

**Supplementary Table S2.** Overview of prediction models for mortality risk from Covid-19 identified in a systematic review of the literature, and performance of each model in derivation cohorts. Formulas to calculate mortality risk to be applied to any population were provided or extracted from original documents.

Author, Year <sup>reference</sup>	Country	Study period (2020)	N	Methods used to derivate nomograms	Predictors in final model	AUROC (95% confidence interval)	Cut-off value	Sensitivity (%)	Specificity (%)	Positive predictive value (%)	Negative predictive value (%)
Abdulaal A et al. 2020 <sup>18</sup>	United Kingdom	1 Mar – 24 Apr	398 (D: 318 V: 80)	Cox regression model	Age; Sex; Obesity; ischaemic heart disease; cardiac failure; chronic liver disease; chronic kidney disease; cerebrovascular event; cough; dyspnoea; abdominal pain; confusion; collapse.	0.869 (0.857 – 0.882)	50%	50	96.6	84.6	83.6
				ANN	Same variables + hypertension; diabetes, NOD; chronic respiratory disease; fever; diarrhoea or vomiting; myalgia and olfactory change.	0.926 (0.911 – 0.941)		64.7	96.8	84.6	91.4
				h(t) = h0(t) × exp(0.05 × age- + (−0.78 × sex) + 1.48 × obesity + (0.93 × ischaemic heart disease) + 0.91 × cardiac failure + (1.36 × chronic liver disease) + (1.03 × chronic kidney disease) + (0.78 × cerebrovascular event) + 1.01 × cough + 1.54 × dyspnoea + (−1.45 × abdominal pain) + 1.81 × confusion + (1.35 × collapse)							
Acar HC et al. 2021 <sup>56</sup>	Turkey	16 March – 18 June	709	Multivariate logistic regression	Age; Comorbidity; Dyspnoea; SpO <sub>2</sub> ; haematocrit; CRP; AST and ferritin	0.922 (0.89 - 0.96)	<17 points (Low Risk (<10%))	NA	NA	NA	NA
							>38 points (High Risk (>90%))				
Total Score: Age [55-64 (4) / 65-74 (8) / >75 (12)] + Comorbidity (3) + Dyspnoea (2) + SpO2 (%) [89-94 (3) / <88 (9)] + Haematocrit (%) [<35% (3)] + CRP (mg/L) [>50 - <100 (2) / ≥ 100 (6)] + AST (IU/L) [>40 - <80 (2) / ≥ 80 (7)] + Ferritin (ng/mL) [>400 - <1000 (2) / ≥ 1000 (5)]											
An C et al. 2020 <sup>19</sup>	Korea	23 Jan - 2 April	10237	LASSO	age >80; acarbose; age >70; metformin; cancer; age >60; nursing home infection; metropolitan; mental illness; cluster	0.963 (0.946 - 0.979)	ND	90.7	91.4	24.6	99.7
				Linear SVM	infection; urban; lung disease or asthma, fenofibrate; male; disability >moderate;	0.962 (0.945 - 0.979)		92.0	91.8	25.7	99.7
				RBF-SVM	symptomatic; ACE inhibitor; beta blocker;	0.958 (0.945 - 0.971)		42.7	97.8	37.6	98.2
				RF	age >40; seniors living alone; loop diuretics; cerebrovascular disease; income (50-75%); DDP-4 inhibitor; cardiovascular disease; sulfonylurea; chronic renal disease; hypertension; Income (medicaid);	0.958 (0.936 - 0.981)		32.0	98.8	44.4	97.9
				KNN	age <40; aspirin; DM; personal contact; statin; income (25-50%); chronic liver disease; calcium channel blocker; income (>75%); disability mild; NSAID; hyperlipidaemia and AR blocker.	0.897 (0.856 -0.937)		81.3	89.5	19.3	99.4
Bellan M et al. 2021 <sup>57</sup>	Italy	1 Mar – 28 April	664 V:bootstrap	Multivariate regression	Age (<74); Male gender; Platelets (<166000); NLR (>4.68) and RDW (>13.7%)	No global (individually stated)	ND	NA	NA	NA	NA



Author, Year <sup>reference</sup>	Country	Study period (2020)	N	Methods used to derivate nomograms	Predictors in final model	AUROC (95% confidence interval)	Cut-off value	Sensitivity (%)	Specificity (%)	Positive predictiv e value (%)	Negative predictive value (%)
