Supplementary

Appendix 1 Included literature information

No.	First author	Article name	The journal
1	Yuan, M.L.	Association of radiologic findings with mortality of patients infected with 2019 novel coronavirus in Wuhan, China	PLoS One
2	Osborne, T. F.	Automated EHR score to predict COVID-19 outcomes at US Department of Veterans Affairs	PLoS One
3	Francone, M.	Chest CT score in COVID-19 patients: correlation with disease severity and short-term prognosis	European Radiology
4	Cozzi, D.	Chest X-ray in new Coronavirus Disease 2019 (COVID-19) infection: findings and correlation with clinical outcome	Radiologia Medica
5	Borghesi, A.	Chest X-ray severity index as a predictor of in-hospital mortality in coronavirus disease 2019: A study of 302 patients from Italy	International Journal of Infectious Diseases
6	Wang, K.	Clinical and laboratory predictors of in-hospital mortality in patients with COVID-19: a cohort study in Wuhan, China	Clinical Infectious Diseases
7	Hong, Y.	Clinical characteristics of Coronavirus Disease 2019 and development of a prediction model for prolonged hospital length of stay	Annals of Translational Medicine
8	Yu, C.	Clinical Characteristics, Associated Factors, and Predicting COVID-19 Mortality Risk: A Retrospective Study in Wuhan, China	American Journal of Preventive Medicine
9	Galloway, J. B.	A clinical risk score to identify patients with COVID-19 at high risk of critical care admission or death: An observational cohort study	Journal of Infection
10	Liu, Y. P.	Combined use of the neutrophil-to-lymphocyte ratio and CRP to predict 7-day disease severity in 84 hospitalized patients with COVID-19 pneumonia: a retrospective cohort study	Annals of Translational Medicine
11	Borghesi, A.	COVID-19 outbreak in Italy: experimental chest X-ray scoring system for quantifying and monitoring disease progression	Radiologia Medica
12	Liu, F. J.	CT quantification of pneumonia lesions in early days predicts progression to severe illness in a cohort of COVID-19 patients	Theranostics
13	Yao, Y.	D-dimer as a biomarker for disease severity and mortality in COVID-19 patients: a case control study	Journal of Intensive Care
14	Zhou, Y. W.	Development and validation a nomogram for predicting the risk of severe COVID-19:Amulti-center study in Sichuan, China	PLoS One
15	Liang, W. H.	Development and Validation of a Clinical Risk Score to Predict the Occurrence of Critical Illness in Hospitalized Patients With COVID-19	JAMA Internal Medicine
16	Dong, Y. M.	Development and Validation of a Nomogram for Assessing Survival in Patients with COVID-19 Pneumonia	Clinical Infectious Diseases
17	Zheng, Y.	Development and Validation of a Prognostic Nomogram Based on Clinical and CT Features for Adverse Outcome Prediction in Patients with COVID-19	Korean Journal of Radiology
18	Zhang, S.	Development and validation of a risk factor-based system to predict short-term survival in adult hospitalized patients with COVID-19: a multicenter, retrospective, cohort study	Critical Care
19	Xiao, L. S.	Development and validation of the HNC-LL score for predicting the severity of coronavirus disease 2019	Ebiomedicine
20	Wang, F.	Establishing a model for predicting the outcome of COVID-19 based on combination of laboratory tests	Travel Medicine and Infectious Disease
21	Zheng, Y. F.	The hemocyte counts as a potential biomarker for predicting disease progression in COVID-19: a retrospective study	Clinical Chemistry and Laboratory Medicine
22	Wu, S.	Identification and validation of a novel clinical signature to predict the prognosis in confirmed COVID-19 patients	Clinical Infectious Diseases
23	Luo, M.	IL-6 and CD8+ T cell counts combined are an early predictor of in-hospital mortality of patients with COVID-19	JCI Insight
24	Huang, J. F.	Individualized prediction nomograms for disease progression in mild COVID-19	Journal of Medical Virology
25	Liu, Q.	Laboratory findings and a combined multifactorial approach to predict death in critically ill patients with COVID-19: a retrospective study	Epidemiology and Infection
