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EVIDENCE SEARCH REPORT

RESEARCH QUESTION: What are the risk factors for severity and death associated with COVID-19?	**UNIQUE IDENTIFIER:** EPM050901-01 ESR

RESOURCES USED:

- CDC website & database
- Centre for Evidence-Based Medicine
- CINAHL
- Embase
- European Centre for Disease Prevention and Control
- Google
- Google Scholar
- Health Canada
- medRxiv
- LitCovid
- MEDLINE
- Public Health England
- Public Health Ontario
- PubMed
- WHO website & database
- Reference/Citation Lists

LIMITS/EXCLUSIONS/INCLUSIONS: English	**REFERENCE INTERVIEW COMPLETED:** May 8 & 11, 2020
DATE: May 12, 2020	
LIBRARIAN: Michelle Dalidowicz, Catherine Young and Mark Mueller	**REQUESTOR:** Dr. Jenny Basran

TEAM: Epidemiology and Modelling

SEARCH ALERTS CREATED: EMBASE AND MEDLINE

CITE AS:

Dalidowicz, M; Young, C; Mueller, M. What are the risk factors for severity and death associated with COVID-19? 2020 May 12; Document no.: EPM050901-01 ESR. In: COVID-19 Rapid Evidence Reviews [Internet]. SK: SK COVID Evidence Support Team, c2020. 48 p. (CEST evidence search report)

LIBRARIAN NOTES/COMMENTS

This evidence search included selection on the part of the librarians and then a secondary selection process that involved a University of Saskatchewan modeller. The selection process followed by the librarians was according to the parameters laid out in the reference interview and concepts provided by the research team.

SEARCH RESULTS

To obtain the full-text articles or to request offsite access, email library@saskhealthauthority.ca.

SUMMARIES, GUIDELINES & OTHER RESOURCES

Centers for Disease Control and Prevention

- Preliminary Estimates of the Prevalence of Selected Underlying Health Conditions Among Patients with Coronavirus Disease 2019 — United States, February 12–March 28, 2020. MMWR Morb Mortal Wkly Rep 2020;69:382–386. https://www.cdc.gov/mmwr/volumes/69/wr/mm6913e2.htm
- Severe outcomes among patients with coronavirus disease 2019 (COVID-19) - United States, February 12-March 16, 2020. MMWR Morb Mortal Wkly Rep. 2020;69(12):343-46. http://dx.doi.org/10.15585/mmwr.mm6912e2
- Centers for Disease Control and Prevention. People who are at higher risk for severe illness https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/people-at-higher-risk.html

Centre for Evidence-Based Medicine

- What prognostic clinical risk prediction scores for COVID-19 are currently available for use in the community setting? https://www.cebm.net/covid-19/what-prognostic-clinical-risk-prediction-scores-for-covid-19-are-currently-available-for-use-in-the-community-setting/
- Diabetes and risk from COVID: https://www.cebm.net/covid-19/diabetes-and-risks-from-covid-19/

Alberta Health Services.

- Clinical risk prediction tools for admitted COVID-19 patients https://www.albertahealthservices.ca/assets/info/ppih/if-ppih-covid-19-rapid-review-crpts-for-admitted-covid-19-patients.pdf

Public Health Ontario.

- COVID-19 – What We Know So Far About…Clinical Severity [April 24, 2020]. https://www.publichealthontario.ca/-/media/documents/ncov/covid-wwksf/what-we-know-clinical-severity.pdf?la=en
- COVID-19 and Severe Outcomes in Ontario – enhanced epidemiological summary. https://www.publichealthontario.ca/-/media/documents/ncov/epi/covid-19-severe-outcomes-ontario-epi-summary.pdf?la=en

European Center for Disease Control and Prevention. Coronavirus disease 2019 (COVID-19) in the EU/EEA and the UK – eighth update. https://www.ecdc.europa.eu/sites/default/files/documents/covid-19-rapid-risk-assessment-coronavirus-disease-2019-eighth-update-8-april-2020.pdf

Norwegian Institute of Public Health.

- The relationship between age comorbidity and disease severity: rapid review. [April 2020] https://www.fhi.no/globalassets/dokumenterfiler/rapporter/2020/covid-19-the-relationship-between-age-comorbidity-and-disease-severity-1st-update-report-2020-v2-.pdf

Dynamed

- https://www.dynamed.com/condition/covid-19-novel-coronavirus#TOPIC_S3T_JCW_3LB
- See section on prognosis and the links to studies

- https://www.dynamed.com/condition/covid-19-and-cardiovascular-disease-patients#TOPIC_VVB_VXB_JLB
- See section on prognosis – they provide study summaries on those that they base their recommendations on

Articles:

Montalto M, Gallo A, Porceddu E, Liguori A, Pero E, Panunzi S, Mingrone G, Gasbarrini A, Landolfi R. VALIDATION OF A SEVERITY SCORE TO IDENTIFY PATIENTS ADMITTED FOR COVID-19 PNEUMONIA AT HIGH RISK FOR AN INTENSIVE APPROACH. https://www.clinicaltrials.gov/ProvidedDocs/99/NCT04372199/Prot_SAP_000.pdf

Simons D, Shahab L, Brown J, Perski O. The association of smoking status with SARS-CoV-2 infection, hospitalisation and mortality from COVID-19: A living rapid evidence review. Qeios. 2020 Apr 23. https://www.qeios.com/read/UJR2AW.3

Prevalence, Severity and Mortality associated with COPD and Smoking in patients with COVID-19: A Rapid Systematic Review and Meta-Analysis
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0233147

OpenSAFELY: factors associated with COVID-19-related hospital death in the linked electronic health records of 17 million adult NHS patients. https://www.medrxiv.org/content/10.1101/2020.05.06.20092999v1.full.pdf

Tools

COVID-19 Prognostic Tool https://qxmd.com/calculate/calculator_731/covid-19-prognostic-tool
COVID-19 Mortality Risk Estimation https://ebmcalc.com/COVID19_Zhou.htm
Machine based learning prognostic model to predict criticality in patients with severe COVID-19 infection
https://www.evidencio.com/models/show/2120

ARTICLES FROM THE LIBRARY DATABASES

Note: References are sorted by year (newest to oldest)

1. Adams ML, Katz DL, Grandpre J. Population based estimates of comorbidities affecting risk for complications from COVID-19 in the US. medRxiv. 2020:2020.03.30.20043919. DOI: 10.1101/2020.03.30.20043919

ABSTRACT: We used 2017 Behavioral Risk Factor Surveillance System (BRFSS) data (N=444,649) to estimate the proportion of US adults who report comorbidities that suggest heightened risk of complications from COVID-19. Co-morbidities included cardiovascular disease, chronic obstructive pulmonary disease (COPD), diabetes, asthma, hypertension, and/or cancer other than skin, based on data from China. Overall 45.4% (95% CI 45.1-45.7) of adults reported any of the 6 comorbidities, increasing from 19.8% (19.1-20.4) for ages 18-29 years to 80.7% (79.5-81.8) for ages 80+ years. State rates ranged from 37.3% (36.2-38.5) in Utah to 58.7% (57.0-60.4) in West Virginia. Rates also varied by race/ethnicity, health insurance status, and employment. Excluded were residents of nursing homes or assisted living facilities. Although almost certainly an underestimate of all adults at risk due to these exclusions, these results should help in estimating healthcare needs for adults with COVID-19 complications living in the community.Competing Interest StatementThe authors have declared no competing interest.Funding StatementData collection, analysis, and interpretation of data for this study were supported by the Centers for Disease Control and Prevention (CDC) Grant/Cooperative Agreement number

1U58DP006069-01Author DeclarationsAll relevant ethical guidelines have been followed; any necessary IRB and/or ethics committee approvals have been obtained and details of the IRB/oversight body are included in the manuscript.YesAll necessary patient/participant consent has been obtained and the appropriate institutional forms have been archived.YesI understand that all clinical trials and any other prospective interventional studies must be registered with an ICMJE-approved registry, such as ClinicalTrials.gov. I confirm that any such study reported in the manuscript has been registered and the trial registration ID is provided (note: if posting a prospective study registered retrospectively, please provide a statement in the trial ID field explaining why the study was not registered in advance).Yes I have followed all appropriate research reporting guidelines and uploaded the relevant EQUATOR Network research reporting checklist(s) and other pertinent material as supplementary files, if applicable.YesOn-line with link provided in paper
https://www.cdc.gov/brfss/data_documentation/index.htm
URL: http://medrxiv.org/content/early/2020/04/02/2020.03.30.20043919.abstract
DOI: 10.1101/2020.03.30.20043919

2. Aggarwal G, Cheruiyot I, Aggarwal S, et al. Association of Cardiovascular Disease with Coronavirus Disease 2019 (COVID-19) Severity: A Meta-Analysis. Current Problems in Cardiology. 2020:100617-. DOI: https://doi.org/10.1016/j.cpcardiol.2020.100617
ABSTRACT: Observational studies have reported an association between underlying cardiovascular diseases (CVD) and worse prognosis in COVID-19 patients, but this still remains unclear. We conducted a meta-analysis of recent studies that reported the association of CVD with worse prognosis and increased mortality in COVID-19 patients. Literature search through PubMed, the Cochrane Library, and Embase was completed by 2 reviewers from November 1, 2019 to April 20, 2020. Inclusion criteria were observational case-control or cohort studies on COVID-19 patients with a history of CVD included, which reported outcomes of COVID-19 infection severity, clearly outlined the definition of “severe disease” and with sample size >10. Data were abstracted independently by 2 authors. Studies were divided into two separate cohorts for analysis: severity (severe vs. non-severe) and mortality (non-survivors vs. survivors). Data was pooled into a meta-analysis to estimate pooled odds ratio (OR) with 95% confidence interval (95% CI) for each outcome. A total of 18 studies (n= 4,858 patients) were included. Sixteen studies were from China, while 2 were from the United States. Pre-existing CVD was associated with a significantly increased risk of a severe form of COVID-19 (OR= 3.14; 95% CI 2.32-4.24; I2=0%; Q= 8.68, p=0.73) and overall risk of COVID-19 all-cause mortality (OR= 11.08; 95% CI: 2.59-47.32; I2=55%; p=0.11). However, this study did not find a significant association between previous history of CVD and mortality in severe COVID-19 disease (OR=1.72; 95% CI: 0.97-3.06, I2=0%, p=0.46). Pre-existing CVD is associated with worse outcomes among patients with COVID-19. Clinicians and policymakers need to take account of these findings in implementing risk stratification models.
URL: http://www.sciencedirect.com/science/article/pii/S0146280620300943
DOI: https://doi.org/10.1016/j.cpcardiol.2020.100617

3. Aggarwal G, Lippi G, Michael Henry B. Cerebrovascular disease is associated with an increased disease severity in patients with Coronavirus Disease 2019 (COVID-19): A pooled analysis of published literature. Int j. 2020:1747493020921664. DOI: https://dx.doi.org/10.1177/1747493020921664
ABSTRACT: INTRODUCTION: There is an urgent need to identify patients at high risk during the ongoing coronavirus disease (COVID-19) pandemic. Whether a history of stroke is associated with increased severity of disease or mortality is unknown. METHOD: We pooled studies from published literature to assess the association of a history of stroke with outcomes in patients with COVID-19. RESULTS: A pooled analysis of 4 studies showed a ~2.5-fold increase in odds of severe COVID-19. While a trend was observed, there was no statistically significant association of stroke with mortality in patients with COVID-19 infection. DISCUSSION: Our findings are limited by a small number of studies and sample size. CONCLUSION: There is a ~2.5-fold increase in odds of severe COVID-19 illness with a history of cerebrovascular disease.

URL:
http://ovidsp.ovid.com/ovidweb.cgi?T=JS&CSC=Y&NEWS=N&PAGE=fulltext&D=medp&AN=32310015http://sfx.library.cdc.gov/cdc?sid=OVID:medline&id=pmid:32310015&id=10.1177%2F1747493020921664&issn=1747-4930&isbn=&volume=&issue=&spage=1747493020921664&pages=1747493020921664&date=2020&title=International+Journal+of+Stroke&atitle=Cerebrovascular+disease+is+associated+with+an+increased+disease+severity+in+patients+with+Coronavirus+Disease+2019+%28COVID-19%29%3A+A+pooled+analysis+of+published+literature.&aulast=Aggarwal&pid=%3Cauthor%3EAggarwal+G%2CLippi+G%2CMichael+Henry+B%3C%2Fauthor%3E&%3CAN%3E32310015%3C%2FAN%3E&%3CDT%3EJournal+Article%3C%2FDT%3E
DOI: https://dx.doi.org/10.1177/1747493020921664

4. Bai X, Fang C, Zhou Y, et al. Predicting COVID-19 malignant progression with AI techniques. medRxiv. 2020:2020.03.20.20037325. DOI: 10.1101/2020.03.20.20037325
ABSTRACT: Background: The coronavirus disease 2019 (COVID-19) has become a worldwide pandemic since mid-December 2019, which greatly challenge public medical systems. With limited medical resources, it is a natural strategy, while adopted, to access the severity of patients then determine the treatment priority. However, our work observes the fact that the condition of many mild outpatients quickly worsens in a short time, i.e. deteriorate into severe/critical cases. Hence, it has been crucial to early identify those cases and give timely treatment for optimizing treatment strategy and reducing mortality. This study aims to establish an AI model to predict mild patients with potential malignant progression. Methods: A total of 133 consecutively mild COVID-19 patients at admission who was hospitalized in Wuhan Pulmonary Hospital from January 3 to February 13, 2020, were selected in this retrospective IRB-approved study. All mild patients at admission were categorized into groups with or without malignant progression. The clinical and laboratory data at admission, the first CT, and the follow-up CT at severe/critical stage of the two groups were compared with Chi-square test, Fisher's exact test, and t test. Both traditional logistic regression and deep learning-based methods were used to build the prediction models. The area under ROC curve (AUC) was used to evaluate the models. Results: The deep learning-based method significantly outperformed logistic regression (AUC 0.954 vs. 0.893). The deep learning-based method achieved a prediction AUC of 0.938 by combining the clinical data and the CT data, significantly outperforming its counterpart trained with clinical data only by 0.141. By further considering the temporal information of the CT sequence, our model achieved the best AUC of 0.954. The proposed model can be effectively used for finding out the mild patients who are easy to deteriorate into severe/critical cases, so that such patients get timely treatments while alleviating the limitations of medical resources.Competing Interest StatementThe authors have declared no competing interest.Funding StatementThis work was supported by National Key R&D Program of China (No. 2018YFB1004600), HUST COVID-19 Rapid Response Call (No. 2020kfyXGYJ093, No. 2020kfyXGYJ094), National Key R&D Program of China (No. 2017YFC1309100), National Science Fund for Distinguished Young Scholars (No. 81925023), National Natural Science Foundation of China (No. 61703049, No. 81771912, No. 81401390).Author DeclarationsAll relevant ethical guidelines have been followed; any necessary IRB and/or ethics committee approvals have been obtained and details of the IRB/oversight body are included in the manuscript.YesAll necessary patient/participant consent has been obtained and the appropriate institutional forms have been archived.YesI understand that all clinical trials and any other prospective interventional studies must be registered with an ICMJE-approved registry, such as ClinicalTrials.gov. I confirm that any such study reported in the manuscript has been registered and the trial registration ID is provided (note: if posting a prospective study registered retrospectively, please provide a statement in the trial ID field explaining why the study was not registered in advance).Yes I have followed all appropriate research reporting guidelines and uploaded the relevant EQUATOR Network research reporting checklist(s) and other pertinent material as supplementary files, if applicable.YesThe corresponding author had full access to all data and the final responsibility to submit for publication.
URL: http://medrxiv.org/content/early/2020/03/27/2020.03.20.20037325.abstract

DOI: 10.1101/2020.03.20.20037325

5. Bello-Chavolla OY, Bahena-Lopez JP, Antonio-Villa NE, et al. Predicting mortality attributable to SARS-CoV-2: A mechanistic score relating obesity and diabetes to COVID-19 outcomes in Mexico. medRxiv. 2020:2020.04.20.20072223. DOI: 10.1101/2020.04.20.20072223

ABSTRACT: BACKGROUND AND AIMS: The SARS-CoV-2 outbreak has posed a challenge to the healthcare systems due to high complications rates observed in patients with cardiometabolic diseases, such as diabetes and obesity. Despite the high prevalence of these conditions, a mechanistic association of its interactions in COVID-19 remain unclear. Here, we identify risk factors and propose a clinical score to predict 30-day lethality in COVID-19 cases, including specific factors for diabetes and obesity and its role in improving risk prediction. METHODS: We obtained data of suspected, confirmed and negative COVID-19 cases and their demographic and health characteristics from the General Directorate of Epidemiology of Mexican Ministry of Health. We investigated specific risk factors associated to SARS-CoV-2 positivity and mortality due to COVID-19. Additionally, we explored the impact of diabetes and obesity on COVID-19 related outcomes and their interaction with other comorbidities in modifying COVID-19 related lethality. Finally, we built our clinical score to predict 30-day lethality using the previously identified risk factors. RESULTS: Among 49,570 evaluated subjects (at April 19th, 2020), we observed an increased risk of SARS-CoV-2 positivity (n=8,261) in those with diabetes, obesity, male subjects and in patients with diabetes and age <40 years (early-onset). Risk factors for increased lethality in COVID-19 includes early-onset diabetes obesity, chronic obstructive pulmonary disease, advanced age, immunosuppression, and chronic kidney disease; we also found that obesity mediates 47.8% of the effect of diabetes on COVID-19 lethality. Early-onset diabetes conferred an increased risk of hospitalization and obesity conferred an increased risk for ICU admission and intubation. Our predictive score for COVID-19 lethality included age ≥65 years, diabetes, diabetes & age <40 years, obesity, age <40 years, CKD, pregnancy and immunosuppression and a categorization of low-risk, mild-risk, moderate-risk, high-risk and very high-risk significantly discriminates lethal from non-lethal COVID-19 cases (c-statistic=0.837). CONCLUSIONS: Here, we propose a mechanistic approach to evaluate risk for complication and lethality attributable to COVID-19 in patients with obesity and diabetes patients in a country with high susceptibility. Furthermore, our novel score offers a clinical tool for quick determination of high-risk susceptibility patients in a first contact scenario.Competing Interest StatementThe authors have declared no competing interest.Funding StatementNo funding received.Author DeclarationsAll relevant ethical guidelines have been followed; any necessary IRB and/or ethics committee approvals have been obtained and details of the IRB/oversight body are included in the manuscript.YesAll necessary patient/participant consent has been obtained and the appropriate institutional forms have been archived.YesI understand that all clinical trials and any other prospective interventional studies must be registered with an ICMJE-approved registry, such as ClinicalTrials.gov. I confirm that any such study reported in the manuscript has been registered and the trial registration ID is provided (note: if posting a prospective study registered retrospectively, please provide a statement in the trial ID field explaining why the study was not registered in advance).Yes I have followed all appropriate research reporting guidelines and uploaded the relevant EQUATOR Network research reporting checklist(s) and other pertinent material as supplementary files, if applicable.YesAll data sources and R code are available for reproducibility of results at https://github.com/oyaxbell/covid_diabetesmx.https://github.com/oyaxbell/covid_diabetesmx

URL: http://medrxiv.org/content/early/2020/04/24/2020.04.20.20072223.abstract

DOI: 10.1101/2020.04.20.20072223

6. Biswas M, Rahaman S, Biswas TK, et al. Effects of Sex, Age and Comorbidities on the Risk of Infection and Death Associated with COVID-19: A Meta-Analysis of 47807 Confirmed Cases. SSRN. 2020. DOI: 10.2139/ssrn.3566146

ABSTRACT: Background: Evidence for the associations of sex, age and comorbidities on the risk of death and infection caused by 2019-nCoV is not well-established. It was a
URL: https://papers.ssrn.com/abstract=3566146https://papers.ssrn.com/sol3/Delivery.cfm?abstractid=3566146
DOI: 10.2139/ssrn.3566146

7. Cao J, Tu WJ, Cheng W, et al. Clinical Features and Short-term Outcomes of 102 Patients with Corona Virus Disease 2019 in Wuhan, China. Clin Infect Dis. 2020;2020/04/03. DOI: 10.1093/cid/ciaa243.; ID: 8418 10.1093/cid/ciaa243
ABSTRACT: OBJECTIVE: In December, 2019, a series of pneumonia cases of unknown cause emerged in Wuhan, Hubei, China. In this study, we investigate clinical and laboratory features and short-term outcomes of patients with Corona Virus Disease 2019(COVID-19). METHODS: All patients with COVID-19 admitted to Wuhan University Zhongnan Hospital in Wuhan, China, between January 3 and February 1, 2020 were included. All those patients were with laboratory-confirmed infection. Epidemiological, clinical, radiological characteristics, underlying diseases, laboratory tests treatment, complications and outcomes data were collected. Outcomes were followed up at discharge until Feb 15, 2020. RESULTS: The study cohort included 102 adult patients. The median (IQR) age was 54 years (37-67years) and 48.0% were female. A total of 34 patients (33.3%) were exposed to source of transmission in the hospital setting (as health care workers, patients, or visitors) and 10 patients (9.8%) had a familial cluster. Eighteen patients (17.6%) were admitted to the ICU, and 17 patients died (mortality, 16.7%; 95% confidence interval CI], 9.4%-23.9%). Among patients who survived, they were younger, more likely were health care workers and less likely suffered from comorbidities. They were also less likely suffered from complications. There was no difference in drug treatment rates between the survival and non-survival groups. Patients who survived less likely required admission to the intensive care unit (14.1% vs. 35.3%). Chest imaging examination showed that death patients more likely had ground-glass opacity (41.2% vs. 12.9%). CONCLUSIONS: The mortality rate was high among the COVID-19 patients described in our cohort who met our criteria for inclusion in this analysis. Patient characteristics seen more frequently in those who died were development of systemic complications following onset of the illness and the severity of disease requiring admission to the ICU. Our data support those described by others that COVID-19 infection results from human-to-human transmission, including familial clustering of cases, and nosocomial transmission. There were no differences in mortality among those who did or did not receive antimicrobial or glucocorticoid drug treatment.
URL: https://www.ncbi.nlm.nih.gov/pubmed/32239127
DOI: 10.1093/cid/ciaa243.; ID: 8418
10.1093/cid/ciaa243