Clift AK et al. 2020 <sup>23</sup>	United Kingdo m	24 Jan - 30 Apr	10776	LASSO	Ethnic group; nursing home or homeless; disability; chronic kidney disease; chemotherapy; blood cancer; bone marrow or stem cell transplant in past 6 months; respiratory tract cancer; radiotherapy in past 6 months; solid organ transplant (excluding kidney and bone marrow); immunosuppressant medication from GP 4+ scripts in past 6 months; leukotriene or long acting $\beta$ agonist 4+ scripts in past 6 months; oral steroids 4+ scripts in past 6 months; sickle cell disease or severe immunodeficiency; diabetes; COPD; asthma; rare lung conditions; pulmonary hypertension or pulmonary fibrosis; coronary heart disease; stroke; atrial fibrillation; congestive cardiac failure; thromboembolism; peripheral vascular disease; congenital heart disease; dementia; Parkinson's disease; epilepsy; motor neurone disease, multiple sclerosis, myasthenia gravis, or Huntington's; cerebral palsy; severe mental illness; osteoporotic fracture; rheumatoid arthritis or SLE; cirrhosis of liver	C- Statistic  Men: 0.928 (0.919 - 0.938)  Women: 0.933 (0.923 - 0.944)	NA	NA	NA	NA	NA
Ding Z et al. 2021 <sup>54</sup>	China	18 Jan- 25 Apr	2073	Cox regression	Age; severe pneumonia; lymphocyte count; platelets; CRP; D-dimer; creatinine; cTnl; AST and D-bilirubine.	0.887 (0.844 - 0.929) C- Statistic	NA	NA	NA	NA	NA

Author, Year <sup>reference</sup>	Country	Study period (2020)	N	Methods used to derivate nomograms	Predictors in final model	AUROC (95% confidence interval)	Cut-off value	Sensitivity (%)	Specificity (%)	Positive predictive value (%)	Negative predictive value (%)
Dong YM et al 2021 <sup>61</sup>	China	Jan - Mar	<b>628</b> D: 390 V:238	Cox regression and LASSO	Hypertension; NLR; NT- proBNP	D: 0.922 (14day) / 0.919 (21day) V: 0.922 (14day) / 0.881 (21 day)	NA	NA	NA	NA	NA
Ebell MH et al 2021 <sup>62</sup>	USA	1 Mar – 12 Jun	<b>1442</b> NoLab: 1342 (60% D / 40%V) SimpleLab: 741 (60% D / 40%V)	Multivariate logistic regression	NoLab: Age; Respiratory Rate and O <sub>2</sub> saturation	D: 0.771 V: 0.803	Low (0 – 1 points)	2.5	76.1	1.8	81.5
							Moderate (2 – 5)				
							High (≥ 6 points)	36.4	92.4	45.8	89.2
					SimpleLab: Age; Respiratory Rate and O <sub>2</sub> saturation; CRP; Asthma; WBC and serum creatinine	D: 0.835 V: 0.833	Low (0 – 7 points)	-	-	-	-
							Moderate (8 – 11)				
							High (≥ 12 points)	85.3	66.3	31.4	96.2
Total NoLab Score: Age [50 to 65 years (3 points) > 65 years (5 points)] + Respiratory Rate [≥ 30 breaths/min (3 points)] + O <sub>2</sub> saturation [>93% (2 points)]											
Total SimpleLab Score: [50 to 65 years (6 points) > 65 years (8 points)] + Respiratory Rate [≥ 30 breaths/min (5 points)] + O <sub>2</sub> saturation [>93% (4 points)] + CRP [>10 mg/dL (5 points)] + Asthma [Yes (4 points)] + WBC [>10 x 10 <sup>9</sup> /mL (3 points)] + serum creatinine [>2 mg/dL (4 points)]											
Foieni F et al. 2020 <sup>17</sup>	Italy	15 Mar - 30 Apr	<b>119</b> (D: 79 V: 40)	Multiple linear regression	Age; fever +5 days; hypertension; Patter US “Wet”; P/F ratio; Lactates; WBC and CRP	0,90 (0,801 - 0,982)	Group 1: 0.3087–0.9391; Group 2: 0.9392–1.5696; Group 3: 1.5697–2.2000; Group 4: 2.2001–2.8304	NA	NA	NA	NA
							Total Score: -0,998 + (Age*0,014) + (Fever*0,213) + (Hypertension*0,194) + (US*0,731) + (P/F*0,002) + (Lactate*0,041) + (WBC*-0,022) + (CPR*0,019) https://health-key.it/				
Gao Y et al. 2020 <sup>24</sup>	China	27 Jan – 21 Mar	<b>2160</b>	MRPMC		0.9621 (0.946 – 0.978)		57.3	98.3	85	93.2
				SVM	Respiratory rate; BUN; D- dimer; age; platelets; SpO <sub>2</sub> ; lymphocytes; albumin; sex;	0.9594 (0.942 – 0.976)		60.7	97.8	81.8	93.7
				GBDT	fever; number	0.9454 (0.925 – 0.966)	60% (0.6)	60.7	96.6	75	93.6