26	Hu, K.	Logistic regression analysis of death risk factors of patients with severe and critical coronavirus disease 2019 and their predictive value	Zhonghua wei zhong bing ji jiu yi xue
27	Zhang, P.	The modified NUTRIC score can be used for nutritional risk assessment as well as prognosis prediction in critically ill COVID-19 patients	Clinical Nutrition
28	Lorente-Ros, A.	Myocardial injury determination improves risk stratification and predicts mortality in COVID-19 patients	Cardiology Journal
29	Myrstad, M.	National Early Warning Score 2 (NEWS2) on admission predicts severe disease and in-hospital mortality from Covid-19 - a prospective cohort study	Scandinavian Journal of Trauma Resuscitation & Emergency Medicine
30	Liu, J. Y.	Neutrophil-to-lymphocyte ratio predicts critical illness patients with 2019 coronavirus disease in the early stage	Journal of Translational Medicine
31	Nguyen, Y.	A nomogram to predict the risk of unfavorable outcome in COVID-19: a retrospective cohort of 279 hospitalized patients in Paris area	Annals of Medicine
32	Zhang, C.	A Novel Scoring System for Prediction of Disease Severity in COVID-19	Frontiers in Cellular and Infection Microbiology
33	Satici, C.	Performance of pneumonia severity index and CURB-65 in predicting 30-day mortality in patients with COVID-19	International Journal of Infectious Diseases
34	Pascual Gómez, N. F.	Potential biomarkers predictors of mortality in COVID-19 patients in the Emergency Department	Revista espanola de quimioterapia
35	Luo, Y.	Prealbumin as a Predictor of Prognosis in Patients with Coronavirus Disease 2019	Frontiers in Medicine
36	Bello-Chavolla, O. Y.	Predicting Mortality Due to SARS-CoV-2: A Mechanistic Score Relating Obesity and Diabetes to COVID-19 Outcomes in Mexico	The Journal of Clinical Endocrinology and Metabolism
37	Ji, D.	Prediction for Progression Risk in Patients with COVID-19 Pneumonia: the CALL Score	Clinical Infectious Diseases
38	Zhao, Z.	Prediction model and risk scores of ICU admission and mortality in COVID-19	PLoS One
39	Luo, Y.	Prediction Model Based on the Combination of Cytokines and Lymphocyte Subsets for Prognosis of SARS-CoV-2 Infection	Journal of Clinical Immunology
40	Bi, X. J.	Prediction of severe illness due to COVID-19 based on an analysis of initial Fibrinogen to Albumin Ratio and Platelet count	Platelets
41	Zheng, Q. N.	Prediction of the Rehabilitation Duration and Risk Management for Mild-Moderate COVID-19	Disaster Medicine and Public Health Preparedness
42	Liu, X.	Prediction of the severity of Corona Virus Disease 2019 and its adverse clinical outcomes	Japanese Journal of Infectious Diseases
43	Gidari, A.	Predictive value of National Early Warning Score 2 (NEWS2) for intensive care unit admission in patients with SARS-CoV-2 infection	Infectious Diseases
44	Vultaggio, A.	Prompt Predicting of Early Clinical Deterioration of Moderate-to-Severe COVID-19 Patients: Usefulness of a Combined Score Using IL-6 in a Preliminary Study	The Journal of Allergy and Clinical Immunology
45	Yang, P.	A retrospective study on the epidemiological characteristics and establishment of early warning system of severe COVID-19 patients	Journal of Medical Virology
46	Wang, B.	Risk factors analysis and nomogram construction of non-survivors in critical patients with COVID-19	Japanese Journal of Infectious Diseases
47	Chen, R. C.	Risk Factors of Fatal Outcome in Hospitalized Subjects with Coronavirus Disease 2019From a Nationwide Analysis in China	CHEST
48	Shang, Y.	Scoring systems for predicting mortality for severe patients with COVID-19	EClinicalMedicine
49	Li, Q.	A simple algorithm helps early identification of SARS-CoV-2 infection patients with severe progression tendency	INFECTION
50	Zeng, Z.	Simple nomogram based on initial laboratory data for predicting the probability of ICU transfer of COVID-19 patients: Multicenter retrospective study	Journal of Medical Virology
51	Gong, J.	A Tool to Early Predict Severe Corona Virus Disease 2019 (COVID-19): A Multicenter Study using the Risk Nomogram in Wuhan and Guangdong, China	Clinical Infectious Diseases
52	Shang, W. F.	The value of clinical parameters in predicting the severity of COVID-19	Journal of Medical Virology