8. Caramelo F, Ferreira N, Oliveiros B. Estimation of risk factors for COVID-19 mortality - preliminary results. medRxiv. 2020:2020.02.24.20027268. DOI: 10.1101/2020.02.24.20027268
ABSTRACT: Since late December 2019 a new epidemic outbreak has emerged from Whuhan, China. Rapidly the new coronavirus has spread worldwide. China CDC has reported results of a descriptive exploratory analysis of all cases diagnosed until the 11th February 2020, presenting the epidemiologic curves and geo-temporal spread of COVID-19 along with case fatality rate according to some baseline characteristics, such as age, gender and several well-established high prevalence comorbidities. Despite this, we intend to increase even further the predictive value of that manuscript by presenting the odds ratio for mortality due to COVID-19 adjusted for the presence of those comorbidities and baseline characteristics such as age and gender. Besides, we present a way to determine the risk of each particular patient, given his characteristics. We found that age is the variable that presents higher risk of COVID-19 mortality, where 60 or older patients have an OR = 18.8161 (CI95%7.1997; 41.5517]). Regarding comorbidities, cardiovascular disease appears to be the riskiest (OR=12.8328 CI95%10.2736; 15.8643], along with chronic respiratory disease (OR=7.7925 CI95%5.5446; 10.4319]). Males are more likely to die from COVID-19 (OR=1.8518 (CI95%1.5996; 2.1270]). Some limitations such as the lack of information about the correct prevalence of gender per age or about comorbidities per age and gender or the assumption of independence between risk factors are expected to have a small impact on results. A final point

of paramount importance is that the equation presented here can be used to determine the probability of dying from COVID-19 for a particular patient, given its age interval, gender and comorbidities associated.Competing Interest StatementThe authors have declared no competing interest.Funding StatementFunded by National Funds via FCT (Foundation for Science and Technology) through the Strategic Project UIDB/04539/2020 and UIDP/04539/2020 (CIBB).Author DeclarationsAll relevant ethical guidelines have been followed; any necessary IRB and/or ethics committee approvals have been obtained and details of the IRB/oversight body are included in the manuscript.YesAll necessary patient/participant consent has been obtained and the appropriate institutional forms have been archived.YesI understand that all clinical trials and any other prospective interventional studies must be registered with an ICMJE-approved registry, such as ClinicalTrials.gov. I confirm that any such study reported in the manuscript has been registered and the trial registration ID is provided (note: if posting a prospective study registered retrospectively, please provide a statement in the trial ID field explaining why the study was not registered in advance).Yes I have followed all appropriate research reporting guidelines and uploaded the relevant EQUATOR Network research reporting checklist(s) and other pertinent material as supplementary files, if applicable.YesData used in this work is
public.https://apps.uc.pt/mypage/faculty/fcaramelo/en/covid
URL: http://medrxiv.org/content/early/2020/02/25/2020.02.24.20027268.abstract
DOI: 10.1101/2020.02.24.20027268

9. Cdc Covid-19 Response Team CfDC, Prevention. Severe Outcomes Among Patients with Coronavirus Disease 2019 (COVID-19) — United States, February 12–March 16, 2020. MMWR Morb Mortal Wkly Rep. 2020;69(12):343-6. DOI: http://dx.doi.org/10.15585/mmwr.mm6912e2
ABSTRACT: What is already known about this topic? Early data from China suggest that a majority of coronavirus disease 2019 (COVID-19) deaths have occurred among adults aged ≥60 years and among persons with serious underlying health conditions. What is added by this report? This first preliminary description of outcomes among patients with COVID-19 in the United States indicates that fatality was highest in persons aged ≥85, ranging from 10% to 27%, followed by 3% to 11% among persons aged 65–84 years, 1% to 3% among persons aged 55-64 years, <1% among persons aged 20–54 years, and no fatalities among persons aged ≤19 years. What are the implications for public health practice? COVID-19 can result in severe disease, including hospitalization, admission to an intensive care unit, and death, especially among older adults. Everyone can take actions, such as social distancing, to help slow the spread of COVID-19 and protect older adults from severe illness.
URL: https://www.cdc.gov/mmwr/volumes/69/wr/mm6912e2.htm?s_cid=mm6912e2_w
DOI: http://dx.doi.org/10.15585/mmwr.mm6912e2

10. Chen C, Yan D, Zhou Y. Risk factors associated with fatal outcomes of novel coronavirus infection pneumonia (COVID-19): A systematic review and meta-analysis. Research Square prepub. 2020.
ABSTRACT: Background: The COVID-19 infection has caused 111652 deaths worldwide as of 13 April 2020. Risk factors for fatal outcomes of COVID-19 have varied across studies due to limited samples and have lacked effective qualitative and quantitative measurements. We performed a meta-analysis to evaluate risk factors for fatal outcomes of COVID-19. Methods: Data on demographic, clinic, laboratory findings and complications were extracted. Quantitative and qualitative synthesis was conducted for weighted-mean-difference (WMD) and odds-ratio (OR). Results: A total of 30 studies involving 5741 survivors and 1670 deaths were included. The death cases were significantly older than survivors (WMD=15.36, 95% CI: 12.90-17.82), male and smoking history showed higher risk to develop fatal outcome (OR=3.37, 95% CI: 2.27-5.01; OR=1.37, 95% CI: 1.02-1.83, respectively). The clinical symptoms including dyspnea (OR=4.63, 95% CI: 2.85-7.54), hemoptysis (OR=3.11, 95% CI: 1.26-7.56), malaise (OR=2.44, 95% CI: 1.49-3.97). comorbidities with coronary heart disease (OR=4.36, 95% CI: 1.91-9.97), COPD (OR=3.70, 95% CI: 2.03-6.73) and cardiovascular disease (OR=3.45, 95% CI: 2.54-4.70). Compared to survivors, many laboratory indexes increased in deaths group, including serum ferritin (WMD=741.47, 95% CI: 566.77-916.16), lactate dehydrogenase (WMD=226.86, 95% CI: 177.08-276.64) and

myoglobin (WMD=102.58, 95% CI: 65.12-140.04), and the decreased indexes included PaO2/FiO2 (WMD=-71.61, 95% CI:Â -134.11 to -9.11), platelets (WMD=-41.09, 95% CI:Â -47.33 to -34.85) and PaO2 (WMD=-26.09, 95% CI: -38.9 to -13.29). Main complications contributed to the fatal outcome included sepsis (OR=184.61, 95% CI: 33.43-1019.42), shock (OR=133.76, 95% CI: 36.86-485.34) and respiratory failure (OR=47.37, 95% CI: 20.65-108.66). Conclusion: The main risk factors associated with fatal outcome of COVID-19 involved male, older age, smoking history, chronic medical conditions including coronary heart disease, COPD and cardiovascular disease, clinical symptoms including dyspnea, hemoptysis and malaise, the increased laboratory indexes including serum ferritin, lactate dehydrogenase and myoglobin, the decreased indexes including PaO2/FiO2, platelets and PaO2, main complications including sepsis, shock and respiratory failure. These factors could be considered in triaging patients and allocating medical resources when such medical resources are scarce, devising improved protocols for patient diagnosis and management, and developing new drugs and other therapies to treat COVID-19 patients.
URL: https://www.researchsquare.com/article/rs-23204/v1

11. Chen R, Liang W, Jiang M, et al. Risk factors of fatal outcome in hospitalized subjects with coronavirus disease 2019 from a nationwide analysis in China. Chest. 2020. DOI: 10.1016/J.CHEST.2020.04.010
ABSTRACT: BACKGROUND The novel coronavirus disease 2019 (COVID-19) has become a global health emergency. Cumulative number of new confirmed case and death are still increasing out of China. However, the independent predicted factors associated with the fatal outcome remain uncertain. METHODS A retrospective cohort of 1590 hospitalized subjects with COVID-19 throughout China was established. The prognostic effects of variables, including clinical features and laboratory findings, were analyzed using Kapla-Meier method and Cox proportional hazard model. A prognostic nomogram was formulated to predict the survival of patient with COVID-19. RESULTS In this nationwide cohort, non-survivors showed higher incidence of elderly people, subjects with co-existing chronic illness, dyspnea and laboratory abnormalities on admission, compared with survivors. Multivariate Cox regression analysis showed that age≥75 (HR: 7.86, 95% CI: 2.44-25.35), age between 65-74 years (HR:3.43, 95%CI: 1.24-9.5), coronary heart disease (HR:4.28, 95%CI:1.14-16.13), cerebrovascular disease(HR:3.1, 95%CI:1.07-8.94), dyspnea (HR: 3.96, 95%CI:1.42-11), procalcitonin>0.5ng/ml(HR:8.72, 95%CI:3.42-22.28), aspartate aminotransferase>40U/liter (HR: 2.2, 95% CI: 1.1- 6.73) were independent risk factors associated with fatal outcome. A nomogram was established based on the results of multivariate analysis. The internal bootstrap resampling approach suggested the nomogram has sufficient discriminatory power with the C-index of 0.91 (95%CI 0.85-0.97). The calibration plots also demonstrated good consistence between the prediction and the observation. CONCLUSIONS The proposed nomogram accurately predict clinical outcomes of patients with COVID-19 based on individual characteristics. Earlier identification, more intensive surveillance and appropriate therapy should be considered in patients with high risk.
URL: https://www.sciencedirect.com/science/article/pii/S0012369220307108
DOI: 10.1016/J.CHEST.2020.04.010

12. Chen T, Dai Z, Mo P, et al. Clinical characteristics and outcomes of older patients with coronavirus disease 2019 (COVID-19) in Wuhan, China (2019): a single-centered, retrospective study. Journals of Gerontology Series A Biological Sciences & Medical Sciences. 2020;11:11. DOI: https://dx.doi.org/10.1093/gerona/glaa089
ABSTRACT: BACKGROUND: In December 2019, the coronavirus disease 2019 (COVID-19) emerged in Wuhan city and spread rapidly throughout China and the world. In this study, we aimed to describe the clinical course and outcomes of older patients with COVID-19. METHODS: This is a retrospective investigation of hospitalized older patients with confirmed COVID-19 at Zhongnan Hospital of Wuhan University from January 1, 2020, to February 10, 2020. RESULTS: In total, 203 patients were diagnosed with COVID-19, with a median age of 54 years (interquartile range, 41-68; range, 20-91 years). Men accounted for 108 (53.2%) of the cases, and 55 patients (27.1%) were 65 years of age. Among patients who were 65 years and older, the mortality rate was 34.5% (19/55), which was significantly higher than that of younger patients at 4.7% (7/148). Common symptoms of

older patients with COVID-19 included fever (94.5%; n=52), dry cough (69.1%; n=38), and chest distress (63.6%; n=35). Compared with young patients, older patients had more laboratory abnormalities and comorbidities. Through a multivariate analysis of the causes of death in older patients, we found that males, comorbidities, time from disease onset to hospitalization, abnormal kidney function, and elevated procalcitonin levels were all significantly associated with death. CONCLUSIONS: In the recent outbreak of COVID-19, our local hospital in Wuhan found that patients aged 65 and older had greater initial comorbidities, more severe symptoms, and were more likely to experience multi-organ involvement and death, as compared with younger patients.
DOI: https://dx.doi.org/10.1093/gerona/glaa089

13. Chen Y, Gong X, Wang L, et al. Effects of hypertension, diabetes and coronary heart disease on COVID-19 diseases severity: a systematic review and meta-analysis. medRxiv. 2020:2020.03.25.20043133. DOI: 10.1101/2020.03.25.20043133
ABSTRACT: Background: COVID-19 patients with chronic diseases such as hypertension, diabetes and coronary heart diseases is more likely to worsen, but with mixed results for COVID-19 severity. This meta-analysis is to analyze the correlation between hypertension, diabetes, coronary heart disease and COVID-19 disease severity. Methods: Available data from PubMed, Web of Science, China National Knowledge Infrastructure Database, WanFang Database and VIP Database, were analyzed using a fixed effects model meta-analysis to derive overall odds ratios (OR) with 95% CIs. Funnel plots and Begg's were used to assess publication bias. Findings: Of 182 articles found following our initial search, we assessed 34 full-text articles, of which 9 articles with 1936 COVID-19 patients met all selection criteria for our meta-analysis. No significant heterogeneity between studies. There were significant correlations between COVID-19 severity and hypertension OR=2.3 95% CI (1.76, 3.00), P<0.01], diabetes OR=2.67, 95% CI (1.91, 3.74), P<0.01], coronary heart disease OR=2.85 95% CI (1.68, 4.84), P<0.01]. Most of the studies in the funnel plot are on the upper part and few on the base part, and are roughly symmetrical left and right. Begg's test: hypertension (Z=-0.1, P=1.0), diabetes (Z=0.73, P=0.466), coronary heart disease (Z=0.38, P=0.707), all found no publication bias. Interpretation: Hypertension, diabetes, and coronary heart disease can affect the severity of COVID-19. It may be related to the imbalance of angiotensin-converting enzyme 2 (ACE2) and the cytokine storm induced by Glucolipid metabolic disorders (GLMD).Competing Interest StatementThe authors have declared no competing interest.Clinical TrialNAFunding StatementNational Natural Science Foundation of China (No. 81830113, 81530102); Major basic and applied basic research projects of Guangdong Province of China (No. 2019B030302005); National key R & D plan "Research on modernization of traditional Chinese medicine" (No. 2018YFC1704200) and Natural Science Foundation of Guangdong Province (No. 2018A030313391)Author DeclarationsAll relevant ethical guidelines have been followed; any necessary IRB and/or ethics committee approvals have been obtained and details of the IRB/oversight body are included in the manuscript.YesAll necessary patient/participant consent has been obtained and the appropriate institutional forms have been archived.YesI understand that all clinical trials and any other prospective interventional studies must be registered with an ICMJE-approved registry, such as ClinicalTrials.gov. I confirm that any such study reported in the manuscript has been registered and the trial registration ID is provided (note: if posting a prospective study registered retrospectively, please provide a statement in the trial ID field explaining why the study was not registered in advance).Yes I have followed all appropriate research reporting guidelines and uploaded the relevant EQUATOR Network research reporting checklist(s) and other pertinent material as supplementary files, if applicable.YesAll data included in this study are available upon request by contact with the corresponding author.
URL: http://medrxiv.org/content/early/2020/03/30/2020.03.25.20043133.abstract
DOI: 10.1101/2020.03.25.20043133

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10.1111/anae.15103.

ABSTRACT: The virus responsible for COVID-19 binds to the angiotensin converting enzyme-2 (ACE-2) receptor [1]. Several articles have noted that hypertension is a risk factor for COVID-19 [2-7]. It is currently difficult to distinguish between hypertension as an independent risk factor in COVID-19 from one that co-varies with other patient factors such as age and cardiovascular disease. It is difficult from individual reports to determine whether hypertension is a risk factor for development of symptomatic disease or hospitalisation or for more severe disease. Reviewing the literature that reports rates of hypertension amongst included patients indicates a consistent association with more severe disease and increased mortality.
URL: https://www.ncbi.nlm.nih.gov/pubmed/32339251
DOI: 10.1111/anae.15103
10.1111/anae.15103.

15. Deng G, Yin M, Chen X, et al. Clinical determinants for fatality of 44,672 patients with COVID-19. Critical Care. 2020;24(1):179-. DOI: 10.1186/s13054-020-02902-w
URL: https://ccforum.biomedcentral.com/articles/10.1186/s13054-020-02902-w
DOI: 10.1186/s13054-020-02902-w

16. Du RH, Liang LR, Yang CQ, et al. Predictors of Mortality for Patients with COVID-19 Pneumonia Caused by SARS-CoV-2: A Prospective Cohort Study. European Respiratory Journal. 2020;08(5):08. DOI: https://dx.doi.org/10.1183/13993003.00524-2020
ABSTRACT: To identify factors associated with the death for patients with COVID-19 pneumonia caused by a novel coronavirus SARS-CoV-2.All clinical and laboratory parameters were collected prospectively from a cohort of patients with COVID-19 pneumonia who were hospitalised to Wuhan Pulmonary Hospital, Wuhan City, Hubei Province, China, between December 25, 2019 and February 7, 2020. Univariate and multivariate logistic regression was performed to investigate the relationship between each variable and the risk for death of COVID-19 pneumonia patients.A total of 179 patients with COVID-19 pneumonia (97 male and 82 female) were included in the present prospective study, of whom 21 died. Univariate and multivariate logistic regression analysis revealed that age =65 years (odd ratio, 3.765; 95% confidence interval, 1.146-17.394; p=0.023), preexisting concurrent cardiovascular or cerebrovascular diseases (2.464; 0.755-8.044; p=0.007), CD3 sup + /sup CD8 sup + /sup T cells =75 cell.muL sup -1 /sup (3.982; 1.132-14.006; p 0.001), and cardiac troponin I =0.05 ng.mL sup -1 /sup (4.077; 1.166-14.253; p 0.001) were associated with an increase in risk of mortality of COVID-19 pneumonia. In the sex-, age-, and comorbid illness-matched case study, CD3 sup + /sup CD8 sup + /sup T cells =75 cell.muL sup -1 /sup and cardiac troponin I =0.05 ng.mL sup -1 /sup remained to be the predictors for high mortality of COVID-19 pneumonia. We identified four risk factors, age =65 years, preexisting concurrent cardiovascular or cerebrovascular diseases, CD3 sup + /sup CD8 sup + /sup T cells =75 cell.muL sup -1 /sup , and cardiac troponin I =0.05 ng.mL sup -1 /sup , especially the latter two factors, were predictors for mortality of COVID-19 pneumonia patients.
DOI: https://dx.doi.org/10.1183/13993003.00524-2020

17. Emami A, Javanmardi F, Pirbonyeh N, et al. Prevalence of Underlying Diseases in Hospitalized Patients with COVID-19: a Systematic Review and Meta-Analysis. Arch Acad Emerg Med. 2020;8(1):e35.
ABSTRACT: Introduction: In the beginning of 2020, an unexpected outbreak due to a new corona virus made the headlines all over the world. Exponential growth in the number of those affected makes this virus such a threat. The current meta-analysis aimed to estimate the prevalence of underlying disorders in hospitalized COVID-19 patients. Methods: A comprehensive systematic search was performed on PubMed, Scopus, Web of science, and Google scholar, to find articles published until 15 February 2020. All relevant articles that reported clinical characteristics and epidemiological information of hospitalized COVID-19 patients were included in the analysis. Results: The data of 76993 patients presented in 10 articles were included in this study. According to the meta-analysis, the pooled prevalence of hypertension, cardiovascular disease, smoking history and diabetes in people

infected with SARS-CoV-2 were estimated as 16.37% (95%CI: 10.15%-23.65%), 12.11% (95%CI 4.40%-22.75%), 7.63% (95%CI 3.83%-12.43%) and 7.87% (95%CI 6.57%-9.28%), respectively. Conclusion: According to the findings of the present study, hypertension, cardiovascular diseases, diabetes mellitus, smoking, chronic obstructive pulmonary disease (COPD), malignancy, and chronic kidney disease were among the most prevalent underlying diseases among hospitalized COVID-19 patients, respectively.
URL: https://www.ncbi.nlm.nih.gov/pubmed/32232218

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URL: https://doi.org/10.1016/S2213-2600(20)30116-8
DOI: 10.1016/S2213-2600(20)30116-8; 13
10.1016/S2213-2600(20)30116-8

19. Feng Y, Ling Y, Bai T, et al. COVID-19 with Different Severity: A Multi-center Study of Clinical Features. American Journal of Respiratory & Critical Care Medicine. 2020;10:10. DOI: https://dx.doi.org/10.1164/rccm.202002-0445OC
ABSTRACT: RATIONALE: COVID-19 pandemic is now a global health concern. OBJECTIVES: We compared the clinical characteristics, laboratory examinations, CT images and treatment of COVID-19 patients from three different cities in China. METHODS: 476 patients were recruited from Jan 1 to Feb 15, 2020 at three hospitals in Wuhan, Shanghai and Anhui. Patients were divided into four groups according to age and into three groups (moderate, severe, and critical group) according to the fifth version of the guidelines issued by the National Health Commission of China on Diagnosis and Treatment of COVID-19. MEASUREMENTS AND MAIN RESULTS: Compared with moderate group (37.8%), the incidence of comorbidities was higher in severe (46.3%) and critical groups (67.1%). Compared with severe and critical groups, there were more patients taking ACEI/ARB in moderate group. More patients had multiple lung lobe involvement and pleural effusion in the critical group as compared to moderate group. Compared with the moderate group, more patients received antiviral agents within first 4 days than in severe group, and more patients received antibiotics and corticosteriods in critical and severe groups. Patients over 75 years old had significantly lower survival rate than the younger patients. CONCLUSION: Multiple organ dysfunction and impaired immune function were the typical characteristics of severe and critical patients. There was a significant difference in angiotensin-converting enzyme inhibitors/angiotensin II receptor blockers usage among patients with different severities. Involvement of multiple lung lobes and pleural effusion were associated with the severity of COVID-19. Advanced age (=75 years) was a risk factor for mortality. This article is open access and distributed under the terms of the Creative Commons Attribution Non-Commercial No Derivatives License 4.0 (http://creativecommons.org/licenses/by-nc-nd/4.0/).
DOI: https://dx.doi.org/10.1164/rccm.202002-0445OC

20. Fu L, Fei J, Xiang H-X, et al. Influence factors of death risk among COVID-19 patients in Wuhan, China: a hospital-based case-cohort study. medRxiv. 2020:2020.03.13.20035329. DOI: 10.1101/2020.03.13.20035329
ABSTRACT: Background. Coronavirus disease 2019 (COVID-19) triggered by infection with severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) has been widely pandemic all over the world. The aim of this study was to analyze the influence factors of death risk among 200 COVID-19 patients. Methods. Two hundred patients with confirmed SARS-CoV-2 infection were recruited. Demographic data and clinical characteristics were collected from electronic medical records. Biochemical indexes on admission were measured and patient's prognosis was tracked. The association of demographic data, clinical characteristics and biochemical indexes with death risk was analyzed. Results. Of 200 COVID-19 patients, 163 (81.5%) had at least one of comorbidities, including diabetes, hypertension, hepatic disease, cardiac disease, chronic pulmonary disease and others.

