

표 1. 흉부 핵심질문 1-8 근거표

핵심질문 1-8

구분		Number and type of studies	Risk of bias	Indirectness	Imprecision
KQ 1	CT	1 cohort study (n=1138)	No serious limitations	Direct	Serious imprecision (sensitivity)
KQ 2	CT	21 cohort studies (N=11,258) ^a	Serious limitations	Direct	Precise
	CXR	6 cohort studies (N=1606)	Serious limitations	Direct	Serious imprecision
KQ 3	CT	4 cohort studies (N=852)	Serious limitations	Direct	Precise
	CXR	3 cohort studies (N=858)	Serious limitations	Direct	Precise
KQ 4-5	CT	11 cohort studies (N=2,117)	Serious limitations	Direct	Precise
	CXR	2 cohort studies (N=223)	Serious limitations	Direct	Serious imprecision
KQ 6	CT	Imaging series: 2 (N=206)	Very serious limitations	Serious indirectness	Serious imprecision
KQ 7					
KQ 8					
구분	Inconsistency	Other considerations	Summary findings	Certainty of evidence	
KQ 1	Unable to determine	None	Se: 0.18 (0.10-0.30) Sp: 0.98 (0.97-0.99)	Low	
KQ 2	Consistent	None	Pooled Se: 0.89 (0.85-0.91) Pooled Sp: 0.81 (0.73-0.88)	Moderate	
	Consistent	None	Pooled Se: 0.72 (0.56-0.84) Pooled Sp: 0.71	Low	

			(0.51-0.86)	
KQ 3	Consistent	None	CT findings associated with subsequent adverse clinical outcomes	Low
	Consistent	None	CXR findings associated with subsequent adverse clinical outcomes	Low
KQ 4-5	Consistent	None	CT findings predicted subsequent adverse clinical outcomes, though CT was not always an independent predictor	Low
	Consistent	None	CXR findings predicted subsequent adverse clinical outcomes	Very low
KQ 6	Consistent	None	Prevalence of pulmonary embolus 30% and 23%	Very low
KQ 7				
KQ 8				

CT: Cohort Studies of Diagnostic Accuracy for COVID-19 Diagnosis

Author, Year Country Clinical Setting Study Dates	Eligibility Criteria	Sample Size SARS-CoV-2 Infection Prevalence	Imaging	Definition of Positive Imaging Test	Imaging Reader
Ai, et al. 202019 China (Wuhan); hospital; 6 January to 6 February 2020	Suspected of COVID-19; underwent both chest CT imaging and SARS-CoV-2	n=1014 56% SARS-CoV-2 infection	Reconstructed slice thickness: 0.625 to 1.25mm Tube voltage: 120 kVp; automatic	Imaging read as positive for COVID-19	2 radiologists who came to consensus

	RT-PCR; time interval between CT and RT-PCR ≤7 days.		current tube modulation (30–70 mAs)		
Aslan S, 202020 Turkey(Giresun); outpatient clinic;15 March to 16 April 2020	Suspected COVID-19,with CT and RT-PCR	n=306 82% SARS-CoV-2 infection	Slice thickness: 3mm Low dose scanning protocol Tube voltage: 8 kVP, tube current 35-50 MA Dose length product 20.4 mGy.cm and effective dose 0.29 mSv	CT findings positive (Fleischner society guidelines)	3 radiologists with 7, 8, and 8 years' experience, with consensus
Barbosa P,202022 Brazil(Sao Paolo); cancer center; February to March 2020	Suspected SARS-CoV-2 infection with CT and SARS CoV-2 RT-PCR on same day	n=91 27% SARS-CoV-2 infection	Slice thickness: Not reported	A: Typical CT findings (Society or Thoracic Radiology, American College of Radiology, and Radiological Society of North America consensus statement) B: Typical or indeterminate CT findings	2 radiologists jointly reviewed CT images
BesuttiG, 202023 Italy (Reggio Emilia); ED; 13 to 23 March 2020	Suspected COVID-19 with CT and RT-PCR within 3 days	n=696 79% SARS-CoV-2 infection	Slice thickness: 2.5 mm, interval 1.25mm (reconstructed at 1.0/1.25 mm) Automatic tube current modulation	A: Highly suggestive CT findings, based on structured reporting protocol B: Highly suggestive or suggestive CT findings	Radiologist (number of radiologists unclear)
Borges da Silva Teles G, 202024 Brazil (Sao Paolo); tertiary	Suspected acute respiratory infection, CT	n=175 50% SARS-CoV-2 infection	Slice thickness: Reconstructed slice thickness 1mm	A: Typical CT findings (Radiological Society of	2 radiologists (11 and 2 years of experience),

care medical center; 15 to 24 March 2020	and RT-PCR within 7 days		Automatic milliamperage setting range 10 to 440 mA	North America consensus statement) B: Typical or indeterminate CT findings	with consensus
Brun A, 2020 ²⁷ France (Paris); ED; 20 March to 8 April 2020	Intermediate probability for COVID-19, defined as fever and/or respiratory symptoms, atypical findings at auscultation (no crackles or unilateral crackles or diminished breath sounds), and normal or equivocal chest radiograph (including unilateral opacities)	n=307 57% SARS-CoV-2 infection	Slice thickness: Reconstructed slice thickness 0.6 mm Unenhanced low-dose volumetric acquisition	Probable or highly probable CT findings (Radiological Society of North America consensus statement)	A: Radiologist 1 B: Radiologist 2
Caruso, et al., 2020 ^{28,67} Italy (Rome); ED; 4 to 19 March 2020	Suspected COVID-19 patients with fever and respiratory symptoms such as cough, and dyspnea; patients with mild respiratory symptoms and close contact with a confirmed COVID-19 patient; or patients with a	n=158 39% SARS-CoV-2 infection	Reconstruction slice thickness: 1.25 mm Tube voltage: 120 kV; automatic current tube modulation (100-250 mAs)	CT positive for viral pneumonia using clinically available dedicated application (Thoracic VCAR v13.1, GE)	Two radiologists in consensus evaluated images using a clinically available dedicated application for diagnosis of viral

	previously positive test result. Patients who underwent chest CT with contrast for vascular indication were excluded.				
Dangis, et al., 202033 Belgium (Bonheiden); hospital; 14 to 24 March 2020	Possible COVID-19 infection and both SARS-CoV-2 RT PCR and low-dose chest CT at presentation.	n=192 43% SARS-CoV-2 infection	Reconstructed slice thickness: 1 mm and 0.7 mm increment with standard lung-tissue kernel and 3 mm and 3 mm increment with standard soft tissue kernel Low-dose chest CT protocol applied (average patient tube voltage 100 kVp and tube current 20 mAs) Dose-length product (mGy-cm): 41.4 vs. 38.7 Effective dose (mSv): 0.58 vs. 0.54	Imaging classified as positive for COVID-19 (scored based on the presence of findings as presented by Ng et al and Shi et al)	Two radiologists with 8 and 7 years of experience
De Smet K, 2020a34 and 2020b35 Belgium (Roeselare); tertiary care medical center; 19 March to 20 April 2020	Symptomatic: Clinical suspicion of COVID-19 pneumonia, CT and RT PCR within 24 hours Asymptomatic: No COVID-19 symptoms but admitted for	Symptomatic: n=859 42% SARS-CoV-2 infection Asymptomatic: n=1138 5% SARS-CoV-2 infection	slice thickness: 1 or 1.25 mm	A: Dutch COVID-19 Reporting and Data System classification system(CORADS) score 5 B: CORADS score ≥ 4 C: CORADS	2 radiologists with 24 and 9 years of experience, with consensus

	other conditions or procedures			score ≥ 3	
Debray M, 202036	Suspected COVID-19, with CT and RT-PCR	n=241 66% SARS-CoV-2 infection	Reconstruction slice thickness: 1 mm with 0.8 mm inter-slice gap Tube voltage: 120 kVp; automatic exposure control for tube current	A: CT classified as evocative (French society of Radiology) B: CT classified as evocative or compatible	4 senior radiologists with 4 to 25 years of experience, with consensus
Ducray V, 202038 France (Lyon); ED; 3 March to 4 April 2020	Hospitalized for clinical symptoms, CT for suspected CT and RT-PCR (timing with regard to CT not reported)	n=694 41% SARS-CoV-2 infection	Slice thickness: Mean 2.3mm (range 0.6 to 3 mm) Mean volumetric Computed Tomography Dose Index: 9.71 mGy Mean dose length product: 387.4 mGy.cm	A: Surely COVID-19 CT findings B: Surely or possible COVID-19 CT findings	"Senior" radiologists, number unclear
Falaschi Z, 202039 Italy (Novara); ED; 4 March to 9 April 2020	Suspected SARS-CoV-2 infection, CT and RT-PCR within 7 days	n=773 60% SARS-CoV-2 infection	Slice thickness: Reconstructed slice thickness 1 mm Persons up to 90 kg: Mean CT dose index 8.9 mGy and mean dose length product 334.2 mGy*cm Persons ≥ 90 kg: Mean CT dose index 15.1 mGy and mean dose length product 557.6 mGy*cm	Typical or indeterminate CT findings (STR/ACR/RSN A)	2 radiologists with >10 years thoracic imaging experience, with consensus