				Logistic Regression	comorbidities; sputum; chronic kidney disease and consciousness	0.9614 (0.946 – 0.977)		56.2	98.1	83.3	93.1
				KNN		0.9615 (0.946 – 0.977)		51.7	98.9	88.5	92.5

Author, Year <sup>reference</sup>	Country	Study period (2020)	N	Methods used to derivate nomograms	Predictors in final model	AUROC (95% confidence interval)	Cut-off value	Sensitivity (%)	Specificity (%)	Positive predictive value (%)	Negative predictive value (%)
Guan X et al. 2021 <sup>63</sup>	China	27 Jan - 5 Apr	1270 D: 984 V:286	Cox regression, LASSO and XGBoost	Disease severity; Age; hsCRP; LDH; ferritin and LDH	D: 0.921 V: 0.891	NA	NA	NA	NA	NA
Harmouch F et al. 2020 <sup>64</sup>	USA	1 Mar – 15 Apr	560	Multivariate logistic regression	Age and Troponin (≥0.05ng/ml)	0.793 (0.733 – 0.853)	NA	NA	NA	NA	NA
He J et al. 2021 <sup>65</sup>	China	4 Feb – 31 Mar	3611 D: 2119 V: 1412	Multivariate logistic regression	Nomo1: Age; Dyspnea; Anorexia; WBC; NLR; PLT; AST; Albumin and CRP	D: 0.920 (0.882 – 0.957) V: 0.92 (0.86 – 0.98)	NA	86.7	88.7	NA	NA
					Nomo2: Age; Dyspnea; NLR and CRP	D: 0.896 (0.855 – 0.936) V: 0.89 (0.83 – 0.96)		76.7	89.8	NA	NA
Hu C et al. 2020 <sup>48</sup>	China	28 Jan - 11 Mar	284 (D: 184 V: 64)	Random Forest		0.922		91.4	76	NA	NA
				Bagged FDA		0.899		88.1	73	NA	NA
				Logistic Regression	Age; lymphocytes; D-dimer and CRP	0.895	50%	89.2	68.7	NA	NA
				PLS		0.885		91.2	66.3	NA	NA
				Elastic net		0.884		91.2	64.7	NA	NA
				Total Score: -4,211 + 0,013xCRP + 0,059xAge + 0,112xDD - 1,984xLym <a href="https://phenomics.fudan.edu.cn/risk_scores/">https://phenomics.fudan.edu.cn/risk_scores/</a>							
Ji D et al. 2020 <sup>12</sup>	China	20 Jan - 22 Feb	208	Cox regression	Comorbidity; age; lymphocyte and LDH	0.91 (0.86 – 0.94)	6 points 9 points	95 45	78 97	50.7 78.3	98.5 11.9
						Total Score: (Comorbidity x4) + (Age> 60 x3) + (Lymphocytes ≤ 1 x 10 <sup>9</sup> x3) + (LDH >500 x3 ó LDH 250 - 500 x2)					
Jian M et al. 2021 <sup>66</sup>	China	D: 1 Jan – 10 Apr V: 13 Jan – 25 Mar	1905 D: 1717 V: 188	Cox regression	Age; Gender; COPD; AST; hsCRP; hsTNI; WBC; Lymphocyte count; D-dimer and Procalcitonin	D: C-Statistic 0.888 (0.869 – 0.907) V: C-Statistic 0.838 (0.777– 0.899)	Low Risk (<2%) Moderate Risk (2 -9%) High Risk (>9%)	NA	NA	NA	NA
						Total Score: Age [10y (0 points) / 20y (11 points) / 30y (22 points) / 40y (33 points) / 50y (44 points) / 60y (56 points) / 70y (67 points) / 80y (78 points) / 90y (89 points) / 100y (100 points)] + Gender [Female (0 points) Male (20 points)] + COPD [No (0 points Yes (23 points)] + AST [≤ 40 U/L (0 points) >40 U/L (22 points)] + hsCRP [≤ 10 mg/L (0) >10 mg/L (50 POINTS)] + hsTNI [≤15.6 (0 points) >15.6 (52 points)] + WBC [4-10 10 <sup>9</sup> /L (0 points) <4 10 <sup>9</sup> /L (7 points) ≥ 10 10 <sup>9</sup> /L (40 points)] + Lymphocyte count [≥ 1 10 <sup>9</sup> /L (0 points) ≥0.8 to <1 10 <sup>9</sup> /L (1 point) ≥ 0.5 to <0.8 10 <sup>9</sup> /L (12 points) <0.5 10 <sup>9</sup> /L (43 points)] + D-dimer [≤ 0.5 µg/L (0 points) ≥0.5 to <1 µg/L (7 points) ≥ 1 µg/L (37 points)] + Procalcitonin [<0.05 ng/mL(0 points) ≥0.05 to <0.5 ng/mL (37 points) ≥0.5 to <2 ng/mL (54 points) ≥ 2 ng/mL (69 points)]					

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Kamran SM et al. 2020 <sup>25</sup>	Pakistan	10 Apr-31 Aug	252	Cox regression	Respiratory rate; resting oxygen saturation and alveolar-arterial oxygen gradient	0.850 (0.80 - 0.89)	9 points	80	84	55	95
Kim DH et al. 2021 <sup>68</sup>	Korea	Up to 30 Apr	5621	Cox regression	Sex; BMI; CCIS; Dyspnea; Hemoglobin; Lymphocyte and Platelet	C- Statistic 0.933	NA	NA	NA	NA	NA
