	1	1	1	1	1
	Well described setting	1	1	1	1	0	1	1
Study	Well described intervention/ exposure	1	1	1	1	1	1	1
Elements	Well described control/ comparator	1	1	1	1	1	1	1
	Well described outcome	1	1	1	1	1	1	1
	Clear timeline of exposures/ interventions and outcomes	1	1	1	1	1	1	1
	Randomization appropriately performed	0	0	0	0	0	0	0
Selection Bias: Sampling	Allocation adequately concealed	0	0	0	0	0	0	0
	Population sampling appropriate to study design	1	1	1	1	1	1	1
Selection Bias:	Attrition not significantly different between groups	1	1	1	1	1	1	1
Attrition	Attrition <10-15% of population	1	1	1	1	1	1	1

	Author Year	Cummins 2021 ¹⁴	De Vito 2021 ¹⁵	Eshrati 2020 ¹⁶	Estiri 2021 ¹⁷	Experton 2021 ¹⁸	Fayol 2021 ⁶⁷	Ferastraoaru 2021 ¹⁹
	Outcome(s)	Mortality, ICU Admission, Hospitalization	Mortality	Mortality	Hospitalization	Mortality, Hospitalization	ICU admission, hospitalization	Mortality
Domain	Signaling question		Data was extracted from medical records	data retrieved from medical records	medical records	Data extracted from database	data extracted from electronic health records	electronic health records
	Attrition appropriately analyzed	1	1	1	1	1	1	1
	Measure of intervention/ exposure is valid	0	0	0	0	0	0	0
Information	Measure of outcome is valid	1	1	1	1	1	1	1
Bias: Measurement and	Fidelity to intervention is measured	0	0	0	0	0	0	0
n	Fidelity to intervention is valid	0	0	0	0	0	0	0
	Prospective study	1	1	1	1	1	1	1
	Adequately powered to detect result	0	0	0	1	0	0	0
	Outcome assessor blinded	0	0	0	0	0	0	0
	Study participant blinded	0	0	0	0	0	0	0
Information	Investigator/ data analyst blinded	0	0	0	0	0	0	0
Bias: Performance & Detection	Data collection methods described in sufficient detail	1	1	1	1	1	1	1
	Data collection methods appropriate	1	1	1	1	1	1	1
	Sufficient follow up to detect outcome	1	1	1	1	1	0	1

	Author Year	Cummins 2021 ¹⁴	De Vito 2021 ¹⁵	Eshrati 2020 ¹⁶	Estiri 2021 ¹⁷	Experton 2021 ¹⁸	Fayol 2021 ⁶⁷	Ferastraoaru 2021 ¹⁹
	Outcome(s)	Mortality, ICU Admission, Hospitalization	Mortality	Mortality	Hospitalization	Mortality, Hospitalization	ICU admission, hospitalization	Mortality
Domain	Signaling question		Data was extracted from medical records	data retrieved from medical records	medical records	Data extracted from database	data extracted from electronic health records	electronic health records
	Appropriate statistical analyses for collected data	1	1	1	1	1	1	1
Information Bias: Analytic	Appropriate statistical analyses are conducted correctly	1	1	1	1	1	1	1
	Confidence interval is narrow	0	0	0	0	1	0	1
	Potential confounders identified	1	1	1	1	1	1	0
Confounding	Adjustment for confounders in study design phase	0	0	0	0	0	0	1
	Adjustment for confounders in data analysis phase	1	1	1	1	1	1	0
Reporting Bias	All pre-specified outcomes are adequately reported	1	1	1	1	1	1	1
Other Bias	No other sources of bias	1	0	1	1	1	1	1
COI	Funding sources disclosed and no obvious conflict of interest	1	1	1	1	1	1	1
SCORE	Threat to internal validity	23	22	23	24	23	22	1
Jeone	Low, Moderate, High	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	23

	Author Year	Fisman 2020 ²⁰	Gao 2021 ⁷⁸	Garcia-Posada 2021 ⁷⁹	Ge 2021 ²¹	Girardin 2021 ²²	Gottlieb 2020 ⁶⁸	Grasselli 2020 ²³
	Outcome(s)	Mortality	Hospitalization	Mortality, Hospitalization	Mortality	Mortality	ICU Admission, Hospitalization	Mortality
Domain	Signaling question	Data retrieved from electronic medical records	datasets	Data collected from patients admitted to hospital	insurance database	data was extracted from medical records	extracted from medical records	database based on the prescription of the general practitioners
	Design appropriate to research question	1	1	1	1	1	1	1
	Well described population	1	1	1	1	1	1	1
Study	Well described setting	1	1	1	1	1	1	1
	Well described intervention/ exposure	1	1	1	1	1	0	1
Elements	Well described control/ comparator	1	1	1	1	1	0	1
	Well described outcome	1	1	1	1	1	1	1
	Clear timeline of exposures/ interventions and outcomes	1	1	1	1	1	0	1
	Randomization appropriately performed	0	0	0	0	0	0	0
Selection Bias: Sampling	Allocation adequately concealed	0	0	0	0	0	0	0
	Population sampling appropriate to study design	1	0	1	1	1	1	1
Selection Bias: Attrition	Attrition not significantly different between groups	1	1	1	1	1	0	1

	Author Year	Fisman 2020 ²⁰	Gao 2021 ⁷⁸	Garcia-Posada 2021 ⁷⁹	Ge 2021 ²¹	Girardin 2021 ²²	Gottlieb 2020 ⁶⁸	Grasselli 2020 ²³
	Outcome(s)	Mortality	Hospitalization	Mortality, Hospitalization	Mortality	Mortality	ICU Admission, Hospitalization	Mortality
Domain	Signaling question	Data retrieved from electronic medical records	datasets	Data collected from patients admitted to hospital	insurance database	data was extracted from medical records	extracted from medical records	database based on the prescription of the general practitioners
	Attrition <10-15% of population	1	1	1	1	1	0	1
	Attrition appropriately analyzed	1	1	1	1	1	0	1
	Measure of intervention/ exposure is valid	0	0	0	0	0	0	0
Information	Measure of outcome is valid	1	1	1	1	1	1	1
Bias: Measurement and	Fidelity to intervention is measured	0	0	0	0	0	0	0
Misclassificatio n	Fidelity to intervention is valid	0	0	0	0	0	0	0
	Prospective study	1	1	1	1	1	0	1
	Adequately powered to detect result	1	0	0	0	0	1	0
	Outcome assessor blinded	0	0	0	0	0	0	0
lu fa ma di an	Study participant blinded	0	0	0	0	0	0	0
Information Bias: Performance & Detection	Investigator/ data analyst blinded	0	0	0	0	0	0	0
	Data collection methods described in sufficient detail	1	1	1	1	1	0	1
	Data collection methods appropriate	1	1	1	1	1	1	1