Giannitto C, 202042 Italy (Milan); hospital; 1 to 29 March 2020	Moderate or high pretest probability of COVID-19 based on community or cluster transmission and moderate to severe respiratory symptoms, with CT and negative initial RT PCR within 4 days	n=41 44% SARS-CoV-2 infection	Reconstruction slice thickness: 2 mm Tube voltage 12 kV; tube current modulation 127 mAs	Suspected COVID-19 pneumonia (vs. non COVID-19 pneumonia or negative CT)	2 radiologists with 5 and 15 years of experience in chest imaging, with consensus
Gietema H, 202043 The Netherlands (Maastricht); ED; 13 to 24 March 2020	Respiratory symptoms, with CT and RT-PCR	n=193 43% SARS-CoV-2 infection	slice thickness Reconstructed slice thickness 1.25 mm Acquisition parameters 120 kVp, 50-210 mAs	CT suspicious for COVID-19 (based on Ai et al19, Kanne et al103)	Senior resident (initial reading) and experienced radiologist (final reading)
He J, 202044	Suspected COVID-19, with CT and RT-PCR	n=82 41% SARS-CoV-2 infection	slice thickness: 1 mm Tube voltage and tube current not reported	CT findings positive (Chung et al 104, Pan et al 100)	2 radiologists with 14 and 17 years of experience, with consensus
Hermans J, 202045 The Netherlands (Rotterdam and Schiedam); ED; 27 March to 20 April 2020	Suspected infection with COVID-19 with 1) new respiratory symptoms for ≤2 weeks and present in last 24 hours, 2) saturation ≤94% and/or respiratory rate ≥20/minute and/or abdominal complaints; and/or	n=319 42% SARS-CoV-2 infection	Slice thickness: Not reported Tube voltage and tube current not reported	CO-RADS score 4-5	Board-certified radiologists trained to read and classify using CO-RADS classification (number per image not reported); 2 independent radiologists consulted if needed

	3) high clinical suspicion in the absence of symptoms; with CT and RT-PCR performed within 24 hours				
Herpe G, 202046 France; 26 hospitals; 2 March to 24 April 2020	Clinical suspicion of COVID-19, with CT and RT-PCR	n=4824 53% SARS-CoV-2 infection	Slice thickness and other parameters not reported (varied)	CT positive ("in accordance with international guidelines," otherwise not described)	1 radiologist with at least 5 years of experience; in cases of doubt or difficulties, 2nd radiologist with at least 5 years of experience and consensus
Korevaar D, 202050 The Netherlands (Amsterdam); ED; 16 March to 16 April 2020	Suspected COVID-19, with CT and RT-PCR on admission	n=239 47% SARS-CoV-2 infection	Slice thickness: Not reported Low-dose CT	A: CO-RADS score 4-5 B: CO-RADS score 3-5	Radiologists with varying experience; "informal" second read performed in some cases by a dedicated acute radiologist, with consensus
Krdzalic J, 202051 The Netherlands (Heerlen/Sittard/Geleen); clinical setting not reported; 12 to 20 March 2020	Clinical suspicion of COVID-19 (fever, cough, and/or dyspnea), with CT and RT PCR	n=56 50% SARS-CoV-2 infection	Slice thickness: Reconstructed slice thickness 1.0 mm and 1.0 mm increment 120 kVp and 667 or 404 max mA	A: Positive or equivocal CT by general radiologist B: CO-RADS score 3-5 by chest radiologist	A: General radiologist report reviewed in consensus by 2 radiologists B: Chest radiologist with 5 years' experience

Kuzan T, 202052 Turkey(Istanbul); ED; 17 to 25 March 2020	Suspected COVID-19 ,with CT and RT-PCR	n=120 58% SARS-CoV- 2 infection	Slice thickness: 1.25 mm without interslice gap Tube voltage 120 kVP, automatic tube current modulation, 100-250 mAs	CT positive or indeterminate (British Society of Thoracic Imaging, version 2)	2 radiologists, with consensus
Luo N, 202057 China (Dalian City); fever clinic; 20 January to 9 February 2020	Suspected COVID-19 due to potential contact, with CT prior to treatment and RT PCR	n=140 56% SARS-CoV- 2 infection	Slice thickness: 1 mm Tube voltage 120 kV, automatic tube current	CT positive, criteria not described	2 senior radiologists, with consensus
Miranda Magalhães Santos J, 202060 Brazil (Sao Paolo); ED; 13 to 23 March 2020	Suspected COVID-19, with CT and RT-PCR within 4 days	n=71 (75 CT) 51% SARS-CoV- 2 infection	Slice thickness: Not reported Tube voltage 120 kV, mA with automatic exposure control scanner	CT typical findings (RSNA criteria)	2 radiologists with 11 and 4 years of experience, with consensus
202016 The Netherlands (Nijmegen); ED; 14 to 25 March 2020	Presenting to the emergency department with suspected COVID-19 based on lower respiratory tract infection symptoms including cough and clinically relevant dyspnea requiring hospital	n=105 50% SARS-CoV- 2 infection	Slice thickness: Not reported Tube voltage: 100, 120 or 135 kV; low dose protocol Dose length product (mGy-cm): 39.4	Based on categorization using the COVID-19 Reporting and Data System, threshold not utilized (only AUROC reported)	Average of 8 radiologists (4 had <5 years of experience; the remainder had 5 to 27 years of experience)

	admission with or without fever >38 degrees C; CT performed and SARS-CoV-2 RT-PCR within 5 days of CT.				
Schulze-Hagen M, 202068 Germany (Aachen); hospital; 29 January to 4 February 2020	Clinical symptoms of COVID-19, with CT and RT-PCR within 24 hours	n=191 39% SARS-CoV-2 infection	Reconstruction slice thickness: 3 mm and 1mm Tube voltage 80 kV and tube current 35 mA with automatic dose modulation program	CO-RADS score 3-5	1 radiologist
Song S, 202069 China (Wuhan); hospital; 29 January to 4 February 2020	Suspected COVID-19, with CT and RT-PCR within 3 days	n=211 53% SARS-CoV-2 infection	Reconstruction slice thickness: 1 mm Tube voltage 120 kV, tube current regulated by an automatic exposure control system	CT positive (based on main findings described in publications, not further specified)	2 radiologists with 8 and 4 years of experience, with consensus
Wen, et al. 202073 China (Hunan Province); hospital; 21 January to 14 February 2020	Under investigation for COVID-19; excluded persons with fever >14 days but no acute respiratory infection signs or symptoms or exposure history; acute respiratory infection signs or symptoms >14 days but no exposure history; and	n=103 85% SARS-CoV-2 infection	Slice thickness: 2 to 3 mm without interslice gap Tube voltage: 120 kV, automatic current tube modulation (145-300 mAs) Computed tomography dose index (mGy): 9.34 4.13 Dose-length product (mGy-cm):	CT read as positive for COVID-19; Fleischner Society lexicon used	3 radiologists with 8 to 15 years of experience; disagreements resolved through discussion and consensus

	acute respiratory infection symptoms in the last 14 days but no exposure history, laboratory tests, or other examination sufficient to exclude COVID-19. All patients were hospitalized ≥ 2 weeks.		314.03		
Yang, et al., 202074 China (Nanchang); hospital; 23 January to 9 February 2020	Evaluated for possible COVID-19 with RT-PCR for SARS-CoV-2 and CT.	n=274 19% SARS-CoV-2 infection	Slice thickness: Not reported	A: Imaging read as positive B: Imaging total score ≥ 2 C: Imaging read as positive and score ≥ 2 D: Imaging read as positive	2 radiologists jointly reviewed CT images
Author, Year Country Clinical Setting Study Dates	Reference Standard	True Positives (n)	False Positives (n)	False Negatives (n)	True Negatives (n)
Ai, et al., 202019 China (Wuhan); hospital; 6 January to 6 February 2020	SARS-CoV-2 RT PCR	Overall: 580 <60 years:362 ≥ 60 years:218 Female: 308 Male: 272	Overall: 308 <60 years:225 ≥ 60 years:83 Female: 160 Male: 148	Overall:21 <60 ears:15 ≥ 60 years: 6 Female: 9 Male: 12	Overall:105 <60 years:81 ≥ 60 years:24 Female: 70 Male: 35
Aslan S, 202020 Turkey(Giresun);outpatient clinic; 15 March to 16 April 2020	SARS-CoV-2 RT-PCR (repeat for initial negative in some patients)	226	20	24	36

Barbosa P, 202022 Brazil (Sao Paolo); cancer center; February to March 2020	SARS-CoV-2 RT-PCR	A:16 B:23	A:10 B:25	A:9 B:2	A:56 B:41
Besutti G, 202023 Italy (Reggio Emilia); ED; 13 to 23 March 2020	1. SARS-CoV -2 RT PCR 2. SARS-CoV -2 RT PCR (repeat for initial negative in some patients)	A1:423 A2:428 B1:520 B2:526	A1:31 A2:26 B1:61 B2:55	A1:128 A2:135 B1:31 B2:37	A1:114 A2:107 B1:84 B2:78
Borges da Silva Teles G, 202024 Brazil (Sao Paolo);tertiary care medical center; 15 to 24 March 2020	SARS-CoV-2 RT-PCR	A:64 B:72	A:1 B:11	A:23 B:15	A:86 B:77
Brun A, 202027 France (Paris); ED; 20 March to 8 April 2020	1:SARS-CoV- 2 RT PCR 2:SARS-CoV- 2 RT PCR or negative PCR, CT classified as highly probable or probable, and clinical diagnosis based on blinded review of clinical data and outcomes	A1:153 B1:143 1(average): 148 A2:167 B2:158 2(average): 162	A1:21 B1:24 1(average): 22 A2:7 B2:10 2(average): 8	A1:21 B1:31 1(average): 26 A2:21 B2:30 2(average): 26	A1:112 B1:109 1(average): 110 A2:112 B2:109 2(average): 110
Caruso, et al., 202028,67 Italy (Rome); ED; 4 to 19	SARS-CoV-2 RT PCR (repeat for initial	60	42	2	54