Among all patients, critical cases, defined as oxygenation index lower than 200, accounted for 26.2%. Severe cases, oxygenation index from 200 to 300, were 29.7%. Besides, common cases, oxygenation index higher than 300, accounted for 44.1%. At the end of follow-up, 34 (17%) were died on mean 10.9 day after hospitalization. Stratified analysis revealed that older ages, lower oxygenation index and comorbidities elevated death risk of COVID-19 patients. On admission, 85.5% COVID-19 patients were with at least one of extrapulmonary organ injuries. Univariable logistic regression showed that ALT and TBIL, two indexes of hepatic injury, AST, myoglobin and LDH, AST/ALT ratio, several markers of myocardial injury, creatinine, urea nitrogen and uric acid, three indexes of renal injury, were positively associated with death risk of COVID-19 patients. Multivariable logistic regression revealed that AST/ALT ratio, urea nitrogen, TBIL and LDH on admission were positively correlated with death risk of COVID-19 patients. Conclusion. Older age, lower oxygenation index and comorbidities on admission elevate death risk of COVID-19 patients. AST/ALT ratio, urea nitrogen, TBIL and LDH on admission may be potential prognostic indicators. Early hospitalization is of great significance to prevent multiple organ damage and improve the survival of COVID-19 patients.Competing Interest StatementThe authors have declared no competing interest.Clinical TrialCoronavirus disease 2019 (COVID-19) triggered by infection with severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) has been widely pandemic all over the world. After the first patient was reported in December 2019 in Wuhan City, Hubei Province, China, this infecting disease broke out quickly, spread around all over the world and was persistently evolving so far. Until 6 March, 2020, 80581 cases were confirmed to have been infected with SARS-CoV-2 and 3016 cases died from SARS-CoV-2 infection in China. In other countries, total 17024 COVID-19 patients were confirmed and 343 patients died after being infected with SARS-CoV-2. This novel disease is a neo-type respiratory contagious disease that has high infectivity and mortality as well as heavy damage on public health. Clinical trial has been registered before this research. However, it needs a long time to finish all the process, the clinical trial ID is not obtained temporarily and still transacted. Funding StatementThis study was supported by National Natural Science Foundation of China (81630084) and National Natural Science Foundation Incubation Program of the Second Affiliated Hospital of Anhui Medical University (2019GQFY06).Author DeclarationsAll relevant ethical guidelines have been followed; any necessary IRB and/or ethics committee approvals have been obtained and details of the IRB/oversight body are included in the manuscript.YesAll necessary patient/participant consent has been obtained and the appropriate institutional forms have been archived.YesI understand that all clinical trials and any other prospective interventional studies must be registered with an ICMJE-approved registry, such as ClinicalTrials.gov. I confirm that any such study reported in the manuscript has been registered and the trial registration ID is provided (note: if posting a prospective study registered retrospectively, please provide a statement in the trial ID field explaining why the study was not registered in advance).Yes I have followed all appropriate research reporting guidelines and uploaded the relevant EQUATOR Network research reporting checklist(s) and other pertinent material as supplementary files, if applicable.YesWe declare that all data referred to in the manuscript is availability.
URL: http://medrxiv.org/content/early/2020/03/16/2020.03.13.20035329.abstract; or SSRN Mar 23: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3551430
DOI: 10.1101/2020.03.13.20035329

21. Garg S, Kim L, Whitaker M, et al. Hospitalization Rates and Characteristics of Patients Hospitalized with Laboratory-Confirmed Coronavirus Disease 2019 - COVID-NET, 14 States, March 1-30, 2020. MMWR Morb Mortal Wkly Rep. 2020;69(15):458-64. DOI: 10.15585/mmwr.mm6915e3.; ID: 19398 10.15585/mmwr.mm6915e3
ABSTRACT: Since SARS-CoV-2, the novel coronavirus that causes coronavirus disease 2019 (COVID-19), was first detected in December 2019 (1), approximately 1.3 million cases have been reported worldwide (2), including approximately 330,000 in the United States (3). To conduct population-based surveillance for laboratory-confirmed COVID-19-associated hospitalizations in the United States, the COVID-19-Associated Hospitalization Surveillance Network (COVID-NET) was created using the existing infrastructure of the Influenza Hospitalization

Surveillance Network (FluSurv-NET) (4) and the Respiratory Syncytial Virus Hospitalization Surveillance Network (RSV-NET). This report presents age-stratified COVID-19-associated hospitalization rates for patients admitted during March 1-28, 2020, and clinical data on patients admitted during March 1-30, 2020, the first month of U.S. surveillance. Among 1,482 patients hospitalized with COVID-19, 74.5% were aged â‰¥50 years, and 54.4% were male. The hospitalization rate among patients identified through COVID-NET during this 4-week period was 4.6 per 100,000 population. Rates were highest (13.8) among adults aged â‰¥65 years. Among 178 (12%) adult patients with data on underlying conditions as of March 30, 2020, 89.3% had one or more underlying conditions; the most common were hypertension (49.7%), obesity (48.3%), chronic lung disease (34.6%), diabetes mellitus (28.3%), and cardiovascular disease (27.8%). These findings suggest that older adults have elevated rates of COVID-19-associated hospitalization and the majority of persons hospitalized with COVID-19 have underlying medical conditions. These findings underscore the importance of preventive measures (e.g., social distancing, respiratory hygiene, and wearing face coverings in public settings where social distancing measures are difficult to maintain)(â€) to protect older adults and persons with underlying medical conditions, as well as the general public. In addition, older adults and persons with serious underlying medical conditions should avoid contact with persons who are ill and immediately contact their health care provider(s) if they have symptoms consistent with COVID-19 (https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html) (5). Ongoing monitoring of hospitalization rates, clinical characteristics, and outcomes of hospitalized patients will be important to better understand the evolving epidemiology of COVID-19 in the United States and the clinical spectrum of disease, and to help guide planning and prioritization of health care system resources.
URL: https://www.ncbi.nlm.nih.gov/pubmed/32298251
DOI: 10.15585/mmwr.mm6915e3.; ID: 19398
10.15585/mmwr.mm6915e3

22. Guan W-J, Liang W-H, Zhao Y, et al. Comorbidity and its impact on 1590 patients with Covid-19 in China: A Nationwide Analysis. The European respiratory journal. 2020. DOI: 10.1183/13993003.00547-2020
ABSTRACT: BACKGROUND: The coronavirus disease 2019 (Covid-19) outbreak is evolving rapidly worldwide. OBJECTIVE: To evaluate the risk of serious adverse outcomes in patients with coronavirus disease 2019 (Covid-19) by stratifying the comorbidity status. METHODS: We analysed the data from 1590 laboratory-confirmed hospitalised patients 575 hospitals in 31 province/autonomous regions/provincial municipalities across mainland China between December 11(th), 2019 and January 31(st), 2020. We analyse the composite endpoints, which consisted of admission to intensive care unit, or invasive ventilation, or death. The risk of reaching to the composite endpoints was compared according to the presence and number of comorbidities. RESULTS: The mean age was 48.9 years. 686 patients (42.7%) were females. Severe cases accounted for 16.0% of the study population. 131 (8.2%) patients reached to the composite endpoints. 399 (25.1%) reported having at least one comorbidity. The most prevalent comorbidity was hypertension (16.9%), followed by diabetes (8.2%). 130 (8.2%) patients reported having two or more comorbidities. After adjusting for age and smoking status, COPD [hazards ratio (HR) 2.681, 95% confidence interval (95%CI) 1.424-5.048], diabetes (HR 1.59, 95%CI 1.03-2.45), hypertension (HR 1.58, 95%CI 1.07-2.32) and malignancy (HR 3.50, 95%CI 1.60-7.64) were risk factors of reaching to the composite endpoints. The HR was 1.79 (95%CI 1.16-2.77) among patients with at least one comorbidity and 2.59 (95%CI 1.61-4.17) among patients with two or more comorbidities. CONCLUSION: Among laboratory-confirmed cases of Covid-19, patients with any comorbidity yielded poorer clinical outcomes than those without. A greater number of comorbidities also correlated with poorer clinical outcomes.
URL: https://www.ncbi.nlm.nih.gov/pubmed/32217650
DOI: 10.1183/13993003.00547-2020

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ABSTRACT: The novel coronavirus disease (COVID-19) outbreak, caused by SARS-CoV-2, represents the greatest medical challenge in decades. We provide a comprehensive review of the clinical course of COVID-19, its comorbidities, and mechanistic considerations for future therapies. While COVID-19 primarily affects the lungs, causing interstitial pneumonitis and severe acute respiratory distress syndrome (ARDS), it also affects multiple organs, particularly the cardiovascular system. Risk of severe infection and mortality increase with advancing age and male sex. Mortality is increased by comorbidities: cardiovascular disease, hypertension, diabetes, chronic pulmonary disease, and cancer. The most common complications include arrhythmia (atrial fibrillation, ventricular tachyarrhythmia, and ventricular fibrillation), cardiac injury [elevated highly sensitive troponin I (hs-cTnI) and creatine kinase (CK) levels], fulminant myocarditis, heart failure, pulmonary embolism, and disseminated intravascular coagulation (DIC). Mechanistically, SARS-CoV-2, following proteolytic cleavage of its S protein by a serine protease, binds to the transmembrane angiotensin-converting enzyme 2 (ACE2) —a homologue of ACE—to enter type 2 pneumocytes, macrophages, perivascular pericytes, and cardiomyocytes. This may lead to myocardial dysfunction and damage, endothelial dysfunction, microvascular dysfunction, plaque instability, and myocardial infarction (MI). While ACE2 is essential for viral invasion, there is no evidence that ACE inhibitors or angiotensin receptor blockers (ARBs) worsen prognosis. Hence, patients should not discontinue their use. Moreover, renin–angiotensin–aldosterone system (RAAS) inhibitors might be beneficial in COVID-19. Initial immune and inflammatory responses induce a severe cytokine storm [interleukin (IL)-6, IL-7, IL-22, IL-17, etc.] during the rapid progression phase of COVID-19. Early evaluation and continued monitoring of cardiac damage (cTnI and NT-proBNP) and coagulation (D-dimer) after hospitalization may identify patients with cardiac injury and predict COVID-19 complications. Preventive measures (social distancing and social isolation) also increase cardiovascular risk. Cardiovascular considerations of therapies currently used, including remdesivir, chloroquine, hydroxychloroquine, tocilizumab, ribavirin, interferons, and lopinavir/ritonavir, as well as experimental therapies, such as human recombinant ACE2 (rhACE2), are discussed.
URL: https://academic.oup.com/cardiovascres/advance-article/doi/10.1093/cvr/cvaa106/5826160
DOI: 10.1093/cvr/cvaa106

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ABSTRACT: AbstractBackground: To investigate the risk factors related to aggravation and clinical outcomes in coronavirus disease 2019 (COVID-19) patients.Methods: We performed a retrospective study on the risk factors for disease progression of cases with COVID-19. Based on the clinical types, the patients were divided into a progression group and an improvement group. Multivariable logistic regression and ROC curve analysis were performed to explore the risk factors for disease progression.Results: A total of 101 patients were included in this study; diseases progression occurred in 17 patients, 84 patients improved, 6 were transferred to intensive care unit (ICU), and 5 died. The mean time to obtain negative nucleic acid results was 12.5?±?5.0?days. Multivariate logistic analysis indicated that age (OR, 0.104; p?=?.002), C-reactive protein (CRP) (OR, 0.093; p?<?.001) and lymphocyte count (OR, 3.397; p?=?.022) were risk factors for disease progression. ROC curve analysis revealed that the AUC of age, CRP and lymphocyte count for disease progression were 0.873, 0.911 and 0.817, respectively.Conclusions: Older age increased CRP and decreased lymphocyte count resulted in potential risk factors for COVID-19 progression. This may be helpful in identifying patients whose condition worsens at an early stage.
URL: https://doi.org/10.1080/23744235.2020.1759817
DOI: 10.1080/23744235.2020.1759817

25. Hu H, Yao N, Qiu Y. Comparing rapid scoring systems in mortality prediction of critical ill patients with novel coronavirus disease. Academic emergency medicine : official journal of the Society for Academic Emergency Medicine. 2020. DOI: 10.1111/acem.13992
10.1111/acem.13992.

ABSTRACT: OBJECTIVES: Rapid and early severity-of-illness assessment appears to be important for critical ill patients with novel coronavirus disease (COVID-19). This study aimed to evaluate the performance of the rapid scoring system on admission of these patients. METHODS: 138 medical records of critical ill patients with COVID-19 were included in the study. Demographic and clinical characteristics on admission used for calculating Modified Early Warning Score (MEWS) and Rapid Emergency Medicine Score (REMS) and outcomes (survival or death) were collected for each case and extracted for analysis. All patients were divided into two age subgroups (65 and /=65years). The receiver operating characteristic curve analyses were performed for overall patients and both subgroups. RESULTS: The median [25%quartile, 75%quartile] of MEWS of survivors versus non-survivors were 1[1, 2] and 2[1, 3] and that of REMS were 5[2, 6] and 7[6, 10], respectively. In overall analysis, the area under the receiver operating characteristic curve for the REMS in predicting mortality was 0.833 (95% CI: 0.737-0.928), higher than that of MEWS (0.677, 95% CI 0.541-0.813). An optimal cut-off of REMS (/=6) had a sensitivity of 89.5%, a specificity of 69.8%, a positive predictive value of 39.5%, and a negative predictive value of 96.8%. In the analysis of subgroup of patients aged 65years, the area under the receiver operating characteristic curve for the REMS in predicting mortality was 0.863 (95% CI: 0.743-0.941), higher than that of MEWS (0.603, 95% CI 0.462-0.732). CONCLUSION: To our knowledge, this study was the first exploration on rapid scoring systems for critical ill patients with COVID-19. The REMS could provide emergency clinicians with an effective adjunct risk stratification tool for critical ill patients with COVID-19, especially for the patients aged 65 years. The effectiveness of REMS for screening these patients is attributed to its high negative predictive value.
URL: https://www.ncbi.nlm.nih.gov/pubmed/32311790
DOI: 10.1111/acem.13992
10.1111/acem.13992.

26. Hu L, Chen S, Fu Y, et al. Risk Factors Associated with Clinical Outcomes in 323 COVID-19 Patients in Wuhan, China. medRxiv. 2020:2020.03.25.20037721. DOI: 10.1101/2020.03.25.20037721
ABSTRACT: Background With evidence of sustained transmission in more than 190 countries, coronavirus disease 2019 (COVID-19) has been declared a global pandemic. As such, data are urgently needed about risk factors associated with clinical outcomes. Methods A retrospective chart review of 323 hospitalized patients with COVID-19 in Wuhan was conducted. Patients were classified into three disease severity groups (non-severe, severe, and critical), based on their initial clinical presentation. Clinical outcomes were designated as favorable and unfavorable, based on disease progression and response to treatments. Logistic regression models were performed to identify factors associated with clinical outcomes, and logrank test was conducted for the association with clinical progression. Results Current standard treatments did not show significant improvement on patient outcomes in the study. By univariate logistic regression model, 27 risk factors were significantly associated with clinical outcomes. Further, multivariate regression indicated that age over 65 years, smoking, critical disease status, diabetes, high hypersensitive troponin I (>0.04 pg/mL), leukocytosis (>10 x 109/L) and neutrophilia (>75 x 109/L) predicted unfavorable clinical outcomes. By contrast, the use of hypnotics was significantly associated with favorable outcomes. Survival analysis also confirmed that patients receiving hypnotics had significantly better survival. Conclusions To our knowledge, this is the first indication that hypnotics could be an effective ancillary treatment for COVID-19. We also found that novel risk factors, such as higher hypersensitive troponin I, predicted poor clinical outcomes. Overall, our study provides useful data to guide early clinical decision making to reduce mortality and improve clinical outcomes of COVID-19.Competing Interest StatementThe authors have declared no competing interest.Funding StatementFunded by the Natural Science Foundation of Hubei Province ZRMS2019000029 and the Top Youth Talent Program in Hubei ProvinceAuthor DeclarationsAll relevant ethical guidelines have been followed; any necessary IRB and/or ethics committee approvals have been obtained and details of the IRB/oversight body are included in the manuscript.YesAll necessary patient/participant consent has been obtained and the appropriate institutional forms have been archived.YesI understand that all clinical trials and any other prospective interventional studies must be registered with an ICMJE-approved registry, such as ClinicalTrials.gov. I confirm that any such study

reported in the manuscript has been registered and the trial registration ID is provided (note: if posting a prospective study registered retrospectively, please provide a statement in the trial ID field explaining why the study was not registered in advance).Yes I have followed all appropriate research reporting guidelines and uploaded the relevant EQUATOR Network research reporting checklist(s) and other pertinent material as supplementary files, if applicable.YesData sharing not applicable
URL: http://medrxiv.org/content/early/2020/03/26/2020.03.25.20037721.abstract
DOI: 10.1101/2020.03.25.20037721

27. Hu Y, Sun J, Dai Z, et al. Prevalence and severity of corona virus disease 2019 (COVID-19): A systematic review and meta-analysis. Journal of clinical virology : the official publication of the Pan American Society for Clinical Virology. 2020;127:104371. DOI: 10.1016/j.jcv.2020.104371 10.1016/j.jcv.2020.104371.
ABSTRACT: BACKGROUND: Since being first reported in Wuhan, China, in December 8, 2019, the outbreak of the novel coronavirus, now known as COVID-19, has spread globally. Some case studies regarding the characteristics and outcome of patients with COVID-19 have been published recently. We conducted a meta-analysis to evaluate the risk factors of COVID-19. METHODS: Medline, SinoMed, EMBASE, and Cochrane Library were searched for clinical and epidemiological studies on confirmed cases of COVID-19. RESULTS: The incidence of fever, cough, fatigue, and dyspnea symptoms were 85.6 % (95CI 81.3-89.9 %), 65.7 % (95CI 60.1-71.4 %), 42.4 % (95CI 32.2-52.6 %) and 21.4 % (95CI 15.3-27.5 %). The prevalence of diabetes was 7.7 % (95CI 6.1-9.3 %), hypertension was 15.6 % (95CI 12.6-18.6 %), cardiovascular disease was 4.7 % (95CI 3.1-6.2 %), and malignancy was 1.2 % (95CI 0.5-1.8 %). The complications, including ARDS risk, ranged from 5.6-13.2 %, with the pooled estimate of ARDS risk at 9.4 %, ACI at 5.8 % (95CI 0.7-10.8 %), AKI at 2.1 % (95CI 0.6-3.7 %), and shock at 4.7 % (95CI 0.9-8.6 %). The risks of severity and mortality ranged from 12.6 to 23.5% and from 2.0 to 4.4 %, with pooled estimates at 18.0 and 3.2 %, respectively. The percentage of critical cases in diabetes and hypertension was 44.5 % (95CI 27.0-61.9 %) and 41.7 % (95CI 26.4-56.9 %), respectively. CONCLUSION: Fever is the most common symptom in patients with COVID-19. The most prevalent comorbidities are hypertension and diabetes which are associated with the severity of COVID-19. ARDS and ACI may be the main obstacles for patients to treatment recovery. The case severe rate and mortality is lower than that of SARS and MERS.
URL: https://www.ncbi.nlm.nih.gov/pubmed/32315817
DOI: 10.1016/j.jcv.2020.104371
10.1016/j.jcv.2020.104371.

28. Huang I, Lim MA, Pranata R. Diabetes mellitus is associated with increased mortality and severity of disease in COVID-19 pneumonia – A systematic review, meta-analysis, and meta-regression. Diabetes & Metabolic Syndrome: Clinical Research & Reviews. 2020;14(4):395-403. DOI: https://doi.org/10.1016/j.dsx.2020.04.018
ABSTRACT: Background and aims Diabetes Mellitus (DM) is chronic conditions with devastating multi-systemic complication and may be associated with severe form of Coronavirus Disease 2019 (COVID-19). We conducted a systematic review and meta-analysis in order to investigate the association between DM and poor outcome in patients with COVID-19 pneumonia. Methods Systematic literature search was performed from several electronic databases on subjects that assess DM and outcome in COVID-19 pneumonia. The outcome of interest was composite poor outcome, including mortality, severe COVID-19, acute respiratory distress syndrome (ARDS), need for intensive care unit (ICU) care, and disease progression. Results There were a total of 6452 patients from 30 studies. Meta-analysis showed that DM was associated with composite poor outcome (RR 2.38 [1.88, 3.03], $p < 0.001$; I2: 62%) and its subgroup which comprised of mortality (RR 2.12 [1.44, 3.11], $p < 0.001$; I2: 72%), severe COVID-19 (RR 2.45 [1.79, 3.35], $p < 0.001$; I2: 45%), ARDS (RR 4.64 [1.86, 11.58], $p = 0.001$; I2: 9%), and disease progression (RR 3.31 [1.08, 10.14], $p = 0.04$; I2: 0%). Meta-regression showed that the association with composite poor outcome was influenced by age ($p = 0.003$) and hypertension ($p < 0.001$). Subgroup analysis showed that the association was weaker in studies with median age ≥55 years-old (RR 1.92)

compared to <55 years-old (RR 3.48), and in prevalence of hypertension ≥25% (RR 1.93) compared to <25% (RR 3.06). Subgroup analysis on median age <55 years-old and prevalence of hypertension <25% showed strong association (RR 3.33) Conclusion DM was associated with mortality, severe COVID-19, ARDS, and disease progression in patients with COVID-19.
URL: http://www.sciencedirect.com/science/article/pii/S1871402120300837
DOI: https://doi.org/10.1016/j.dsx.2020.04.018

29. Jain V, Yuan J-M. Systematic review and meta-analysis of predictive symptoms and comorbidities for severe COVID-19 infection. medRxiv. 2020:2020.03.15.20035360. DOI: 10.1101/2020.03.15.20035360
ABSTRACT: Background/introduction COVIDâˆ’19, a novel coronavirus outbreak starting in China, is now a rapidly developing public health emergency of international concern. The clinical spectrum of COVIDâˆ’19 disease is varied, and identifying factors associated with severe disease has been described as an urgent research priority. It has been noted that elderly patients with pre-existing comorbidities are more vulnerable to more severe disease. However, the specific symptoms and comorbidities that most strongly predict disease severity are unclear. We performed a systematic review and meta-analysis to identify the symptoms and comorbidities predictive of COVIDâˆ’19 severity. Method This study was prospectively registered on PROSPERO. A literature search was performed in three databases (MEDLINE, EMBASE and Global Health) for studies indexed up to 5th March 2020. Two reviewers independently screened the literature and both also completed data extraction. Quality appraisal of studies was performed using the STROBE checklist. Random effects meta-analysis was performed for selected symptoms and comorbidities to identify those most associated with severe COVIDâˆ’19 infection or ICU admission. Results Of the 2259 studies identified, 42 were selected after title and abstract analysis, and 7 studies (including 1813 COVIDâˆ’19 patients) were chosen for inclusion. The ICU group were older (62.4 years) compared to the non-ICU group (46 years), with a significantly higher proportion of males (67.2% vs. 57.1%, p=0.04). Dyspnoea was the only significant symptom predictive for both severe disease (pOR 3.70, 95% CI 1.83 âˆ’ 7.46) and ICU admission (pOR 6.55, 95% CI 4.28 âˆ’ 10.0). Notwithstanding the low prevalence of COPD in severe disease and ICU-admitted groups (4.5% and 9.7%, respectively), COPD was the most strongly predictive comorbidity for both severe disease (pOR 6.42, 95% CI 2.44 âˆ’ 16.9) and ICU admission (pOR 17.8, 95% CI 6.56 âˆ’ 48.2). Cardiovascular disease and hypertension were also strongly predictive for both severe disease and ICU admission. Those with CVD and hypertension were 4.4 (95% CI 2.64 âˆ’ 7.47) and 3.7 (95% CI 2.22 âˆ’ 5.99) times more likely to have an ICU admission respectively, compared to patients without the comorbidity. Conclusions Dyspnoea was the only symptom strongly predictive for both severe disease and ICU admission, and could be useful in guiding clinical management decisions early in the course of illness. When looking at ICU-admitted patients, who represent the more severe end of the spectrum of clinical severity, COPD patients are particularly vulnerable, and those with cardiovascular disease and hypertension are also at a high-risk of severe illness. To aid clinical assessment, risk stratification, efficient resource allocation, and targeted public health interventions, future research must aim to further define those at high-risk of severe illness with COVIDâˆ’19.Competing Interest StatementThe authors have declared no competing interest.Funding StatementThe authors received no specific funding for this work.Author DeclarationsAll relevant ethical guidelines have been followed; any necessary IRB and/or ethics committee approvals have been obtained and details of the IRB/oversight body are included in the manuscript.YesAll necessary patient/participant consent has been obtained and the appropriate institutional forms have been archived.YesI understand that all clinical trials and any other prospective interventional studies must be registered with an ICMJE-approved registry, such as ClinicalTrials.gov. I confirm that any such study reported in the manuscript has been registered and the trial registration ID is provided (note: if posting a prospective study registered retrospectively, please provide a statement in the trial ID field explaining why the study was not registered in advance).Yes I have followed all appropriate research reporting guidelines and uploaded the relevant EQUATOR Network research reporting checklist(s) and other pertinent mat rial as supplementary files, if applicable.YesAll data are fully available without restriction

URL: http://medrxiv.org/content/early/2020/03/16/2020.03.15.20035360.abstract
DOI: 10.1101/2020.03.15.20035360