http://dx.doi.org/10.21037/atm-20-6933

Appendix 2 Predictors information

No.	First author	Predictors
1	Yuan, M.L.	computed tomography (CT) score
2	Osborne, T. F.	CAN score
3	Francone, M.	computed tomography (CT) score
4	Cozzi, D.	chest X-ray performance
5	Borghesi, A.	Brixia score, patient age, and conditions that induced immunosuppression
6	Wang, K.	clinical: age, history of hypertension and coronary heart disease (CHD) laboratory: baseline age, peripheral capillary oxygen saturation (SpO_2), neutrophil count, lymphocyte count, hsCRP, D-dimer, AST and GFR
7	Hong, Y.	procalcitonin, heart rate, epidemiological history, lymphocyte count and cough
8	Yu, C.	age, male sex, history of diabetes, lymphopenia, and increased procalcitonin
9	Galloway, J. B.	respiratory rate, pulse oximetry saturations and oxygen requirement, higher neutrophil counts, higher CRP, lower albumin and renal impairment
10	Liu, Y. P.	underlying disease, age, NLR, RDW, PLT and CRP
11	Borghesi, A.	chest X-ray score
12	Liu, F. J.	artificial intelligence algorithms, representing the percentages of ground-glass opacity volume (PGV), semi-consolidation volume (PSV), and consolidation volume (PCV) in both lungs
13	Yao, Y.	D-dimer
14	Zhou, Y. W.	body temperature on admission, cough, dyspnea, hypertension, cardiovascular disease, chronic liver disease, and chronic kidney disease
15	Liang, W. H.	chest radiography abnormality, age, hemoptysis, dyspnea, unconsciousness, number of comorbidities, cancer history, neutrophil-to-lymphocyte ratio, lactate dehydrogenase, and direct bilirubin
16	Dong, Y. M.	hypertension, higher neutrophil-to-lymphocyte ratio and increased NT-proBNP
17	Zheng, Y.	underlying comorbidity, lymphocyte count and crazy-paving sign
18	Zhang, S.	older age, high lactate dehydrogenase level, evaluated neutrophil-to-lymphocyte ratio, and high direct bilirubin level
19	Xiao, L. S.	HNC-LL (Hypertension, Neutrophil count, C-reactive protein, Lymphocyte count, Lactate dehydrogenase) score
20	Wang, F.	neutrophils, lymphocytes, platelets, IL–2R
21	Zheng, Y. F.	neutrophil count, lymphocyte count and platelet count
22	Wu, S.	namely neutrophil count, lymphocyte count, procalcitonin, older age, and C-reactive protein
23	Luo, M.	IL-6 (>20 pg/mL) and CD8+ T cell counts (<165 cells/μL)
24	Huang, J. F.	model 1: male gender, age, hypertension, DM, CHD, CVD, COPD, cancer, sputum, T≥38.5℃, onset time model2: male gender, age, DM, CHD, sputum, T≥38.5℃, NLR, WBC