March 2020	negative test)				
Dangis, et al., 202033 Belgium (Bonheiden); hospital; 14 to 24 March 2020	SARS-CoV-2 RT PCR (repeat for initial negative De Smet K, 2020a34 and 2020b35 Belgium (Roeselare); tertiary care medical center; 19 March to 20 April 2020 test)	1 (all patients): 72 2 (clinical symptoms >48 hours): 65	1:7 2:6	1:11 2:3	1:102 2:82
De Smet K, 2020a34 and 2020b35 Belgium (Roeselare); tertiary care medical center; 19 March to 20 April 2020	SARS-CoV-2 RT-PCR	Symptomatic A:279 B:304 C:319 Asymptomatic A:11 B:19 C:27	Symptomatic A:33 B:76 C:138 Asymptomatic A:23 B:60 C:121	Symptomatic A:79 B:54 C:39 Asymptomatic A:49 B:41 C:33	Symptomatic A:468 B:425 C:363 Asymptomatic A:1055 B:1018 C:957
Debray M, 202036	SARS-CoV-2 RT-PCR	A:119 B:134	A:4 B:19	A:39 B:24	A:79 B:62
Ducray V, 202038 France (Lyon); ED; 3 March to 4 April 2020	SARS-CoV-2 RT-PCR	A:259 B:268	A:49 B:74	A:28 B:19	A:358 B:333
Falascchi Z, 202039 Italy (Novara); ED; 4 March to 9 April 2020	SARS-CoV-2 RT-PCR	Overall: 419 Male: 261 Female: 158 Age <50: 81 ≥50: 338 <60: 166 ≥60: 253	Overall: 66 Male: 33 Female: 33 Age <50: 16 ≥50: 50 <60: 29 ≥60: 37	Overall: 43 Male: 21 Female: 22 Age <50: 15 ≥50: 28 <60: 19 ≥60: 24	Overall: 245 Male: 108 Female: 137 Age <50: 94 ≥50: 151 <60: 126 ≥60: 119
Giannitto C, 202042 Italy (Milan); hospital; 1 to 29 March 2020	Repeat nasopharyngeal SARS-CoV-2 RT-PCR or bronchoalveolar lavage RT-PCR	14	10	6	38

Gietema H, 202043 The Netherlands (Maastricht); ED; 13 to 24 March 2020	SARS-CoV-2 RT-PCR (including repeat within 48 hours for initial negative)	Overall:74	Overall:35	Overall:9	Overall:75
He J, 202044	SARS-CoV-2 RT-PCR (serial)	26	8	2	46
Hermans J, 202045 The Netherlands (Rotterdam and Schiedam); ED; 27 March to 20 April 2020	SARS-CoV-2 RT-PCR	120	22	13	163
Herpe G, 202046 France; 26 hospitals; 2 March to 24 April 2020	1.Finaldiagnosis 2.SARS-CoV-2 RT PCR	A:2319 B:1999 B1(female): 749 B2(male): 1249 B3(≤60 years):769 B4(>60 years):1230 B5 (Prevalence <20%):743 B6 (Prevalence 20-30%):522 B7 (Prevalence 30-40%):734	A:204 B:525 B1:201 B2:324 B3:203 B4:322 B5:264 B6:90 B7:171	A:245 B:250 B1:133 B2:117 B3:105 B4:145 B5:77 B6:83 B7:90	A:2056 B:2050 B1:1072 B2:977 B3:849 B4:1201 B5:1164 B6:494 B7:392
Korevaar D, 202050 (Amsterdam); ED; 16 March to 16 April 2020	SARS-CoV-2 RT-PCR	A:104 B:119	A:38 B:62	A:8 B:3	A:89 B:65
Krdzalic J,	SARS-CoV-2	A:25	A:19	A:3	A:9

202051 The Netherlands (Heerlen/ Sittard/Geleen); clinical setting not reported; 12 to 20 March 2020	RT-PCR (repeat for initial negative)	B:25	B:7	B:3	B:21
Kuzan T, 202052 Turkey(Istanbul) ; ED; 17 to 25 March 2020	SARS-CoV-2 RT-PCR (repeat for initial negative)	65	40	4	11
Luo N, 202057 China (Dalian City); fever clinic; 20 January to 9 February 2020	SARS-CoV-2 RT-PCR	70	7	8	55
Miranda Magalhães Santos J, 202060 Brazil (Sao Paolo); ED; 13 to 23 March 2020	SARS-CoV-2 RT-PCR	30	1	6	38
202016 The Netherlands (Nijmegen); ED; 14 to 25 March 2020	1.SARS-CoV-2 RT PCR 2.SARS-CoV-2 RT PCR or clinical diagnosis with negative RT-PCR	NR	NR	NR	NR
Schulze-Hagen M, 202068 Germany (Aachen); hospital; 29 January to 4 February 2020	SARS-CoV-2 RT-PCR (repeat and clinical course for initial negative)	71	10	4	106
Song S,	SARS-CoV-2	108	55	3	45

202069 China (Wuhan); hospital; 29 January to 4 February 2020	RT-PCR (repeat for initial negative if clinical suspicion)					
Wen, et al., 202073 China (Hunan Province); hospital; 21 January to 14 February 2020	SARS-CoV-2 RT-PCR (repeat if negative) First RT-PCR positive: 42% Second RT-PCR:33% Third RT-PCR:16% Fourth RT-PCR:9%	82	7	6	8	
Yang, et al., 202074 China (Nanchang); hospital; 23 January to 9 February 2020	SARS-CoV-2 RT-PCR	A:48 B:47 C:42 D:53	A:70 B:151 C:52 D:169	A:5 B:6 C:11 D:0	A:151 B:70 C:52 D:52	
Author, Year Country Clinical Setting Study Dates	Sensitivity	Specificity	PPV	NPV	AUROC	Risk of Bias and Other Limitations
Ai, et al. 202019 China (Wuhan); hospital; 6 January to 6 February 2020	Overall:0.96 (0.95-0.98) <60years: 0.96(0.94- 0.98) ≥60:0.97 (0.94-0.99) Female:0.97 (0.95-0.99) Male:0.96 (0.93-0.98)	Overall:0.25 (0.22-0.30) <60years: 0.26(0.22- 0.32) ≥60:0.22 (0.16-0.31) Female:0.30 (0.25-0.37) Male:0.19 (0.14-0.25)	Overall:0.65 (0.62-0.68) <60years: 0.62(0.58- 0.66) ≥60years: 0.72(0.67- 0.77) Female:0.66 (0.60-0.69) Male:0.65 (0.60-0.69)	Overall:0.83 (0.76-0.89) <60years: 0.84(0.76- 0.90) ≥60years: 0.80(0.63- 0.91) Female:0.89 (0.80-0.94) Male:0.74 (0.61-0.85)	NR	Moderate
Aslan S, 202020	0.90 (0.86-0.949)	0.64 (0.50-0.77)	0.92 (0.89-0.94)	0.60 (0.49-0.70)	NR	Moderate

Turkey (Giresun); outpatient clinic; 15 March to 16 April 2020						
Barbosa P, 202022 Brazil (Sao Paolo); cancer center; February to March 2020	A:0.64 (0.42–0.82) B:0.92 (0.74–0.99)	A:0.85 (0.74–0.92) B:0.62 (0.49–0.74)	A:0.62(0.46–0.75) B:0.48 (0.40–0.56)	A:0.86 (0.78–0.91) B:0.95 (0.84–0.99)	NR	Moderate
Besutti G, 202023 Italy (Reggio Emilia); ED; 13 to 23 March 2020	A1:0.77 (0.73–0.80) A2:0.76 (0.72–0.80) B1:0.94 (0.92–0.96) B2:0.93 (0.91–0.95)	A1:0.79 (0.71–0.85) A2:0.80 (0.73–0.87) B1:0.58 (0.50–0.66) B2:0.59 (0.50–0.67)	A1:0.93 (0.90–0.95) A2:0.94 (0.92–0.96) B1:0.90 (0.87–0.92) B2:0.91 (0.88–0.93)	A1:0.47 (0.41–0.54) A2:0.44 (0.38–0.51) B1:0.73 (0.64–0.81) B2:0.68 (0.58–0.76)	NR	Moderate
Borges da Silva Teles G, 202024 Brazil (Sao Paolo); tertiary care medical center; 15 to 24 March 2020	A:0.74 (0.63–0.82) B:0.83 (0.73–0.90)	A:0.98 (0.92–0.997) B:0.88 (0.79–0.94)	A:0.97 (0.90–0.997) B:0.87 (0.78–0.93)	A:0.79 (0.70–0.86) B:0.84 (0.74–0.91)	NR	Moderate
Brun A, 202027 France(Paris); ED; 20 March to 8 April 2020	1(average): 0.85 (0.79–0.90) 2(average): 0.86 (0.80–0.91)	1(average): 0.83 (0.76–0.89) 2(average): 0.93 (0.87–0.979)	1(average): 0.87 (0.82–0.91) 2(average): 0.95 (0.91–0.98)	1(average): 0.81 (0.75–0.86) 2(average): 0.81 (0.75–0.86)	A1:0.89 (0.86–0.93) B1:0.87 (0.83–0.91) A2:0.94 (0.91–0.97) B2:0.92 (0.89–0.95)	Moderate
Caruso, et al., 202028,67 Italy(Rome); ED; 4 to 19	0.97 (0.88–0.99)	0.56 (0.45–0.66)	0.59 (0.53–0.64)	0.96 (0.87–0.99)	NR	Moderate