Ke Z et al. 2022 <sup>67</sup>	China	Jan - Mar	96 D: 66 V: 30	Cox regression and LASSO	Age; Temperature; Oxygen saturation; initial oxygen mode; Lymphocyte count and Radscore	C- Statistic D: 0.912 (0.867– 0.907) V: 0.907 (0.849– 0.966)	NA	NA	NA	NA	NA
Knight SR et al. 2020 <sup>15</sup>	United Kingdom	6 Feb - 20 May	57824 (D: 35463 V: 22361)	Machine learning	Age; sex; number comorbidities; respiratory rate; peripheral oxygen saturation; Glasgow scale; urea level and CPR	0.786 (0.781 – 0.790)	> 9 points	92.5	38.6	39.3	92.3
						> 15 points	38	89.8	61.5	77.1	
						Total Score: Age (<50; 50 - 59; +2; 60 - 69; +4; 70- 79; +6; >=80; +7) + Sex (Female; Male +1) + N° comorbidities (0; 1; +1; >=2; +2) + Respiratory Rate (breaths/min) (<20; 20 - 29; +1 ; >=30; +2) + peripheral oxygen saturation (>=92; <92; +2) + Glasglow scale (15; <15; +2) + Urea level (mmol/L) (<7; 7- 14; +1; >14; +3) + RCP (mg/L) (<50; 50 - 99; +1; >=100; +2) <a href="https://isaric4c.net/risk/v2/">https://isaric4c.net/risk/v2/</a>					
Li J et al. 2021 <sup>69</sup>	China	8 Jan – 17 Mar	326	Multivariate logistic regression	Age; CVD; WBC; Platelet; AST; Cystatin C, CRP; CKMB and D-dimer	C- Statistic 0.903	NA	NA	NA	NA	NA
Li L et al. 2021 <sup>70</sup>	China	D: 13 Feb – 5 Mar V: 5 Mar – 10 Apr	4086 (D: 1780 IV: 1242 EV: 1064)*	Cox regression	Age; Severity at admission; Dyspnoea; Cardiovascular disease; Total bilirubin; Blood glucose; Urea and LDH	C- Statistic D: 0.97 (0.95 – 0.98) IV: 0.96 (0.94 – 0.98) EV: 0.92 (0.86 – 0.98)	NA	NA	NA	NA	NA
Liang W et al. 2020 <sup>26</sup>	China	21 Nov -31 Jan	1590	Logistic regression and LASSO	Chest radiographic abnormality; age; haemoptysis; dyspnoea; unconsciousness, number comorbidities; cancer history; NLR; LDH and direct bilirubin.	0.88 (0.85 - 0.91)	NA	NA	NA	NA	NA

Author, Year <sup>reference</sup>	Country	Study period (2020)	N	Methods used to derivate nomograms	Predictors in final model	AUROC (95% confidence interval)	Cut-off value	Sensitivity (%)	Specificity (%)	Positive predictive value (%)	Negative predictive value (%)
Liu J et al. 2020 <sup>27</sup>	China	30 Jan - 20 Feb	214	Cox regression	Age; lymphocytes; LDH and procalcitonin	0.78 (0.73 - 0.83)	NA	NA	NA	NA	NA
Liu Q et al. 2021 <sup>51</sup>	China	10 Jan – 27 Feb	416 (D: 337 V: 79)	Logistic regression and LASSO	Age; gender and BUN; creatinine ratio	0.838 (0.795 – 0.880) (C- Statistic)	59.8 points	74.5	81	NA	NA
Lorente L et al. 2020 <sup>28</sup>	Spain	-	143	-	RDW	0.71 (0.63 – 0.78)	13%	88	45	25	95
Ma X et al. 2020 <sup>29</sup>	China	22 Jan - 20 Feb	523	Random forest	Pulse oxygen saturation <90%; age; creatinine; creatine kinase; D-dimer; neutrophil percentage; LDH; Leucocyte count; albumin; time form illness onset to hospital admission; glutamic-oxalacetic transaminase; neutrophil count; lymphocyte percentage; respiratory rate >24 breaths per min; prothrombin time; BUN; platelet; direct bilirubin; CRP; incubation period; eosinophil percentage; temperature; chronic respiratory disease; COPD; chest tightness; diabetes; coronary heart disease; chest CT; cardiovascular disease; hypertension; dyspnoea; cluster and Expectoration	0.9852 (0.961 – 1)	0.441	85	98.7	NA	NA
Ma X et al. 2020 <sup>30</sup>	China	15 Jan - 15 Mar	292	Multivariate logistic regression	LDH; CRP and Age	0.952	NA	NA	NA	NA	NA
Total Score: $-10.5772 + 0.0076 \text{ LDH} + 0.00175 \text{ CRP} + 0.0857 \text{ Age}$											
Ma X et al. 2020 <sup>31</sup>	China	12 Jan - 20 Mar	262	Logistic regression	Age; chronic heart disease; lymphocytes; platelets; CRP; LDH and D-Dimer	0.948 (0.923 – 0.973)	NA	NA	NA	NA	NA