25	Liu, Q.	Lymr, BUN and DD at admission
26	Hu, K.	gender, age, concomitant coronary heart disease and hypertension, complicated with myocardial damage and thrombocytopenia
27	Zhang, P.	mNUTRIC score (consisted of five variables: age, APACHE II score at admission, SOFA score at admission, number of comorbidities and pre-ICU hospital length of stay (LOS))
28	Lorente-Ros, A.	cTnI, Charlson comorbidity index (CCI)
29	Myrstad, M.	the external validation of NEWS2/qSOFA/SIRS/CRB-65
30	Liu, J. Y.	NLR
31	Nguyen, Y.	age, overweight, polypnoea, fever, high C-reactive protein, troponin, and lymphopenia
32	Zhang, C.	age, WBC, NEU, GFR, and Myoglobin
33	Satici, C.	the external validation of CURB-65/PSI/ PSI, CRP
34	Pascual Gómez, N. F.	age, total WBC, glucose, creatinine
35	Luo, Y.	PAB, LYM, NEU, PCT, hsCRP, PT, LDH, CR, hs-cTnI
36	Bello-Chavolla, O. Y.	age > 65 years, diabetes mellitus, obesity, CKD, COPD, immunosuppression, and hypertension, SARS-CoV-2 severity
37	Ji, D.	comorbidity, Age, Lymphocyte, LDH
38	Zhao, Z.	ICU: LDH, procalcitonin, smoking history, ever smoker, SpO2, lymphocyte count death: heart failure, procalcitonin, LDH, COPD, SpO2, heart rate, age
39	Luo, Y.	IL-8, CD4 T cells, NK cells
40	Bi, X. J.	FAR, PLT
41	Zheng, Q. N.	white blood cell [WBC], partial pressure of carbon dioxide [PaCO2], serum potassium [K], total bilirubin [TBIL], and aspartate aminotransaminase [AST]
42	Liu, X.	IL-6 level, absolute lymphocyte count, age
43	Gidari, A.	the external validations of (NEWS2) National Early Warning Score 2
44	Vultaggio, A.	IL-6, C-reactive protein, SaO2/FiO2
45	Yang, P.	age, shortness of breath, lymphocyte count, PCT level, LDH level, APTT level, and CRP level
46	Wang, B.	Age, chest tightness, AST and BUN
47	Chen, R. C.	age, coronary heart disease, cerebrovascular disease, dyspnea, procalcitonin level, and aspartate aminotransferase level
48	Shang, Y.	old age, CHD, LYM%, PCT and DD
49	Li, Q.	age, lactate dehydrogenase (LDH), and CD4 count
50	Zeng, Z.	lymphocyte count, platelet count, AST level, LDH level and CRP level
51	Gong, J.	older age; higher lactate dehydrogenase (LDH), C-reactive protein (CRP), coefficient of variation of red blood cell distribution width (RDW), direct bilirubin (DBIL), and blood urea nitrogen (BUN); and lower albumin (ALB)
52	Shang, W. F.	NLR, CRP, and platelets