	Author Year	Fisman 2020 ²⁰	Gao 2021 ⁷⁸	Garcia-Posada 2021 ⁷⁹	Ge 2021 ²¹	Girardin 2021 ²²	Gottlieb 2020 ⁶⁸	Grasselli 2020 ²³
	Outcome(s)	Mortality	Hospitalization	Mortality, Hospitalization	Mortality	Mortality	ICU Admission, Hospitalization	Mortality
Domain	Signaling question	Data retrieved from electronic medical records	datasets	Data collected from patients admitted to hospital	insurance database	data was extracted from medical records	extracted from medical records	database based on the prescription of the general practitioners
	Sufficient follow up to detect outcome	1	1	1	1	1	1	1
	Appropriate statistical analyses for collected data	1	1	1	1	1	1	1
Information Bias: Analytic	Appropriate statistical analyses are conducted correctly	1	1	1	1	1	1	1
	Confidence interval is narrow	0	0	0	1	1	0	0
	Potential confounders identified	1	1	1	1	1	1	1
Confounding	Adjustment for confounders in study design phase	0	0	0	0	0	0	0
	Adjustment for confounders in data analysis phase	1	0	1	1	1	1	1
Reporting Bias	All pre-specified outcomes are adequately reported	1	1	1	1	1	1	1
Other Bias	No other sources of bias	1	1	1	1	1	1	1
СОІ	Funding sources disclosed and no obvious conflict of interest	1	1	1	1	1	1	1

	Author Year	Fisman 2020 ²⁰	Gao 2021 ⁷⁸	Garcia-Posada 2021 ⁷⁹	Ge 2021 ²¹	Girardin 2021 ²²	Gottlieb 2020 ⁶⁸	Grasselli 2020 ²³
	Outcome(s)	Mortality	Hospitalization	Mortality, Hospitalization	Mortality	Mortality	ICU Admission, Hospitalization	Mortality
Domain	Signaling question	Data retrieved from electronic medical records	datasets	Data collected from patients admitted to hospital	insurance database	data was extracted from medical records	extracted from medical records	database based on the prescription of the general practitioners
SCORE	Threat to internal validity	24	21	23	24	24	16	23
	Low, Moderate, High	Moderate	Moderate	Moderate	Moderate	Moderate	High	Moderate

	Author Year	Guan 2021 ⁶⁹	Gupta 2021 ²⁴	Haki 2021 ²⁵	Hansen 2021 ²⁶	He 2021 ²⁷	Hippisley-Cox 2021 ²⁸	Hu 2020 ⁷⁰
	Outcome(s)	Mortality, ICU Admission, Intubation	Mortality	Mortality	Mortality, ICU Admission	Mortality	Mortality, Hospitalization	ICU Admission
Domain	Signaling question	EMR	data was extracted from electronic medical records	Data retrieved from electronic hospital records	data was extracted from national registries	data retrieved from electronic medical records	Data retrieved from database	data was extracted from medical records
	Design appropriate to research question	1	1	1	1	1	1	1
	Well described population	1	1	1	1	1	0	1
Chudu	Well described setting	1	1	1	1	1	1	1
Study Elements	Well described intervention/ exposure	1	1	1	1	1	1	1
	Well described control/ comparator	1	1	1	1	1	1	1
	Well described outcome	1	1	1	1	1	1	1

	Author Year	Guan 2021 ⁶⁹	Gupta 2021 ²⁴	Haki 2021 ²⁵	Hansen 2021 ²⁶	He 2021 ²⁷	Hippisley-Cox 2021 ²⁸	Hu 2020 ⁷⁰
	Outcome(s)	Mortality, ICU Admission, Intubation	Mortality	Mortality	Mortality, ICU Admission	Mortality	Mortality, Hospitalization	ICU Admission
Domain	Signaling question	EMR	data was extracted from electronic medical records	Data retrieved from electronic hospital records	data was extracted from national registries	data retrieved from electronic medical records	Data retrieved from database	data was extracted from medical records
	Clear timeline of exposures/ interventions and outcomes	1	1	1	1	1	1	1
	Randomization appropriately performed	0	0	0	0	0	0	0
Selection Bias: Sampling	Allocation adequately concealed	0	0	0	0	0	0	0
	Population sampling appropriate to study design	1	1	1	1	1	1	1
	Attrition not significantly different between groups	1	1	1	1	1	1	1
Selection Bias: Attrition	Attrition <10-15% of population	1	1	1	1	1	1	1
	Attrition appropriately analyzed	1	1	1	1	1	1	1
Information Bias:	Measure of intervention/ exposure is valid	0	0	0	0	0	0	0
Measurement and	Measure of outcome is valid	1	1	1	1	1	1	1
Misclassificatio n	Fidelity to intervention is measured	0	0	0	0	0	0	0

	Author Year	Guan 2021 ⁶⁹	Gupta 2021 ²⁴	Haki 2021 ²⁵	Hansen 2021 ²⁶	He 2021 ²⁷	Hippisley-Cox 2021 ²⁸	Hu 2020 ⁷⁰
	Outcome(s)	Mortality, ICU Admission, Intubation	Mortality	Mortality	Mortality, ICU Admission	Mortality	Mortality, Hospitalization	ICU Admission
Domain	Signaling question	EMR	data was extracted from electronic medical records	Data retrieved from electronic hospital records	data was extracted from national registries	data retrieved from electronic medical records	Data retrieved from database	data was extracted from medical records
	Fidelity to intervention is valid	0	0	0	0	0	0	0
	Prospective study	1	1	0	1	1	1	1
	Adequately powered to detect result	0	0	0	1	0	1	0
	Outcome assessor blinded	0	0	0	0	0	0	0
	Study participant blinded	0	0	0	0	0	0	0
Information	Investigator/ data analyst blinded	0	0	0	0	0	0	0
Performance & Detection	Data collection methods described in sufficient detail	1	1	1	1	1	1	1
	Data collection methods appropriate	1	1	1	1	1	1	1
	Sufficient follow up to detect outcome	1	1	1	1	1	1	1
	Appropriate statistical analyses for collected data	1	1	1	1	1	1	1
Information Bias: Analytic	Appropriate statistical analyses are conducted correctly	1	1	1	1	1	1	1
	Confidence interval is narrow	0	0	0	0	0	0	0
Confounding	Potential confounders identified	1	1	1	1	1	1	1

	Author Year	Guan 2021 ⁶⁹	Gupta 2021 ²⁴	Haki 2021 ²⁵	Hansen 2021 ²⁶	He 2021 ²⁷	Hippisley-Cox 2021 ²⁸	Hu 2020 ⁷⁰
	Outcome(s)	Mortality, ICU Admission, Intubation	Mortality	Mortality	Mortality, ICU Admission	Mortality	Mortality, Hospitalization	ICU Admission
Domain	Signaling question	EMR	data was extracted from electronic medical records	Data retrieved from electronic hospital records	data was extracted from national registries	data retrieved from electronic medical records	Data retrieved from database	data was extracted from medical records
	Adjustment for confounders in study design phase	0	0	0	0	0	0	0
	Adjustment for confounders in data analysis phase	1	1	1	1	1	1	1
Reporting Bias	All pre-specified outcomes are adequately reported	1	1	1	1	1	1	1
Other Bias	No other sources of bias	1	1	1	1	1	1	1
СОІ	Funding sources disclosed and no obvious conflict of interest	1	1	1	1	1	1	1
SCORE	Threat to internal validity	23	23	22	24	23	23	23
	Low, Moderate, High	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate

	Author Year	Huang 2021 ²⁹	laccarino 2021 ³⁰	lzzy 2020 ⁸⁷	Jacobs 2021 ⁷⁶	Jiang 2021 ³¹	Jung 2021 ⁸⁵	Kandula 2021 ³²
	Outcome(s)	Mortality, ICU admission, ventilation, hospitalization	Mortality	ICU Admission, Hospitalization	Ventilation	Mortality	Mortality	Mortality
Domain	Signaling question	Data was extracted from medical records	questionnaires completed by hospitals/centers	Data from database	Data extracted from medical records	electronic medical records	data retrieved from database	data retrieved from public sources including the US census and large population surveys
	Design appropriate to research question	1	1	1	1	1	1	1
	Well described population	1	1	1	1	1	1	0
	Well described setting	1	1	1	1	1	1	1
Study	Well described intervention/ exposure	1	1	1	1	1	1	1
Elements	Well described control/ comparator	1	1	1	1	1	1	0
	Well described outcome	1	1	1	1	1	1	1
	Clear timeline of exposures/ interventions and outcomes	1	1	1	1	1	1	1
Selection Bias: Sampling	Randomization appropriately performed	0	0	0	0	0	0	0
	Allocation adequately concealed	0	0	0	0	0	0	0
	Population sampling appropriate to study design	1	1	1	1	1	1	1

	Author Year	Huang 2021 ²⁹	laccarino 2021 ³⁰	lzzy 2020 ⁸⁷	Jacobs 2021 ⁷⁶	Jiang 2021 ³¹	Jung 2021 ⁸⁵	Kandula 2021 ³²
	Outcome(s)	Mortality, ICU admission, ventilation, hospitalization	Mortality	ICU Admission, Hospitalization	Ventilation	Mortality	Mortality	Mortality
Domain	Signaling question	Data was extracted from medical records	questionnaires completed by hospitals/centers	Data from database	Data extracted from medical records	electronic medical records	data retrieved from database	data retrieved from public sources including the US census and large population surveys
	Attrition not significantly different between groups	1	1	1	1	1	1	1
Selection Bias: Attrition	Attrition <10-15% of population	1	1	1	1	1	1	1
	Attrition appropriately analyzed	1	1	1	1	1	1	1
	Measure of intervention/ exposure is valid	0	0	0	0	0	0	0
Information	Measure of outcome is valid	1	1	1	1	1	1	1
Blas: Measurement and	Fidelity to intervention is measured	0	0	0	0	0	0	0
n	Fidelity to intervention is valid	0	0	0	0	0	0	0
	Prospective study	1	1	1	1	1	1	1
	Adequately powered to detect result	0	0	0	0	0	0	0
Information Bias: Performance & Detection	Outcome assessor blinded	0	0	0	0	0	0	0
	Study participant blinded	0	0	0	0	0	0	0
	Investigator/ data analyst blinded	0	0	0	0	0	0	0

	Author Year	Huang 2021 ²⁹	laccarino 2021 ³⁰	Izzy 2020 ⁸⁷	Jacobs 2021 ⁷⁶	Jiang 2021 ³¹	Jung 2021 ⁸⁵	Kandula 2021 ³²
	Outcome(s)	Mortality, ICU admission, ventilation, hospitalization	Mortality	ICU Admission, Hospitalization	Ventilation	Mortality	Mortality	Mortality
Domain	Signaling question	Data was extracted from medical records	questionnaires completed by hospitals/centers	Data from database	Data extracted from medical records	electronic medical records	data retrieved from database	data retrieved from public sources including the US census and large population surveys
	Data collection methods described in sufficient detail	1	1	1	1	1	1	1
	Data collection methods appropriate	1	1	1	1	1	1	1
	Sufficient follow up to detect outcome	1	1	1	1	1	1	1
	Appropriate statistical analyses for collected data	1	1	1	1	1	1	1
Information Bias: Analytic	Appropriate statistical analyses are conducted correctly	1	0	1	1	1	1	1
	Confidence interval is narrow	0	0	0	0	0	0	0
	Potential confounders identified	1	1	1	1	1	1	1
Confounding	Adjustment for confounders in study design phase	0	0	0	0	0	0	0
	Adjustment for confounders in data analysis phase	1	1	1	1	1	1	1
Reporting Bias	All pre-specified outcomes are adequately reported	1	1	1	1	1	1	1

	Author Year	Huang 2021 ²⁹	laccarino 2021 ³⁰	lzzy 2020 ⁸⁷	Jacobs 2021 ⁷⁶	Jiang 2021 ³¹	Jung 2021 ⁸⁵	Kandula 2021 ³²
	Outcome(s)	Mortality, ICU admission, ventilation, hospitalization	Mortality	ICU Admission, Hospitalization	Ventilation	Mortality	Mortality	Mortality
Domain	Signaling question	Data was extracted from medical records	questionnaires completed by hospitals/centers	Data from database	Data extracted from medical records	electronic medical records	data retrieved from database	data retrieved from public sources including the US census and large population surveys
Other Bias	No other sources of bias	1	1	1	1	1	1	0
СОІ	Funding sources disclosed and no obvious conflict of interest	1	1	1	1	1	1	1
SCORE	Threat to internal validity	23	22	23	23	23	23	20
	Low, Moderate, High	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate

	Author Year	Kang 2020 ³³	Khose 2020 ⁸⁸	Kim E 2021 ³⁴	Kim Y 2021 ⁷¹	Ko 2021 ⁸⁰	Kridin 2021 ³⁵	Lacedonia 2021 ³⁶
	Outcome(s)	Mortality	Case fatality	Mortality	Mortality, ICU Admission	Hospitalization	Mortality, Hospitalization	Mortality, Ventilation
Domain	Signaling question	data retrieved from medical records	data retrieved from database	data analyzed from medical insurance claims	data retrieved from national medical insurance claims	data extracted from COVID-NET, medical records, and BFRSS data	data extracted from database	data collected from medical records and questionnaires
Study Elements	Design appropriate to research question	1	1	1	1	1	1	1
	Well described population	1	1	1	1	1	1	1
	Well described setting	1	0	1	1	1	1	1

Disclaimer: The findings and conclusions herein are draft and have not been formally disseminated by the Centers for Disease Control and Prevention and should not be construed to represent any agency determination or policy.
	Author Year	Kang 2020 ³³	Khose 2020 ⁸⁸	Kim E 2021 ³⁴	Kim Y 2021 ⁷¹	Ko 2021 ⁸⁰	Kridin 2021 ³⁵	Lacedonia 2021 ³⁶
	Outcome(s)	Mortality	Case fatality	Mortality	Mortality, ICU Admission	Hospitalization	Mortality, Hospitalization	Mortality, Ventilation
Domain	Signaling question	data retrieved from medical records	data retrieved from database	data analyzed from medical insurance claims	data retrieved from national medical insurance claims	data extracted from COVID-NET, medical records, and BFRSS data	data extracted from database	data collected from medical records and questionnaires
	Well described intervention/ exposure	1	1	1	1	1	1	1
	Well described control/ comparator	1	1	1	1	1	1	1
	Well described outcome	1	1	1	1	1	1	1
	Clear timeline of exposures/ interventions and outcomes	1	1	1	1	1	1	1
	Randomization appropriately performed	0	0	0	0	0	0	0
Selection Bias: Sampling	Allocation adequately concealed	0	0	0	0	0	0	0
	Population sampling appropriate to study design	1	1	1	1	0	1	1
	Attrition not significantly different between groups	1	1	1	1	1	1	1
Selection Bias: Attrition	Attrition <10-15% of population	1	1	1	1	1	1	1
	Attrition appropriately analyzed	1	1	1	1	1	1	1