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ABSTRACT: Background: Estimating the prevalence of severe or critical illness and case fatality of COVID-19 outbreak in December, 2019 remains a challenge due to biases associated with surveillance, data synthesis and reporting. We aimed to address this limitation in a systematic review and meta-analysis and to examine the clinical, biochemical and radiological risk factors in a meta-regression. Methods: PRISMA guidelines were followed. PubMed, Scopus and Web of Science were searched using pre-specified keywords on March 07, 2020. Peer-reviewed empirical studies examining prevalence rates of severe illness, critical illness and mortality among COVID-19 patients were examined. Numerators and denominators to compute the prevalence rates and risk factors were extracted. Random-effects meta-analyses were performed. Results were corrected for publication bias. Meta-regression analyses examined the moderator effects of potential risk factors. Findings: The meta-analysis included 29 studies representing 2,090 individuals. Pooled rates of severe illness, critical illness and case fatality among COVID-19 patients were 15%, 5% and 0.8% respectively. Adjusting for potential underreporting and publication bias, increased these estimates to 26%, 16% and 7.4% respectively. Increasing age and elevated LDH consistently predicted severe / critical disease and case fatality. Hypertension; fever and dyspnea at presentation; and elevated CRP predicted increased severity. Interpretation: Risk factors that emerged in our analyses predicting severity and case fatality should inform clinicians to define endophenotypes possessing a greater risk. Estimated case fatality rate of 7.4% after correcting for publication bias underscores the importance of strict adherence to preventive measures, case detection, surveillance and reporting. Funding Statement: None Declaration of Interests: The authors declare no competing interests
URL: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3564410

31. Kahathuduwa CN, Dhanasekara CS, Chin S-H. Case fatality rate in COVID-19: a systematic review and meta-analysis. medRxiv. 2020:2020.04.01.20050476. DOI: 10.1101/2020.04.01.20050476
ABSTRACT: Background: Estimating the prevalence of severe or critical illness and case fatality of COVID-19 outbreak in December, 2019 remains a challenge due to biases associated with surveillance, data synthesis and reporting. We aimed to address this limitation in a systematic review and meta-analysis and to examine the clinical, biochemical and radiological risk factors in a meta-regression. Methods: PRISMA guidelines were followed. PubMed, Scopus and Web of Science were searched using pre-specified keywords on March 07, 2020. Peer-reviewed empirical studies examining rates of severe illness, critical illness and case fatality among COVID-19 patients were examined. Numerators and denominators to compute the prevalence rates and risk factors were extracted. Random-effects meta-analyses were performed. Results were corrected for publication bias. Meta-regression analyses examined the moderator effects of potential risk factors. Results: The meta-analysis included 29 studies representing 2,090 individuals. Pooled rates of severe illness, critical illness and case fatality among COVID-19 patients were 15%, 5% and 0.8% respectively. Adjusting for potential underreporting and publication bias, increased these estimates to 26%, 16% and 7.4% respectively. Increasing age and elevated LDH consistently predicted severe / critical disease and case fatality. Hypertension; fever and dyspnea at presentation; and elevated CRP predicted increased severity. Conclusions: Risk factors that emerged in our analyses predicting severity and case fatality should inform clinicians to define endophenotypes possessing a greater risk. Estimated case fatality rate of 7.4% after correcting for publication bias underscores the importance of strict adherence to preventive measures, case detection, surveillance and reporting.Competing Interest StatementThe authors have declared no competing interest.Clinical TrialNot applicableFunding StatementThe study was not funded. The authors have no potential conflicts of interest to declare.Author DeclarationsAll relevant ethical guidelines have been followed; any necessary IRB and/or ethics committee approvals have been

obtained and details of the IRB/oversight body are included in the manuscript.YesAll necessary patient/participant consent has been obtained and the appropriate institutional forms have been archived.YesI understand that all clinical trials and any other prospective interventional studies must be registered with an ICMJE-approved registry, such as ClinicalTrials.gov. I confirm that any such study reported in the manuscript has been registered and the trial registration ID is provided (note: if posting a prospective study registered retrospectively, please provide a statement in the trial ID field explaining why the study was not registered in advance).Yes I have followed all appropriate research reporting guidelines and uploaded the relevant EQUATOR Network research reporting checklist(s) and other pertinent material as supplementary files, if applicable.YesThe data presented in the manuscript is based entirely on data extracted from peer-reviewed, published research. The authors are willing to share detailed records of all steps including searching databases, systematically screening the literature, quality assessment, data extraction and meta-analysis (including the scripts).
URL: http://medrxiv.org/content/early/2020/04/06/2020.04.01.20050476.abstract
DOI: 10.1101/2020.04.01.20050476

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ABSTRACT: BACKGROUND: Studies have reminded that cardiovascular metabolic comorbidities made patients more susceptible to suffer 2019 novel corona virus (2019-nCoV) disease (COVID-19), and exacerbated the infection. The aim of this analysis is to determine the association of cardiovascular metabolic diseases with the development of COVID-19. METHODS: A meta-analysis of eligible studies that summarized the prevalence of cardiovascular metabolic diseases in COVID-19 and compared the incidences of the comorbidities in ICU/severe and non-ICU/severe patients was performed. Embase and PubMed were searched for relevant studies. RESULTS: A total of six studies with 1527 patients were included in this analysis. The proportions of hypertension, cardia-cerebrovascularÂ disease and diabetes in patients with COVID-19 were 17.1%, 16.4% and 9.7%, respectively. The incidences of hypertension, cardia-cerebrovascular diseases and diabetes were about twofolds, threefolds and twofolds, respectively, higher in ICU/severe cases than in their non-ICU/severe counterparts. At least 8.0% patients with COVID-19 suffered the acute cardiac injury. The incidence of acute cardiac injury was about 13 folds higher in ICU/severe patients compared with the non-ICU/severe patients. CONCLUSION: Patients with previous cardiovascular metabolic diseases may face a greater risk of developing into the severe condition and the comorbidities can also greatly affect the prognosis of the COVID-19. On the other hand, COVID-19 can, in turn, aggravate the damage to the heart.
URL: https://pubmed.ncbi.nlm.nih.gov/32161990
DOI: 10.1007/s00392-020-01626-9
DOI: 10.1101/2020.02.25.20027672

33. Li M, Dong Y, Wang H, et al. Cardiovascular disease potentially contributes to the progression and poor prognosis of COVID-19. Nutrition, Metabolism and Cardiovascular Diseases. 2020. DOI: https://doi.org/10.1016/j.numecd.2020.04.013
ABSTRACT: Background A novel coronavirus severe acute respiratory syndrome corona virus 2 (SARS-CoV-2) caused pneumonia, Coronavirus Disease 2019 (COVID-19), outbroke in Wuhan, China in December 2019, and spread all over the world. Patients with COVID-19 showed huge differences in the hospital stays, progression and prognosis. As reported, the comorbidities may play an important role in COVID-19. Here, we aim to address the role of cardiovascular disease (CVD) in the progression and prognosis of COVID-19. Methods 83 confirmed COVID-19 patients were divided into the CVD (n=42) and non-CVD (n=41) group according to their medical history. Medical records information including demographic data, medical history, clinical characteristics,

laboratory examinations, chest computed tomography (CT) as well as treatment measures were collected, analyzed and compared between two groups. Results COVID-19 patients with CVD showed: (1) more severe pathological changes in the lung, (2) elevated injury-related enzymes including α-hydroxybutyrate dehydrogenase (HDBH), lactate dehydrogenase (LDH), γ-glutamyltransferase (GGT), creatine kinase (CK) and alanine aminotransferase (ALT), (3) significantly increased uncontrolled inflammation related markers, such as c-reactive protein (CRP), interleukin (IL)-6, serum ferritin, erythrocyte sedimentation rate (ESR) and serum amyloid A (SAA), (4) serious hypercoagulable status reflected by increased D-dimer and serum fibrinogen (FIB), and (5) higher mortality, compared to COVID-19 patients without CVD. Conclusions Our data indicated that CVD is a strong risk factor for a rapid progression and bad prognosis of COVID-19. More intensive medical care should be applied to patients with CVD to prevent rapid deterioration of the disease.
URL: http://www.sciencedirect.com/science/article/pii/S0939475320301344
DOI: https://doi.org/10.1016/j.numecd.2020.04.013

34. Li X, Wang L, Yan S, et al. Clinical characteristics of 25 death cases with COVID-19: a retrospective review of medical records in a single medical center, Wuhan, China. Int J Infect Dis. 2020;94:128-32. DOI: 10.1016/j.ijid.2020.03.053
ABSTRACT: OBJECTIVES: This study aims to summarize the clinical characteristics of death cases with COVID-19 and to identify critically ill patients of COVID-19 early and reduce their mortality. METHODS: The clinical records, laboratory findings and radiological assessments included chest X-ray or computed tomography were extracted from electronic medical records of 25 died patients with COVID-19 in Renmin Hospital of Wuhan University from Jan 14 to Feb 13, 2020. Two experienced clinicians reviewed and abstracted the data. RESULTS: The age and underlying diseases (hypertension, diabetes, etc.) were the most important risk factors for death of COVID-19 pneumonia. Bacterial infections may play an important role in promoting the death of patients. Malnutrition was common to severe patients. Multiple organ dysfunction can be observed, the most common organ damage was lung, followed by heart, kidney and liver. The rising of neutrophils, SAA, PCT, CRP, cTnI, D-dimer, LDH and lactate levels can be used as indicators of disease progression, as well as the decline of lymphocytes counts. CONCLUSIONS: The clinical characteristics of 25 death cases with COVID-19 we summarized, which would be helpful to identify critically ill patients of COVID-19 early and reduce their mortality.
URL: https://www.ncbi.nlm.nih.gov/pubmed/32251805
DOI: 10.1016/j.ijid.2020.03.053

35. Li X, Xu S, Yu M, et al. Risk factors for severity and mortality in adult COVID-19 inpatients in Wuhan. Journal of Allergy and Clinical Immunology. 2020. DOI: https://doi.org/10.1016/j.jaci.2020.04.006
ABSTRACT: Background In December 2019, COVID-19 outbreak occurred in Wuhan. Data on the clinical characteristics and outcomes of patients with severe COVID-19 are limited. Objective The severity on admission, complications, treatment, and outcomes of COVID-19 patients were evaluated. Methods Patients with COVID-19 admitted to Tongji Hospital from January 26, 2020 to February 5, 2020 were retrospectively enrolled and followed-up until March 3, 2020. Potential risk factors for severe COVID-19 were analyzed by a multivariable binary logistic model. Cox proportional hazard regression model was used for survival analysis in severe patients. Results We identified 269 (49.1%) of 548 patients as severe cases on admission. Elder age, underlying hypertension, high cytokine levels (IL-2R, IL-6, IL-10, and TNF-a), and high LDH level were significantly associated with severe COVID-19 on admission. The prevalence of asthma in COVID-19 patients was 0.9%, markedly lower than that in the adult population of Wuhan. The estimated mortality was 1.1% in nonsevere patients and 32.5% in severe cases during the average 32 days of follow-up period. Survival analysis revealed that male, elder age, leukocytosis, high LDH level, cardiac injury, hyperglycemia, and high-dose corticosteroid use were associated with death in patients with severe COVID-19. Conclusions Patients with elder age, hypertension, and high LDH level need careful observation and early intervention to prevent the potential development of severe COVID-19.

Severe male patients with heart injury, hyperglycemia, and high-dose corticosteroid use may have high risk of death.
URL: http://www.sciencedirect.com/science/article/pii/S0091674920304954
DOI: https://doi.org/10.1016/j.jaci.2020.04.006

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ABSTRACT: INTRODUCTION: As the coronavirus disease 2019 (COVID-19) outbreak, identification of clinical predictors of severe or fatal disease are necessary to enable risk stratification and optimize allocation of limited resources. Hypertension has been widely reported to be associated with increase disease severity, however, other studies have reported different findings. OBJECTIVES: To evaluate the association of hypertension and severe and fatal COVID-19. PATIENTS AND METHODS: Scopus, Medline, and Web of Science was performed to identify studies reporting the rate of hypertension in COVID-19 patients with severe or non-severe disease or among survivors and non-survivors. The obtained data was pooled into a meta-analysis to calculate odds ratio (OR) with 95% confidence intervals (95%CI). RESULTS: Hypertension was associated with a nearly 2.5-fold significantly increased risk of severe COVID-19 disease (OR: 2.49 95%CI: 1.98-3.12] I2=24%), as well as with a similarly significant higher risk of mortality (OR: 2.42 95%CI: 1.51-3.90] I2=0%). In meta-regression, a significant correlation was observed with an increase in mean age of patients with severe COVID-19 associated with increased log odds of hypertension and severity (p=0.03). CONCLUSIONS: The results of this pooled analysis of the current scientific literature would suggest that hypertension may be associated with an up to 2.5-fold higher risk of severe and fatal COVID-19, especially among older individuals.
URL: https://www.ncbi.nlm.nih.gov/pubmed/32231171
DOI: 10.20452/pamw.15272.; ID: 6649
10.20452/pamw.15272

37. Liu W, Tao Z-W, Lei W, et al. Analysis of factors associated with disease outcomes in hospitalized patients with 2019 novel coronavirus disease. Chinese medical journal. 2020;Publish Ahead of Print(9):1032-8. DOI: 10.1097/CM9.0000000000000775
ABSTRACT: Background: Since early December 2019, the 2019 novel coronavirus disease (COVID-19) has caused pneumonia epidemic in Wuhan, Hubei province of China. This study aims to investigate the factors affecting the progression of pneumonia in COVID-19 patients. Associated results will be used to evaluate the prognosis and to find the optimal treatment regimens for COVID-19 pneumonia. Methods: Patients tested positive for the COVID-19 based on nucleic acid detection were included in this study. Patients were admitted to 3 tertiary hospitals in Wuhan between December 30, 2019, and January 15, 2020. Individual data, laboratory indices, imaging characteristics, and clinical data were collected, and statistical analysis was performed. Based on clinical typing results, the patients were divided into a progression group or an improvement/stabilization group. Continuous variables were analyzed using independent samples t-test or Mann-Whitney U test. Categorical variables were analyzed using Chi-squared test or Fisher exact test. Logistic regression analysis was performed to explore the risk factors for disease progression. Results: Seventy-eight patients with COVID-19-induced pneumonia met the inclusion criteria and were included in this study. Efficacy evaluation at 2 weeks after hospitalization indicated that 11 patients (14.1%) had deteriorated, and 67 patients (85.9%) had improved/stabilized. The patients in the progression group were significantly older than those in the disease improvement/stabilization group (66 51, 70] vs. 37 32, 41] years, Uâ€Š=â€Š4.932, Pâ€Š=â€Š0.001). The progression group had a significantly higher proportion of patients with a history of smoking than the improvement/stabilization group (27.3% vs. 3.0%, Ï‡2â€Š=â€Š9.291, Pâ€Š=â€Š0.018). For all the 78 patients, fever was the most common initial symptom, and the maximum body temperature at admission was significantly higher in the progression group than in the improvement/stabilization group (38.2 37.8, 38.6] vs. 37.5 37.0, 38.4]Â°C, Uâ€Š=â€Š2.057, Pâ€Š=â€Š0.027).

Moreover, the proportion of patients with respiratory failure (54.5% vs. 20.9%, Ï‡2â€Š=â€Š5.611, Pâ€Š=â€Š0.028) and respiratory rate (34 18, 48] vs. 24 16, 60] breaths/min, Uâ€Š=â€Š4.030, Pâ€Š=â€Š0.004) were significantly higher in the progression group than in the improvement/stabilization group. C-reactive protein was significantly elevated in the progression group compared to the improvement/stabilization group (38.9 14.3, 64.8] vs. 10.6 1.9, 33.1] mg/L, Uâ€Š=â€Š1.315, Pâ€Š=â€Š0.024). Albumin was significantly lower in the progression group than in the improvement/stabilization group (36.62â€ŠÂ±â€Š6.60 vs. 41.27â€ŠÂ±â€Š4.55â€Šg/L, Uâ€Š=â€Š2.843, Pâ€Š=â€Š0.006). Patients in the progression group were more likely to receive high-level respiratory support than in the improvement/stabilization group (Ï‡2â€Š=â€Š16.01, Pâ€Š=â€Š0.001). Multivariate logistic analysis indicated that age (odds ratio OR], 8.546; 95% confidence interval CI]: 1.628â€“44.864; Pâ€Š=â€Š0.011), history of smoking (OR, 14.285; 95% CI: 1.577â€“25.000; Pâ€Š=â€Š0.018), maximum body temperature at admission (OR, 8.999; 95% CI: 1.036â€“78.147, Pâ€Š=â€Š0.046), respiratory failure (OR, 8.772, 95% CI: 1.942â€“40.000; Pâ€Š=â€Š0.016), albumin (OR, 7.353, 95% CI: 1.098â€“50.000; Pâ€Š=â€Š0.003), and C-reactive protein (OR, 10.530; 95% CI: 1.224âˆ’34.701, Pâ€Š=â€Š0.028) were risk factors for disease progression. Conclusions: Several factors that led to the progression of COVID-19 pneumonia were identified, including age, history of smoking, maximum body temperature on admission, respiratory failure, albumin, C-reactive protein. These results can be used to further enhance the ability of management of COVID-19 pneumonia. Correspondences to: Dr. Yi Hu, Department of Respiratory and Critical Care Medicine, The Central Hospital of Wuhan, Tongji Medical College, Huazhong University of Science and Technology, Wuhan, Hubei 430030, ChinaE-Mail: huyi@zxhospital.com; Dr. Yang Ming, The Provost's Office, The Central Hospital of Wuhan, Tongji Medical College, Huazhong University of Science and Technology, Wuhan, Hubei 430030, ChinaE-Mail: 194341@qq.com How to cite this article: Liu W, Tao ZW, Lei W, Ming-Li Y, Kui L, Ling Z, Shuang W, Yan D, Jing L, Liu HG, Ming Y, Yi H. Analysis of factors associated with disease outcomes in hospitalized patients with 2019 novel coronavirus disease. Chin Med J 2020;00:00â€“00. doi: 10.1097/CM9.0000000000000775 Wei Liu and Zhao-Wu Tao contributed equally to this work. Received February 11, 2020
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DOI: 10.1097/CM9.0000000000000775

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ABSTRACT: We read with interest the article in this journal which revealed the critical role of timely supply of medical resources for COVID-19 patients.1 The pandemic of COVID-19 has placed an enormous burden on health authorities across the world. The virus, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2; previously known as 2019-nCoV), causes acute respiratory disease with common signs of infection being respiratory symptoms, fever, cough and breathing difficulties. In more severe cases, infection causes pneumonia, lung failure, septic shock, organ failure and risk of death. The WHO reports that 80% of those infected will develop mild symptoms, 14% severe symptoms and 6% will become critically ill. Given the wide clinical spectrum of COVID-19, a key challenge faced by frontline clinical staff is prioritisation of stretched resources. Thus, there is a critical need for robust risk assessment for clinical management. To address this, we identified consecutive patients with moderate or severe COVID-19 discharged from the general wards of Renmin Hospital of Wuhan University between 5 February 2020 to 14 March 2020 (Ethics approval No: WDRY2020-K124). All patients had been diagnosed with COVID-19 according to WHO interim guidance and had radiologic evidence of pneumonia or infiltrates on chest CT scan according. The criteria for patient discharge was the absence of fever for at least 3 days, substantial improvement in both lungs on chest CT, clinical remission of respiratory symptoms, and two throat-swab samples negative for viral RNA obtained at least 24 hours apart. In

total, 99 patients (61 pneumonia and 38 severe pneumonia) with key information in their medical records were included in this study. Demographic, clinical, laboratory, and treatment data were extracted from electronic medical records. Risk factors that affect disease severity and length of hospital stay were investigated with appropriate statistical methods using R (V3.6.1) or GraphPad Prism (V8.2.1).
URL: https://doi.org/10.1016/j.jinf.2020.04.008
DOI: 10.1016/j.jinf.2020.04.008

39. Matsushita K, Ding N, Kou M, et al. The relationship of COVID-19 severity with cardiovascular disease and its traditional risk factors: A systematic review and meta-analysis. medRxiv. 2020:2020.04.05.20054155. DOI: 10.1101/2020.04.05.20054155
ABSTRACT: Background: Whether cardiovascular disease (CVD) and its traditional risk factors predict severe coronavirus disease 2019 (COVID-19) is uncertain, in part, because of potential confounding by age and sex. Methods: We performed a systematic review of studies that explored pre-existing CVD and its traditional risk factors as risk factors of severe COVID-19 (defined as death, acute respiratory distress syndrome, mechanical ventilation, or intensive care unit admission). We searched PubMed and Embase for papers in English with original data (â‰¥10 cases of severe COVID-19). Using random-effects models, we pooled relative risk (RR) estimates and conducted meta-regression analyses. Results: Of the 373 publications identified in our search, 15 papers met our inclusion criteria, with 51,845 COVID-19 patients including 9,066 severe cases. Older age was consistently associated with severe COVID-19 in all eight eligible studies, with RR >~5 in >60-65 vs. <50 years. Two studies showed no change in the RR of age after adjusting for covariate(s). In univariate analyses, factors significantly associated with severe COVID-19 were male sex (14 studies; pooled RR=1.70, 95%CI 1.52-1.89]), hypertension (10 studies; 2.74 2.12-3.54]), diabetes (11 studies; 2.81 2.01-3.93]), and CVD (9 studies; 3.58 2.06-6.21]). RR for male sex was likely to be independent of age. Meta-regression analyses were suggestive of confounding by age for the other three factors. Only two studies reported multivariable analysis, with one showing non-significant association for CVD and the other demonstrating adjusted RR ~2 for hypertension and diabetes. No study explored renin-angiotensin system inhibitors as a risk factor for severe COVID-19. Conclusions: In addition to older age and male sex, hypertension, diabetes, and CVD were associated in univariate analyses with severe COVID-19. Although there is still uncertainty regarding the magnitude of potential confounding, these risk factors can be used to inform objective decisions on COVID-19 testing, clinical management, and workforce planning.Competing Interest StatementThe authors have declared no competing interest.Funding StatementThis project is supported by Resolve to Save Lives, which is funded by Bloomberg Philanthropies, the Bill and Melinda Gates Foundation, and Gates Philanthropy.Author DeclarationsAll relevant ethical guidelines have been followed; any necessary IRB and/or ethics committee approvals have been obtained and details of the IRB/oversight body are included in the manuscript.YesAll necessary patient/participant consent has been obtained and the appropriate institutional forms have been archived.YesI understand that all clinical trials and any other prospective interventional studies must be registered with an ICMJE-approved registry, such as ClinicalTrials.gov. I confirm that any such study reported in the manuscript has been registered and the trial registration ID is provided (note: if posting a prospective study registered retrospectively, please provide a statement in the trial ID field explaining why the study was not registered in advance).Yes I have followed all appropriate research reporting guidelines and uploaded the relevant EQUATOR Network research reporting checklist(s) and other pertinent material as supplementary files, if applicable.YesThis systematic review is based on published studies.
URL: http://medrxiv.org/content/early/2020/04/07/2020.04.05.20054155.abstract
DOI: 10.1101/2020.04.05.20054155

40. Mehra MR, Desai SS, Kuy S, et al. Cardiovascular Disease, Drug Therapy, and Mortality in Covid-19. N Engl J Med. 2020;2020/05/02. DOI: 10.1056/NEJMoa2007621.; ID: 35896
10.1056/NEJMoa2007621