http://dx.doi.org/10.21037/atm-20-6933

Included studies references

1. Yuan M, Yin W, Tao Z, et al. Association of radiologic findings with mortality of patients infected with 2019 novel coronavirus in Wuhan, China. Plos One 2020;15.
2. Osborne TF, Veigulis ZP, Arreola DM, et al. Automated EHR score to predict COVID-19 outcomes at US Department of Veterans Affairs. Plos One 2020;15.
3. Francone M, Iafrate F, Masci GM, et al. Chest CT score in COVID-19 patients: correlation with disease severity and short-term prognosis. European Radiology 2020;30:6808-17.
4. Cozzi D, Albanesi M, Cavigli E, et al. Chest X-ray in new Coronavirus Disease 2019 (COVID-19) infection: findings and correlation with clinical outcome. Radiologia Medica 2020;125:730-7.
5. Borghesi A, Zigliani A, Golemi S, et al. Chest X-ray severity index as a predictor of in-hospital mortality in coronavirus disease 2019: A study of 302 patients from Italy. International Journal of Infectious Diseases 2020;96:291-3.
6. Wang K, Zuo P, Liu Y, et al. Clinical and Laboratory Predictors of In-hospital Mortality in Patients With Coronavirus Disease-2019: A Cohort Study in Wuhan, China. Clinical infectious diseases: an official publication of the Infectious Diseases Society of America 2020;71:2079-88.
7. Hong Y, Wu X, Qu J, et al. Clinical characteristics of Coronavirus Disease 2019 and development of a prediction model for prolonged hospital length of stay. Annals of Translational Medicine 2020;8.
8. Yu C, Lei Q, Li W, et al. Clinical Characteristics, Associated Factors, and Predicting COVID-19 Mortality Risk: A Retrospective Study in Wuhan, China. American Journal of Preventive Medicine 2020;59:168-75.
9. Galloway JB, Norton S, Barker RD, et al. A clinical risk score to identify patients with COVID-19 at high risk of critical care admission or death: An observational cohort study. Journal of Infection 2020;81:282-8.
10. Liu Y-P, Li G-M, He J, et al. Combined use of the neutrophil-to-lymphocyte ratio and CRP to predict 7-day disease severity in 84 hospitalized patients with COVID-19 pneumonia: a retrospective cohort study. Annals of Translational Medicine 2020;8.
11. Borghesi A, Maroldi R. COVID-19 outbreak in Italy: experimental chest X-ray scoring system for quantifying and monitoring disease progression. Radiologia Medica 2020;125:509-13.
12. Liu F, Zhang Q, Huang C, et al. CT quantification of pneumonia lesions in early days predicts progression to severe illness in a cohort of COVID-19 patients. Theranostics 2020;10:5613-22.
13. Yao Y, Cao J, Wang Q, et al. D-dimer as a biomarker for disease severity and mortality in COVID-19 patients: a case control study. Journal of Intensive Care 2020;8.
14. Zhou YW, He YQ, Yang H, et al. Development and validation a nomogram for predicting the risk of severe COVID-19: A multi-center study in Sichuan, China. Plos One 2020;15.