Author, Year <sup>reference</sup>	Country	Study period (2020)	N	Methods used to derivate nomograms	Predictors in final model	AUROC (95% confidence interval)	Cut-off value	Sensitivity (%)	Specificity (%)	Positive predictive value (%)	Negative predictive value (%)
Magro B et al. 2021 <sup>52</sup>	Italy	22 Feb - 7 Apr	<b>2191</b> (D: 1810 V: 381)	Cox regression	Age; gender; LDH; ischemic heart disease; liver disease; diabetes and days elapsed from first symptoms before hospitalization	0.822 (0.722 – 0.922)	NA	NA	NA	NA	NA
	<a href="https://sites.google.com/community.unipa.it/covid-19riskpredictions/c19-rp">https://sites.google.com/community.unipa.it/covid-19riskpredictions/c19-rp</a>										
Moon HJ et al. 2021 <sup>71</sup>	South Korea	1 Feb – 30 Apr	<b>5626</b>	Cox regression and Multivariate logistic regression	Age; Gender; Fever; Dyspnoea; DM; Cancer and Dementia	Overall mortality 0.959 (0.945 – 0.933)	NA	NA	NA	NA	NA
	Multivariate logistic regression total score: -7.05 + 2.81*Age (years) + 1.08*Male gender + 0.27*Fever + 2.14*Dyspnoea + 1.17*DM + 1.38*Cancer +2.12*Dementia Cox regression total score: 2.58*Age (years) + 0.84*Male gender + 0.67*Fever + 1.58*Dyspnoea + 0.69*DM + 0.82*Cancer +1.49*Dementia										
Niu Y et al. 2021 <sup>53</sup>	China	23 Jan - 5 Mar	<b>662</b> (D: 150 V: 512)	Multivariate logistic regression	Diabetes; LDH and SOFA Score	0.970 (0.947 – 0.992)	-	90.3	90.8	NA	NA
	Total Score: -5.594 +(1.124 x SOFA) + (2.578 x LDH ([LDH≤245] = 0, [LDH>245] = 1) + (2.349 x Diabetes (without diabetes = 0, with diabetes = 1))										
Ottenhoff MC et al. 2021 <sup>72</sup>	Dutch	27 Feb – 8 Jun	<b>2273</b>	Multivariate logistic regression	Age; Number of medication; Chronic cardiac disease (not hypertension); Blood ph; Blood albumin; Urea nitrogen; LDH; Oxygen saturation and oxygen saturation measure on room air or	0.81 (0.77 – 0.85)	NA	77	71	41	93
				XGBoost	oxygen therapy	0.82 (0.79 – 0.85)	NA	67	75	44	91
Pan D et al. 2020 <sup>32</sup>	China	9 Feb – 10 Mar	<b>204</b> (D: 120 V: 84)	Multivariate logistic regression	CRP; PaO <sub>2</sub> /FIO <sub>2</sub> and troponin I	0.988 (0.972 – 1.000)	NA	NA	NA	NA	NA
Pan P et al. 2020 <sup>33</sup>	China	2 Feb – 15 Apr	<b>123</b> (D: 98 V: 25)	Log regression	LDH; prothrombin time; creatinine; lymphocytes; neutrophils; eosinophils; total bilirubin and albumin	0.84 (0.656 - 1)	0.3962	73.3	80	84.6	66.7
				AdaBoost		0.911 (0.802 – 1)	0.4283	66.7	90	90.9	64.3
				GBDT		0.85 (0.699 – 1)	0.4583	73.3	80	84.6	66.7
				XGBoost model		0.92 (0.814 – 1)	0.4478	80%	90	92.3	75
				CatBoost		0.9133 (0.799 – 1)	0.5063	86.7	80	86.7	80
Park JG et al. 2020 <sup>34</sup>	Korea	19 Jan - 2 Mar	<b>289</b>	Cox regression	Age; AST; ALT and platelets	0.702 (0.627 – 0.778)	≥4.95	48.5	87.6	55%	84.4
						Total Score: age × AST/ (platelet count × √ALT)					



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Pfeifer N et al. 2022 <sup>73</sup>	Germany	1 Mar – 31 Mar	164	Multivariate logistic regression	Age; Cognitive deterioration; O2 saturation; Lymphocytopenia; renal function deterioration; CRP; Monocyte count and Comorbidity	0.937	NA	NA	NA	NA	NA
Rahman T et al. 2021 <sup>74</sup>	China	10 Jan - 18 Feb	375 D: 70% V: 30%	Multivariate logistic regression	Age; Neutrophils count; Platelet count; Monocytes; WBC; Lymphocyte count and RDW	0.961	<10.8 (Low Risk (<5%) 10.8 – 10.96 (Moderate Risk (5 -50%) > 10.96 (High Risk (>50%)	87	90	NA	NA