March 2020						
Dangis, et al., 202033 Belgium (Bonheiden); hospital; 14 to 24 March 2020	1:0.87 (0.80–0.98) 2:0.96 (0.91–0.999)	1:0.94 (0.89–0.982) 2:0.93 (0.88–0.98)	1:0.91 (0.85–0.97) 2:0.92 (0.85–0.98)	1:0.90 (0.85–0.96) 2:0.96 (0.92–0.999)	NR	Moderate
De Smet K, 2020a34 and 2020b35 Belgium (Roeselare); tertiary care medical center; 19 March to 20 April 2020	Symptomatic A:0.78 (0.73–0.82) B:0.85 (0.81–0.89) C:0.89 (0.85–0.92) Asymptomatic A:0.18 (0.10–0.30) B:0.32 (0.20–0.45) C:0.45 (0.32–0.58)	Symptomatic A:0.93 (0.91–0.95) B:0.85 (0.81–0.88) C:0.73 (0.68–0.76) Asymptomatic A:0.98 (0.97–0.99) B:0.94 (0.93–0.96) C:0.89 (0.87–0.91)	Symptomatic A:0.89 (0.86–0.92) B:0.80 (0.76–0.83) C:0.70 (0.67–0.73) Asymptomatic A:0.32 (0.20–0.48) B:0.24 (0.20–0.28) C:0.18 (0.14–0.24)	Symptomatic A:0.86 (0.83–0.88) B:0.89 (0.86–0.91) C:0.90 (0.87–0.93) Asymptomatic A:0.96 (0.95–0.96) B:0.96 (0.95–0.97) C:0.97 (0.96–0.97)	Symptomatic :0.89 (0.87–0.91) Asymptomatic :0.70 (0.67–0.73)	Low
Debray M, 202036	A:0.75 (0.68–0.82) B:0.85 (0.78–0.90)	A:0.95 (0.88–0.99) B:0.77 (0.66–0.85)	A:0.97 (0.92–0.99) B:0.88 (0.83–0.91)	A:0.67 (0.61–0.73) B:0.72 (0.64–0.79)	NR	Moderate
Ducray V, 202038 France(Lyon); ED; 3 March to 4 April 2020	A:0.90 (0.87–0.93) B:0.93 (0.90–0.96)	A:0.88 (0.84–0.91) B:0.82 (0.78–0.85)	A:0.84 (0.80–0.88) B:0.78 (0.74–0.82)	A:0.93 (0.90–0.95) B:0.95 (0.92–0.96)	NR	Moderate
Falaschi Z, 202039 Italy(Novara); ED; 4 March to 9 April 2020	Overall:0.91 (0.88–0.93) Male:0.92 (0.89–0.95) Female:0.88 (0.82–0.92) Age<50: 0.84(0.76–0.91) ≥50:0.91 (0.90–0.95) <60:0.90 (0.84–0.94)	Overall:0.79 (0.74–0.83) Male:0.77 (0.69–0.83) Female:0.81 (0.73–0.86) Age<50: 0.85(0.76–0.91) ≥50:0.75 (0.68–0.81) <60:0.81 (0.74–0.87)	Overall:0.86 (0.84–0.89) Male:0.89 (0.85–0.91) Female:0.83 (0.78–0.87) Age<50: 0.84(0.76–0.89) ≥50:0.87 (0.84–0.90) <60:0.85 (0.80–0.89)	Overall:0.85 (0.81–0.88) Male:0.84 (0.77–0.89) Female:0.86 (0.81–0.90) Age<50: 0.86(0.80–0.91) ≥50:0.84 (0.79–0.89) <60:0.87 (0.81–0.91)	NR	Moderate

	≥60:0.91 (0.87–0.94)	≥60:0.76 (0.69–0.83)	≥60:0.87 (0.84–0.90)	≥60:0.83 (0.77–0.88)		
Giannitto C, 202042 Italy(Milan); hospital; 1 to 29 March 2020	0.70 (0.46–0.88)	0.79 (0.65–0.90)	0.58 (0.43–0.72)	0.86 (0.76(0.93)	0.75 (CI not reported)	Moderate
Gietema H, 202043 The Netherlands (Maastricht) ; ED; 13 to 24 March 2020	Overall:0.89 (0.80–0.95) 1(CURB–65 0–2):0.88 (0.79–0.94) 2(CURB–65 ≥3):1.0 (0.54–1.0) 3(SOFA score0–1): 0.62 (0.35–0.85) 4(SOFA score≥2): 0.96 (0.87–0.99)	Overall:0.68 (0.59–0.77) 1:0.70 (0.60–0.78) 2:0.54 (0.23–0.83) 3:0.70 (0.54–0.83) 4:0.67 (0.55–0.78)	Overall:0.68 (0.61–0.74) 1:0.69 (0.62–0.76) 2:0.54 (0.39–0.70) 3:0.46 (0.31–0.60) 4:0.74 (0.66–0.80)	Overall:0.89 (0.82–0.94) 1:0.88 (0.80–0.94) 2:1.00(CI notreported) 3:0.82 (0.71–0.90) 4:0.94 (0.84–0.98)	NR	Moderate
He J, 202044	0.93 (0.76–0.99)	0.85 (0.73–0.93)	0.76 (0.63–0.86)	0.96 (0.86–0.99)	NR	Moderate
Hermans J, 202045 The Netherlands (Rotterdam and Schiedam); ED; 27 March to 20 April 2020	0.90 (0.84–0.95)	0.88 (0.83–0.92)	0.84 (0.79–0.89)	0.93 (0.88–0.96)	0.91 (0.88–0.95)	Moderate
Herpe G, 202046 France; 26 hospitals; 2 March to 24 April 2020	A:0.90 (0.89–0.91) B:0.88 (0.86–0.90) B1:0.85 (0.84–0.87) B2:0.91 (0.89–0.91) B3:0.88 (0.87–0.90)	A:0.91 (0.91–0.92) B:0.80 (0.79–0.81) B1:0.84 (0.82–0.86) B2:0.75 (0.72–0.77) B3:0.81 (0.80–0.83)	A:0.92 (0.91–0.93) B:0.79 (0.78–0.81) B1:0.79 (0.77–0.81) B2:0.79 (0.77–0.80) B3:0.79 (0.78–0.81)	A:0.89 (0.87–0.90) B:0.89 (0.87–0.90) B1:0.88 (0.87–0.90) B2:0.89 (0.88–0.90) B3:0.89 (0.86–0.90)	NR	Moderate

	B4:0.89 (0.88–0.91) B5:0.91 (0.90–0.92) B6:0.86 (0.83–0.88) B7:0.89 (0.88–0.91)	B4:0.79 (0.78–0.80) B5:0.82 (0.81–0.83) B6:0.85 (0.83–0.86) B7:0.70 (0.68–0.71)	B4:0.74 (0.72–0.76) B5:0.85 (0.84–0.86) B6:0.81 (0.80–0.82)	B4:0.90 (0.89–0.91) B5:0.94 (0.93–0.95) B6:0.85 (0.84–0.87) B7:0.81 (0.79–0.84)		
Korevaar D, 202050 The Netherlands (Amsterdam); ED; 16 March to 16 April 2020	A:0.93 (0.86–0.97) B:0.98 (0.93–0.99)	A:0.70 (0.61–0.78) B:0.51 (0.42–0.60)	A:0.73 (0.68–0.78) B:0.66 (0.62–0.70)	A:0.92 (0.85–0.96) B:0.96 (0.87–0.99)	NR	Low
Krdzalic J, 202051 The Netherlands (Heerlen/ Sittard/ Geleen); clinical setting not reported; 12 to 20 March 2020	A:0.89 (0.72–0.98) B:0.89 (0.72–0.98)	A:0.32 (0.16–0.52) B:0.75 (0.55–0.89)	A:0.57 (0.41–0.72) B:0.78 (0.60–0.91)	A:0.75 (0.43–0.94) B:0.88 (0.68–0.97)	A:NR B:0.84(CI NR)	Moderate
Kuzan T, 202052 Turkey (Istanbul); ED; 17 to 25 March 2020	0.94 (0.86–0.98)	0.22 (0.11–0.35)	0.62 (0.58–0.66)	0.73 (0.43–0.89)	NR	Moderate
Luo N, 202057 China(Dalian City); fever clinic; 20 January to 9 February 2020	0.90 (0.81–0.95)	0.89 (0.78–0.95)	0.91 (0.83–0.95)	0.87 (0.78–0.93)	NR	High
Miranda Magalhães Santos J,	0.83 (0.67–0.94)	0.97 (0.87–0.999)	0.97 (0.81–0.995)	0.86 (0.75–0.93)	0.92 (0.84–0.99)	Moderate 140 patients who

202060 Brazil (Sao Paolo); ED; 13 to 23 March 2020						underwent CT did not undergo RT PCR; diagnostic accuracy reported for 75 CTs continued in 71 patients
202016 The Netherlands (Nijmegen); ED; 14 to 25 March 2020	NR	NR	NR	NR	1:0.91 (0.85-0.97) 2:0.95 (0.91-0.99)	Moderate
Schulze-Hagen M, 202068 Germany (Aachen); hospital: 29 January to 4 February 2020	0.95 (0.87-0.98)	0.91 (0.85-0.96)	0.88 (0.80-0.93)	0.96 (0.91-0.99)	0.96 (0.93-0.99)	Moderate
Song S, 202069 China(Wuhan); hospital: 29 January to 4 February 2020	0.97 (0.92-0.99)	0.45 (0.35-0.55)	0.66 (0.62-0.70)	0.94 (0.83-0.98)	CT:0.71 (0.66-0.76) Basicmodel (age, mono- cyte, RBC, hyperten- sion,dry cough):0.74 (0.67-0.80) CT+basic model:0.81 (0.75-0.87) p<0.01for CT+basic modelvs. basicmodel	Moderate
Wen, et al., 202073	0.93 (0.86-0.97)	0.53 (0.27-0.79)	0.92 (0.87-0.95)	0.57 (0.35-0.77)	NR	Moderate NPV appears