15. Liang W, Liang H, Ou L, et al. Development and Validation of a Clinical Risk Score to Predict the Occurrence of Critical Illness in Hospitalized Patients With COVID-19. Jama Internal Medicine 2020;180:1081-9.
16. Dong Y-M, Sun J, Li Y-X, et al. Development and Validation of a Nomogram for Assessing Survival in Patients with COVID-19 Pneumonia. Clinical infectious diseases: an official publication of the Infectious Diseases Society of America 2020.
17. Zheng YY, Xiao AL, Yu XR, et al. Development and Validation of a Prognostic Nomogram Based on Clinical and CT Features for Adverse Outcome Prediction in Patients with COVID-19. Korean Journal of Radiology 2020;21:1007-17.
18. Zhang S, Guo M, Duan L, et al. Development and validation of a risk factor-based system to predict short-term survival in adult hospitalized patients with COVID-19: a multicenter, retrospective, cohort study. Critical Care 2020;24.
19. Xiao L-s, Zhang W-F, Gong M-c, et al. Development and validation of the HNC-LL score for predicting the severity of coronavirus disease 2019. Ebiomedicine 2020;57.
20. Wang F, Hou H, Wang T, et al. Establishing a model for predicting the outcome of COVID-19 based on combination of laboratory tests. Travel Medicine and Infectious Disease 2020;36.
21. Zheng Y, Zhang Y, Chi H, et al. The hemocyte counts as a potential biomarker for predicting disease progression in COVID-19: a retrospective study. Clinical Chemistry and Laboratory Medicine 2020;58:1106-15.
22. Wu S, Du Z, Shen S, et al. Identification and validation of a novel clinical signature to predict the prognosis in confirmed COVID-19 patients. Clinical infectious diseases: an official publication of the Infectious Diseases Society of America 2020.
23. Luo M, Liu J, Jiang W, et al. IL-6 and CD8(+) T cell counts combined are an early predictor of in-hospital mortality of patients with COVID-19. Jci Insight 2020;5.
24. Huang J, Cheng A, Lin S, et al. Individualized prediction nomograms for disease progression in mild COVID-19. Journal of Medical Virology 2020;92:2074-80.
25. Liu Q, Song NC, Zheng ZK, et al. Laboratory findings and a combined multifactorial approach to predict death in critically ill patients with COVID-19: a retrospective study. Epidemiology and Infection 2020;148.
26. Hu K, Li B. Logistic regression analysis of death risk factors of patients with severe and critical coronavirus disease 2019 and their predictive value. Zhonghua wei zhong bing ji jiu yi xue 2020;32:544-7.
27. Zhang P, He Z, Yu G, et al. The modified NUTRIC score can be used for nutritional risk assessment as well as prognosis prediction in critically ill COVID-19 patients. Clinical nutrition (Edinburgh, Scotland) 2020.
28. Lorente-Ros A, Monteagudo Ruiz JM, Rincon LM, et al. Myocardial injury determination improves risk stratification and predicts mortality in COVID-19 patients. Cardiology journal 2020;27:489-96.