Total Score: -12.75911 + [0.5784669 x Neutrophils count (10 <sup>3</sup> /μL)] + (0.0724752 x Age) – [0.009611 x Platelet count (10 <sup>3</sup> /μL)] + [0.0931182 x Monocytes (%)] + [0.0064276 x WBC (10 <sup>3</sup> /μL)] – [3.567051 x Lymphocyte count (10 <sup>3</sup> /μL)] + [0.7140086 x RDW (%)]											
Rahman T et al. 2021 <sup>75</sup>	USA and China	D: 24 Mar – 30 Apr V: 10 Jan – 18 Feb	759 D: 384 V: 375	Multivariate logistic regression	Age; Lymphocyte count; D-dimer; CRP and creatinine	D: 0.940 V: 0.987	<16.6 (Low Risk (<5%) 16.7 – 19.8 (Moderate Risk (5 -50%) > 19.8 (High Risk (>50%)	91	78	NA	NA
Total Score: -0.7606855 + (1.904726 * Age) – (1.964625* Lymphocyte count) – (1.508334 * D-dimer) + (0.709297 * CRP) + (0.2467726 * Creatinine)											
Salto-Alejandre S et al. 2020 <sup>35</sup>	Spain	21 Feb – 8 Apr	244	Multivariate logistic regression	Peripheral capillary oxygen saturation; neutrophils; platelets; LDH and CRP	0.891 (0.847 – 0.936)	50%	62.5	90.1	68.6	87.4
Total Score: = –4.655 + 3.075 (SpO2 <95%) + 1.324 (neutrophil count >7.5 × 10 <sup>9</sup> per L) + 1.492 (platelet count <130 × 10 <sup>9</sup> per L) + 0.981 (LDH ≥300 UI/L) + 0.916 (CRP ≥100 mg/L)											
Sánchez-Montañes M et al. 2020 <sup>76</sup>	Spain	5 Feb – 23 Apr	1696	Logistic Regression Decision Tree RF Tree Naive Bayes	Age; Gender; O2 Saturation; Residential Institution and Oncological Patient Deterioration	0.89 0.81 0.90 0.87	80 NA	73 77 79	83 83 79	46 45 44 41	96 94 97 95
Santos-Lozano A et al. 2020 <sup>36</sup>	Spain	28 Feb – 30 Mar	1369	artificial neural network	Age; glomerular filtration rate; haemoglobin; albumin and LDH	0.91 (0.71–0.96)	NA	61	95	NA	NA
Soto-Mota A et al. 2020 <sup>16</sup>	Mexico	30 Apr- 20 May	400	Multivariate logistic regression	Lymphocytes; Sat O2; white blood cells; hypertension; age; renal injury and myocardial injury	0,96 (0,94 - 0,98)	>65	63	97.5	96	72.5
Total Score: (X /(1+X) *100): Age (<40 (0,002) / 40 - 49 (0,004) / 50 - 59 (0,013) / 60 - 69 (0,037) / 70 - 79 (0,087) / >=80 (0,174) * HTA (x 2,06) * SO2<88% (x 6,85) * Mio Injury (x 6) * WBC >10000 (x 4,23) *Lymphocytes <800 (x 2,89) * Renal Injury (x 4,23) <a href="https://lowharmcalc.com/">https://lowharmcalc.com/</a>											

Author, Year <sup>reference</sup>	Country	Study period (2020)	N	Methods used to derivate nomograms	Predictors in final model	AUROC (95% confidence interval)	Cut-off value	Sensitivity (%)	Specificity (%)	Positive predictive value (%)	Negative predictive value (%)
Torres- Macho J et al. 2020 <sup>50</sup>	Spain	2 Mar - 31 May	<b>1968</b> (D: 1181 V: 393)	WoE Method		0.865					
				Gradient Boosting		0.975					
				Random Forest	Age; O <sub>2</sub> saturation; creatinine;	1	NA	NA	NA	NA	
				SVM Linear Kernel	lymphocytes; haemoglobin; smoking;	0.869					
				Neural Network	CRP; platelets and sodium	0.929					
				SVM Quadratic Kernel		0.921					
				Total Score: Age [<46 (-46 ) / 46-60 (4) / 61 – 78 (29) >78 (50) missing (28)] + O <sub>2</sub> Saturation [<88 (59) / 88–92 (36) / 93-96 (21) / ≥97 (-2) / missing (30)] + Creatinine [<0.77 (14) / 0.77-1.08 (21) / >1.71 (48) / missing (29)] + Lymphocytes [<500 (55) / 500-799 (37) / 800-100 (22) / missing (19)] + Hemoglobin [<11.2 (51) / 11.2-12.2 (36) / >12.2 (25) / missing (20)] + smoking [No (25) / Yes (43) / missing (22)] + CRP [<9.7 (8) / 9.7-65.9 (20) / 66-188.5 (35) / >188.5 (45) / missing (18)] + Platelets [<124 (48) / >124 (27) / missing (18)] + Sodium [<144 (28) / >144 ( 53) / missing (17)] <a href="http://www.pandemyc-score.co/m">www.pandemyc-score.co / m</a>							
Turcotte JJ et al. 2020 <sup>40</sup>	USA	1 Mar – 12 Apr	<b>117</b>	logistic regression and Cox regression	Temperature at admission; supplemental O2 at admission; sputum production; insulin dependent diabetes and chronic kidney disease.	0.88 (0.812 – 0.956)	26.3*	83.7*	79.4*	NA	NA