	Author Year	Kang 2020 ³³	Khose 2020 ⁸⁸	Kim E 2021 ³⁴	Kim Y 2021 ⁷¹	Ko 2021 ⁸⁰	Kridin 2021 ³⁵	Lacedonia 2021 ³⁶
	Outcome(s)	Mortality	Case fatality	Mortality	Mortality, ICU Admission	Hospitalization	Mortality, Hospitalization	Mortality, Ventilation
Domain	Signaling question	data retrieved from medical records	data retrieved from database	data analyzed from medical insurance claims	data retrieved from national medical insurance claims	data extracted from COVID-NET, medical records, and BFRSS data	data extracted from database	data collected from medical records and questionnaires
	Measure of intervention/ exposure is valid	0	0	0	0	0	0	0
Information	Measure of outcome is valid	1	1	1	1	1	1	1
Bias: Measurement and	Fidelity to intervention is measured	0	0	0	0	0	0	1
n	Fidelity to intervention is valid	0	0	0	0	0	0	1
	Prospective study	1	1	1	1	1	1	1
	Adequately powered to detect result	0	1	0	0	0	0	0
	Outcome assessor blinded	0	0	0	0	0	0	0
	Study participant blinded	0	0	0	0	0	0	0
Information	Investigator/ data analyst blinded	0	0	0	0	0	0	0
Performance & Detection	Data collection methods described in sufficient detail	1	1	1	1	1	1	1
	Data collection methods appropriate	1	1	1	1	1	1	0
	Sufficient follow up to detect outcome	1	0	1	1	1	1	1
Information Bias: Analytic	Appropriate statistical analyses for collected data	1	1	1	1	1	1	1

	Author Year	Kang 2020 ³³	Khose 2020 ⁸⁸	Kim E 2021 ³⁴	Kim Y 2021 ⁷¹	Ko 2021 ⁸⁰	Kridin 2021 ³⁵	Lacedonia 2021 ³⁶
	Outcome(s)	Mortality	Case fatality	Mortality	Mortality, ICU Admission	Hospitalization	Mortality, Hospitalization	Mortality, Ventilation
Domain	Signaling question	data retrieved from medical records	data retrieved from database	data analyzed from medical insurance claims	data retrieved from national medical insurance claims	data extracted from COVID-NET, medical records, and BFRSS data	data extracted from database	data collected from medical records and questionnaires
	Appropriate statistical analyses are conducted correctly	1	1	1	1	1	1	1
	Confidence interval is narrow	0	1	0	0	0	0	0
	Potential confounders identified	1	1	1	1	1	1	1
Confounding	Adjustment for confounders in study design phase	0	1	0	0	0	0	0
	Adjustment for confounders in data analysis phase	1	0	1	1	1	1	1
Reporting Bias	All pre-specified outcomes are adequately reported	1	1	1	1	1	1	1
Other Bias	No other sources of bias	1	1	1	1	1	1	1
СОІ	Funding sources disclosed and no obvious conflict of interest	1	1	1	1	1	1	1
SCORE	Threat to internal validity	23	23	23	23	22	23	24
-	Low, Moderate, High	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate

	Author Year	Lazcano 2021 ³⁷	Lee 2021 ⁸⁶	Li 2020 ³⁸	Lim 2021 ³⁹	Lobelo 2021 ⁸¹	Machado-Alba 2021 ⁷²	Maestre-Muniz 2021 ⁴⁰
	Outcome(s)	Mortality	Mortality, ICU admission, Ventilation, Hospitalization	Mortality	Mortality	Hospitalization	Mortality, ICU Admission	Mortality
Domain	Signaling question	data extracted from database	data extracted from medical records	Data retrieved from medical records	Data obtained from electronic medical records and chest CTs	data extracted from electronic health record	Data extracted from medical records	Data was extracted from electronic medical records
	Design appropriate to research question	1	1	1	1	1	1	1
Study	Well described population	1	1	0	1	1	1	1
	Well described setting	1	1	0	1	1	1	1
	Well described intervention/ exposure	1	1	1	1	1	1	1
Elements	Well described control/ comparator	1	1	1	1	1	1	1
	Well described outcome	1	1	1	1	1	1	1
	Clear timeline of exposures/ interventions and outcomes	1	1	1	1	1	1	1
	Randomization appropriately performed	0	0	0	0	0	0	0
Selection Bias: Sampling	Allocation adequately concealed	0	0	0	0	0	0	0
	Population sampling appropriate to study design	1	1	1	1	1	1	1
Selection Bias: Attrition	Attrition not significantly different between groups	1	1	1	1	1	1	1

	Author Year	Lazcano 2021 ³⁷	Lee 2021 ⁸⁶	Li 2020 ³⁸	Lim 2021 ³⁹	Lobelo 2021 ⁸¹	Machado-Alba 2021 ⁷²	Maestre-Muniz 2021 ⁴⁰
	Outcome(s)	Mortality	Mortality, ICU admission, Ventilation, Hospitalization	Mortality	Mortality	Hospitalization	Mortality, ICU Admission	Mortality
Domain	Signaling question	data extracted from database	data extracted from medical records	Data retrieved from medical records	Data obtained from electronic medical records and chest CTs	data extracted from electronic health record	Data extracted from medical records	Data was extracted from electronic medical records
	Attrition <10-15% of population	1	1	1	1	1	1	1
	Attrition appropriately analyzed	1	1	0	1	1	1	1
Information	Measure of intervention/ exposure is valid	0	0	0	0	0	0	0
	Measure of outcome is valid	1	1	1	1	1	1	1
Bias: Measurement and	Fidelity to intervention is measured	0	0	0	0	0	0	0
n	Fidelity to intervention is valid	0	0	0	0	0	0	0
	Prospective study	1	1	1	1	1	1	1
	Adequately powered to detect result	0	0	0	0	0	0	0
	Outcome assessor blinded	0	0	0	0	0	0	0
Information	Study participant blinded	0	0	0	0	0	0	0
Information Bias: Performance & Detection	Investigator/ data analyst blinded	0	0	0	0	0	0	0
	Data collection methods described in sufficient detail	1	1	1	1	1	1	1
	Data collection methods appropriate	1	1	1	1	1	1	1

	Author Year	Lazcano 2021 ³⁷	Lee 2021 ⁸⁶	Li 2020 ³⁸	Lim 2021 ³⁹	Lobelo 2021 ⁸¹	Machado-Alba 2021 ⁷²	Maestre-Muniz 2021 ⁴⁰
	Outcome(s)	Mortality	Mortality, ICU admission, Ventilation, Hospitalization	Mortality	Mortality	Hospitalization	Mortality, ICU Admission	Mortality
Domain	Signaling question	data extracted from database	data extracted from medical records	Data retrieved from medical records	Data obtained from electronic medical records and chest CTs	data extracted from electronic health record	Data extracted from medical records	Data was extracted from electronic medical records
	Sufficient follow up to detect outcome	1	1	1	1	1	1	1
	Appropriate statistical analyses for collected data	1	1	1	1	1	1	1
Information Bias: Analytic	Appropriate statistical analyses are conducted correctly	1	1	1	1	1	1	1
	Confidence interval is narrow	0	0	0	0	0	0	0
	Potential confounders identified	1	1	1	1	1	1	1
Confounding	Adjustment for confounders in study design phase	0	0	0	0	0	0	0
	Adjustment for confounders in data analysis phase	1	1	1	1	1	1	1
Reporting Bias	All pre-specified outcomes are adequately reported	1	1	1	1	1	1	1
Other Bias	No other sources of bias	1	1	1	1	1	1	1
СОІ	Funding sources disclosed and no obvious conflict of interest	1	1	1	1	1	1	1