 http://dx.doi.org/10.21037/atm-20-6933

29. Myrstad M, Ihle-Hansen H, Tveita AA, et al. National Early Warning Score 2 (NEWS2) on admission predicts severe disease and in-hospital mortality from Covid-19-a prospective cohort study. Scandinavian Journal of Trauma Resuscitation & Emergency Medicine 2020;28.
30. Liu J, Liu Y, Xiang P, et al. Neutrophil-to-lymphocyte ratio predicts critical illness patients with 2019 coronavirus disease in the early stage. Journal of Translational Medicine 2020;18.
31. Nguyen Y, Corre F, Honsel V, et al. A nomogram to predict the risk of unfavourable outcome in COVID-19: a retrospective cohort of 279 hospitalized patients in Paris area. Annals of Medicine 2020;52:367-75.
32. Zhang C, Qin L, Li K, et al. A Novel Scoring System for Prediction of Disease Severity in COVID-19. Frontiers in Cellular and Infection Microbiology 2020;10.
33. Satici C, Demirkol MA, Altunok ES, et al. Performance of pneumonia severity index and CURB-65 in predicting 30-day mortality in patients with COVID-19. International Journal of Infectious Diseases 2020;98:84-9.
34. Pascual Gomez NF, Monge Lobo I, Granero Cremades I, et al. Potential biomarkers predictors of mortality in COVID-19 patients in the Emergency Department. Revista espanola de quimioterapia: publicacion oficial de la Sociedad Espanola de Quimioterapia 2020;33:267-73.
35. Luo Y, Xue Y, Mao L, et al. Prealbumin as a Predictor of Prognosis in Patients With Coronavirus Disease 2019. Frontiers in Medicine 2020;7.
36. Yaxmehen Bello-Chavolla O, Paola Bahena-Lopez J, Eduardo Antonio-Villa N, et al. Predicting Mortality Due to SARS-CoV-2: A Mechanistic Score Relating Obesity and Diabetes to COVID-19 Outcomes in Mexico. Journal of Clinical Endocrinology & Metabolism 2020;105:2752-61.
37. Ji D, Zhang D, Xu J, et al. Prediction for Progression Risk in Patients With COVID-19 Pneumonia: The CALL Score. Clinical Infectious Diseases 2020;71:1393-9.
38. Zhao Z, Chen A, Hou W, et al. Prediction model and risk scores of ICU admission and mortality in COVID-19. Plos One 2020;15.
39. Luo Y, Mao LY, Yuan X, et al. Prediction Model Based on the Combination of Cytokines and Lymphocyte Subsets for Prognosis of SARS-CoV-2 Infection. Journal of Clinical Immunology 2020;40:960-9.
40. Bi X, Su Z, Yan H, et al. Prediction of severe illness due to COVID-19 based on an analysis of initial Fibrinogen to Albumin Ratio and Platelet count. Platelets 2020;31:674-9.
41. Zheng Q-N, Xu M-Y, Zheng Y-L, et al. Prediction of the Rehabilitation Duration and Risk Management for Mild-Moderate COVID-19. Disaster medicine and public health preparedness 2020:1-6.
42. Liu X, Shi S, Xiao J, et al. Prediction of the Severity of the Coronavirus Disease and Its Adverse Clinical Outcomes. Jpn J Infect Dis 2020;73:404-10.
43. Gidari A, De Socio GV, Sabbatini S, et al. Predictive value of National Early Warning Score 2 (NEWS2) for intensive care unit admission in patients with SARS-CoV-2 infection. Infectious Diseases 2020;52:698-704.
44. Vultaggio A, Vivarelli E, Virgili G, et al. Prompt Predicting of Early Clinical Deterioration of Moderate-to-Severe COVID-19 Patients: Usefulness of a Combined Score Using IL-6 in a Preliminary Study. Journal of Allergy and Clinical Immunology-in Practice 2020;8:2575-+.
45. Yang P, Wang P, Song Y, et al. A retrospective study on the epidemiological characteristics and establishment of an early warning system of severe COVID-19 patients. Journal of Medical Virology 2020;92:2173-80.
46. Wang B, Zhong F, Zhang H, et al. Risk Factor Analysis and Nomogram Construction for Non-Survivors among Critical Patients with COVID-19. Jpn J Infect Dis 2020;73:452-8.
47. 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;158:97-105.
48. Shang Y, Liu T, Wei Y, et al. Scoring systems for predicting mortality for severe patients with COVID-19. EClinicalMedicine 2020;24:100426-.
49. Li Q, Zhang J, Ling Y, et al. A simple algorithm helps early identification of SARS-CoV-2 infection patients with severe progression tendency. Infection 2020;48:577-84.
50. Zeng Z, Ma Y, Zeng H, et al. Simple nomogram based on initial laboratory data for predicting the probability of ICU transfer of COVID-19 patients: Multicenter retrospective study. Journal of Medical Virology 2020.
51. Gong J, Ou J, Qiu X, et al. A Tool for Early Prediction of Severe Coronavirus Disease 2019 (COVID-19): A Multicenter Study Using the Risk Nomogram in Wuhan and Guangdong, China. Clin Infect Dis 2020;71:833-40.
52. Shang W, Dong J, Ren Y, et al. The value of clinical parameters in predicting the severity of COVID-19. J Med Virol 2020;92:2188-92.