				Total Score: 22.316 – 0.242 temp + 0.189 O2L + 1.907 sputum + 2.471 IDDM + 1.567 CKD							
Vaid A et al. 2020 <sup>38</sup>	USA	15 Mar – 22 May	<b>4098</b> (D: 1514 V: 2584)	XGBoost	Age; anion gap; CRP; LDH; oxygen saturation;	0.853 (0.85 – 0.856)		50	94.4	NA	NA
				Log Regression	BUN; ferritin; RDW; diastolic blood pressure and lactate (mortality at 7 days)	0.821 (0.818 – 0.824)	NA	46.3	92	NA	NA
				LASSO		0.821 (0.818 – 0.823)		46.2	92	NA	NA
Varol Y et al. 2020 <sup>39</sup>	Turkey	11 Mar - 15 May	<b>383</b>	Logistic regression	Charlson comorbidity index; lymphocyte ratio; age and dyspnoea	0.802 (0.777 - 0.886)	2.5 poi nts	82	73	NA	NA
				Total Score: Lymphocytes % [≥17.6 (0) / <17.6 (1)] + Age [<50 (0) / 50-65 (1) / ≥65 (2)] + CCI score [<3 (0) / ≥3 (1)] + Dyspnoea [Without (0) / With (1)]							
Wang B et al. 2020 <sup>40</sup>	China	Befo re 20 Mar	<b>104</b>	Logistic regression	Age; chest tightness (oppression); AST and BUN	0.893 (0.807 - 0.980)	NA	96	74.1	NA	NA

Author, Year <sup>reference</sup>	Country	Study period (2020)	N	Methods used to derivate nomograms	Predictors in final model	AUROC (95% confidence interval)	Cut-off value	Sensitivity (%)	Specificity (%)	Positive predictive value (%)	Negative predictive value (%)
Wang H et al. 2021 <sup>77</sup>	China	1 Mar – 16 Apr	4711 D: 75% V:25%	Multivariate models	Age; SpO2; MAP and Temperature	D: 0.798 (0.779 – 0.816) V: 0.783 (0.751 – 0.815)	NA	80.4	65.6	NA	NA
						80		61.6	NA	NA	
						Total Score: 0.742 + (0.006 x Age) + (-0.007 x SpO2) + (0.012 x Temperature) + (-0.008 x MAP) https://wanghai.shinyapps.io/dynnomapp/					
Wang J et al. 2020 <sup>14</sup>	China	28 Jan - 4 Mar	278 (D: 234 V: 44)	Multivariate logistic regression	Age; ferritin and D-dimer	0.871	≥85	86.4	81.8	39.6	91.7
Wang K et al. 2020 <sup>78</sup>	China	D: 7 Jan – 11 Feb V: 1 Feb – 20 Feb	340 D: 296 V: 44	Multivariate logistic regression and XGBoost / AIC	Clinical model: Age; Hypertension and Coronary heart disease Laboratory model: Age; SpO2; Neutrophils count; Lymphocyte count; hsCRP; D-dimer; AST and GFR	0.88 (0.80 – 0.95)  0.83 (0.68 – 0.93)	NA	92.3	77.4	21.4	99.3
								64.3	93.3	81.8	84.8
Wang R et al. 2020 <sup>41</sup>	China	Jan - Feb	450	Multivariate logistic regression	WBC; prognostic nutritional index [serum albumin (g/L) + 5 ×lymphocyte count (10 <sup>9</sup> /L)] and LDH	0.950 (0.922 - 0.978)	NA	84.1	92.2	NA	NA
Weng Z et al. 2020 <sup>11</sup>	China	1 Jan – 15 Feb	301 (D: 176 V: 125)	LASSO	Age; NLR and CRP	0.921 (0.835 – 0.968)	< 59 > 101	95.2 52.4	70.3 96.8	30.3 69.8	99.1 93.8
						Total Score: (1.14 × age – 20) + (1.63 × NLR) + (5.00 × D – dimer) + (0.14 × CRP)					
Wu G et al. 202 <sup>13</sup>	China	16 Feb – 20 Mar	110	LASSO	Urea; WBC; prothrombin activity; IL-2R; indirect bilirubin; myoglobin and fibrinogen degradation products	0.997 (0.99 - 1.00)	NA	98	91	NA	NA
Xiao F et al. 2021 <sup>79</sup>	China	Jan – Feb	74	Cox regression and LASSO	Age; Malignancy; Highest temperature; Radiomics lesion and Radiomics lung	C- Statistic 0.899 (0.850 – 0.950)	NA	NA	NA	NA	NA
Xiao LS et al. 2020 <sup>42</sup>	China	1 Jan – 18 Mar	442 (D: 231 V: 211)	Multivariate logistic regression	Hypertension; Neutrophils; CRP; lymphocytes and LDH	0.861 (0.800 – 0.922)	≥=-1.508	85	76	NA	NA

Author, Year <sup>reference</sup>	Country	Study period (2020)	N	Methods used to derivate nomograms	Predictors in final model	AUROC (95% confidence interval)	Cut-off value	Sensitivity (%)	Specificity (%)	Positive predictive value (%)	Negative predictive value (%)