	Author Year	Lazcano 2021 ³⁷	Lee 2021 ⁸⁶	Li 2020 ³⁸	Lim 2021 ³⁹	Lobelo 2021 ⁸¹	Machado-Alba 2021 ⁷²	Maestre-Muniz 2021 ⁴⁰
	Outcome(s)	Mortality	Mortality, ICU admission, Ventilation, Hospitalization	Mortality	Mortality	Hospitalization	Mortality, ICU Admission	Mortality
Domain	Signaling question	data extracted from database	data extracted from medical records	Data retrieved from medical records	Data obtained from electronic medical records and chest CTs	data extracted from electronic health record	Data extracted from medical records	Data was extracted from electronic medical records
SCORE	Threat to internal validity	23	23	20	23	23	23	23
	Low, Moderate, High	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate

	Author Year	Manohar 2021 ⁴¹	Marron 2021 ⁴²	Merzon 2021 ⁴³	Meza 2021 ⁴⁴	Mollalo 2021 ⁴⁵	Momeni- Boroujeni 2021 ⁴⁶	Morales-Romero 2021 ⁷⁵
	Outcome(s)	Mortality, hospitalized	Mortality, ICU admission, ventilation	Mortality, hospitalization	Mortality, Hospitalization	Mortality	Mortality	Mortality, ICU admission, Intubation, Hospitalization
Domain	Signaling question	data from EMR	data extracted from EMR	data from HMO	data from electronic health records	Data retrieved from USAFacts and University of Washington Global Health Data Exchange	data extracted from medical records	Data collected by national database
	Design appropriate to research question	1	1	1	1	1	1	1
	Well described population	1	1	1	1	1	1	1
Church	Well described setting	1	1	1	1	1	1	1
Study Elements	Well described intervention/ exposure	1	1	1	1	1	1	1
	Well described control/ comparator	1	1	1	1	1	1	1
	Well described outcome	1	1	1	1	1	1	1

	Author Year	Manohar 2021 ⁴¹	Marron 2021 ⁴²	Merzon 2021 ⁴³	Meza 2021 ⁴⁴	Mollalo 2021 ⁴⁵	Momeni- Boroujeni 2021 ⁴⁶	Morales-Romero 2021 ⁷⁵
	Outcome(s)	Mortality, hospitalized	Mortality, ICU admission, ventilation	Mortality, hospitalization	Mortality, Hospitalization	Mortality	Mortality	Mortality, ICU admission, Intubation, Hospitalization
Domain	Signaling question	data from EMR	data extracted from EMR	data from HMO	data from electronic health records	Data retrieved from USAFacts and University of Washington Global Health Data Exchange	data extracted from medical records	Data collected by national database
	Clear timeline of exposures/ interventions and outcomes	1	1	1	1	0	1	1
	Randomization appropriately performed	0	0	0	0	0	0	0
Selection Bias: Sampling	Allocation adequately concealed	0	0	0	0	0	0	0
	Population sampling appropriate to study design	1	1	1	1	1	1	1
	Attrition not significantly different between groups	1	1	1	1	1	1	1
Selection Bias: Attrition	Attrition <10-15% of population	1	1	1	1	1	1	1
	Attrition appropriately analyzed	1	1	1	1	1	1	1
Information Bias:	Measure of intervention/ exposure is valid	0	1	0	0	0	0	0
Measurement and	Measure of outcome is valid	1	1	1	1	0	1	1
Misclassificatio n	Fidelity to intervention is measured	0	0	0	0	0	0	0

	Author Year	Manohar 202141	Marron 2021 ⁴²	Merzon 2021 ⁴³	Meza 2021 ⁴⁴	Mollalo 2021 ⁴⁵	Momeni- Boroujeni 2021 ⁴⁶	Morales-Romero 2021 ⁷⁵
	Outcome(s)	Mortality, hospitalized	Mortality, ICU admission, ventilation	Mortality, hospitalization	Mortality, Hospitalization	Mortality	Mortality	Mortality, ICU admission, Intubation, Hospitalization
Domain	Signaling question	data from EMR	data extracted from EMR	data from HMO	data from electronic health records	Data retrieved from USAFacts and University of Washington Global Health Data Exchange	data extracted from medical records	Data collected by national database
	Fidelity to intervention is valid	0	0	0	0	0	0	0
	Prospective study	1	1	1	1	0	1	1
	Adequately powered to detect result	1	0	0	0	0	1	1
	Outcome assessor blinded	0	0	0	0	0	0	0
	Study participant blinded	0	0	0	0	0	0	0
Information Bias:	Investigator/ data analyst blinded	0	0	0	0	0	0	0
Performance & Detection	Data collection methods described in sufficient detail	1	1	1	1	1	1	1
	Data collection methods appropriate	1	1	1	1	1	1	1
	Sufficient follow up to detect outcome	1	1	1	1	1	1	1
	Appropriate statistical analyses for collected data	1	1	1	1	1	1	1
Information Bias: Analytic	Appropriate statistical analyses are conducted correctly	1	1	1	1	1	1	1
	Confidence interval is narrow	0	0	0	0	1	0	0

	Author Year	Manohar 2021 ⁴¹	Marron 2021 ⁴²	Merzon 2021 ⁴³	Meza 2021 ⁴⁴	Mollalo 2021 ⁴⁵	Momeni- Boroujeni 2021 ⁴⁶	Morales-Romero 2021 ⁷⁵
	Outcome(s)	Mortality, hospitalized	Mortality, ICU admission, ventilation	Mortality, hospitalization	Mortality, Hospitalization	Mortality	Mortality	Mortality, ICU admission, Intubation, Hospitalization
Domain	Signaling question	data from EMR	data extracted from EMR	data from HMO	data from electronic health records	Data retrieved from USAFacts and University of Washington Global Health Data Exchange	data extracted from medical records	Data collected by national database
	Potential confounders identified	1	1	1	1	1	1	1
Confounding	Adjustment for confounders in study design phase	0	0	0	0	0	0	0
	Adjustment for confounders in data analysis phase	1	1	1	1	1	1	1
Reporting Bias	All pre-specified outcomes are adequately reported	1	1	1	1	1	1	1
Other Bias	No other sources of bias	1	1	1	1	1	1	1
СОІ	Funding sources disclosed and no obvious conflict of interest	1	1	1	0	1	1	1
SCORE	Threat to internal validity	24	24	23	22	21	24	24
JCORE	Low, Moderate, High	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate

	Author Year	Mushtaq 202147	Naqvi 2021 ⁴⁸	Oh 2021 ⁴⁹	Parlak 2021 ⁵⁰	Parra-Bracamonte 2020 ⁵¹	Puebla Neira 2021 ⁵²	Purroy 2021 ⁵³
	Outcome(s)	Mortality	Mortality	Mortality	Mortality, ICU admission	Mortality	Mortality, ICU, Mechanical Ventilation	Mortality
Domain	Signaling question	data was extracted from electronic database	Data was collected prospectively at the time of visit	data was extracted from database	data extracted from medical records	extracted from open data source	data extracted from electronic health records	data extracted from medical records
	Design appropriate to research question	1	1	1	1	1	1	1
Study	Well described population	1	1	1	1	1	1	1
	Well described setting	1	1	1	1	1	1	1
	Well described intervention/ exposure	1	1	1	1	1	1	1
Elements	Well described control/ comparator	1	1	1	1	1	1	1
	Well described outcome	1	1	1	1	1	1	1
	Clear timeline of exposures/ interventions and outcomes	1	1	1	1	1	1	1
	Randomization appropriately performed	0	0	0	0	0	0	0
Selection Bias: Sampling	Allocation adequately concealed	0	0	0	0	0	0	0
	Population sampling appropriate to study design	1	1	1	1	1	1	1
Selection Bias: Attrition	Attrition not significantly different between groups	1	1	1	1	1	1	1

	Author Year	Mushtaq 202147	Naqvi 2021 ⁴⁸	Oh 2021 ⁴⁹	Parlak 2021 ⁵⁰	Parra-Bracamonte 2020 ⁵¹	Puebla Neira 2021 ⁵²	Purroy 2021 ⁵³
	Outcome(s)	Mortality	Mortality	Mortality	Mortality, ICU admission	Mortality	Mortality, ICU, Mechanical Ventilation	Mortality
Domain	Signaling question	data was extracted from electronic database	Data was collected prospectively at the time of visit	data was extracted from database	data extracted from medical records	extracted from open data source	data extracted from electronic health records	data extracted from medical records
	Attrition <10-15% of population	1	1	1	1	1	1	1
	Attrition appropriately analyzed	1	1	1	1	1	1	1
	Measure of intervention/ exposure is valid	0	0	0	0	0	0	0
Information	Measure of outcome is valid	1	1	1	1	1	1	1
Bias: Measurement and	Fidelity to intervention is measured	0	0	0	0	0	0	0
n	Fidelity to intervention is valid	0	0	0	0	0	0	0
	Prospective study	1	1	1	1	1	1	1
	Adequately powered to detect result	0	0	1	0	0	0	0
	Outcome assessor blinded	0	0	0	0	0	0	0
Information	Study participant blinded	0	0	0	0	0	0	0
Bias:	Investigator/ data analyst blinded	0	0	0	0	0	0	0
Performance & Detection	Data collection methods described in sufficient detail	1	1	1	1	1	1	1
	Data collection methods appropriate	1	1	1	1	1	1	1

	Author Year	Mushtaq 202147	Naqvi 2021 ⁴⁸	Oh 2021 ⁴⁹	Parlak 2021 ⁵⁰	Parra-Bracamonte 2020 ⁵¹	Puebla Neira 2021 ⁵²	Purroy 2021 ⁵³
	Outcome(s)	Mortality	Mortality	Mortality	Mortality, ICU admission	Mortality	Mortality, ICU, Mechanical Ventilation	Mortality
Domain	Signaling question	data was extracted from electronic database	Data was collected prospectively at the time of visit	data was extracted from database	data extracted from medical records	extracted from open data source	data extracted from electronic health records	data extracted from medical records
	Sufficient follow up to detect outcome	1	1	1	1	1	1	1
	Appropriate statistical analyses for collected data	1	1	1	1	1	1	1
Information Bias: Analytic	Appropriate statistical analyses are conducted correctly	1	1	1	1	1	1	1
	Confidence interval is narrow	0	0	0	0	1	0	0
	Potential confounders identified	1	1	1	1	1	1	1
Confounding	Adjustment for confounders in study design phase	0	0	0	0	0	0	0
	Adjustment for confounders in data analysis phase	1	1	1	1	1	1	1
Reporting Bias	All pre-specified outcomes are adequately reported	1	1	1	1	1	1	1
Other Bias	No other sources of bias	1	1	1	1	1	1	1
СОІ	Funding sources disclosed and no obvious conflict of interest	1	1	1	1	1	1	1

	Author Year	Mushtaq 2021 ⁴⁷	Naqvi 2021 ⁴⁸	Oh 2021 ⁴⁹	Parlak 2021 ⁵⁰	Parra-Bracamonte 2020 ⁵¹	Puebla Neira 2021 ⁵²	Purroy 2021 ⁵³
	Outcome(s)	Mortality	Mortality	Mortality	Mortality, ICU admission	Mortality	Mortality, ICU, Mortality Ventilation	
Domain	Signaling question	data was extracted from electronic database	Data was collected prospectively at the time of visit	data was extracted from database	data extracted from medical records	extracted from open data source	data extracted from electronic health records	data extracted from medical records
SCORE	Threat to internal validity	23	23	24 23		24	23	23
	Low, Moderate, High	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate

	Author Year	Ramos-Martinez 2021 ⁸³	Rezaei 2021 ⁵⁴	Rubio-Rivas 2021 ⁷³	Rubio-Rivas 2020 ⁵⁵	Sahin 2021 ⁵⁶	Sami 2021 ⁵⁷	Santorelli 2021 ⁵⁸
	Outcome(s)	Re-admissions	Mortality	Mortality, ICU Admission, Intubation, Ventilation	Mortality, ICU admission, Ventilation	Mortality	Mortality	Mortality, ICU admission
Domain	Signaling question	data extracted from nation-wide registry	Data from electronic health records	Data extracted from medical records	Data extracted from nationwide registry	Data from medical records	data from medical records	data from EMR
	Design appropriate to research question	1	1	1	1	1	1	1
	Well described population	1	1	1	1	1	1	1
	Well described setting	1	1	1	1	1	1	1
Study Elements	Well described intervention/ exposure	1	0	1	1	1	1	1
	Well described control/ comparator	1	0	1	1	1	1	1
	Well described outcome	1	1	1	1	1	1	1
	Clear timeline of exposures/	1	1	1	1	1	1	1

	Author Year	Ramos-Martinez 2021 ⁸³	Rezaei 2021 ⁵⁴	Rubio-Rivas 2021 ⁷³	Rubio-Rivas 2020 ⁵⁵	Sahin 2021 ⁵⁶	Sami 2021 ⁵⁷	Santorelli 2021 ⁵⁸
	Outcome(s)	Re-admissions	Mortality	Mortality, ICU Admission, Intubation, Ventilation	Mortality, ICU admission, Ventilation	Mortality	Mortality	Mortality, ICU admission
Domain	Signaling question	data extracted from nation-wide registry	Data from electronic health records	Data extracted from medical records	Data extracted from nationwide registry	Data from medical records	data from medical records	data from EMR
	interventions and outcomes							
	Randomization appropriately performed	0	0	0	0	0	0	0
Selection Bias: Sampling	Allocation adequately concealed	0	0	0	0	0	0	0
	Population sampling appropriate to study design	1	1	1	1	1	1	1
	Attrition not significantly different between groups	1	1	1	1	1	0	1
Selection Bias: Attrition	Attrition <10-15% of population	1	1	1	1	1	0	1
	Attrition appropriately analyzed	1	1	1	1	1	0	1
lafa maatia a	Measure of intervention/ exposure is valid	0	0	0	0	0	0	0
Information Bias: Measurement and Misclassificatio n	Measure of outcome is valid	1	1	1	1	1	1	1
	Fidelity to intervention is measured	0	0	0	0	0	0	0
	Fidelity to intervention is valid	0	0	0	0	0	0	0
	Prospective study	1	1	1	1	1	1	1

Disclaimer: The findings and conclusions herein are draft and have not been formally disseminated by the Centers for Disease Control and Prevention and should not be construed to represent any agency determination or policy.