China(Hunan Province); hospital: 21 January to 14 February 2020						to be an error, calculated as 0.57
Yang, et al. 202074 China (Nanchang); hospital: 23 January to 9 February 2020	A:0.91 (0.79–0.97) B:0.89 (0.77–0.96) C:0.79 (0.66–0.89) D:1.0(0.93–1.0)	A:0.68 (0.62–0.74) B:0.32 (0.26–0.38) C:0.50 (0.40–0.60) D:0.24 (0.18–0.30)	A:0.41 (0.36–0.46) B:0.24 (0.21–0.26) C:0.45 (0.39–0.51) D:0.24 (0.23–0.25)	A:0.97 (0.93–0.99) B:0.92 (0.84–0.96) C:0.83 (0.73–0.89) D:1.0	A:0.79 (0.86–0.73) B:0.60 (0.52–0.68) C:0.78 (0.85–0.71) D:0.62 (0.69–0.54)	Moderate

CXR: Cohort Studies of Diagnostic Accuracy for COVID-19 Diagnosis

Author, Year Country Clinical Setting Study Dates	Eligibility Criteria	Sample Size SARS-CoV-2 Infection Prevalence	Imaging	Definition of Positive Imaging Test	Imaging Reader
Cozzi A, 202032 Italy (San Donato Milanese); ED; 24 February to 8 April 2020	Suspected COVID-19, with CXR and RT-PCR and CXR within 12 hours of admission	n=535 76% SARS-CoV-2 infection	Chest X-ray	Classified as positive for SARS-CoV-2 infection	1 of 7 radiologists performed original read, 1 radiologist with 5 years of experience classified CXR report as positive or negative
Ippolito D, 202047 Italy (Monza); ED; 1 to 13 March 2020	Suspected SARS-CoV-2 infection, with CXR and RT PCR	n=518 39% SARS-CoV-2 infection	Chest X-ray	Classified as positive for SARS-CoV-2 infection	1 radiologist with 15 years of experience
Kerpel A, 202048 Israel(Tel Aviv); ED; 6 to 31 March 2020	Underwent RT-PCR and CXR	n=179 58% SARS-CoV-2 infection	Chest X-ray	A: Positive (any opacity) B: RALE score	1: Radiologist with 28 years of experience 2: Radiologist with 40 years of

					experience
Pakray A, 202061 USA (Royal Oak); ED: 12 to 28 March 2020	Suspected COVID-19 with CXR and RT-PCR	n=110 67% SARS-CoV- 2 infection	Chest X-ray	Positive (not defined)	Included (but not limited to) 1 of 3 radiologists with 9 to 15 years of experience
Pare J,202062 USA (Boston); ED: 20 March to 6 April 2020	Evaluated for COVID-19, with RT-PCR, US within 2 weeks, and CXR	n=43 63% SARS-CoV- 2 infection	Chest X-ray	Positive (report included infection in the differential, based on words such as opacity, consolidation, or airspace disease)	Not reported
Peyrony O, 202063 France (Paris); ED: 9 March to 4 April 2020	Suspected COVID-19, with CXR and RT-PCR	n=129 62% SARS-CoV- 2 infection	Chest X-ray	Positive (lung involvement, not otherwise described)	Notreported
Author, Year Country Clinical Setting Study Dates	Reference Standard	True Positives (n)	False Positives (n)	False Negatives (n)	True Negatives (n)
Cozzi A, 202032 Italy (San Donato Milanese);ED: 24 February to 8 April 2020	SARS-CoV-2 RT-PCR (repeat for initial negative or follow-up by phone)	A (Total): 363 B (>10 y experience): 298 C (<10 y experience): 65 D (male): 243 E (female): 120 F (Feb 24 to March 15): 105 G (March 16 to April 8):	A:50 B:34 C:16 D:27 E:23 F:21 G:29	A:45 B:37 C:8 D:28 E:17 F:25 G:20	A:77 B:66 C:11 D:42 E:35 F:44 G:33

		258			
Ippolito D, 202047 Italy (Monza); ED; 1 to 13 March 2020	SARS-CoV-2 RT-PCR	116	35	88	279
Kerpel A, 202048 Israel(Tel Aviv); ED; 6 to 31 March 2020	SARS-CoV-2 RT-PCR (repeat for initial negative)	A1: 90 A2: 72 Average: 81	A1:56 A2:55 Average:56	A1:14 A2:32 Average:23	A1:19 A2:20 Average:20
Pakray A, 202061 USA(Royal Oak); ED; 12 to 28 March 2020	SARS-CoV-2 RT-PCR	148	2	24	16
Pare J, 202062 USA (Boston); ED; 20 March to 6 April 2020	SARS-CoV-2 RT-PCR	14	4	13	12
Peyrony O, 202063 France (Paris); ED; 9 March to 4 April 2020	SARS-CoV-2 RT-PCR (including repeat within 48 hours for initial negative in some patients)	41	13	39	36

Author, Year Country Clinical Setting Study Dates	Sensitivity	Specificity	PPV	NPV	AUROC	Risk of Bias and Other Limitations
Cozzi A, 202032 Italy (San Donato Milanese);ED; 24 February to 8 April 2020	A:0.89 (0.86-0.92) B:0.89 (0.85-0.92) C:0.89 (0.80-0.95) D:0.90 (0.85-0.93) E:0.88	A:0.61 (0.52-0.69) B:0.66 (0.56-0.75) C:0.41 (0.22-0.61) D:0.61 (0.48-0.72) E:0.60	A:0.88 (0.85-0.90) B:0.90 (0.87-0.92) C:0.80 (0.75-0.85) D:0.90 (0.87-0.92) E:0.84	A:0.63 (0.56-0.70) B:0.64 (0.56-0.71) C:0.58 (0.38-0.75) D:0.60 (0.50-0.69) E:0.67	NR	High

	(0.81-0.93) F:0.81 (0.73-0.87) G:0.93 (0.89-0.96)	(0.47-0.73) F:0.68 (0.55-0.79) G:0.53 (0.40-0.66)	(0.79-0.88) F:0.83 (0.78-0.88) G:0.90 (0.87-0.92)	(0.56-0.77) F:0.64 (0.54-0.72) G:0.62 (0.50-0.73)		
Ippolito D, 202047 Italy (Monza); ED; 1 to 13 March 2020	A(overall): 0.57 (0.50-0.64) B(symptom s≤5days): 0.37 (0.24-0.52) C(symptom s>5days): 0.76 (0.47-0.67) D(age≤50 years):0.47 (0.23-0.72) E(age>50 years):0.59 (0.48-0.69)	A:0.89 (0.85-0.92) B:0.93 (0.87-0.96) C:0.68 (0.45-0.86) D:1.00 (0.94-1.00) E:0.82 (0.73-0.89)	A:0.77 (0.70-0.82) B:0.65 (0.62-0.87) C:0.85 (0.75-0.91) D:1.00 (0.90-1.00) E:0.75 (0.65-0.82)	A:0.76 (0.73-0.79) B:0.80 (0.76-0.83) C:0.56 (0.41-0.69) D:0.87 (0.81-0.91) E:0.70 (0.64-0.75)	NR	Moderate
Kerpel A, 202048 Israel (Tel Aviv); ED; 6 to 31 March 2020	A1:0.87 (0.78-0.92) A2:0.69 (0.59-0.78) Average: 0.78 (0.69-0.85)	A1:0.25 (0.16-0.37) A2:0.27 (0.17-0.38) Average: 0.26 (0.17-0.38)	A1:0.61 (0.58-0.65) A2:0.57 (0.52-0.61) Average: 0.59 (0.55-0.63)	A1:0.58 (0.42-0.72) A2:0.38 (0.28-0.50) Average: 0.47 (0.34-0.59)	B1:0.62 (0.53-0.72) B2:0.51 (0.41-0.60) B1(days 0-2):0.29 (0.14-0.44) B2(days 0-2):0.25 (0.10-0.40) B1(days 3-5):0.71 (0.57-0.92) B2(days 3-5):0.56 (0.35-0.77) B1(days ≥6):0.74 (0.57-0.90) B2(days ≥6):0.70 (0.55-0.86)	Low
Pakray A, 202061	0.86 (0.80-0.91)	0.89 (0.65-0.99)	0.999 (0.95-0.996)	0.40 (0.31-0.50)	NR	High

USA (Royal Oak); ED; 12 to 28 March 2020						
Pare J,202062 USA (Boston); ED; 20 March to 6 April 2020	0.52 (0.32–0.71)	0.75 (0.48–0.93)	0.78 (0.58–0.90)	0.48 (0.36–0.60)	NR	High Data discrepancies ,diagnostic accuracy estimates based on data provided in study
Peyrony O, 202063 France (Paris); ED; 9 March to 4 April 2020	0.51 (0.40–0.63)	0.73 (0.59–0.85)	0.76 (0.65–0.84)	0.48 (0.41–0.55)	NR	High Not all patients who underwent RT–PCR underwent CXR

CT: Studies on the Association Between Imaging Findings and
Health Outcomes in Persons With COVID–19

Author, Year Country Clinical Setting Study Dates	Eligibility Criteria	Population characteristics	Sample Size	Imaging	Imaging Timing
Chon Y,202029 South Korea (Daegu); hospital; 22 February to 3 April 2020 Added for November 2020 update	COVID–19 based on SARS–CoV–2 RT–PCR, hospitalized, with CT within the first week of hospitalization	Age (mean, years): 62 Female: 73% Fever: 29% Chills: 18% Cough: 38% Sputum: 29% Rhinorrhea: 12% Myalgia: 26% Dyspnea: 16% HTN: 31% DM: 19% Chronic lung disease: 6.1% Cardiovascular disease: 7.6% Absolute lymphocyte count (cells/	n=281 Hospitalized: n=281 (100%) Intubation or mortality: n=10 (3.6%)	Slice thickness: 1 mm Tube voltage 120 kVp; tube current 60 mAs with automatic exposure control	Within first week of hospitalization