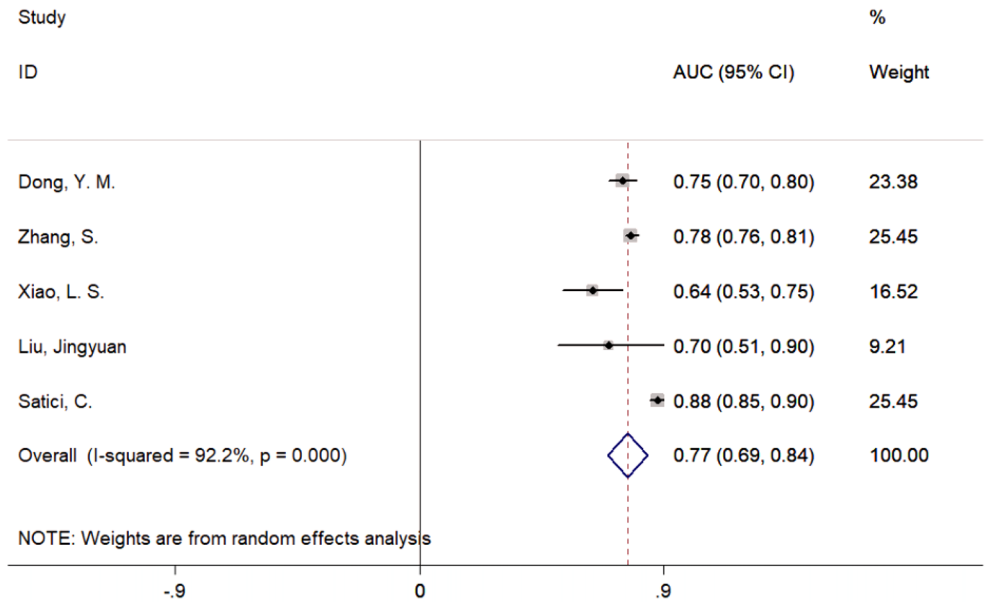
 http://dx.doi.org/10.21037/atm-20-6933

Appendix 3 Completeness of reporting TRIPOD items

Complete reporting ≥ 75%			Complete reporting ≤ 25%		
TRIPOD Items	content	Ratio	TRIPOD Items	content	Ratio
Item 3a	Explain the medical context (including whether diagnostic or prognostic) and rationale for developing or validating the multivariable prediction model, including references to existing models.	100% (D) 100% (V) 100% (D&V) 75% (IV)	Item 9	Describe how missing data were handled (e.g., complete-case analysis, single imputation, multiple imputation) with details of any imputation method.	5% (D) 14% (V) 8% (D&V) 0% (IV)
Item 3b	Specify the objectives, including whether the study describes the development or validation of the model or both.	100% (D) 100% (V) 100% (D&V) 75% (IV)	Item 10b	Specify type of model, all model-building procedures (including any predictor selection), and method for internal validation.	0% (D) 0% (D&V) 0% (IV)
Item 4a	Describe the study design or source of data (e.g., randomized trial, cohort, or registry data), separately for the development and validation data sets, if applicable.	97% (D) 100% (V) 92% (D&V) 100% (IV)	Item 13b	Describe the characteristics of the participants (basic demographics, clinical features, available predictors), including the number of participants with missing data for predictors and outcome.	5% (D) 0% (V) 0% (D&V) 0% (IV)
item 4b	Specify the key study dates, including start of accrual; end of accrual; and, if applicable, end of follow-up.	89% (D) 93% (V) 85% (D&V) 100% (IV)	Item 17	If done, report the results from any model updating (i.e., model specification, model performance, recalibration). If updating was not done, score this TRIPOD item as 'Not applicable'.	0% (V) 0% (D&V)
item 5a	Specify key elements of the study setting (e.g., primary care, secondary care, general population) including number and location of centers.	84% (D) 100% (V) 92% (D&V) 100% (IV)			
item 5b	Describe eligibility criteria for participants.	95% (D) 100% (V) 100% (D&V) 100% (IV)			
item 5c	Give details of treatments received, if relevant. (i.e. notably for prognostic studies with long term follow-up)	83% (D) 100% (V) 100% (D&V) 100% (IV)			
Item 6a	Clearly define the outcome that is predicted by the prediction model, including how and when assessed.	89% (D) 100% (V) 92% (D&V) 100% (IV)			
Item 10c	For validation, describe how the predictions were calculated.	100% (V) 100% (D&V) 100% (IV)			
Item 10e	Describe any model updating (e.g., recalibration) arising from the validation, if done.	100% (V) 100% (D&V) 100% (IV)			
Item 11	Provide details on how risk groups were created, if done. If risk groups were not created, score this item as Yes.	81% (D) 100% (V) 100% (D&V) 100% (IV)			
Item 14a	Specify the number of participants and outcome events in each analysis.	100% (D) 100% (D&V) 100% (IV)			
Item 14b	If done, report the unadjusted association between each candidate predictor and outcome.	100% (D) 92% (D&V) 100% (IV)			

(D), (V), (D&V), (IV) stands for the following types of prediction models, namely development, external validation of existing models, development & validation of the same model and incremental values.

http://dx.doi.org/10.21037/atm-20-6933



AUC is the abbreviation of the area under the receiver operator characteristic curve.

Appendix 4 The forest plot of CURB-65 discrimination

http://dx.doi.org/10.21037/atm-20-6933