	Author Year	Ramos-Martinez 2021 ⁸³	Rezaei 2021 ⁵⁴	Rubio-Rivas 2021 ⁷³	Rubio-Rivas 2020 ⁵⁵	Sahin 2021 ⁵⁶	Sami 2021 ⁵⁷	Santorelli 2021 ⁵⁸
	Outcome(s)	Re-admissions	Mortality	Mortality, ICU Admission, Intubation, Ventilation	Mortality, ICU admission, Ventilation	Mortality	Mortality	Mortality, ICU admission
Domain	Signaling question	data extracted from nation-wide registry	Data from electronic health records	Data extracted from medical records	Data extracted from nationwide registry	Data from medical records	data from medical records	data from EMR
	Adequately powered to detect result	0	0	1	0	0	0	0
	Outcome assessor blinded	0	0	0	0	0	0	0
	Study participant blinded	0	0	0	0	0	0	0
Information	Investigator/ data analyst blinded	0	0	0	0	0	0	0
Bias: Performance & Detection	Data collection methods described in sufficient detail	1	1	1	1	1	1	1
	Data collection methods appropriate	1	0	1	1	1	1	1
	Sufficient follow up to detect outcome	1	1	1	1	1	1	1
	Appropriate statistical analyses for collected data	1	1	1	1	1	1	1
Information Bias: Analytic	Appropriate statistical analyses are conducted correctly	1	1	1	1	1	1	1
	Confidence interval is narrow	0	1	0	0	0	0	0
Confounding	Potential confounders identified	1	1	1	1	1	1	1
comounding	Adjustment for confounders in study design phase	0	0	0	0	0	0	0

	Author Year	Ramos-Martinez 2021 ⁸³	Rezaei 2021 ⁵⁴	Rubio-Rivas 2021 ⁷³	Rubio-Rivas 2020 ⁵⁵	Sahin 2021 ⁵⁶	Sami 2021 ⁵⁷	Santorelli 2021 ⁵⁸
	Outcome(s)	Re-admissions	Mortality	Mortality, ICU Admission, Intubation, Ventilation	Mortality, ICU admission, Ventilation	Mortality	Mortality	Mortality, ICU admission
Domain	Signaling question	data extracted from nation-wide registry	Data from electronic health records	Data extracted from medical records	Data extracted from nationwide registry	Data from medical records	data from medical records	data from EMR
	Adjustment for confounders in data analysis phase	1	1	1	1	1	1	1
Reporting Bias	All pre-specified outcomes are adequately reported	1	1	1	1	0	1	1
Other Bias	No other sources of bias	1	1	1	1	1	1	1
СОІ	Funding sources disclosed and no obvious conflict of interest	1	1	1	1	1	1	1
SCORE	Threat to internal validity	23	21	24	23	22	20	23
	Low, Moderate, High	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate

	Author Year	Sen 2021 ⁸⁴	Shin 2021 ⁵⁹	Song 2020 ⁷⁷	Tang 2020 ⁶⁰	Tessitore 2021 ⁶¹	Timberlake 2021 ⁶²	Tsai 2021 ⁶³
	Outcome(s)	Mortality, ICU Admission, Intubation, Ventilation, Hospitalization	Mortality	Mortality, Ventilation	Mortality, Hospitalization	Mortality	Mortality, ICU admission, Intubation	Mortality
Domain	Signaling question	data from electronic medical records	national database	data was extracted from medical records and self-reported by patients	data extracted from medical records	Data extracted from electronic medical records	Data was extracted from retrospective chart review of all patients	VA COVID-19 data resource
	Design appropriate to research question	1	1	1	1	1	1	1
	Well described population	1	1	1	1	1	1	1
	Well described setting	1	1	1	1	1	1	1
Study	Well described intervention/ exposure	1	1	1	1	1	1	1
Elements	Well described control/ comparator	0	1	1	1	1	1	1
	Well described outcome	1	1	1	1	1	1	1
	Clear timeline of exposures/ interventions and outcomes	1	1	1	1	1	1	1
	Randomization appropriately performed	0	0	0	0	0	0	0
Selection Bias: Sampling	Allocation adequately concealed	0	0	0	0	0	0	0
	Population sampling appropriate to study design	1	1	1	1	1	1	1
Selection Bias: Attrition	Attrition not significantly different between groups	1	1	1	1	1	1	1

	Author Year	Sen 2021 ⁸⁴	Shin 2021 ⁵⁹	Song 2020 ⁷⁷	Tang 2020 ⁶⁰	Tessitore 2021 ⁶¹	Timberlake 2021 ⁶²	Tsai 2021 ⁶³
	Outcome(s)	Mortality, ICU Admission, Intubation, Ventilation, Hospitalization	Mortality	Mortality, Ventilation	Mortality, Hospitalization	Mortality	Mortality, ICU admission, Intubation	Mortality
Domain	Signaling question	data from electronic medical records	national database	data was extracted from medical records and self-reported by patients	data extracted from medical records	Data extracted from electronic medical records	Data was extracted from retrospective chart review of all patients	VA COVID-19 data resource
	Attrition <10-15% of population	1	1	1	1	1	1	1
	Attrition appropriately analyzed	1	1	1	1	1	1	1
	Measure of intervention/ exposure is valid	0	0	0	0	0	0	0
Information	Measure of outcome is valid	1	1	1	1	1	1	1
Bias: Measurement and Misclassificatio	Fidelity to intervention is measured	1	0	0	0	0	0	0
n	Fidelity to intervention is valid	1	0	0	0	0	0	0
	Prospective study	1	1	1	1	1	1	1
	Adequately powered to detect result	1	0	0	0	1	0	0
	Outcome assessor blinded	0	0	0	0	0	0	0
Information	Study participant blinded	0	0	0	0	0	0	0
Bias: Performance & Detection -	Investigator/ data analyst blinded	0	0	0	0	0	0	0
	Data collection methods described in sufficient detail	1	1	1	1	1	1	1

	Author Year	Sen 2021 ⁸⁴	Shin 2021 ⁵⁹	Song 2020 ⁷⁷	Tang 2020 ⁶⁰	Tessitore 2021 ⁶¹	Timberlake 2021 ⁶²	Tsai 2021 ⁶³
	Outcome(s)	Mortality, ICU Admission, Intubation, Ventilation, Hospitalization	Mortality	Mortality, Ventilation	Mortality, Hospitalization	Mortality	Mortality, ICU admission, Intubation	Mortality
Domain	Signaling question	data from electronic medical records	national database	data was extracted from medical records and self-reported by patients	data extracted from medical records	Data extracted from electronic medical records	Data was extracted from retrospective chart review of all patients	VA COVID-19 data resource
	Data collection methods appropriate	1	1	0	1	1	1	1
	Sufficient follow up to detect outcome	1	1	1	1	1	1	1
	Appropriate statistical analyses for collected data	1	1	1	1	1	1	1
Information Bias: Analytic	Appropriate statistical analyses are conducted correctly	1	1	1	1	1	1	1
	Confidence interval is narrow	0	0	0	0	0	0	0
	Potential confounders identified	1	1	1	1	1	1	1
Confounding	Adjustment for confounders in study design phase	0	0	0	0	0	0	0
	Adjustment for confounders in data analysis phase	1	1	1	1	1	1	1
Reporting Bias	All pre-specified outcomes are adequately reported	1	1	1	1	1	1	1
Other Bias	No other sources of bias	1	1	1	1	1	1	1