		<p>μL): 1,510 C-reactive protein (mg/dL): 0.2 LDH (U/L): 424</p>			
<p>Colombi D, 202031 Italy(Piacenza) ; ED; 17 February to 10 March 2020</p>	<p>SARS-CoV-2 RT-PCR positive, with imaging findings on chest CT.</p>	<p>ICU admission or death vs. no ICU admission or death Age (mean, years): 73 vs. 62 Female: 26% vs. 24% Smoking (current or former): 18% vs. 10% CV comorbidities: 71% vs. 39% Pulmonary comorbidities: 20% vs. 14% Chronic kidney failure: 11% vs. 2% Diabetes: 20% vs. 11% Fever: 99% vs. 96% Cough: 62% vs. 60% Dyspnea: 43% vs. 28% Asthenia: 12% vs. 12% Other: 22% vs. 18% Time since symptom onset: 5 vs. 6 Temperature at admission</p>	<p>n=236 Hospitalized: n=236 (100%) ICU admission or death: n=108 (46%)</p>	<p>Reconstruction slice thickness: 1–2 mm Low-dose CT acquisition performed</p>	<p>Emergency department</p>

		(degrees C): 37.8 vs. 37.5 SpO2 (%): 91% vs. 94% WBC count (x 109/L): 6.8 vs. 5.2 Lymphocyte count(x109/L): 0.87 vs. 1.1 C-reactive protein (mg/dL): 13.3 vs. 5.1			
Feng Z,202040 China(Hunan); hospital; 17 January to 1 February 2020 Added for November 2020 update	COVID-19 based on SARS-CoV-2 RT-PCR and admission chest CT	Derivation vs. validation cohorts Age (mean, years): 44 vs. 46 Female: 49% vs. 49% Lymphocyte count(x109/L): 1.1 vs. 1.1 C-reactive protein(mg/L): 17.4 vs. 16.9	Derivation vs. validation cohorts n=141 vs.106 Hospitalized: n=141 (100%) vs. 106 (100%) Mortality: n=1(0.7%) vs. 1(0.9%) ICU admission: n=4 (2.8%) vs. 4 (3.8%) Mechanical ventilation: n=6 (4.3%) vs. 5 (4.7%) Severe pneumonia: n=15 (11%) vs. 10 (9.4%)	Slice thickness: Reconstructed thickness 1mm for transverse scans and 3mm for sagittal and coronal scans	Admission
Francone M, 202041 Italy (Rome); ED; 6 to 22 March 2020 Added for November 2020 update	SARS-CoV-2 RT-PCR positive, with CT	Age (mean, years): 63 Female: 35% Symptomatic: 100% Fever: 87% Cough: 52% Dyspnea: 43% Diarrhea: 9.2% Increased CRP:	n=130 ospitalized: n=123 (95%) Mortality: n=20 (15%)	Slice thickness: Reconstructed thickness 1mm	Unclear

		87% Increased d-dimer: 88% Leukopenia: 30% Decreased lymphocyte count: 62% Decreased O2 saturation: 40% Decreased PaO2/FiO2 ratio: 66% Critical: 6.9% Severe: 32% Mild: 61%			
202053 Italy (Rome); hospital; 5 to 24 March 2020 Added for November 2020 update	SARS-CoV-2 pneumonia (RT PCR positive)who underwent CT at admission	Age (mean, years): 61 Female: 36% SaO2: 97% PaO2/FiO2: 323	n=189 Hospitalized: n=189 (100%) ICU with mechanical ventilation: n=27 (14%)	Reconstruction slice thickness: 1 mm Tube voltage 120 kV; tube current 100 mAs	Admission
Li K, 202054 China (Tongji); hospital; 31 January to 5 March 2020 Added for November 2020 update	COVID-19 (SARS-CoV-2 RT-PCR positive), with CT within 1 week of admission	Age(mean, years): 57 Female: 42% DM: 15% HTN: 30% Coronary heart disease: 4% Chronic obstructive pulmonary disease: 2% Cancer: 3% Current smoker: 7% Fever: 92% Chills: 23% Cough: 75% Dyspnea: 51% Chest pain:	n=102 Hospitalized: n=102 (100%) Mortality: n=15 (15%)	Reconstruction slice thickness: 1.00 or 1.25mm Tube voltage 120 or 120kV, automatic tube current modulation at 100 to 400 mA	Within 1 week of admission

		<p>7%</p> <p>Fatigue: 34%</p> <p>Myalgia: 24%</p> <p>Respiratory rate >20/minute: 46%</p> <p>Duration from symptom onset (days): 11</p> <p>LDH >225 U/L: 74%</p> <p>D-dimer >1 µg/mL: 45%</p> <p>C-reactive protein ≥3 mg/L: 84%</p>			
<p>Li Y, 2020⁵⁵</p> <p>China (Tongji); hospital; 21 January to 14 February 2020</p> <p>Added for November 2020 update</p>	<p>≥60 years of age, SARS-CoV-2 infection (RT-PCR positive), with CT prior to admission or within 24 hours of admission</p>	<p>Age (mean, years): 71</p> <p>Female: 34%</p> <p>Fever: 80%</p> <p>Cough: 45%</p> <p>Dyspnea: 17%</p> <p>Chest tightness: 9.2%</p> <p>Fatigue and poor appetite: 21%</p> <p>Duration of symptoms (median, days): 7</p>	<p>n=98</p> <p>Hospitalized: n=98 (100%)</p> <p>Mortality: n=46 (47%)</p>	<p>Reconstruction slice thickness: 1.25 mm</p> <p>Other parameters not reported ('no standard CT protocol applied')</p>	<p>Prior to admission or within 24 hours of admission</p>
<p>Mahdjoub E, 2020⁵⁸</p> <p>France (Paris); hospital; 1 to 20 March 2020</p> <p>Added for November 2020 update</p>	<p>COVID-19 (SARS-CoV-2 RT-PCR positive) with admission CT</p>	<p>Mechanical ventilation or death vs. no mechanical ventilation or death</p> <p>Age (median, years): 73.6 vs. 61.4</p> <p>Female: 20% vs. 43%</p> <p>COPD: 15% vs. 3.3%</p> <p>DM: 30% vs. 22%</p> <p>HRN:</p>	<p>n=142</p> <p>Hospitalized: n=142 (100%)</p> <p>ICU or mortality: n=20 (14%)</p>	<p>Details not provided</p>	<p>Admission</p>

		40% vs. 45% Coronary heart disease: 25% vs. 12% Cerebrovascular disease: 20% vs. 5.7% Respiratory rate (times/minute): 22 vs. 20 Oxygen saturation,%: 93 vs. 97			
Matos J, 202059 Italy (Genoa); EDI; 1 to 22 March 2020 Added for November 2020 update	Pneumonia symptoms (two or more of the following: fever, cough, dyspnea), SARS-CoV-2 RT-PCR positive, and positive CT scan	Age (median, years): 64 Female: 39% ≥1 comorbidity: 38% Symptomatic: 100% Duration of symptoms at time of CT (median,days); 5 Lymphocyte (% , median): 18.8 C-reactive protein (mg/L, median): 4.94	n=106 Hospitalized: n=97 (92%) Mortality: n=25 (24%) Mechanical ventilation: n=17 (16%)	Reconstruction slice thickness: 1.25 mm Tube voltage: 120 kVP smart mA tube current modulation (range 100 to 400 mA)	Admission
Raoufi M, 202064 Iran (Tehran); EDI; 22 February to 22 March 2020 Added for November 2020 update	COVID-19 (SARS-CoV-2 RT-PCR positive), with CT	Age (median, years): 54 Female: 34% Cough: 60% Fever: 56% Dyspnea: 48% DM: 23% Cardiovascular disease:13% HTN: 12%	n=380 Hospitalized: n=154 (54%) Mortality: n=29 (7.6%)	Slice thickness: 4 mm Tube voltage: 100 kVP, tube current 50 to 100 mAs	Emergency department
Ruch Y, 202065 France (Strasbourg); hospital:March	Hospitalized for COVID-19 (SARS-CoV-2 PCR positive), with CT	Age (mean, years): 66 Female: 40% BMI (mean, kg/m2): 28.9	n=572 Hospitalized: n=572 (100%) Early severe	Reconstruction slice thickness: 1 mm Tube voltage: 100 to 135 kV,	Admission

2020 Added for November 2020 update		DM: 25% HTN: 52% Chronic heart failure: 10% Chronic lung disease: 17% Fever: 76% Dyspnea: 70% Cough: 66% Chest pain: 9% SpO2 (mean): 93% Time from symptom onset to CT (mean,days):6.5 C-reactive protein(mean, mg/L): 88.2 Lymphocyte count(mean, cells/mm3):882 Lactate(mean, mmol/L):1.0	disease (death or ICU admission in the 7 days after hospital admission): n=206 (36%)	tube current maximum 2-50 mAs	
Sabri A, 202066 Iran (Tehran); hospital; 21 February to 17 March 2020 Added for November 2020 update	Hospitalized and SARS-CoV-2 RT-PCR positive, with CT	Age (mean, years): 54 Female: Not reported RR >20/minute: 18% Pulse rate >100/minute: 33% Fever >38 degrees C:43% Oxygen saturation <88%: 20%	n=63 Hospitalized: n=63 (100%) Mortality: n=9 (14%) ICU: n=18 (29%)	Technical parameters not reported	Admission
Wang X, 202072 China (Hubei); hospital; dates not reported Added for	Hospitalized with COVID-19 (SARS-CoV-2 RT-PCR positive) and at least 2 CT scans	Age (median, years): 42 Female: 45% HTN: 13% DM: 3.7% Cardiovascular disease: 2.5%	n=161 Hospitalized: n=161 (100%) Mortality: n=15 (9.3%) Survivors with severe	Slice thickness: Not reported Tube voltage: 120 kV, tube current varied	Unclear