ABSTRACT: BACKGROUND: Coronavirus disease 2019 (Covid-19) may disproportionately affect people with cardiovascular disease. Concern has been aroused regarding a potential harmful effect of angiotensin-converting-enzyme (ACE) inhibitors and angiotensin-receptor blockers (ARBs) in this clinical context. METHODS: Using an observational database from 169 hospitals in Asia, Europe, and North America, we evaluated the relationship of cardiovascular disease and drug therapy with in-hospital death among hospitalized patients with Covid-19 who were admitted between December 20, 2019, and March 15, 2020, and were recorded in the Surgical Outcomes Collaborative registry as having either died in the hospital or survived to discharge as of March 28, 2020. RESULTS: Of the 8910 patients with Covid-19 for whom discharge status was available at the time of the analysis, a total of 515 died in the hospital (5.8%) and 8395 survived to discharge. The factors we found to be independently associated with an increased risk of in-hospital death were an age greater than 65 years (mortality of 10.0%, vs. 4.9% among those ≤65 years of age; odds ratio, 1.93; 95% confidence interval CI], 1.60 to 2.41), coronary artery disease (10.2%, vs. 5.2% among those without disease; odds ratio, 2.70; 95% CI, 2.08 to 3.51), heart failure (15.3%, vs. 5.6% among those without heart failure; odds ratio, 2.48; 95% CI, 1.62 to 3.79), cardiac arrhythmia (11.5%, vs. 5.6% among those without arrhythmia; odds ratio, 1.95; 95% CI, 1.33 to 2.86), chronic obstructive pulmonary disease (14.2%, vs. 5.6% among those without disease; odds ratio, 2.96; 95% CI, 2.00 to 4.40), and current smoking (9.4%, vs. 5.6% among former smokers or nonsmokers; odds ratio, 1.79; 95% CI, 1.29 to 2.47). No increased risk of in-hospital death was found to be associated with the use of ACE inhibitors (2.1% vs. 6.1%; odds ratio, 0.33; 95% CI, 0.20 to 0.54) or the use of ARBs (6.8% vs. 5.7%; odds ratio, 1.23; 95% CI, 0.87 to 1.74). CONCLUSIONS: Our study confirmed previous observations suggesting that underlying cardiovascular disease is associated with an increased risk of in-hospital death among patients hospitalized with Covid-19. Our results did not confirm previous concerns regarding a potential harmful association of ACE inhibitors or ARBs with in-hospital death in this clinical context. (Funded by the William Harvey Distinguished Chair in Advanced Cardiovascular Medicine at Brigham and Women's Hospital.).
URL: https://www.ncbi.nlm.nih.gov/pubmed/32356626
DOI: 10.1056/NEJMoa2007621.; ID: 35896
10.1056/NEJMoa2007621

41. Meng Y, Wu P, Lu W, et al. Sex-specific clinical characteristics and prognosis of coronavirus disease-19 infection in Wuhan, China: A retrospective study of 168 severe patients. PLOS Pathogens. 2020;16(4):e1008520-e. DOI: 10.1371/journal.ppat.1008520
ABSTRACT: To confirm the relationship between sex and the progression of Coronavirus Disease-19 (COVID-19), and its potential mechanism, among severe patients. For this retrospective study, we included 168 consecutive severe patients with pathogen-confirmed COVID-19 who were hospitalized between January 16th and February 4th, 2020, at Tongji Hospital in Wuhan, China. Clinical characteristics, laboratory parameters, and outcomes were compared and analyzed between males and females. In the present study, we analyzed 168 severe patients with COVID-19, including 86 males and 82 females, and 48 patients (28.6%) were diagnosed as critically ill. Of 86 male patients, 12.8% (11/86) died and 75.6% (65/86) were discharged; of 82 female patients, 7.3% (6/82) died and 86.6% (71/82) were discharged. Eleven laboratory parameters showed significant differences between male and female patients, and six of them were higher during the whole clinical course in patients who died than in patients who were discharged. In adjusted logistic regression analysis, males with comorbidities presented a higher risk of being critically ill than males without comorbidities (OR = 3.824, 95% CI = 1.279–11.435). However, this association attenuated to null in female patients (OR = 2.992, 95% CI = 0.937–9.558). A similar sex-specific trend was observed in the relation between age and critically ill conditions. We highlighted sex-specific differences in clinical characteristics and prognosis. Male patients appeared to be more susceptible to age and comorbidities. Sex is an important biological variable that should be considered in the prevention and treatment of COVID-19.
URL: https://dx.plos.org/10.1371/journal.ppat.1008520
DOI: 10.1371/journal.ppat.1008520

42. Nasiri MJ, Haddadi S, Tahvildari A, et al. COVID-19 clinical characteristics, and sex-specific risk of mortality: Systematic Review and Meta-analysis. medRxiv. 2020:2020.03.24.20042903. DOI: 10.1101/2020.03.24.20042903

ABSTRACT: Objectives: The rapidly evolving coronavirus disease 2019 (COVID-19), was declared a pandemic by the World Health Organization on March 11, 2020. It was first detected in the city of Wuhan in China and has spread globally resulting in substantial health and economic crisis in many countries. Observational studies have partially identified the different aspects of this disease. Up to this date, no comprehensive systematic review for the clinical, laboratory, epidemiologic and mortality findings has been published. We conducted this systematic review and meta-analysis for a better understanding of COVID-19. Methods: We reviewed the scientific literature published from January 1, 2019 to March 3, 2020. Statistical analyses were performed with STATA (version 14, IC; Stata Corporation, College Station, TX, USA). The pooled frequency with 95% confidence intervals (CI) was assessed using random effect model. Publication bias was assessed and p <0.05 was considered a statistically significant publication bias. Results: Out of 1102 studies, 32 satisfied the inclusion criteria. A total of 4789 patients with a mean age of 49 years were evaluated. Fever (83.0%, CI 77.5 to 87.6), cough (65.2%, CI 58.6 to 71.2) and myalgia/fatigue (34.7, CI 26.0 to 44.4) were the most common symptoms. The most prevalent comorbidities were hypertension (18.5 %, CI 12.7 to 24.4) and Cardiovascular disease (14.9 %, CI 6.0 to 23.8). Among the laboratory abnormalities, elevated C-Reactive Protein (CRP) (72.0% (CI 54.3 to 84.6) and lymphopenia (50.1%, CI 38.0 to 62.4) were the most common findings. Bilateral ground-glass opacities (66.0%, CI 51.1 to 78.0) was the most common CT-Scan presentation. Pooled mortality rate was 6.6%, with males having significantly higher mortality compared to females (OR 3.4; 95% CI 1.2 to 9.1, P = 0.01). Conclusion: COVID-19 commonly presented with a progressive course of cough and fever with more than half of hospitalized patients showing leukopenia or a high CRP on their laboratory findings. Mortality associated with COVID19 was higher than that reported in studies in China with Males having a 3-fold higher risk of mortality in COVID19 compared to females.Competing Interest StatementThe authors have declared no competing interest.Funding StatementThe author(s) received no specific funding for this study.Author DeclarationsAll relevant ethical guidelines have been followed; any necessary IRB and/or ethics committee approvals have been obtained and details of the IRB/oversight body are included in the manuscript.YesAll necessary patient/participant consent has been obtained and the appropriate institutional forms have been archived.YesI understand that all clinical trials and any other prospective interventional studies must be registered with an ICMJE-approved registry, such as ClinicalTrials.gov. I confirm that any such study reported in the manuscript has been registered and the trial registration ID is provided (note: if posting a prospective study registered retrospectively, please provide a statement in the trial ID field explaining why the study was not registered in advance).Yes I have followed all appropriate research reporting guidelines and uploaded the relevant EQUATOR Network research reporting checklist(s) and other pertinent material as supplementary files, if applicable.YesAuthors can confirm that all relevant data are included in the article and/or its supplementary information files

URL: http://medrxiv.org/content/early/2020/03/26/2020.03.24.20042903.abstract

DOI: 10.1101/2020.03.24.20042903

43. Nikpouraghdam M, Jalali Farahani A, Alishiri G, et al. Epidemiological characteristics of coronavirus disease 2019 (COVID-19) patients in IRAN: A single center study. Journal of clinical virology : the official publication of the Pan American Society for Clinical Virology. 2020;127:104378. DOI: https://dx.doi.org/10.1016/j.jcv.2020.104378

ABSTRACT: BACKGROUND: An outbreak of COVID-19 in Iran has spread throughout the country. Identifying the epidemiological characteristics of this disease will help to make appropriate decisions and thus control the epidemic. The aim of this study was characterization of the epidemiological features of COVID-19 in Iran., METHODS: In this retrospective study, data related to the epidemiological characteristics of COVID-19 patients admitted to Baqiyatallah Hospital in Tehran, Iran, from 19 February 2020 to 15 April 2020 have been analyzed and reported. Patient characteristics including age, gender and underlying diseases were investigated. Data

were collected through patient records. Sex ratio, Case Fatality Rate (CFR) and daily trend of cases were also determined. A multiple logistic regression analysis was also performed to assess affecting factors on mortality., RESULTS: From February 19, 2020 to April 15, 2020, 12870 patients referred to the hospital emergency department, of which 2968 were hospitalized with COVID-19 diagnosis. The majority of cases were in the age group of 50 to 60 years of old. The male-to-female ratio was 1.93:1. A total of 239 deaths occurred among all cases for an overall CFR of 1.85% based on the total number of patients (both outpatient and inpatient) and 8.06% among hospitalized patients. Out of all patients 10.89% had comorbidity. Diabetes, chronic respiratory diseases, hypertension, cardiovascular diseases, chronic Kidney diseases and cancer were the most common comorbidities with 3.81, 2.02 , 1.99 , 1.25, 0.60 and 0.57 %, respectively. Male gender (OR=1.45, 95% CI: 1.08-1.96), older age (OR=1.05, 95% CI: 1.04-1.06) and having underlying diseases (OR=1.53, 95% CI: 1.04-2.24) were significantly associated with mortality., CONCLUSIONS: The results of this study showed that Male gender, older age and having comorbidities were significantly associated with the risk of death among COVID-19 patients. It is important to pay special attention to male elderly patients with underlying diseases. Copyright © 2020 Elsevier B.V. All rights reserved.
URL: http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=medp&NEWS=N&AN=32353762
DOI: https://dx.doi.org/10.1016/j.jcv.2020.104378

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URL: https://www.ncbi.nlm.nih.gov/pubmed/32203977
DOI: 10.1001/jama.2020.4683 [doi]

45. Parohan M, Yaghoubi S, Seraj A, et al. Risk factors for mortality of adult inpatients with Coronavirus disease 2019 (COVID-19): a systematic review and meta-analysis of retrospective studies. medRxiv. 2020:2020.04.09.20056291. DOI: 10.1101/2020.04.09.20056291
ABSTRACT: Background: Coronavirus disease 2019 (COVID-19) is an emerging disease that was first reported in Wuhan city, the capital of Hubei province in China, and has subsequently spread worldwide. Risk factors for mortality have not been well summarized. Current meta-analysis of retrospective cohort studies was done to summarize available findings on the association between age, gender, comorbidities and risk of death from COVID-19 infection. Methods: Online databases including Web of Science, PubMed, Scopus and Google scholar were searched to detect relevant publications up to 22 March 2020, using relevant keywords. To pool data, random-effects model was used. Furthermore, sensitivity analysis and publication bias test were also done. Results: In total, six retrospective studies with 22,350 COVID-19 infected patients and 741 cases of death were included in the current meta-analysis. A significant positive association was found between older age (≥65 years old) and COVID-19 mortality (combined effect size=2.39 (over twofold), 95% CIs=1.75-3.28, p<0.001). Such finding was also seen for hypertension (combined effect size=3.29 (over threefold), 95% CIs=1.54-7.05, p=0.002), diabetes (combined effect size=3.11 (over threefold), 95% CIs=1.10-8.80, p=0.032), chronic obstructive pulmonary disease (COPD) (combined effect size=7.69 (over sevenfold), 95% CIs=5.65-10.47, p<0.001) and cardiovascular diseases (CVDs) (combined effect size=7.39 (over sevenfold), 95% CIs=2.88-18.96, p<0.001). Conclusions: Older age, hypertension, diabetes, COPD and CVDs were associated with greater risk of death from COVID-19 infection. These findings could help clinicians to identify patients with poor prognosis at an early stage.Competing Interest StatementThe authors have declared no competing interest.Funding StatementThe authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.Author DeclarationsAll relevant ethical guidelines have been followed; any necessary IRB and/or ethics committee approvals have been obtained and details of the IRB/oversight body are included in the manuscript.YesAll necessary patient/participant consent has been obtained and the appropriate institutional forms have been archived.YesI understand that all clinical trials and any other prospective interventional studies must be registered with an ICMJE-approved registry, such as ClinicalTrials.gov. I confirm that any such study reported in the manuscript has been registered and the trial registration ID is provided (note: if posting a

prospective study registered retrospectively, please provide a statement in the trial ID field explaining why the study was not registered in advance).Yes I have followed all appropriate research reporting guidelines and uploaded the relevant EQUATOR Network research reporting checklist(s) and other pertinent material as supplementary files, if applicable.YesAll data are publicly available.
URL: http://medrxiv.org/content/early/2020/04/11/2020.04.09.20056291.abstract
DOI: 10.1101/2020.04.09.20056291

46. Patanavanich R, Glantz SA. Smoking is Associated with COVID-19 Progression: A Meta-Analysis. medRxiv. 2020:2020.04.13.20063669. DOI: 10.1101/2020.04.13.20063669
ABSTRACT: Objective: To determine the association between smoking and progression of COVID-19. Design: A meta-analysis of 12 published papers. Data Source: PubMed database was searched on April 6, 2020. Eligibility criteria and data analysis: We included studies reporting smoking behavior of COVID-19 patients and progression of disease. Search terms included smoking, smoker*, characteristics, risk factors, outcomes, and COVID-19, COVID, coronavirus, sar cov-2, sar cov 2. There were no language limitations. One author extracted information for each study, screened the abstract or the full text, with questions resolved through discussion among both authors. A random effects meta-analysis was applied. Main Outcome Measures: The study outcome was progression of COVID-19 among people who already had the disease. Results: We identified 12 papers with a total of 9,025 COVID-19 patients, 878 (9.7%) with severe disease and 495 with a history of smoking (5.5%). The meta-analysis showed a significant association between smoking and progression of COVID-19 (OR 2.25, 95% CI 1.49-3.39, p=0.001). Limitations in the 12 papers suggest that the actual risk of smoking may be higher. Conclusions: Smoking is a risk factor for progression of COVID-19, with smokers having higher odds of COVID-19 progression than never smokers. Physicians and public health professionals should collect data on smoking as part of clinical management and add smoking cessation to the list of practices to blunt the COVID-19 pandemic.Competing Interest StatementThe authors have declared no competing interest.Funding StatementThis work was supported by National Institute of Drug Abuse grant R01DA043950, cooperative agreement U54HL147127 from the National Heart, Lung, and Blood Institute and the Food and Drug Administration Center for Tobacco Products and the Faculty of Medicine Ramathibodi Hospital, Mahidol University, Thailand. The content is solely the responsibility of the authors and does not necessarily represent the official views of NIH or the Food and Drug Administration. The funding sources for this study had no role in the study design, data collection, data analysis, data interpretation, or the writing of the manuscript. Author DeclarationsAll relevant ethical guidelines have been followed; any necessary IRB and/or ethics committee approvals have been obtained and details of the IRB/oversight body are included in the manuscript.YesAll necessary patient/participant consent has been obtained and the appropriate institutional forms have been archived.YesI understand that all clinical trials and any other prospective interventional studies must be registered with an ICMJE-approved registry, such as ClinicalTrials.gov. I confirm that any such study reported in the manuscript has been registered and the trial registration ID is provided (note: if posting a prospective study registered retrospectively, please provide a statement in the trial ID field explaining why the study was not registered in advance).Yes I have followed all appropriate research reporting guidelines and uploaded the relevant EQUATOR Network research reporting checklist(s) and other pertinent material as supplementary files, if applicable.YesAll data are included in the manuscript.
URL: http://medrxiv.org/content/early/2020/04/16/2020.04.13.20063669.abstract
DOI: 10.1101/2020.04.13.20063669

47. Petrilli CM, Jones SA, Yang J, et al. Factors associated with hospitalization and critical illness among 4,103 patients with COVID-19 disease in New York City. medRxiv. 2020:2020.04.08.20057794. DOI: 10.1101/2020.04.08.20057794
ABSTRACT: Background: Little is known about factors associated with hospitalization and critical illness in Covid-19 positive patients. Methods: We conducted a cross-sectional analysis of all patients with laboratory-confirmed

Covid-19 treated at a single academic health system in New York City between March 1, 2020 and April 2, 2020, with follow up through April 7, 2020. Primary outcomes were hospitalization and critical illness (intensive care, mechanical ventilation, hospice and/or death). We conducted multivariable logistic regression to identify risk factors for adverse outcomes, and maximum information gain decision tree classifications to identify key splitters. Results: Among 4,103 Covid-19 patients, 1,999 (48.7%) were hospitalized, of whom 981/1,999 (49.1%) have been discharged home, and 292/1,999 (14.6%) have died or were discharged to hospice. Of 445 patients requiring mechanical ventilation, 162/445 (36.4%) have died. Strongest hospitalization risks were age ≥75 years (OR 66.8, 95% CI, 44.7-102.6), age 65-74 (OR 10.9, 95% CI, 8.35-14.34), BMI>40 (OR 6.2, 95% CI, 4.2-9.3), and heart failure (OR 4.3 95% CI, 1.9-11.2). Strongest critical illness risks were admission oxygen saturation <88% (OR 6.99, 95% CI 4.5-11.0), d-dimer>2500 (OR 6.9, 95% CI, 3.2-15.2), ferritin >2500 (OR 6.9, 95% CI, 3.2-15.2), and C-reactive protein (CRP) >200 (OR 5.78, 95% CI, 2.6-13.8). In the decision tree for admission, the most important features were age >65 and obesity; for critical illness, the most important was SpO2<88, followed by procalcitonin >0.5, troponin <0.1 (protective), age >64 and CRP>200. Conclusions: Age and comorbidities are powerful predictors of hospitalization; however, admission oxygen impairment and markers of inflammation are most strongly associated with critical illness.Competing Interest StatementThe authors have declared no competing interest.Funding StatementThis work was funded in part by the Kenneth C. Griffin Charitable Fund, which had no role in the study design; in the collection, analysis, and interpretation of data; in the writing of the report; or in the decision to submit the article for publication.Author DeclarationsAll relevant ethical guidelines have been followed; any necessary IRB and/or ethics committee approvals have been obtained and details of the IRB/oversight body are included in the manuscript.YesAll necessary patient/participant consent has been obtained and the appropriate institutional forms have been archived.YesI understand that all clinical trials and any other prospective interventional studies must be registered with an ICMJE-approved registry, such as ClinicalTrials.gov. I confirm that any such study reported in the manuscript has been registered and the trial registration ID is provided (note: if posting a prospective study registered retrospectively, please provide a statement in the trial ID field explaining why the study was not registered in advance).Yes I have followed all appropriate research reporting guidelines and uploaded the relevant EQUATOR Network research reporting checklist(s) and other pertinent material as supplementary files, if applicable.YesIndividual level data are not available for this study. For aggregate data please contact the corresponding author.
URL: http://medrxiv.org/content/early/2020/04/11/2020.04.08.20057794.abstract
DOI: 10.1101/2020.04.08.20057794

48. Rahman A, Sathi NJ. Risk Factors of the Severity of COVID-19: A Meta-Analysis. medRxiv. 2020:2020.04.30.20086744. DOI: 10.1101/2020.04.30.20086744
ABSTRACT: Background: Although the infection rate of COVID-19 is very high, all the patients getting infected don't always die or go through brutal states. This indicates there may be some factors that possibly boost the severity of COVID-19. Objective: We intend to identify some probable risk factors that are responsible for the severity of COVID-19 using a meta-analysis. Methods: The literature exploration lasted up to 18 April 2020 and through PubMed,Google Scholar, EMBASE, and Cochrane Library we have identified 10 pertinent publications. To paraphrase the outcomes of autonomous researches, we have performed a random-effect meta-analysis. Results: Among 2272 patients' information extracted from the selected literature majority (60%) are male patients. This study found sex (male) (Risk ratio [RR] =1.29, 95% CI, 1.07 to 1.54), hypertension (RR=1.79, 95% CI, 1.57 to 2.04), diabetes (RR=1.57, 95% CI, 1.25 to 1.98), fatigue or myalgia (RR=1.17, 95% CI, 1.02; 1.35), and smoking history (RR=1.71, 95% CI,1.25; 2.35) are potential risk factors for the severity of COVID-19. We found fever (RR=1.21, 95% CI, 0.66 to 2.22), cough (1.13, 95% CI, 0.98 to 1.30), and diarrhea (RR=1.14, 95% CI, 0.93 to 1.40) as insignificant risk factors for COVID-19 severity. Conclusions: The finding of this research may be beneficial to identify patients with higher risks to provide additional medical attention from the very beginning of the treatment.Competing Interest StatementThe authors have declared no competing interest.Funding StatementNo fundingAuthor DeclarationsAll relevant ethical guidelines have been followed; any necessary IRB

and/or ethics committee approvals have been obtained and details of the IRB/oversight body are included in the manuscript.YesAll necessary patient/participant consent has been obtained and the appropriate institutional forms have been archived.YesI understand that all clinical trials and any other prospective interventional studies must be registered with an ICMJE-approved registry, such as ClinicalTrials.gov. I confirm that any such study reported in the manuscript has been registered and the trial registration ID is provided (note: if posting a prospective study registered retrospectively, please provide a statement in the trial ID field explaining why the study was not registered in advance).Yes I have followed all appropriate research reporting guidelines and uploaded the relevant EQUATOR Network research reporting checklist(s) and other pertinent material as supplementary files, if applicable.YesThe studies are available online and full-text accessible.
URL: http://medrxiv.org/content/early/2020/05/05/2020.04.30.20086744.abstract
DOI: 10.1101/2020.04.30.20086744

49. Roncon L, Zuin M, Rigatelli G, et al. Diabetic patients with COVID-19 infection are at higher risk of ICU admission and poor short-term outcome. Journal of clinical virology : the official publication of the Pan American Society for Clinical Virology. 2020;127:104354. DOI: https://dx.doi.org/10.1016/j.jcv.2020.104354
ABSTRACT: BACKGROUND: The prognostic significance of diabetes mellitus (DM) in patients with coronavirus 2019 disease (COVID-19) remains unknown., OBJECTIVES: To assess the risk of ICU admission and morality risk in diabetic COVID-19 patients., STUDY DESING: A database search was conducted to identify studies comparing diabetic COVID-19 patients hospitalized in intensive care unit (ICU) and those reporting the overall mortality of these patients published up to March 25, 2020 within MEDLINE, Scopus and Web of Science. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were followed in abstracting data and assessing validity. Quality assessment was performed using the Newcastle-Ottawa quality assessment scale. The main outcome was the risk of ICU admission in diabetic patients with COVID-19 infection while the second was the mortality risk in overall diabetic COVID-19 patients. Data were pooled using the Mantel-Haenszel random effects models with odds ratio (OR) as the effect measure with the related 95 % confidence interval (CI). Statistical heterogeneity between groups was measured using the Higgins I2 statistic., RESULTS: Among 1382 patients (mean age 51.5 years, 798 males), DM resulted to be the second more frequent comorbidities. Diabetic patients resulted to have a significant increased risk of ICU admission (OR: 2.79, 95 % CI 1.85-4.22, p < 0.0001, I2 = 46 %). In 471 patients (mean age 56.6 years, 294 males) analysed for the secondary outcome diabetic subjects resulted to be at higher mortality risk (OR 3.21, 95 % CI 1.82-5.64, p < 0.0001, I2 = 16 %)., CONCLUSIONS: Diabetic patients with COVID-19 patients are at higher risk of ICU admission and show an higher mortality risk. Copyright © 2020 Elsevier B.V. All rights reserved.
URL: http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=medp&NEWS=N&AN=32305882
DOI: https://dx.doi.org/10.1016/j.jcv.2020.104354