Yadaw AS et al. 2020 <sup>43</sup>	USA	9 Mar - 6 Apr	<b>3841</b> ( <b>D</b> : 2880 <b>V</b> : 961)	Logistic regression; RF; SVM; XGBoost	Age; sex; ethnicity; encounter type; temperature; systolic blood pressure; diastolic blood pressure; oxygen saturation; lowest oxygen saturation; smoking; asthma; COPD; hypertension; obesity; diabetes; HIV and cancer	0.91 (0.88 - 0.94)	NA	NA	NA	NA	NA
Yan L et al. 2020 <sup>44</sup>	China	10 Jan - 18 Feb	<b>485</b> ( <b>D</b> : 375 <b>V</b> : 110)	XGBoost	LDH; lymphocytes and CRP	0.978	NA	NA	NA	NA	NA
Yu J et al. 2021 <sup>80</sup>	China	24 Jan – 26 Apr	<b>314</b>	Cox regression	Age; admission classification; WBC; Neu%, Ferritin; CEA; and D-Dimer	C-Statistic 0.84 (0.79 – 0.88)	NA	NA	NA	NA	NA
Zhang B et al. 2020 <sup>40</sup>	China	3 Jan – 20 Mar	<b>233</b>	LASSO	Age; LDH; AST; prothrombin time; serum creatinine; sodium; fasting blood glucose and D-dimer	0.943 (0.927 – 0.957)	0.190	96.8%	82.4%	58%	99%
Zhang S et al. 2020 <sup>45</sup>	China	12 Jan - 9 Feb	<b>828</b>	Cox regression	Age; LDH; NLR and direct bilirubin	C-Statistic 0.886 (0.873–0.899)	NA	NA	NA	NA	NA
Total Score: [(Age-20) x1.25] + [NLR>8 (26.6) / NLR≤8 (0)] + [Direct bilirubin>5 (16.06) / Direct bilirubin≤5 (0)] + [LDH>360 (67.63) / LDH≤360 (0)]											
Zhao Z et al. 2020 <sup>46</sup>	USA	9 Mar – 20 Apr	<b>641</b> ( <b>D</b> : 454 <b>V</b> : 187)	Logistic regression	Age; heart failure; procalcitonin; LDH; COPD; SpO <sub>2</sub> and heart rate	0.87 (0.83-0.92)	NA	7.1%	100%	NA	NA
Total Score: Heart Failure (1) + Procalcitonin >0.34 ng/mL (1) + LDH>460 U/L (1) + COPD (1) + SpO <sub>2</sub> <92% (1) + Heart rate>117 bpm (1) + Age>63 years (1)											
Zhou J et al. 2020 <sup>2</sup>	China	12 Jan - 26 Feb	<b>118</b>	Multivariate logistic regression	LDH; BUN; D-dimer; albumin and NLR	0.955	0.6005	88.9%	98.4%	NA	NA
Zinellu A et al. 2020 <sup>47</sup>	Italy	15 Mar - 15 May	<b>115</b>	Cox regression	AST and ALT	0.701 (0.603-0.787)	<1.49	74%	70%	NA	NA
Total score: AST / ALT											

**N:** Participants for model development (**D**) or internal validation (**V**) sets. **ACE-inhibitor:** Angiotensin converting enzyme inhibitor; **ALT:** Alanine aminotransferase; **ANN:** artificial neural network; **AR blocker:** Angiotensin II receptor blocker; **AST:** Aspartate aminotransferase; **BUN:** Blood urea nitrogen; **CEA:** Carcioembryonic antigen; **CKD:** Chronic kidney disease; **COPD:** Chronic obstructive pulmonary disease; **CRP:** C-reactive protein; **cTnI:** cardiac troponin I; **D-Bil:** Direct bilirubin; **DM:** Diabetes mellitus; **DPP-4 inhibitor:** Dipeptidyl peptidase 4 inhibitor; **GBDT:** gradient boosted decision tree; **GFR:** glomerular filtration rate; **IL-2R:** Interleukin 2 receptor; **IL-6:** Interleukin 6; **KNN:** k-nearest neighbours; **LASSO:** least absolute shrinkage and selection operator; **LDH:** Lactate dehydrogenase; **MAP:** mean arterial pressure; **NA:** Not available; **Neu%:** neutrophils percentage; **NLR:** Neutrophils to lymphocyte ratio; **NOD:** number of days of symptoms prior to hospital admission; **NSAID:** Nonsteroidal anti-inflammatory drugs; **P/F ratio:** arterial oxygen pressure (PaO<sub>2</sub>) / fractional inspired oxygen (FiO<sub>2</sub>); **PLS:** Partial least square; **RBF-SVM:** SVM with radial basis function kernel; **RDW:** Red cell distribution width; **RF:** random forest; **SLE:** Systematic lupus erythematosus; **SVM:** support vector machine; **WBC:** White blood cells. \*optimal cut-off for ICU admission or death.