November 2020 update		<p>Fever: 84%</p> <p>Myalgia: 29%</p> <p>Dry cough:48%</p> <p>Fatigue: 37%</p> <p>Dyspnea: 5.6%</p> <p>Chest tightness: 17%</p> <p>Respiratory rate (median, per minute): 20</p> <p>Lymphocyte count <1.5 10⁹/L: 88%</p> <p>D-dimer ≥0.5 mg/L: 27%</p> <p>LDH (median, U/L): 191</p>	<p>disease: n=55 (34%)</p> <p>COVID-19 complication: 37 (23%)</p>		
Yuan M, 202075 China(Wuhan); hospital: 1 to 25 January 2020	<p>Diagnosed with COVID-19 (SARS-CoV-2 RT-PCR positive) and discharged with recovered symptoms or died in hospital.</p>	<p>Mortality vs. survival</p> <p>Age (median, years): 68 vs. 55</p> <p>Female: 60% vs. 53%</p> <p>Time since symptom onset (median,days):8</p> <p>HTN: 50% vs. 0%</p> <p>DM: 60% vs. 0%</p> <p>Cardiac disease: 30% vs. 0%</p> <p>Fever: 60% vs. 88%</p> <p>Cough: 50% vs. 65%</p> <p>Myalgia: 10% vs. 12%</p> <p>Dyspnea: 100% vs. 6%</p>	<p>n=27</p> <p>Hospitalized: n=27 (100%)</p> <p>Mortality: n=10 (37%)</p>	<p>Slice thickness: 5 mm</p>	Unclear
Zheng Y, 202076 China(Wuhan); hospital: 21	<p>COVID-19 (SARS-CoV-2 RT-PCR positive),</p>	<p>Training vs. validation cohort Age (mean, years):</p>	<p>Training vs. validation cohort n=166 vs. 72</p>	<p>Slice thickness: 1 mm</p> <p>Tube voltage and current</p>	Admission

January to 3 March 2020 Added for November 2020 update	admission CT, and minimum hospital stay of 7 days	44 vs. 45 Female: 38% vs. 47% Duration (median,days): 3 vs. 4 Fever: 80% vs. 69% Cough: 52% vs. 43% Fatigue: 14% vs. 12% Chest distress: 12% vs. 10% Cardiovascular and cerebrovascular disease: 9.0% vs. 8.3% Malignancy: 2.4% vs. 2.8% Lymphocyte count (x10 ⁹ /L): 1.10 vs. 1.34 C-reactive protein(mg/L): 12.80 vs. 9.80 Oxygen treatment: 31% vs. 29%	Hospitalized: n=166 (100%) vs. 72 (100%) ICU, mechanical ventilation, or mortality: n=35 (21%) vs. 10 (14%)	not reported	
Author, Year Country Clinical Setting Study Dates	Imaging Predictors	Imaging Reader	Outcome	Results	Risk of Bias and Other Limitations
Chon Y, 2020 South Korea (Daegu); hospital; 22 February to 3 April 2020 Added for November 2020 update	CT severity score 0 to 40 (Yang et al 99), 20 segments scored 0 to 2	Two radiologists with 3 and 9 years of experience	Intubation or death	Intubation or death (HR) Model 1 CT score >5: Adjusted HR 7.29 (1.37-38.68) Pleural effusion: Adjusted HR 5.67 (1.04-30.8)	High

				<p>Model 2 Consolidation with or without ground glass opacity: Adjusted OR 1.87 (0.40–8.70) Crazy paving appearance: Adjusted HR 4.27 (0.96–19.00)</p>	
<p>Colombi D, 202031 Italy(Piacenza); ED; 17 February to 10 March 2020</p>	<p>1: Clinical model 2: Model with % lung well-aerated assessed visually and clinical parameters; threshold not prespecified 3: Model with % lung well-aerated assessed with software and clinical parameters; threshold not prespecified 4: Model with clinical parameters, well aerated lung volume <2.9 L and adipose tissue are >262 cm²; threshold not</p>	<p>1: Not applicable 2: 2 radiologists with 5 and 14 years of experience 3: Software to calculate CT parameters 4: Software to calculate CT parameters</p>	<p>ICU admission or death</p>	<p>Sensitivity 1: 0.75 (0.66–0.82) 2: 0.72 (0.63–0.80) 3: 0.75 (0.66–0.83) 4: 0.75 (0.66–0.83) Specificity 1: 0.73 (0.65–0.81) 2: 0.81 (0.73–0.88) 3: 0.80 (0.72–0.86) 4: 0.81 (0.73–0.88) Positive predictive value 1: 0.70 (0.61–0.78) 2: 0.76 (0.68–0.82) 3: 0.75 (0.68–0.81) 4: 0.77 (0.69–0.83) Negative predictive</p>	<p>High</p>

	pre-specified			value 1: 0.78 (0.72–0.83) 2: 0.78 (0.73–0.83) 3: 0.80 (0.73–0.85) 4: 0.79 (0.74–0.84) AUROC 1: 0.83 (0.78–0.88) 2: 0.86 (0.81–0.90) 3: 0.86 (0.80–0.90) 4: 0.86 (0.81–0.90)	
Feng Z, 202040 China(Hunan); hospital; 17 January to 1 February 2020 Added for November 2020 update	CT severity score 0 to 25 based on extent of involvement of 5 lobes	Two radiologists with >10 years of experience, 3rd radiologist to resolve disagreement	Severe pneumonia (respiratory distress [respiratory rate ≥30/minute], hypoxia [oxygen saturation ≤93% resting], hypoxemia [arterial blood oxygen partial pressure/oxygen concentration ≤300 mm Hg], critically ill [mechanical ventilation, shock, ICU admission])	Severe pneumonia Derivation vs. validation cohort CT severity score: Adjusted OR 1.19 (1.01–1.41) vs. NR AUROC for multivariate nomogram (age, neutrophil to lymphocyte ratio, and CT severity score): 0.87 (0.77–0.96) vs. 0.90 (0.81–0.98)	Moderate Risk estimate for CT severity score not reported for validation cohort
Francone M, 202041 Italy (Rome); ED; 6 to 22 March 2020 Added for	CT severity score 0 to 25 (Pan et al) based on extent of involvement	Not reported	Mortality	Mortality CT score ≥18 vs. <18: Adjusted HR 3.74 (1.10–12.77)	High

November 2020 update	of 5 lobes			AUROC for multivariate model: 0.76 (0.65 to 0.88)	
202053 Italy (Rome); hospital; 5 to 24 March 2020 Added for November 2020 update	CT semiautomatic quantitative lung volume involvement (%)	Two radiologists with at least 10 year experience with aid of semiautomatic system	ICU with mechanical ventilation	ICU with mechanical ventilation Lung volume involvement >23.0%: Sensitivity 0.96 (0.81–0.999) and specificity 0.96 (0.92–0.99), AUC 0.98 (0.95–1.00)	Moderate
Li K, 202054 China (Tongji); hospital; 31 January to 5 March 2020 Added for November 2020 update	CT severity score 0 to 25 (Chang et al) based on extent of involvement in 5 lobes	Two radiologists, with consensus	Mortality	Mortality, among patients with CT within 1 week of symptom onset CT total severity score (per unit increase): Adjusted OR 1.54 (1.00–2.37) CT total severity score ≥15 vs. <15: OR 35.00 (3.32–368.57) (not included in multivariate model)	Moderate Analysis restricted to patients with CT within 1 week of symptom onset
Li Y, 202055 China (Tongji); hospital; 21 January to 14 February 2020 Added for November	CT severity score 0 to 60 (Chung et al), based on extent of involvement of 5 lobes	Two radiologists with 8 and 3 years of experience: with consensus	Mortality	Mortality ≤ 5 days subgroup: CT score >14.5 sensitivity 0.83 and	Moderate

2020 update	(each scored 0 to 12)			specificity 0.77; adjusted AUC 0.88 (0.79–0.98) 6–10 days subgroup: CT score ≥ 27.5 sensitivity 0.88, specificity 0.71, AUC 0.90 (0.68–0.98)	
Mahdjoub E, 202058 France (Paris); hospital; 1 to 20 March 2020 Added for November 2020 update	CT severity score 0 to 25, based on extent of involvement of 5 lobes (each scored 0 to 5)	Two radiologists, other details not provided	ICU or mortality	ICU or mortality CT score ≥ 13 vs. < 13 : Adjusted OR 44.24 (8.61–227.36) CT score (AUC): 0.85	Moderate
Matos J, 202059 Italy (Genoa); EDI; 1 to 22 March 2020 Added for November 2020 update	CT quantitative volume of disease	1 of 2 radiologists with 10 and 15 years of experience	ICU or mortality	ICU or mortality CT quantitative volume of disease: AUC 0.75 (CI not reported)	Moderate
Raoufi M, 202064 Iran (Tehran); ED; 22 February to 22 March 2020 Added for November 2020 update	CT severity score 0 to 25 (Pan et al 100), based on extent of involvement of 5 lobes (each scored 0 to 5)	1 radiologist with 10 years of experience	Mortality	Mortality CT severity score > 12 : sensitivity 0.76 (0.56–0.89) and specificity 0.76 (0.71–0.80) CT severity score: AUC: 0.80 (0.72–0.88)	Moderate
Ruch Y, 202065 France	CT lung involvement $> 50\%$	2 radiologists	Early severe disease (death or ICU)	Early severe disease CT lung	Moderate