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URL: http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=medc&NEWS=N&AN=32188484
DOI: https://dx.doi.org/10.1186/s13054-020-2833-7

51. Singh AK, Gupta R, Ghosh A, et al. Diabetes in COVID-19: Prevalence, pathophysiology, prognosis and practical considerations. Diabetes & metabolic syndrome. 2020;14(4):303-10. DOI: https://dx.doi.org/10.1016/j.dsx.2020.04.004
ABSTRACT: BACKGROUND AND AIMS: High prevalence of diabetes makes it an important comorbidity in patients with COVID-19. We sought to review and analyze the data regarding the association between diabetes

and COVID-19, pathophysiology of the disease in diabetes and management of patients with diabetes who develop COVID-19 infection., METHODS: PubMed database and Google Scholar were searched using the key terms 'COVID-19', 'SARS-CoV-2', 'diabetes', 'antidiabetic therapy' up to April 2, 2020. Full texts of the retrieved articles were accessed., RESULTS: There is evidence of increased incidence and severity of COVID-19 in patients with diabetes. COVID-19 could have effect on the pathophysiology of diabetes. Blood glucose control is important not only for patients who are infected with COVID-19, but also for those without the disease. Innovations like telemedicine are useful to treat patients with diabetes in today's times. Copyright © 2020 Diabetes India. Published by Elsevier Ltd. All rights reserved.
URL: http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=medp&NEWS=N&AN=32298981
DOI: https://dx.doi.org/10.1016/j.dsx.2020.04.004

52. Su VYF, Yang Y-H, Yang K-Y, et al. The Risk of Death in 2019 Novel Coronavirus Disease (COVID-19) in Hubei Province SSRN- Lancet prepublication. 2020.
ABSTRACT: Background: The current outbreak of novel coronavirus (2019-nCoV or SARS-CoV-2) in China and globally requires urgent research to guide the appropriate treatment of patients with coronavirus disease 2019 (COVID-19). Methods: We conducted a case-control study to the evaluate risk factors of death in patients with COVID-19. We used published data of cases from Huanan Seafood Market, Jinyintan Hospital, and deaths publicly released by the Government. The study included 41 patients partially exposed to the Huanan Seafood Market, 99 patients from Jinyintan Hospital, and 32 deaths (COVID-19 death group). Findings: Compared to cases in the Huanan Seafood Market group and Jinyintan Hospital group, cases from the COVID-19 death group were older, with an earlier onset of dyspnea, as well as more comorbidities, shortness of breath, confusion, and chest pain. In the COVID-19 death group, patients that died within 14 days of the onset of the illness were older than patients that died after 14 days. Patients were more likely to be in the COVID-19 death group if they were older [odds ratios (OR) 26.0], had any comorbidity (OR 4.7), hypertension (OR 3.5), cardiovascular disease (OR 5.1), endocrine system disease (OR 3.5), and respiratory system disease (OR 18.1). These patients exhibited the following symptoms: shortness of breath (OR 11.8), confusion (OR 3.3), chest pain (OR 29.1), and fever + cough + shortness of breath (OR 4.4). Interpretation: Old age, medical comorbidities, dyspnea, confusion, and chest pain at admission are associated with a higher risk of death in patients with COVID-19.
URL: (2/14/2020). Available at SSRN: https://ssrn.com/abstract=3539655

53. Team CC-R. Coronavirus Disease 2019 in Children - United States, February 12-April 2, 2020. MMWR Morb Mortal Wkly Rep. 2020;69(14):422-6. DOI: 10.15585/mmwr.mm6914e4.; ID: 10862 10.15585/mmwr.mm6914e4
ABSTRACT: As of April 2, 2020, the coronavirus disease 2019 (COVID-19) pandemic has resulted in >890,000 cases and >45,000 deaths worldwide, including 239,279 cases and 5,443 deaths in the United States (1,2). In the United States, 22% of the population is made up of infants, children, and adolescents aged <18 years (children) (3). Data from China suggest that pediatric COVID-19 cases might be less severe than cases in adults and that children might experience different symptoms than do adults (4,5); however, disease characteristics among pediatric patients in the United States have not been described. Data from 149,760 laboratory-confirmed COVID-19 cases in the United States occurring during February 12-April 2, 2020 were analyzed. Among 149,082 (99.6%) reported cases for which age was known, 2,572 (1.7%) were among children aged <18 years. Data were available for a small proportion of patients on many important variables, including symptoms (9.4%), underlying conditions (13%), and hospitalization status (33%). Among those with available information, 73% of pediatric patients had symptoms of fever, cough, or shortness of breath compared with 93% of adults aged 18-64 years during the same period; 5.7% of all pediatric patients, or 20% of those for whom hospitalization status was known, were hospitalized, lower than the percentages hospitalized among all adults aged 18-64 years (10%) or

those with known hospitalization status (33%). Three deaths were reported among the pediatric cases included in this analysis. These data support previous findings that children with COVID-19 might not have reported fever or cough as often as do adults (4). Whereas most COVID-19 cases in children are not severe, serious COVID-19 illness resulting in hospitalization still occurs in this age group. Social distancing and everyday preventive behaviors remain important for all age groups as patients with less serious illness and those without symptoms likely play an important role in disease transmission (6,7).
URL: https://www.ncbi.nlm.nih.gov/pubmed/32271728
DOI: 10.15585/mmwr.mm6914e4.; ID: 10862
10.15585/mmwr.mm6914e4

54. Team CC-R. Preliminary Estimates of the Prevalence of Selected Underlying Health Conditions Among Patients with Coronavirus Disease 2019 - United States, February 12-March 28, 2020. MMWR Morbidity and mortality weekly report. 2020;69(13):382-6. DOI: https://dx.doi.org/10.15585/mmwr.mm6913e2
ABSTRACT: On March 11, 2020, the World Health Organization declared Coronavirus Disease 2019 (COVID-19) a pandemic (1). As of March 28, 2020, a total of 571,678 confirmed COVID-19 cases and 26,494 deaths have been reported worldwide (2). Reports from China and Italy suggest that risk factors for severe disease include older age and the presence of at least one of several underlying health conditions (3,4). U.S. older adults, including those aged >=65 years and particularly those aged >=85 years, also appear to be at higher risk for severe COVID-19-associated outcomes; however, data describing underlying health conditions among U.S. COVID-19 patients have not yet been reported (5). As of March 28, 2020, U.S. states and territories have reported 122,653 U.S. COVID-19 cases to CDC, including 7,162 (5.8%) for whom data on underlying health conditions and other known risk factors for severe outcomes from respiratory infections were reported. Among these 7,162 cases, 2,692 (37.6%) patients had one or more underlying health condition or risk factor, and 4,470 (62.4%) had none of these conditions reported. The percentage of COVID-19 patients with at least one underlying health condition or risk factor was higher among those requiring intensive care unit (ICU) admission (358 of 457, 78%) and those requiring hospitalization without ICU admission (732 of 1,037, 71%) than that among those who were not hospitalized (1,388 of 5,143, 27%). The most commonly reported conditions were diabetes mellitus, chronic lung disease, and cardiovascular disease. These preliminary findings suggest that in the United States, persons with underlying health conditions or other recognized risk factors for severe outcomes from respiratory infections appear to be at a higher risk for severe disease from COVID-19 than are persons without these conditions.
URL: http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=medl&NEWS=N&AN=32240123
DOI: https://dx.doi.org/10.15585/mmwr.mm6913e2

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ABSTRACT: Currently, the number of patients with coronavirus disease 2019 (COVID-19) has increased rapidly, but relationship between comorbidity and patients with COVID-19 still not clear. The aim was to explore whether the presence of common comorbidities increases COVID-19 patients' risk. A literature search was performed using the electronic platforms (PubMed, Cochrane Library, Embase, and other databases) to obtain relevant research studies published up to March 1, 2020. Relevant data of research endpoints in each study were extracted and merged. All data analysis was performed using Stata12.0 software. A total of 1558 patients with COVID-19 in 6 studies were enrolled in our meta-analysis eventually. Hypertension (OR: 2.29, P<0.001), diabetes (OR: 2.47, P<0.001), chronic obstructive pulmonary disease (COPD) (OR: 5.97, P<0.001), cardiovascular disease (OR: 2.93, P<0.001), and cerebrovascular disease (OR:3.89, P=0.002)were independent risk factors associated with COVID-19 patients. The meta-analysis revealed no correlation between increased risk of COVID-19 and liver disease, malignancy, or renal disease. Hypertension, diabetes, COPD, cardiovascular disease, and cerebrovascular disease are major risk factors for patients with COVID-19. Knowledge of these risk factors can be a resource for clinicians in the early appropriate medical management of patients with COVID-19.

URL: https://www.ncbi.nlm.nih.gov/pubmed/32267833
DOI: 10.18632/aging.103000.; ID: 10365
10.18632/aging.103000

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ABSTRACT: Importance: In December 2019, novel coronavirus (2019-nCoV)-infected pneumonia (NCIP) occurred in Wuhan, China. The number of cases has increased rapidly but information on the clinical characteristics of affected patients is limited. Objective: To describe the epidemiological and clinical characteristics of NCIP. Design, Setting, and Participants: Retrospective, single-center case series of the 138 consecutive hospitalized patients with confirmed NCIP at Zhongnan Hospital of Wuhan University in Wuhan, China, from January 1 to January 28, 2020; final date of follow-up was February 3, 2020. Exposures: Documented NCIP. Main Outcomes and Measures: Epidemiological, demographic, clinical, laboratory, radiological, and treatment data were collected and analyzed. Outcomes of critically ill patients and noncritically ill patients were compared. Presumed hospital-related transmission was suspected if a cluster of health professionals or hospitalized patients in the same wards became infected and a possible source of infection could be tracked. Results: Of 138 hospitalized patients with NCIP, the median age was 56 years (interquartile range, 42-68; range, 22-92 years) and 75 (54.3%) were men. Hospital-associated transmission was suspected as the presumed mechanism of infection for affected health professionals (40 [29%]) and hospitalized patients (17 [12.3%]). Common symptoms included fever (136 [98.6%]), fatigue (96 [69.6%]), and dry cough (82 [59.4%]). Lymphopenia (lymphocyte count, 0.8 x 109/L [interquartile range {IQR}, 0.6-1.1]) occurred in 97 patients (70.3%), prolonged prothrombin time (13.0 seconds [IQR, 12.3-13.7]) in 80 patients (58%), and elevated lactate dehydrogenase (261 U/L [IQR, 182-403]) in 55 patients (39.9%). Chest computed tomographic scans showed bilateral patchy shadows or ground glass opacity in the lungs of all patients. Most patients received antiviral therapy (oseltamivir, 124 [89.9%]), and many received antibacterial therapy (moxifloxacin, 89 [64.4%]; ceftriaxone, 34 [24.6%]; azithromycin, 25 [18.1%]) and glucocorticoid therapy (62 [44.9%]). Thirty-six patients (26.1%) were transferred to the intensive care unit (ICU) because of complications, including acute respiratory distress syndrome (22 [61.1%]), arrhythmia (16 [44.4%]), and shock (11 [30.6%]). The median time from first symptom to dyspnea was 5.0 days, to hospital admission was 7.0 days, and to ARDS was 8.0 days. Patients treated in the ICU (n = 36), compared with patients not treated in the ICU (n = 102), were older (median age, 66 years vs 51 years), were more likely to have underlying comorbidities (26 [72.2%] vs 38 [37.3%]), and were more likely to have dyspnea (23 [63.9%] vs 20 [19.6%]), and anorexia (24 [66.7%] vs 31 [30.4%]). Of the 36 cases in the ICU, 4 (11.1%) received high-flow oxygen therapy, 15 (41.7%) received noninvasive ventilation, and 17 (47.2%) received invasive ventilation (4 were switched to extracorporeal membrane oxygenation). As of February 3, 47 patients (34.1%) were discharged and 6 died (overall mortality, 4.3%), but the remaining patients are still hospitalized. Among those discharged alive (n = 47), the median hospital stay was 10 days (IQR, 7.0-14.0). Conclusions and Relevance: In this single-center case series of 138 hospitalized patients with confirmed NCIP in Wuhan, China, presumed hospital-related transmission of 2019-nCoV was suspected in 41% of patients, 26% of patients received ICU care, and mortality was 4.3%.
URL: https://www.ncbi.nlm.nih.gov/pubmed/32031570
DOI: 10.1001/jama.2020.1585 [doi]

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ABSTRACT: In December 2019, coronavirus disease 2019 (COVID-19) outbreak was reported from Wuhan, China. Information on the clinical course and prognosis of COVID-19 was not thoroughly described. We described the clinical courses and prognosis in COVID-19 patients. Retrospective case series of COVID-19 patients from Zhongnan Hospital of Wuhan University in Wuhan and Xishui Hospital, Hubei Province, China, up to February 10, 2020. Epidemiological, demographic, and clinical data were collected. The clinical course of survivors and non-

survivors were compared. Risk factors for death were analyzed. A total of 107 discharged patients with COVID-19 were enrolled. The clinical course of COVID-19 presented as a tri-phasic pattern. Week 1 after illness onset was characterized by fever, cough, dyspnea, lymphopenia, and radiological multi-lobar pulmonary infiltrates. In severe cases, thrombocytopenia, acute kidney injury, acute myocardial injury, and adult respiratory distress syndrome were observed. During week 2, in mild cases, fever, cough, and systemic symptoms began to resolve and platelet count rose to normal range, but lymphopenia persisted. In severe cases, leukocytosis, neutrophilia, and deteriorating multi-organ dysfunction were dominant. By week 3, mild cases had clinically resolved except for lymphopenia. However, severe cases showed persistent lymphopenia, severe acute respiratory dyspnea syndrome, refractory shock, anuric acute kidney injury, coagulopathy, thrombocytopenia, and death. Older age and male sex were independent risk factors for poor outcome of the illness. A period of 7–13 days after illness onset is the critical stage in the COVID-19 course. Age and male gender were independent risk factors for death of COVID-19.
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DOI: 10.1186/s13054-020-02895-6

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ABSTRACT: Background This study aimed to develop mortality-prediction models for patients with Coronavirus disease 2019 (COVID-19). Methods The training cohort were consecutive patients with COVID-19 in the First People's Hospital of Jiangxia District in Wuhan from January 7, 2020 to February 11, 2020. We selected baseline clinical and laboratory data through the stepwise Akaike information criterion and ensemble XGBoost model to build mortality-prediction models. We then validated these models by randomly collecting COVID-19 patients in the Infection department of Union Hospital in Wuhan from January 1, 2020, to February 20, 2020. Results 296 patients with COVID-19 were enrolled in the training cohort, 19 of whom died during hospitalization and 277 were discharged from the hospital. The clinical model developed with age, history of hypertension and coronary heart disease showed AUC of 0.88 (95% CI, 0.80-0.95); threshold, -2.6551; sensitivity, 92.31%; specificity, 77.44% and negative predictive value (NPV), 99.34%. The laboratory model developed with age, high-sensitivity C-reactive protein (hsCRP), peripheral capillary oxygen saturation (SpO2), neutrophil and lymphocyte count, D-dimer, aspartate aminotransferase (AST) and glomerular filtration rate (GFR) had a significantly stronger discriminatory power than the clinical model (p=0.0157), with AUC of 0.98 (95% CI, 0.92-0.99); threshold, -2.998; sensitivity, 100.00%; specificity, 92.82% and NPV, 100.00%. In the subsequent validation cohort (N=44), the AUCs (95% CI) were 0.83 (0.68, 0.93) and 0.88 (0.75, 0.96) for clinical model and laboratory model, respectively. Conclusions We developed two predictive models for the in-hospital mortality of patients with COVID-19 in Wuhan and validated in patients from another center.
URL: https://academic.oup.com/cid/advance-article/doi/10.1093/cid/ciaa538/5828281
DOI: 10.1093/cid/ciaa538

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ABSTRACT: OBJECTIVE: To investigate the characteristics and prognostic factors in the elderly patients with COVID-19., METHODS: Consecutive cases over 60 years old with COVID-19 in Renmin Hospital of Wuhan University from Jan 1 to Feb 6, 2020 were included. The primary outcomes were death and survival till March 5. Data of demographics, clinical features, comorbidities, laboratory tests and complications were collected and compared for different outcomes. Cox regression was performed for prognostic factors., RESULTS: 339 patients with COVID-19 (aged 71+/-8 years,173 females (51%)) were enrolled, including 80 (23.6%) critical, 159 severe (46.9%) and 100 moderate (29.5%) cases. Common comorbidities were hypertension (40.8%), diabetes (16.0%) and cardiovascular disease (15.7%). Common symptoms included fever (92.0%), cough (53.0%), dyspnea (40.8%) and fatigue (39.9%). Lymphocytopenia was a common laboratory finding (63.2%). Common complications

included bacterial infection (42.8%), liver enzyme abnormalities (28.7%) and acute respiratory distress syndrome (21.0%). Till Mar 5, 2020, 91 cases were discharged (26.8%), 183 cases stayed in hospital (54.0%) and 65 cases (19.2%) were dead. Shorter length of stay was found for the dead compared with the survivors (5 (3-8) vs. 28 (26-29), P < 0.001). Symptoms of dyspnea (HR 2.35, P=0.001), comorbidities including cardiovascular disease (HR 1.86, P=0.031) and chronic obstructive pulmonary disease (HR 2.24, P=0.023), and acute respiratory distress syndrome (HR 29.33, P < 0.001) were strong predictors of death. And a high level of lymphocytes was predictive of better outcome (HR0.10, P < 0.001)., CONCLUSIONS: High proportion of severe to critical cases and high fatality rate were observed in the elderly COVID-19 patients. Rapid disease progress was noted in the dead with a median survival time of 5 days after admission. Dyspnea, lymphocytopenia, comorbidities including cardiovascular disease and chronic obstructive pulmonary disease, and acute respiratory distress syndrome were predictive of poor outcome. Close monitoring and timely treatment should be performed for the elderly patients at high risk. Copyright © 2020. Published by Elsevier Ltd.
URL: http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=medp&NEWS=N&AN=32240670
DOI: https://dx.doi.org/10.1016/j.jinf.2020.03.019

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ABSTRACT: OBJECTIVE: To investigate the epidemiological and clinical features of patients with COVID-19 in Anhui province of China., METHOD: In this descriptive study, we obtained epidemiological, demographic, manifestations, laboratory data and radiological findings of patients confirmed by real-time RT-PCR in the NO.2 People's Hospital of Fuyang City from Jan 20 to Feb 9, 2020. Clinical outcomes were followed up to Feb 18, 2020., RESULTS: Of 125 patients infected SARS-CoV-2, the mean age was 38.76 years (SD, 13.799) and 71(56.8%) were male. Common symptoms include fever [116 (92.8%)], cough [102(81.6%)], and shortness of breath [57(45.6%)]. Lymphocytopenia developed in 48(38.4%) patients. 100(80.0%) patients showed bilateral pneumonia, 26(20.8%) patients showed multiple mottling and ground-glass opacity. All patients were given antiviral therapy. 19(15.2%) patients were transferred to the intensive care unit. By February 18, 47(37.6%) patients were discharged and none of patients died. Among the discharged patients, the median time of length of stay was 14.8 days (SD 4.16)., CONCLUSION: In this single-center, retrospective, descriptive study, fever is the most common symptom. Old age, chronic underlying diseases and smoking history may be risk factors to worse condition. Certain laboratory inspection may contribute to the judgment of the severity of illness. Copyright © 2020. Published by Elsevier Ltd.
URL: http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=medp&NEWS=N&AN=32289565
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ABSTRACT: The recent outbreak of COVID-19 has been rapidly spreading on a global scale. To date, there is no specific vaccine against the causative virus, SARS-CoV-2, nor is there an effective medicine for treating COVID-19, thus raising concerns with respect to the effect of risk factors such as clinical course and pathophysiological parameters on disease severity and outcome in patients with COVID-19. By extracting and analyzing all available published clinical data, we identified several major clinical characteristics associated with increased disease severity and mortality among patients with COVID-19. Specifically, preexisting chronic conditions such as hypertension, cardiovascular disease, chronic kidney disease, and diabetes are strongly associated with an increased risk of developing severe COVID-19; surprisingly, however, we found no correlation between chronic liver disease and increased disease severity. In addition, we found that both acute cardiac injury and acute kidney injury are highly correlated with an increased risk of COVID-19-related mortality. Given the high risk of

comorbidity and the high mortality rate associated with tissue damage, organ function should be monitored closely in patients diagnosed with COVID-19, and this approach should be included when establishing new guidelines for managing these high-risk patients. Moreover, additional clinical data are needed in order to determine whether a supportive therapy can help mitigate the development of severe, potentially fatal complications, and further studies are needed to identify the pathophysiology and the mechanism underlying this novel coronavirus-associated infectious disease. Taken together, these findings provide new insights regarding clinical strategies for improving the management and outcome of patients with COVID-19. Copyright © 2020 Xinhui Wang et al.
URL: http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=prem&NEWS=N&AN=32377638
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ABSTRACT: OBJECTIVE: This study explores the clinical characteristics of patients with diabetes with severe covid-19, and the association of diabetes with survival duration in patients with severe covid-19. RESEARCH DESIGN AND METHODS: In this single-center, retrospective, observational study, the clinical and laboratory characteristics of 193 patients with severe covid-19 were collected. 48 patients with severe covid-19 had diabetes, and 145 patients (ie, the controls) did not have diabetes. A severe case was defined as including at least one of the following criteria: (1) Respiratory rate >30/min. (2) Oxygen saturation </=93%. (3) PaO2/FiO2</=300 mm Hg. (4) Patients, either with shock or respiratory failure, requiring mechanical ventilation, or combined with other organ failure, requiring admission to intensive care unit (ICU). RESULTS: Of 193 patients with severe covid-19, 48 (24.9%) had diabetes. Compared with patients with severe covid-19 without diabetes, patients with diabetes were older, susceptible to receiving mechanical ventilation and admission to ICU, and had higher mortality. In addition, patients with severe covid-19 with diabetes had higher levels of leukocyte count, neutrophil count, high-sensitivity C reaction protein, procalcitonin, ferritin, interleukin (IL) 2 receptor, IL-6, IL-8, tumor necrosis factor alpha, D-dimer, fibrinogen, lactic dehydrogenase and N-terminal pro-brain natriuretic peptide. Among patients with severe covid-19 with diabetes, more non-survivors were men (30 (76.9%) vs 9 (23.1%)). Non-survivors had severe inflammatory response, and cardiac, hepatic, renal and coagulation impairment. Finally, the Kaplan-Meier survival curve showed a trend towards poorer survival in patients with severe covid-19 with diabetes than patients without diabetes. The HR was 1.53 (95% CI 1.02 to 2.30; p=0.041) after adjustment for age, sex, hypertension, cardiovascular disease and cerebrovascular disease by Cox regression. The median survival durations from hospital admission in patients with severe covid-19 with and without diabetes were 10 days and 18 days, respectively. CONCLUSION: The mortality rate in patients with severe covid-19 with diabetes is considerable. Diabetes may lead to an increase in the risk of death.
URL: https://www.ncbi.nlm.nih.gov/pubmed/32345579
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ABSTRACT: BACKGROUND: An outbreak of coronavirus disease 2019 (COVID-19) occurred in Wuhan, China; the epidemic is more widespread than initially estimated, with cases now confirmed in multiple countries., AIMS: The aim of this meta-analysis was to assess the prevalence of comorbidities in the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infected patients and the risk of underlying diseases in severe patients compared to non-severe patients., METHODS: A literature search was conducted using the databases PubMed, EMBASE, and Web of Science through February 25, 2020. Odds ratios (ORs) and 95% confidence intervals (CIs) were pooled using random-effects models., RESULTS: Seven studies were included in the meta-analysis, including 1 576 infected patients. The results showed the most prevalent clinical symptom was fever (91.3%, 95% CI: 86-97%), followed by cough (67.7%, 95% CI: 59-76%), fatigue (51.0%, 95% CI: 34-68%) and dyspnea (30.4%, 95% CI: 21-40%). The most prevalent comorbidities were hypertension (21.1%, 95% CI: 13.0-27.2%) and diabetes (9.7%, 95% CI: 7.2-12.2%), followed by cardiovascular disease (8.4%, 95% CI: 3.8-13.8%) and respiratory system disease (1.5%, 95% CI: 0.9-2.1%). When compared between severe and non-severe patients, the pooled OR of hypertension, respiratory system disease, and cardiovascular disease were 2.36 (95% CI: 1.46-3.83), 2.46 (95% CI: 1.76-3.44) and 3.42 (95% CI: 1.88-6.22) respectively., CONCLUSION: We assessed the prevalence of comorbidities in the COVID-19 patients and found that underlying disease, including hypertension, respiratory system disease and cardiovascular disease, may be risk factors for severe patients compared with non-severe patients.