	Author Year	Sen 2021 ⁸⁴	Shin 2021 ⁵⁹	Song 2020 ⁷⁷	Tang 2020 ⁶⁰	Tessitore 2021 ⁶¹	Timberlake 2021 ⁶²	Tsai 2021 ⁶³
	Outcome(s)	Mortality, ICU Admission, Intubation, Ventilation, Hospitalization	Mortality	Mortality, Ventilation	Mortality, Hospitalization	Mortality	Mortality, ICU admission, Intubation	Mortality
Domain	Signaling question	data from electronic medical records	national database	data was extracted from medical records and self-reported by patients	data extracted from medical records	Data extracted from electronic medical records	Data was extracted from retrospective chart review of all patients	VA COVID-19 data resource
COI	Funding sources disclosed and no obvious conflict of interest	1	1	1	1	1	1	1
SCORE	Threat to internal validity	25	23	22	23	24	23	23
	Low, Moderate, High	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate

	Author Year	Valent 2021 ⁶⁴	Vera-Zertuche 2021 ⁷⁴	Wei 2021 ⁸²	Yoshida 2021 ⁶⁵
	Outcome(s)	Mortality, ICU Admission, Hospitalization	Mortality, ICU admission, Ventilation, Hospitalization	Hospitalization	Mortality, ICU admission, Ventilation
Domain	Signaling question	data from database	Data extracted from an open dataset	Data extracted from electronic health records	data was extracted from medical records
	Design appropriate to research question	1	1	1	1
C+udu	Well described population	1	1	1	1
Elements	Well described setting	1	1	1	1
	Well described intervention/ exposure	1	1	1	1

	Author Year	Valent 2021 ⁶⁴	Vera-Zertuche 2021 ⁷⁴	Wei 2021 ⁸²	Yoshida 2021 ⁶⁵
	Outcome(s)	Mortality, ICU Admission, Hospitalization	Mortality, ICU admission, Ventilation, Hospitalization	Hospitalization	Mortality, ICU admission, Ventilation
Domain	Signaling question	data from database	Data extracted from an open dataset	Data extracted from electronic health records	data was extracted from medical records
	Well described control/ comparator	1	1	1	1
	Well described outcome	1	1	1	1
	Clear timeline of exposures/ interventions and outcomes	1	1	1	1
Selection Bias: Sampling	Randomization appropriately performed	0	0	0	0
	Allocation adequately concealed	0	0	0	0
	Population sampling appropriate to study design	1	1	1	1
Selection Bias: Attrition	Attrition not significantly different between groups	1	1	1	1
	Attrition <10-15% of population	1	1	1	1
	Attrition appropriately analyzed	1	1	1	1
Information Bias: Measurement and	Measure of intervention/ exposure is valid	0	0	0	0
	Measure of outcome is valid	1	1	1	1

	Author Year	Valent 2021 ⁶⁴	Vera-Zertuche 2021 ⁷⁴	Wei 2021 ⁸²	Yoshida 2021 ⁶⁵
	Outcome(s)	Mortality, ICU Admission, Hospitalization	Mortality, ICU admission, Ventilation, Hospitalization	Hospitalization	Mortality, ICU admission, Ventilation
Domain	Signaling question	data from database	Data extracted from an open dataset	Data extracted from electronic health records	data was extracted from medical records
Misclassificatio n	Fidelity to intervention is measured	0	0	0	0
	Fidelity to intervention is valid	0	0	0	0
	Prospective study	1	1	1	1
	Adequately powered to detect result	0	0	0	0
Information Bias: Performance & Detection	Outcome assessor blinded	0	0	0	0
	Study participant blinded	0	0	0	0
	Investigator/ data analyst blinded	0	0	0	0
	Data collection methods described in sufficient detail	1	1	1	1
	Data collection methods appropriate	1	1	1	1
	Sufficient follow up to detect outcome	0	1	1	1
Information Bias: Analytic	Appropriate statistical analyses for collected data	1	1	1	1
	Appropriate statistical analyses are conducted correctly	1	1	1	1
	Confidence interval is narrow	0	0	1	0

	Author Year	Valent 2021 ⁶⁴	Vera-Zertuche 2021 ⁷⁴	Wei 2021 ⁸²	Yoshida 2021 ⁶⁵
	Outcome(s)	Mortality, ICU Admission, Hospitalization	Mortality, ICU admission, Ventilation, Hospitalization	Hospitalization	Mortality, ICU admission, Ventilation
Domain	Signaling question	data from database	Data extracted from an open dataset	Data extracted from electronic health records	data was extracted from medical records
Confounding	Potential confounders identified	1	1	1	1
	Adjustment for confounders in study design phase	0	0	0	0
	Adjustment for confounders in data analysis phase	1	1	1	1
Reporting Bias	All pre-specified outcomes are adequately reported	1	1	1	1
Other Bias	No other sources of bias	1	1	1	1
СОІ	Funding sources disclosed and no obvious conflict of interest	1	1	1	1
SCORE	Threat to internal validity	22	23	24	23
	Low, Moderate, High	Moderate	Moderate	Moderate	Moderate

Threat to internal validity measures:

- Low >75% of elements are satisfied indicated by a 1 meaning yes,
- Moderate ≤75% to > 50% of elements are satisfied indicated by a 1 meaning yes.,
- High ≤50% of elements are satisfied, which is indicated by a 1 meaning yes.

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D. Abbreviations

Acronym	Full
95% CI	95% confidence interval
ALC	Absolute lymphocyte count
aHR	Adjusted hazard ratio
aOR	Adjusted odds ratio
aRR	Adjusted risk ratio
BMI	Body mass index
CF	Cystic fibrosis
CHF	Chronic heart failure
COI	Conflict of interest
COPD	Chronic obstructive pulmonary disease
ECMO	Extracorporeal membrane oxygenation
EMR	Electronic medical records
ERT	Evidence Review Team
HR	Hazard ratio
ICD-10	International Classification of Diseases, 10th Revision
ICD-9	International Classification of Diseases, 9th Revision
ICS	Inhaled corticosteroid
ICU	Intensive care unit
IVA	Internal Validity Assessment
LABA	Long-acting beta-agonist
LAMA	Long-acting muscarinic antagonist
LTRA	Leukotriene receptor antagonist therapy
MOA	Measure(s) of association
ND	Not defined
NR	Not reported
NSAID	Non-steroidal anti-inflammatory drug
OCS	Oral corticosteroid
OR	Odds ratio
PECO	Population, exposure, comparator, and outcomes

RR	Risk ratio
RT-PCR	Real-time polymerase chain reaction
SABA	Short-acting beta-agonist
SAMA	Short-acting muscarinic antagonist
US	United States