(Strasbourg); hospital; March 2020 Added for November 2020 update			admission in the 7 days after hospital admission)	involvement >50%: Adjusted OR 2.35 (1.24–4.46)	
Sabri A, 202066 Iran (Tehran); hospital; 21 February to 17 March 2020 Added for November 2020 update	CT severity score 0 to 20 (Jin et al 101), based on extent of involvement of 5 lobes (each scored 0 to 4) Number of lobes involved Pericardial effusion	2 radiologists with 5 years of experience, 3rd radiologist to resolve disagreements	Mortality ICU	Mortality CT severity score: 9.8 (non survivor) vs. 7 (survivor), p=0.04; not retained in multivariate model Lobes involved: 4.9 vs. 4, p<0.001; adjusted OR 7.64 (1.58–13.68) ICU admission CT severity score: 8.7 (ICU) vs. 7 (non-ICU), p=0.15; not retained in multivariate model Lobes involved: 4.8 vs. 4, p=0.03; not retained in multivariate model Pericar- dial effusion: 26.6% vs. 4.2%, p=0.03; adjusted OR 1.14 (95% CI 1.11 to 1.70)	High

Wang X, 202072 China (Hubei); hospital; dates not reported Added for November 2020 update	CT severity score 0 to 15 based on extent of involvement of 5 lobes (each scored 0 to 3)	2 physicians in each hospital (5 to 25 years of experience), with consensus	COVID-19 complication (ARDS, acute kidney injury, liver dysfunction, acute coronary injury, septic shock, arrhythmia, secondary infection)	COVID-19 complication CT severity score >10 vs. ≤5: Adjusted OR 31.28 (2.97-329.80) CT severity score 5-10 vs. ≤5: Adjusted OR 5.86 (1.70-20.23)	Moderate
Yuan M, 202075 China(Wuhan); hospital: 1 to 25 January 2020	CT score > 24.5; sum of radiologic score (1=normal attenuation, 2=ground glass, 3=consolidation) times lung parenchyma distribution score (1=<25% abnormality, 2=25-50%, 3=50-75%, 4=over 75%) for 6 lung zones (range 0 to 72)	Two radiologists, discrepancies resolved by consensus	Mortality	Sensitivity: 0.96 (CI NR) Specificity: 0.84 (CI NR) AUROC: 0.90 (0.87-0.93)	High
Zheng Y, 202076 China(Wuhan); hospital: 21 January to 3 March 2020 Added for November 2020	CT severity score 0 to 24 (Ooi et al102) based on extent of involvement of 6 lobes (each scored 0 to 4)	2 radiologists with 20 and 23 years of experience	ICU, mechanical ventilation, or mortality	ICU, mechanical ventilation, or mortality CT severity score: Adjusted HR 1.07 (0.99-1.15)	Moderate

				<p>Crazy paving sign: Adjusted HR 2.15 (1.03–4.48) Training vs. validation cohort Radiological model: AUC 0.71 (0.63–0.89) vs. 0.87 (0.80–0.94) Clinical model: AUC 0.78 (0.72–0.84) vs. 0.81 (0.74–0.88) Combined model: 0.82 (0.76–0.88) vs. 0.89 (0.82–0.96)</p>	
--	--	--	--	---	--

CXR: Studies on the Association Between Imaging Findings and Health Outcomes in Persons With COVID-19

Author, Year Country Clinical Setting Study Dates	Eligibility Criteria	Population characteristics	Sample Size	Imaging	Imaging Timing
Cocconcelli E, 2020 Italy (Padua); hospital; March to May 2020 Added for November 2020 update	SARS-CoV-2 RT-PCR positive, with CXR	Age (mean, years): 68 Female: 27% Current smoker: 9% BMI(kg/m ²): 25 Duration of symptoms: 4 pO ₂ at admission (mmHg): 90 P/F at	n=102 High-intensity medical care: n=31 Low-intensity medical care: n=71	Chest x-ray	Admission

		admission:429 Cardiovascular disease: 59% Respiratory disease:18% Oncologic: 13%			
Kerpel A, 202048 Israel (Tel Aviv); ED; 6 to 31 March 2020 Added for November 2020 update	SARS-CoV-2 RT-PCR positive, with CXR	Age (mean, years): 57 Female: 25% Symptomatic: Not reported	n=104 Hospitalized: n=104 (100%) ICU: n=14 (13%) Mortality: n=7 (6.7%) Intubation: n=14 (13%)	Chest x-ray	Emergency department
Kim H, 202049 USA (New York); ED; 12 to 26 March 2020 Added for November 2020 update	Symptomatic (fever, cough, dyspnea, or hypoxia), SARS CoV-2 RT-PCR test, with CXR	Age (mean, years): 59 Female: 50% Symptomatic: 100% SARS-CoV-2 positive: 31% (55% were not tested)	n=416 Hospitalized: n=416 (100%) Intubated: n=32 (7.7%) Mortality: n=20 (4.8%)	Chest x-ray	Emergency department
Lichter Y, 202056 Israel (Tel Aviv); medical ward or ICU; 21 March to 4 May 2020 Added for November 2020 update	COVID-19 (SARS-CoV-2 RT-PCR positive), with CXR	Age (mean, years): 65 Female: 38% Ischemic heart disease: 18% Congestive heart failure: 9.2% Transient ischemic attack/stroke: 12% DM: 28% Smoking:11% HTN: 56% Lymphocyte count(median, 103/ μ L): 1.1 C-reactive protein(media	n=120 Hospitalized: 120 (100%) Mortality: 23 (19%) Intubation: 14(12%)	Chest x-ray	Admission

		n, mg/L):55.4 D-dimer (median,mg/L): 0.83 O2 saturation: 95% Sequential organ failure assessment score (median): 1			
Toussie D, 202070 USA (New York); ED; 10 to 26 March 2020	Age 21 to 50 years, SARS CoV-2 RT-PCR positive, with CXR	Age (mean, years): 39 Female: 38% Time from symptom onset (median,days):4 Current smoker: 15% BMI ≥31 kg/m2 : 48% Asthma: 14% HTN: 16% DM: 12% HIV: 2% Febrile: 30%	n=338 Hospitalized: n=145 (100%) Intubation: n=28 (8.3%) Mortality: n=10 (3.0%)	Chest x-ray	Emergency department
Author, Year Country Clinical Setting Study Dates	Imaging Predictors	Imaging Reader	Outcome	Results	Risk of Bias and Other Limitations
Cocconcelli E, 202030 Italy (Padua); hospital; March to May 2020 Added for November 2020 update	CXR score 0 to 36 (0 to 3 for each of 12 lobes)	Two radiologists with >10 years of experience	High intensity medical care (invasive/non invasive ventilation or high-flow nasal cannula requiring admission to ICU)	High intensity medical care X-ray global score >3 vs. <3: Adjusted OR 0.40 (0.02–3.63)	Moderate
Kerpel A, 202048 Israel (Tel Aviv); ED; 6 to 31 March 2020	CXR RALE score 0 to 48 (0 to 4 for each of 12 lobes)	Poor outcome (ICU hospitalization, intubation , or death)	A: Radiologist with 28 years of experience B: Radiologist with 40 years	Poor outcome Reader 1: AUROC 0.84 (0.74–0.94) Reader 2:	Moderate

Added for November 2020 update			of experience	AUROC 0.77 (0.64–0.91)	
Kim H, 202049 USA (New York); ED; 12 to 26 March 2020 Added for November 2020 update	Graded 1 to 3 based on extent of alveolar opacities	1 experienced radiologist with >20 years of experience	Time to discharge Intubation Mortality	CXR grade (HR [unclear if adjusted], per grade increase) Time to discharge: 0.61 (0.51–0.73) Intubation: 3.69 (2.25–6.07) Mortality: 1.45 (0.83–2.54)	High
Lichter Y, 202056 Israel (Tel Aviv); medical ward or ICU; 21 March to 4 May 2020 Added for November 2020 update	Presence of bilateral infiltrates, lobar infiltrates, pleural effusion, or hilar congestion	Not reported	Mortality Intubation Intubation or death	Mortality Bilateral infiltrates: HR 2.5 (1.07–6.1) Lobar infiltrates: HR 1.2 (0.2–4.3) Pleural effusion: HR 1.7 (0.5–5.0) Hilar congestion: HR 3.7 (1.07–10.2) Intubation Bilateral infiltrates: HR 2.5 (0.8–9.6) Lobar infiltrates: HR 1.7 (0.3–6.6) Pleural	High

				effusion: HR 1.8 (0.4–6.1) Hilar congestion: HR 0.7 (0.05–4.0) Intubation or mortality Bilateral infiltrates: HR 1.9 (0.8–4.4) Lobar infiltrates: HR 1.8 (0.5–4.8) Pleural effusion: HR 1.2 (0.3–3.2) Hilar congestion: HR 2.4 (0.55–7.0)	
Toussie D, 202070 USA (New York); ED; 10 to 26 March 2020	CXR score 0 to 12 (0 to 1 for each of 12 lobes)	Two radiologists with 10 and 26 years of experience	Hospital admission Intubation Prolonged stay	Hospital admission, all patients, CXR score ≥ 2 Sensitivity: 0.66 (0.58 to 0.74) Specificity: 0.79 (0.73 to 0.85) AUROC: 0.77 (0.72 to 0.82) Adjusted OR: 6.2 (3.5 to 11) Intubation, admitted patients, CXR score ≥ 3	Moderate

				Sensitivity: 0.68 (0.48 to 0.84) Specificity: 0.67 (0.57 to 0.75) AUROC: 0.74 (0.64 to 0.84) Adjusted OR: 4.7 (1.8 to 13) Prolonged stay, admitted patients, CXR score ≥ 3 Sensitivity: 0.52 (0.33 to 0.71) Specificity: 0.63 (0.53 to 0.72) AUROC: 0.62 (0.50 to 0.73) Adjusted OR: 1.1 (0.8 to 1.5)	
--	--	--	--	---	--