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DOI: https://dx.doi.org/10.1016/j.ijid.2020.03.017

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ABSTRACT: Coronavirus Disease 2019 (COVID-19) is an emerging infectious disease first identified in Wuhan City, Hubei Province, China. As of February 19th , 2020, there had been 333 confirmed cases reported in Shanghai, China. This study elaborates on the epidemiological and clinical characteristics of COVID-19 based on a descriptive study of the 333 patients infected with COVID-19 in Shanghai for the purpose of probing into this new disease and providing reference. Among the 333 confirmed cases in Shanghai, 172 (51.7%) were males and 161 (48.3%) were females, with a median age of 50 years. 299 (89.8%) cases presented mild symptoms. 139 (41.7%) and 111 (33.3%) cases were infected in Wuhan and Shanghai, respectively. 148 (44.4%) cases once had contact with confirmed cases before onset, while 103 (30.9%) cases had never contacted confirmed cases but they had a sojourn history in Wuhan. The onset date of the first case in Shanghai was December 28th , with the peak appearing on January 27th . The median incubation period of COVID-19 was estimated to be 7.2 days. 207 (62.2%) cases had fever symptoms at the onset, whereas 273 (82.0%) cases experienced fever before hospitalization. 56 (18.6%) adults experienced a decrease in white blood cell and 84 (42.9%) had increased c-reactive protein after onset. Elderly, male, and heart disease history were risk factors for severe or critical pneumonia. These findings suggest that most cases experienced fever symptoms and had mild pneumonia. Strengthening the health management of elderly men, especially those with underlying diseases, may help reduce the incidence of severe and critical pneumonia. Time intervals from onset to visit, hospitalization and diagnosis confirmed were all shortened after Shanghai's first-level public health emergency response. Shanghai's experience proves that COVID-19 can be controlled well in megacities.

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DOI: https://dx.doi.org/10.1111/tbed.13604

67. Zhang J, Wang X, Jia X, et al. Risk factors for disease severity, unimprovement, and mortality of COVID-19 patients in Wuhan, China. Clin Microbiol Infect. 2020. DOI: 10.1016/j.cmi.2020.04.012
ABSTRACT: OBJECTIVE: Since December 2019, coronavirus disease (COVID-19) emerged in Wuhan. However, the characteristics and risk factors associated with disease severity, unimprovement and mortality are unclear. METHODS: All consecutive patients diagnosed with COVID-19 admitted to the Renmin Hospital of Wuhan University from January 11 to February 6, 2020 were enrolled in this retrospective cohort study. RESULTS: A total of 663 COVID-19 patients were included in this study. Among those, 247 (37.3%) had at least one kind of chronic disease. A total of 0.5% (n=3) of patients were diagnosed with mild COVID-19, while 37.8% (251/663), 47.5% (315/663), and 14.2% (94/663) were in moderate, severe, and critical condition, respectively. In our hospital during follow-up, 251 of 663 (37.9%) patients were improved and 25 patients died, leading to a mortality rate of 3.77%. Older patients (>60 years old) and those with chronic diseases were prone to have severe and critical COVID-19 conditions, show unimprovement, and die (P < 0.001, < 0.001). Multivariate logistic regression analysis identified being male (OR = 0.486, 95% CI 0.311-0.758; P = 0.001), having severe COVID-19 conditions (OR = 0.129, 95% CI 0.082-0.201; P < 0.001), expectoration (OR = 1.796, 95% CI 1.062-3.036; P = 0.029), muscle ache (OR = 0.309, 95% CI 0.153-0.626; P = 0.001), and decreased albumin (OR = 1.929, 95% CI 1.199-3.104; P = 0.007) were associated with unimprovement in COVID-19 patients. CONCLUSION: Being male, in severe COVID-19 conditions, expectoration, muscle ache, and decreased albumin were independent risk factors which influence the improvement of COVID-19 patients.
URL: https://www.ncbi.nlm.nih.gov/pubmed/32304745
DOI: 10.1016/j.cmi.2020.04.012

68. Zhang J, Yu M, Tong S, et al. Predictive factors for disease progression in hospitalized patients with coronavirus disease 2019 in Wuhan, China. Journal of clinical virology : the official publication of the Pan American Society for Clinical Virology. 2020;127:104392. DOI: https://dx.doi.org/10.1016/j.jcv.2020.104392
ABSTRACT: BACKGROUND: A few studies have revealed the clinical characteristics of hospitalized patients with COVID-19. However, predictive factors for the outcomes remain unclear., OBJECTIVE: Attempted to determine the predictive factors for the poor outcomes of patients with COVID-19., STUDY DESIGN: This is a single-center, retrospective study. Clinical, laboratory, and treatment data were collected and analyzed from 111 hospitalized patients with laboratory-confirmed COVID-19 in Union Hospital. The gathered data of discharged and deteriorated patients were compared., RESULTS: Among these 111 patients, 93 patients were discharged and 18 patients were deteriorated. The lymphocyte count (0.56 G/L [0.47-0.63] vs 1.30 G/L [0.95-1.65]) was lower in the deteriorated group than those in the discharged group. The numbers of pulmonary lobe involved (5.00 [5.00-5.00] vs 4.00 [2.00-5.00]), serum C-reactive protein (CRP, 79.52 mg/L [61.25-102.98] vs 7.93 mg/L [3.14-22.50]), IL-6 (35.72 pg/mL [9.24-85.19] vs 5.09 pg/mL [3.16-9.72]), and IL-10 (5.35 pg/mL [4.48-7.84] vs 3.97 pg/mL [3.34-4.79]) concentrations in deteriorated patients were elevated compared with discharged patients. Multivariate logistic regression analysis showed that male gender (OR, 24.8 [1.8-342.1]), comorbidity (OR, 52.6 [3.6-776.4]), lymphopenia (OR, 17.3 [1.1-261.8]), and elevated CRP (OR, 96.5 [4.6-2017.6]) were the independent risk factors for the poor prognosis in COVID-19 patients., CONCLUSIONS: This finding would facilitate the early identification of high-risk COVID-19 patients. Copyright © 2020 Elsevier B.V. All rights reserved.
URL: http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=medp&NEWS=N&AN=32361327
DOI: https://dx.doi.org/10.1016/j.jcv.2020.104392

69. Zhang J-J, Dong X, Cao Y-Y, et al. Clinical characteristics of 140 patients infected with SARS-CoV-2 in Wuhan, China. Allergy. 2020:10.1111/all.14238. DOI: 10.1111/all.14238
ABSTRACT: BACKGROUND: Coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection has been widely spread. We aim to investigate the clinical characteristic and allergy status of patients infected with SARS-CoV-2. METHODS: Electronic medical records including

demographics, clinical manifestation, comorbidities, laboratory data, and radiological materials of 140 hospitalized COVID-19 patients, with confirmed result of SARS-CoV-2 viral infection, were extracted and analyzed. RESULTS: An approximately 1:1 ratio of male (50.7%) and female COVID-19 patients was found, with an overall median age of 57.0Â years. All patients were community-acquired cases. Fever (91.7%), cough (75.0%), fatigue (75.0%), and gastrointestinal symptoms (39.6%) were the most common clinical manifestations, whereas hypertension (30.0%) and diabetes mellitus (12.1%) were the most common comorbidities. Drug hypersensitivity (11.4%) and urticaria (1.4%) were self-reported by several patients. Asthma or other allergic diseases were not reported by any of the patients. Chronic obstructive pulmonary disease (COPD, 1.4%) patients and current smokers (1.4%) were rare. Bilateral ground-glass or patchy opacity (89.6%) was the most common sign of radiological finding. Lymphopenia (75.4%) and eosinopenia (52.9%) were observed in most patients. Blood eosinophil counts correlate positively with lymphocyte counts in severe (rÂ =Â .486, PÂ <Â .001) and nonsevere (rÂ =Â .469, PÂ <Â .001) patients after hospital admission. Significantly higher levels of D-dimer, C-reactive protein, and procalcitonin were associated with severe patients compared to nonsevere patients (all PÂ <Â .001). CONCLUSION: Detailed clinical investigation of 140 hospitalized COVID-19 cases suggests eosinopenia together with lymphopenia may be a potential indicator for diagnosis. Allergic diseases, asthma, and COPD are not risk factors for SARS-CoV-2 infection. Older age, high number of comorbidities, and more prominent laboratory abnormalities were associated with severe patients.
URL: https://pubmed.ncbi.nlm.nih.gov/32077115
DOI: 10.1111/all.14238

70. Zhang Y, Cui Y, Shen M, et al. Comorbid Diabetes Mellitus was Associated with Poorer Prognosis in Patients with COVID-19: A Retrospective Cohort Study. medRxiv. 2020:2020.03.24.20042358. DOI: 10.1101/2020.03.24.20042358
ABSTRACT: Background The 2019 novel coronavirus disease (COVID-19) emerged in Wuhan, Hubei province, China, and was characterized as pandemic by the World Health Organization. Diabetes mellitus is an established risk factor for poor clinical outcomes, but the association of diabetes with the prognosis of COVID-19 have not been reported yet. Methods In this cohort study, we retrospectively reviewed 258 consecutive hospitalized COVID-19 patients with or without diabetes at the West Court of Union Hospital of Huazhong University of Science and Technology in Wuhan, China, recruited from January 29 to February 12, 2020. The cases were confirmed by real-time PCR and the demographic, clinical, laboratory, radiological, and treatment data were collected and analyzed. Prognosis was defined as hospitalization, discharged survivor and death, which was followed up until March 12, 2020. Results Of the 258 hospitalized patients (63 with diabetes) with COVID-19, the median age was 64 years (range 23-91), and 138 (53.5%) were male. No significant differences in age and sex were identified between patients with and without diabetes. Common symptoms included fever (82.2%), dry cough (67.1%), polypnea (48.1%), and fatigue (38%). Patients with diabetes had significantly higher leucocyte and neutrophil counts, and higher levels of fasting blood glucose, serum creatinine, urea nitrogen and creatine kinase isoenzyme MB at admission compared with those without diabetes. COVID-19 patients with diabetes were more likely to develop severe or critical disease condition with more complications at presentation, and had higher incidence rates of antibiotic therapy, non-invasive and invasive mechanical ventilation, and death (11.1% vs. 4.1%). Cox proportional hazard model showed that diabetes (adjusted hazard ratio aHR]=3.64; 95% confidence interval CI]: 1.09, 12.21) and fasting blood glucose (aHR=1.19; 95% CI: 1.08, 1.31) were associated with the fatality of COVID-19, adjusting for potential confounders. Conclusions Diabetes mellitus is associated with greater disease severity and a higher risk of mortality in patients with COVID-19. Primary and secondary prevention strategies are needed for COVID-19 patients with diabetes.Competing Interest StatementThe authors have declared no competing interest.Funding StatementThis study was supported by Emergency Project of Prevention and Control for COVID-19 of Central South University (No. 900202); Science and technology innovation project of Hunan Province (No. S2018SFYLJS0108); National Key R&D Program of China (No. 2016YFC1304204).Author DeclarationsAll relevant ethical guidelines have been followed; any necessary IRB

and/or ethics committee approvals have been obtained and details of the IRB/oversight body are included in the manuscript.YesAll necessary patient/participant consent has been obtained and the appropriate institutional forms have been archived.YesI understand that all clinical trials and any other prospective interventional studies must be registered with an ICMJE-approved registry, such as ClinicalTrials.gov. I confirm that any such study reported in the manuscript has been registered and the trial registration ID is provided (note: if posting a prospective study registered retrospectively, please provide a statement in the trial ID field explaining why the study was not registered in advance).Yes I have followed all appropriate research reporting guidelines and uploaded the relevant EQUATOR Network research reporting checklist(s) and other pertinent material as supplementary files, if applicable.YesData is available upon request to corresponding authors.
URL: http://medrxiv.org/content/early/2020/03/26/2020.03.24.20042358.abstract
DOI: 10.1101/2020.03.24.20042358

71. Zhang Y, Fan X, Zhao Y. Risk Factors for In-hospital Progression of Ordinary COVID-19 in Wuhan, China: A Retrospective Cohort Study. Research Square prepub. 2020.
ABSTRACT: Objective: To describe the clinical characteristics and outcomes of ordinary COVID-19 when admitted, to describe how these patients were treated and risk factors for in-hospital progression. Methods: In this retrospective study, we included 291 adult patients diagnosed as ordinary COVID-19 on admission who had been discharged or had died between Jan 20, 2020 and Mar 16, 2020 from General Hospital of Central Theatre Command (Wuhan, China). Results: Of the 291 patients diagnosed as ordinary COVID-19 when admitted, 65 (22.34%) had been recorded COVID-19 progressing at least once, and 226 (77.66%) had been recorded COVID-19 improving during hospitalization. The median time from admission to disease progressed was 5.0 days (2.0-7.0). Multivariable regression showed increasing odds of in-hospital progression associated with male (odds ratio 2.333, 95% CI 1.135-4.395; P=0.020), preexisting cardiovascular diseases (2.433, 1.044-5.671; P=0.039), and lymphopenia (3.482, 1.783-6.799; P<0.001), elevated IL-6 (2.669, 1.084-6.574; P=0.033), d-dimer (2.829, 1.420-5.636; P=0.003) and lactate dehydrogenase (2.855, 1.458-5.591; P= 0.002) on admission. Conclusions: The potential risk factors of male, preexisting cardiovascular disease, lymphopenia, elevated IL-6, and lactate dehydrogenase, d-dimer could help clinicians to identify in-hospital progression among ordinary COVID-19 at early stage to optimize medical treatment.
URL: https://www.researchsquare.com/article/rs-23094/v1

72. Zhang Z, Chen L, Ni H, et al. Clinical characteristics of 2019 novel coronavirus pneumonia and risk factors for severe cases: a meta-analysis involving 5,729 patients. Research Square prepub. 2020. DOI: https://dx.doi.org/10.21203/rs.3.rs-17871/v1
ABSTRACT: Objective: 2019 novel coronavirus (2019-nCov) has become a global health emergency. However, the clinical presentations are not well characterized. The study aimed to describe clinical characteristics of 2019-nCov pneumonia with meta-analytic approach, and to identify risk factors for developing severe cases. Methods: The electronic databases of PubMed, Google Scholar and MedRxiv were searched from December 2019 to February 2020. Records were included if they reported clinical characteristics of 2019-nCov pneumonia. Studies using crowd sourcing data for mathematical modeling but not reporting clinical data were excluded. The study was reported according to the PRISMA guideline. Data were extracted by independent reviewers. Proportions and mean values were pooled across component studies by using the meta-analytic approach. Data were pooled with fixed or random-effects model as appropriate. Clinical characteristics such as age, gender, symptoms, treatment and mortality outcome were pooled across studies if appropriate. Risk factors for development of severe cases were reported. Results: A total of 13 studies involving 5,729 patients were included for quantitative analysis. The mean age of the study population was 50 years (95% CI: 47 to 53). The most common initial symptoms were cough (68.0%; 95% CI: 65.6 to 70.4%), followed by fever (56.5%; 95% CI: 53.9 to 58.9%), fatigue (42.5%; 95% CI: 39.9 to 45.1%) and anorexia (31.7%; 95% CI: 26.5 to 38.4%). The severe cases accounts for 22.5% of the whole population (95% CI: 21.4 to 23.6%). The overall mortality rate was 1.8% (95% CI: 1.5 to 2.2%), which was consistent with the real time epidemic tracking data. There was substantial

heterogeneity across included studies (O = 0.84; p < 0.001). A number of comorbidities and symptoms such as hypertension, COPD, dyspnea, elevated C-reactive protein and procalcitonin were found to be associated with increased risk of developing severe cases. Conclusions: Our study described clinical characteristics of the 2019-nCov pneumonia in a systematic way. Multiple risk factors were identified for severe cases.
URL: , 18 March 2020, PREPRINT (Version 1) available at Research Square [+https://doi.org/10.21203/rs.3.rs-17871/v1+]
DOI: https://dx.doi.org/10.21203/rs.3.rs-17871/v1

73. Zhao Q, Meng M, Kumar R, et al. The impact of COPD and smoking history on the severity of Covid-19: A systemic review and meta-analysis. Journal of medical virology. 2020. DOI: https://dx.doi.org/10.1002/jmv.25889
ABSTRACT: AIMS: Comorbidities are associated with the severity of Coronavirus Disease 2019 (Covid-19). This meta-analysis aimed to explore the risk of severe Covid-19 in patients with pre-existing chronic obstructive pulmonary disease (COPD) and ongoing smoking history., METHODS: A comprehensive systematic literature search was carried out to find studies published from December 2019 to 22nd March 2020 from 5 Database. The language of literature included English and Chinese. The point prevalence of severe Covid-19 in patients with pre-existing COPD and those with ongoing smoking was evaluated with this meta-analysis., RESULTS: Overall 11 case-series, published either in Chinese or English language with a total of 2002 cases were included in the study. The pooled OR of COPD and the development of severe Covid-19 was 4.38 (Fixed effect model, 95% CI: 2.34-8.20), while the OR of ongoing smoking was 1.98 (Fixed effect model, 95% CI: 1.29-3.05). There was no publication bias as examined by the funnel plot and Egger's test (p=NS). The heterogeneity of included studies was moderate for both COPD and ongoing smoking history on the severity of Covid-19., CONCLUSIONS: COPD and ongoing smoking history attribute to the worse progression and outcome of Covid-19. This article is protected by copyright. All rights reserved. Copyright This article is protected by copyright. All rights reserved.
URL: http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=medp&NEWS=N&AN=32293753
DOI: https://dx.doi.org/10.1002/jmv.25889

74. Zhao X, Zhang B, Li P, et al. Incidence, clinical characteristics and prognostic factor of patients with COVID-19: a systematic review and meta-analysis. medRxiv. 2020:2020.03.17.20037572. DOI: 10.1101/2020.03.17.20037572
ABSTRACT: Background: Recently, Coronavirus Disease 2019 (COVID-19) outbreak started in Wuhan, China. Although the clinical features of COVID-19 have been reported previously, data regarding the risk factors associated with the clinical outcomes are lacking. Objectives: To summary and analyze the clinical characteristics and identify the predictors of disease severity and mortality. Methods: The PubMed, Web of Science Core Collection, Embase, Cochrane and MedRxiv databases were searched through February 25, 2020. Meta-analysis of Observational Studies in Epidemiology (MOOSE) recommendations were followed. We extracted and pooled data using random-effects meta-analysis to summary the clinical feature of the confirmed COVID-19 patients, and further identify risk factors for disease severity and death. Heterogeneity was evaluated using the I2 method and explained with subgroup analysis and meta-regression. Results: A total of 30 studies including 53000 patients with COVID-19 were included in this study, the mean age was 49.8 years (95% CI, 47.5-52.2 yrs) and 55.5% were male. The pooled incidence of severity and mortality were 20.2% (95% CI, 15.1-25.2%) and 3.1% (95% CI, 1.9-4.2%), respectively. The predictor for disease severity included old age (â‰¥ 50 yrs, odds ratio OR] = 2.61; 95% CI, 2.29-2.98), male (OR =1.348, 95% CI, 1.195-1.521), smoking (OR =1.734, 95% CI, 1.146-2.626) and any comorbidity (OR = 2.635, 95% CI, 2.098-3.309), especially chronic kidney disease (CKD, OR = 6.017; 95% CI, 2.192-16.514), chronic obstructive pulmonary disease (COPD, OR = 5.323; 95% CI, 2.613-10.847) and cerebrovascular disease (OR = 3.219; 95% CI, 1.486-6.972). In terms of laboratory results, increased lactate dehydrogenase (LDH), C-reactive protein (CRP) and D-dimer and decreased blood platelet and lymphocytes count were highly associated with severe COVID-19 (all for P < 0.001). Meanwhile, old age (â‰¥ 60 yrs, RR = 9.45; 95% CI, 8.09-11.04), followed by cardiovascular disease (RR = 6.75; 95% CI, 5.40-8.43) hypertension (RR =

4.48; 95% CI, 3.69-5.45) and diabetes (RR = 4.43; 95% CI, 3.49-5.61) were found to be independent prognostic factors for the COVID-19 related death. Conclusions: To our knowledge, this is the first evidence-based medicine research to explore the risk factors of prognosis in patients with COVID-19, which is helpful to identify early-stage patients with poor prognosis and adapt effective treatment.Competing Interest StatementThe authors have declared no competing interest.Funding StatementNoneAuthor DeclarationsAll relevant ethical guidelines have been followed; any necessary IRB and/or ethics committee approvals have been obtained and details of the IRB/oversight body are included in the manuscript.YesAll necessary patient/participant consent has been obtained and the appropriate institutional forms have been archived.YesI understand that all clinical trials and any other prospective interventional studies must be registered with an ICMJE-approved registry, such as ClinicalTrials.gov. I confirm that any such study reported in the manuscript has been registered and the trial registration ID is provided (note: if posting a prospective study registered retrospectively, please provide a statement in the trial ID field explaining why the study was not registered in advance).Yes I have followed all appropriate research reporting guidelines and uploaded the relevant EQUATOR Network research reporting checklist(s) and other pertinent material as supplementary files, if applicable.YesThe raw/processed data required to reproduce these findings cannot be shared at this time as the data also forms part of an ongoing study.
URL: http://medrxiv.org/content/early/2020/03/20/2020.03.17.20037572.abstract
DOI: 10.1101/2020.03.17.20037572

75. Zheng X, Chen J, Deng L, et al. Clinical Features and Risk Factors for the Severity of Inpatients with COVID-19: A Retrospective Cohort Study. SSRN- Lancet prepublication. 2020.
ABSTRACT: Background: Coronavirus disease 2019 (COVID-19) have become a pandemic in the world since it was found and caused an outbreak on December, 2019, Wuhan, China, caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Epidemiological and clinical features of patients with COVID-19 have been investigated but risk factors for disease severity in the early stage have not been well described. Methods: In this retrospective cohort study, we included in-hospital patients with laboratory confirmed COVID-19 from the Fifth Affiliated Hospital of Sun Yat-Sen University (Zhuhai, China) who had been discharged by Mar 9, 2020. Demographic, clinical, treatment, and laboratory data extracted from electronic medical records and dynamic change of biochemical indicators in hospital were compared between common and severe type patients. Univariable and multivariable logistic regression methods were used to explore the risk factors associated with the severity of COVID-19. Findings: 52 patients were included in this study, of whom 22 were severe type and 30 for common type. 30 (57.7%) patients had a comorbidity, with hypertension being the most common (12 23.1%] patients), followed by diabetes (6 11.5%] patients) and cardiovascular disease (3 5.8%] patients). Multivariable regression demonstrated increasing odds of severity associated with the duration of fever (odds ratio 1.22, 95% CI 1.051â€“1.416, per day increase; p=0Â·009), CRP (1.061, 95% CI 1.009-1.116; p=0.02), and oxygen partial pressure less than 80 mmHg (8.034, 95% CI 1.216â€“53.082; p=0Â·031) on admission. Lymphocyte, lymphocyte percentage, and platelet within 20 days of illness onset were lower in the severe patients compared with common patients, red blood cell and hemoglobin from illness onset decreased but eosinophils increased gradually in COVID-19 patients. Additionally, elevated levels of AST, bilirubin, NT-proBNP, D-dimer, CK, and lactate dehydrogenase were more commonly observed in severe COVID-19 patients. Interpretation: The potential risk factors of the duration of fever, CRP and oxygen partial pressure less than 80 mmHg could benefit for clinicians to evaluate the severity of patients with COVID-19 at an early stage and provide a reference for evaluating therapeutic effect.
URL: http://dx.doi.org/10.2139/ssrn.3562460

76. Zheng Z, Peng F, Xu B, et al. Risk factors of critical & mortal COVID-19 cases: A systematic literature review and meta-analysis. The Journal of infection. 2020. DOI: https://dx.doi.org/10.1016/j.jinf.2020.04.021

ABSTRACT: BACKGROUND: An epidemic of Coronavirus Disease 2019 (COVID-19) began in December 2019 and triggered a Public Health Emergency of International Concern (PHEIC). We aimed to find risk factors for the progression of COVID-19 to help reducing the risk of critical illness and death for clinical help., METHODS: The data of COVID-19 patients until March 20, 2020 were retrieved from four databases. We statistically analyzed the risk factors of critical/mortal and non-critical COVID-19 patients with meta-analysis., RESULTS: Thirteen studies were included in Meta-analysis, including a total number of 3027 patients with SARS-CoV-2 infection. Male, older than 65, and smoking were risk factors for disease progression in patients with COVID-19 (male: OR=1.76, 95% CI (1.41, 2.18), P < 0.00001; age over 65 years old: OR =6.06, 95% CI(3.98, 9.22), P < 0.00001; current smoking: OR =2.51, 95% CI(1.39, 3.32), P=0.0006). The proportion of underlying diseases such as hypertension, diabetes, cardiovascular disease, and respiratory disease were statistically significant higher in critical/mortal patients compared to the non-critical patients (diabetes: OR=3.68, 95% CI (2.68, 5.03), P < 0.00001; hypertension: OR=2.72, 95% CI (1.60,4.64), P=0.0002; cardiovascular disease: OR=5.19, 95% CI(3.25, 8.29), P < 0.00001; respiratory disease: OR=5.15, 95% CI(2.51, 10.57), P < 0.00001). Clinical manifestations such as fever, shortness of breath or dyspnea were associated with the progression of disease [fever: 0R=0.56, 95% CI (0.38, 0.82), P=0.003;shortness of breath or dyspnea: 0R=4.16, 95% CI (3.13, 5.53), P < 0.00001]. Laboratory examination such as aspartate amino transferase(AST) > 40U/L, creatinine(Cr) >= 133mol/L, hypersensitive cardiac troponin I(hs-cTnI) > 28pg/mL, procalcitonin(PCT) > 0.5ng/mL, lactatede hydrogenase(LDH) > 245U/L, and D-dimer > 0.5mg/L predicted the deterioration of disease while white blood cells(WBC)<4x109/L meant a better clinical status[AST > 40U/L:OR=4.00, 95% CI (2.46, 6.52), P < 0.00001; Cr >= 133mumol/L: OR=5.30, 95% CI (2.19, 12.83), P=0.0002; hs-cTnI > 28 pg/mL: OR=43.24, 95% CI (9.92, 188.49), P < 0.00001; PCT > 0.5 ng/mL: OR=43.24, 95% CI (9.92, 188.49), P < 0.00001;LDH > 245U/L: OR=43.24, 95% CI (9.92, 188.49), P < 0.00001; D-dimer > 0.5mg/L: OR=43.24, 95% CI (9.92, 188.49), P < 0.00001; WBC < 4x109/L: OR=0.30, 95% CI (0.17, 0.51), P < 0.00001]., CONCLUSION: Male, aged over 65, smoking patients might face a greater risk of developing into the critical or mortal condition and the comorbidities such as hypertension, diabetes, cardiovascular disease, and respiratory diseases could also greatly affect the prognosis of the COVID-19. Clinical manifestation such as fever, shortness of breath or dyspnea and laboratory examination such as WBC, AST, Cr, PCT, LDH, hs-cTnI and D-dimer could imply the progression of COVID-19.
URL: http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=medp&NEWS=N&AN=32335169
DOI: https://dx.doi.org/10.1016/j.jinf.2020.04.021

77. Zhou F, Yu T, Du R, et al. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. Lancet (London, England). 2020;395(10229):1054-62. DOI: https://dx.doi.org/10.1016/S0140-6736(20)30566-3
ABSTRACT: BACKGROUND: Since December, 2019, Wuhan, China, has experienced an outbreak of coronavirus disease 2019 (COVID-19), caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Epidemiological and clinical characteristics of patients with COVID-19 have been reported but risk factors for mortality and a detailed clinical course of illness, including viral shedding, have not been well described., METHODS: In this retrospective, multicentre cohort study, we included all adult inpatients (>=18 years old) with laboratory-confirmed COVID-19 from Jinyintan Hospital and Wuhan Pulmonary Hospital (Wuhan, China) who had been discharged or had died by Jan 31, 2020. Demographic, clinical, treatment, and laboratory data, including serial samples for viral RNA detection, were extracted from electronic medical records and compared between survivors and non-survivors. We used univariable and multivariable logistic regression methods to explore the risk factors associated with in-hospital death., FINDINGS: 191 patients (135 from Jinyintan Hospital and 56 from Wuhan Pulmonary Hospital) were included in this study, of whom 137 were discharged and 54 died in hospital. 91 (48%) patients had a comorbidity, with hypertension being the most common (58 [30%] patients), followed by diabetes (36 [19%] patients) and coronary heart disease (15 [8%] patients). Multivariable regression showed increasing odds of in-hospital death associated with older age (odds ratio 1.10, 95% CI 1.03-1.17, per year increase; p=0.0043), higher Sequential Organ Failure Assessment (SOFA) score (5.65, 2.61-12.23; p<0.0001), and d-dimer greater than 1 mug/mL (18.42, 2.64-128.55; p=0.0033) on admission. Median duration of viral

shedding was 20.0 days (IQR 17.0-24.0) in survivors, but SARS-CoV-2 was detectable until death in non-survivors. The longest observed duration of viral shedding in survivors was 37 days., INTERPRETATION: The potential risk factors of older age, high SOFA score, and d-dimer greater than 1 mug/mL could help clinicians to identify patients with poor prognosis at an early stage. Prolonged viral shedding provides the rationale for a strategy of isolation of infected patients and optimal antiviral interventions in the future., FUNDING: Chinese Academy of Medical Sciences Innovation Fund for Medical Sciences; National Science Grant for Distinguished Young Scholars; National Key Research and Development Program of China; The Beijing Science and Technology Project; and Major Projects of National Science and Technology on New Drug Creation and Development.
URL: http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=medl&NEWS=N&AN=32171076
DOI: https://dx.doi.org/10.1016/S0140-6736(20)30566-3

78. Zhou F YTDR, et al. Correction. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. Lancet 2020; published online March 9. https://doi.org/10.1016/S0140-6736(20)30566-3—. The Lancet. 2020;395(10229). DOI: https://doi.org/10.1016/S0140-6736(20)30638-3
ABSTRACT: Zhou F, Yu T, Du R, et al. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. Lancet 2020; published online March 9. https://doi.org/10.1016/S0140-6736(20)30566-3—In this Article, the units for d-dimer, haemoglobin, and high-sensitivity cardiac troponin I have been corrected to μg/mL (d-dimer), g/L (haemoglobin), and pg/mL (high-sensitivity cardiac troponin I). In figure 1, the start of systematic corticosteroid for non-survivors has been changed to day 13 after illness onset. The appendix has also been corrected. These corrections have been made to the online version as of March 12, 2020, and will be made to the printed version.
URL: http://www.sciencedirect.com/science/article/pii/S0140673620306383
DOI: https://doi.org/10.1016/S0140-6736(20)30638-3

79. Zuin M, Rigatelli G, Zuliani G, et al. Arterial hypertension and risk of death in patients with COVID-19 infection: systematic review and meta-analysis. Journal of Infection. 2020. DOI: 10.1016/j.jinf.2020.03.059 10.1016/j.jinf.2020.03.059.
URL: https://www.ncbi.nlm.nih.gov/pubmed/32283158
DOI: 10.1016/j.jinf.2020.03.059
10.1016/j.jinf.2020.03.059.

SEARCH STRATEGIES

CINAHL
Run: May 11, 2020 15:50

S23	S20 OR S22	77
S22	S10 AND S21	42
S21	TX (((risk N1 (ratio? or prediction or assess* or factor* or stratif* or tool*)) or odds ratio? or prediction or prevalence or relative risk? or (risk N3 (regression or multivariate or multi-variate))) N3 (hospitalis* or hospitaliz* or hospital stay or intensive care unit* or ICU or critical* ill* or critical care or criticality or serious or severity or severe or deteriorat* or mortality or death or lethal* or poor prognosis or poor outcome*))	57,848
S20	S10 AND S13 AND S16 AND S19	47
S19	S17 OR S18	941,476

S18	TI (hospitalis* or hospitaliz* or hospital stay or intensive care unit* or ICU or critical* ill* or critical care or criticality or serious or severity or severe or deteriorat* or mortality or death or lethal* or poor prognosis or poor outcome*) OR AB (hospitalis* or hospitaliz* or hospital stay or intensive care unit* or ICU or critical* ill* or critical care or criticality or serious or severity or severe or deteriorat* or mortality or death or lethal* or poor prognosis or poor outcome*)	788,666
S17	(MH "Hospitalization+") OR (MH "Intensive Care Units+") OR (MH "Critical Care Nursing+") OR (MH "Critical Care+") OR (MH "Critical Illness") OR (MH "Severity of Illness") OR (MH "Patient Classification") OR (MH "Clinical Deterioration") OR (MH "Mortality+") OR (MH "Death+")	352,188
S16	S14 OR S15	1,144,660
S15	TI ((risk N1 (ratio? or prediction or assess* or factor* or stratif* or tool*)) or odds ratio? or prediction or prevalence or relative risk? or case control or cohort or (risk N3 (regression or multivariate or multi-variate))) OR AB ((risk N1 (ratio? or prediction or assess* or factor* or stratif* or tool*)) or odds ratio? or prediction or prevalence or relative risk? or case control or cohort or (risk N3 (regression or multivariate or multi-variate)))	673,599
S14	(MH "Risk Assessment") OR (MH "Odds Ratio") OR (MH "Prevalence") OR (MH "Case Control Studies+") OR (MH "Prospective Studies+")	787,032
S13	S11 OR S12	1,976,498
S12	TI (risk factor* or comorbidit* or diabetes or cardiovascular disease* or heart disease* or hypertension or smoking or asthma* or chronic lung disease or chronic respiratory disease or chronic obstructive pulmonary disease or COPD or cancer or chemotherapy) OR AB (risk factor* or comorbidit* or diabetes or cardiovascular disease* or heart disease* or hypertension or smoking or asthma* or chronic lung disease or chronic respiratory disease or chronic obstructive pulmonary disease or COPD or cancer or chemotherapy)	968,176
S11	(MH "Risk Factors+") OR (MH "Age Factors") OR (MH "Geographic Factors") OR (MH "Sex Factors") OR (MH "Race Factors") OR (MH "Comorbidity") OR (MH "Diabetes Mellitus+") OR (MH "Cardiovascular Diseases+") OR (MH "Hypertension+") OR (MH "Smoking+") OR (MH "Lung Diseases, Obstructive+") OR (MH "Neoplasms+") OR (MH "Chemotherapy, Cancer+") OR (MH "Radiotherapy+") OR (MH "Cancer Patients") OR (MH "Cancer Care Facilities")	1,709,552
S10	S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 Limiters - Published Date: 20191201-20201231; English Language	2,588
S9	S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8	14,514
S8	TX ("severe acute respiratory syndrome*")	3,676
S7	TX ((outbreak* or wildlife* or pandemic* or epidemic*) N1 (Wuhan* or Hubei or China* or Chinese* or Huanan*))	672
S6	TX (("seafood market*" or "food market*" or pneumonia*) N10 (Wuhan* or Hubei* or China* or Chinese* or Huanan*))	454
S5	TX (respiratory* N2 (symptom* or disease* or illness* or condition*) N10 (Wuhan* or Hubei* or China* or Chinese* or Huanan*))	1,247
S4	TX ("2019-nCoV" or 2019nCoV or nCoV2019 or "nCoV-2019" or "COVID-19" or COVID19 or "CORVID-19" or CORVID19 or "WN-CoV" or WNCoV or "HCoV-19" or HCoV19 or "2019 novel*" or Ncov or "n-cov" or "SARS-CoV-2" or "SARSCoV-2" or "SARSCoV2" or "SARS-CoV2" or SARSCov19 or "SARS-Cov19" or "SARSCov-19" or "SARS-Cov-19" or Ncovor or Ncorona* or Ncorono* or NcovWuhan* or NcovHubei* or NcovChina* or NcovChinese* or SARS2 or "SARS-2" or SARScoronavirus2 or "SARS-coronavirus-2" or "SARScoronavirus 2" or "SARS coronavirus2" or SARScoronovirus2 or "SARS-coronovirus-2" or "SARScoronovirus 2" or "SARS coronovirus2")	2,246
S3	TX (coronavirus* or coronovirus* or coronavirinae* or CoV or HCoV*)	8,308
S2	TX ((corona* or corono*) N1 (virus* or viral* or virinae*))	257
S1	(MH "Coronavirus Infections+") OR (MH "Coronavirus+") OR (MH "COVID-19")	4,737

Embase 1974 to 2020 May 08

Run: May 11, 2020 15:35

1 exp Coronavirinae/ or exp Coronavirus infection/ (21514)

2 (coronavirus disease 2019 or severe acute respiratory syndrome coronavirus 2).sh,dj. (3649)

3 ((corona* or corono*) adj1 (virus* or viral* or virinae*)).ti,ab,kw. (710)

4 (coronavirus* or coronovirus* or coronavirinae* or CoV).ti,ab,kw. (19099)

5 ("2019-nCoV" or 2019nCoV or nCoV2019 or "nCoV-2019" or "COVID-19" or COVID19 or "CORVID-19" or CORVID19 or "WN-CoV" or WNCoV or "HCoV-19" or HCoV19 or "2019 novel*" or Ncov or "n-cov" or "SARS-CoV-2" or "SARSCoV-2" or "SARSCoV2" or "SARS-CoV2" or SARSCov19 or "SARS-Cov19" or "SARSCov-19" or "SARS-Cov-19" or Ncovor or Ncorona* or Ncorono* or NcovWuhan* or NcovHubei* or NcovChina* or NcovChinese* or SARS2 or "SARS-2" or SARScoronavirus2 or "SARS-coronavirus-2" or "SARScoronavirus 2" or "SARS coronavirus2" or SARScoronovirus2 or "SARS-coronovirus-2" or "SARScoronovirus 2" or "SARS coronovirus2").ti,ab,kw. (7908)

6 (respiratory* adj2 (symptom* or disease* or illness* or condition*) adj10 (Wuhan* or Hubei* or China* or Chinese* or Huanan*)).ti,ab,kw. (542)

7 (("seafood market*" or "food market*" or pneumonia*) adj10 (Wuhan* or Hubei* or China* or Chinese* or Huanan*)).ti,ab,kw. (1317)

8 ((outbreak* or wildlife* or pandemic* or epidemic*) adj1 (Wuhan* or Hubei* or China* or Chinese* or Huanan*)).ti,ab,kw. (99)

9 "severe acute respiratory syndrome*".ti,ab,kw. (5894)

10 or/1-9 (34858)

11 10 and 20191201:20201231.(dc). (9620)

12 risk factor/ or age/ or comorbidity/ or race/ or sex factor/ or exp diabetes mellitus/ or exp cardiovascular disease/ or exp hypertension/ or exp smoking/ or exp asthma/ or chronic obstructive lung disease/ or exp malignant neoplasm/ or exp chemotherapy/ or exp radiotherapy/ (9259019)

13 (risk factor* or comorbidit* or diabetes or cardiovascular disease* or heart disease* or hypertension or smoking or asthma* or chronic lung disease or chronic respiratory disease or chronic obstructive pulmonary disease or COPD or cancer or chemotherapy).ti,ab. (5076382)

14 12 or 13 (10186079)

15 risk assessment/ or odds ratio/ or exp prevalence/ or exp case control study/ or cohort analysis/ (1873935)

16 ((risk adj (ratio? or prediction or assess* or factor* or stratif* or tool*)) or odds ratio? or prediction or prevalence or relative risk? or case control or cohort or (risk adj3 (regression or multivariate or multi-variate))).ti,ab. (2964396)

17 15 or 16 (3536815)

18 hospitalization/ or exp intensive care/ or exp intensive care unit/ or disease severity/ or critical illness/ or patient acuity/ or deterioration/ or terminal disease/ or exp mortality/ or exp death/ (2983521)

19 (hospitalis* or hospitaliz* or hospital stay or intensive care unit* or ICU or critical* ill* or critical care or criticality or serious or severity or severe or deteriorat* or mortality or death or lethal* or poor prognosis or poor outcome*).ti,ab. (4448056)

20 18 or 19 (5568249)

21 11 and 14 and 17 and 20 (290)

22 (((risk adj (ratio? or prediction or assess* or factor* or stratif* or tool*)) or odds ratio? or prediction or prevalence or relative risk? or (risk adj3 (regression or multivariate or multi-variate))) adj3 (hospitalis* or hospitaliz* or hospital stay or intensive care unit* or ICU or critical* ill* or critical care or criticality or serious or severity or severe or deteriorat* or mortality or death or lethal* or poor prognosis or poor outcome*)).af. (195338)

23 11 and 22 (142)

24 21 or 23 (335)

25 limit 24 to (english language and exclude medline journals) (31)

Ovid MEDLINE(R) ALL 1946 to May 08, 2020

Run: May 11, 2020 16:05

1 exp coronavirus/ or exp coronavirus infections/ (17219)

2 ((corona* or corono*) adj1 (virus* or viral* or virinae*)).ti,ab,kw,kf. (952)

3 (coronavirus* or coronovirus* or coronavirinae* or CoV).ti,ab,kw,kf. (18672)

4 ("2019-nCoV" or 2019nCoV or nCoV2019 or "nCoV-2019" or "COVID-19" or COVID19 or "CORVID-19" or CORVID19 or "WN-CoV" or WNCoV or "HCoV-19" or HCoV19 or "2019 novel*" or Ncov or "n-cov" or "SARS-CoV-2" or "SARSCoV-2" or "SARSCoV2" or "SARS-CoV2" or SARSCov19 or "SARS-Cov19" or "SARSCov-19" or "SARS-Cov-19" or Ncovor or Ncorona* or Ncorono* or NcovWuhan* or NcovHubei* or NcovChina* or NcovChinese* or SARS2 or "SARS-2" or SARScoronavirus2 or "SARS-coronavirus-2" or "SARScoronavirus 2" or "SARS coronavirus2" or SARScoronovirus2 or "SARS-coronovirus-2" or "SARScoronovirus 2" or "SARS coronovirus2").ti,ab,kw,kf. (10826)

5 (respiratory* adj2 (symptom* or disease* or illness* or condition*) adj10 (Wuhan* or Hubei* or China* or Chinese* or Huanan*)).ti,ab,kw,kf. (451)

6 (("seafood market*" or "food market*" or pneumonia*) adj10 (Wuhan* or Hubei* or China* or Chinese* or Huanan*)).ti,ab,kw,kf. (1221)

7 ((outbreak* or wildlife* or pandemic* or epidemic*) adj1 (Wuhan* or Hubei* or China* or Chinese* or Huanan*)).ti,ab,kw. (233)

8 "severe acute respiratory syndrome*".ti,ab,kw,kf. (5854)

9 or/1-8 (33131)

10 9 and 20191201:20201231.(dt). (12364)

11 risk factors/ or exp age factors/ or exp comorbidity/ or race factors/ or sex factors/ or exp diabetes mellitus/ or exp cardiovascular diseases/ or hypertension/ or exp smoking/ or exp lung diseases, obstructive/ or exp neoplasms/ or exp antineoplastic protocols/ or radiotherapy/ (6949423)

12 (risk factor* or comorbidit* or diabetes or cardiovascular disease* or heart disease* or hypertension or smoking or asthma* or chronic lung disease or chronic respiratory disease or chronic obstructive pulmonary disease or COPD or cancer or chemotherapy).ti,ab. (3557733)

13 11 or 12 (7979166)

14 exp risk assessment/ or odds ratio/ or prevalence/ or exp case-control studies/ or exp cohort studies/ (2606613)

15 ((risk adj (ratio? or prediction or assess* or factor* or stratif* or tool*)) or odds ratio? or prediction or prevalence or relative risk? or case control or cohort or (risk adj3 (regression or multivariate or multi-variate))).ti,ab. (2035955)

16 14 or 15 (3746974)

17 exp hospitalization/ or exp intensive care units/ or exp critical care/ or critical illness/ or mortality/ or exp patient acuity/ or clinical deterioration/ or exp death/ (771597)

18 (hospitalis* or hospitaliz* or hospital stay or intensive care unit* or ICU or critical* ill* or critical care or criticality or serious or severity or severe or deteriorat* or mortality or death or lethal* or poor prognosis or poor outcome*).ti,ab. (3120270)

19 17 or 18 (3457542)

20 10 and 13 and 16 and 19 (273)

21 (((risk adj (ratio? or prediction or assess* or factor* or stratif* or tool*)) or odds ratio? or prediction or prevalence or relative risk? or (risk adj3 (regression or multivariate or multi-variate))) adj3 (hospitalis* or hospitaliz* or hospital stay or intensive care unit* or ICU or critical* ill* or critical care or criticality or serious or severity or severe or deteriorat* or mortality or death or lethal* or poor prognosis or poor outcome*)).af. (72115)

22 10 and 21 (103)

23 20 or 22 (295)

24 limit 23 to english language (276)

Search terms for other resources used in various combinations:

- Clinical severity or Severe or Progression
- Estimate or predict or prevalence or odds ratio or relative risk
- Underlying health condition or risk factor or comorbidity or smoking