Supplementary Table S1. Search strategy of this systematic review and meta-analysis.

#1 (((((((((Diagnostic Ultrasound) OR (Echography)) OR (Sonography, Medical)) OR (Ultrasonic Imaging)) OR (Ultrasonographic Imaging)) OR (Echotomography, Computer)) OR (Ultrasonic Tomography)) OR (Ultrasonic Diagnoses)) OR (lung ultrasound)) OR (Pulmonary Ultrasonography)
#2 (((((((connective tissue diseases) OR (rheumatoid arthritis)) OR (Systemic Scleroderma)) OR (Systemic Sclerosis)) OR (systemic lupus erythematosus)) OR (Sjogren's syndrome)) OR (spondyloarthritis)) OR (psoriasis)
#3 (((((((Interstitial Lung Diseases) OR (Diffuse Parenchymal Lung Diseases)) OR (Lung Disease, Interstitial)) OR (Interstitial Pneumonia)) OR (Interstitial Pneumonitides)) OR (Interstitial Pneumonitis)) OR (idiopathic pulmonary fibrosis)) OR (sarcoidosis)
#4 (sensitivity) AND (specificity)
#5 #1 AND #2 AND #3 AND 4

Supplementary Table S2. Screening protocols and performance of LUS in CTD-ILD.

Author	Criteria of ultrasound-defined ILD	Probe type and frequency	Number of intercostal spaces for LUS	TP	FP	FN	TN	Total
Vermant 2025	B-lines >5	Curved 3.5 MHz array probe	72	12	43	0	54	109
Ottaviani 2025	B-lines>5	5–13 MHz linear probe	14	39	4	5	53	101
Ferro 2025	Pleural irregularity score ≥15	10–15 MHz, 5 cm linear probe	N	20	5	3	33	61
Sofíudóttir 2024	B-lines ≥10 and visceral pleural thickening	1–5 MHz convex transducer (C251)	14	19	26	4	28	77
Otaola 2024	B-lines ≥5	A convex probe (1–8 MHz)	14	29	20	3	54	106
Han 2024	B-lines and pleural thickness	A convex probe (2.0–9.0 MHz) and a linear array probe (5–12 MHz)	12	70	4	5	25	104
Zhang 2023	B-lines, pleural lines, complications and pleural effusions	a linear probe (4.0–13.0 MHz) and a convex probe (1.0–7.0 MHz).	72	44	2	1	13	60
Koshy 2023	B-lines and pleural line	Linear probe of 8–12 Mhz and convex probe of 4 MHz	N	29	1	2	10	42
Huang 2023	B-lines >10	A 2–10 MHz high frequency linear array probe	14	56	4	9	19	88
Gutierrez 2022	B-lines >5	5–13 and 4–12 MHz broadband multifrequency linear transducers	14	25	5	2	42	74
Gargani 2022	B-lines >6	Convex (3.5–6.0 MHz) or linear transducers (7.0–10.0 MHz)	14	28	8	5	28	69
Carlo 2022	B-lines >9	A 4–13 MHz linear probe	14	18	1	7	46	72
Xie 2021	Semi-quantitative scoring of pleural lines	A 5–12 MHz linear probe	N	48	2	18	32	100
Mena-Vázquez 2021	B-lines ≥50	A multifrequency (1–8 MHz) curved linear transducer	72	26	1	9	35	71
Fotoh 2021	B-lines ≥3 in a segment or >5 in adjacent spaces	A 4–13 MHz broadband linear transducer	14	75	0	0	75	150
Fairchild 2021	Pleural thickening and irregularity	A medium frequency linear probe	14	11	2	0	7	20
Buda 2021	B-lines and pleural line	A 2–6 MHz convex transducer and a 4–12 MHz linear transducer	16	27	1	1	147	176
Wang 2020	B-lines, pleural lines and pulmonary sliding sign	2–5 MHz convex array and 3–9 MHz linear array transducers	50	47	2	1	10	60
Tu 2020	B-lines	A 5–10 MHz linear probe	12	36	5	3	19	63
Ji 2019	B-lines	A 5–12 Hz convex probe	10	41	4	9	16	70
Hassan 2019	B-lines >5	A convex transducer of 3.5 MHz	72	29	25	0	13	67
Tardella 2018	B-lines >10	A 4–13 MHz broadband linear transducer	14	26	1	1	12	40
Edis 2016	B-lines ≥3 in a region or >5 in adjacent spaces	A 5–10 MHz linear probe	14	29	3	0	16	48
Sperandeo 2015	B-lines >3	A 3.5–5 MHz convex probe	N	134	2	15	24	175
Moazedi-Fuerst 2015	B-lines and pleural line	A convex 3.5 MHz transducer and a linear probe	18	13	2	0	5	20
Mohammadi 2014	B-lines >5	A 7–10 MHz broad band linear multi-frequency transducer	10	39	2	14	15	70
Moazedi-Fuerst 2014	B-lines and pleural line	A convex 3.5 MHz transducer and a linear probe	18	16	2	1	45	64
Cogliati 2014	B-lines ≥17	A 5–2 MHz convex probe	72	12	7	1	19	39

TP: true positive; FP: false positive; FN: false negative; TN: true negative.

Supplementary Table S3. The PLR, NLR and DOR of LUS in screening CTD-ILD, RA-ILD and SSc-ILD.

Type	PLR	NLR	DOR
CTD-ILD	7.5 (4.8, 11.6)	0.09 (0.06, 0.13)	86 (45, 164)
RA-ILD	9.3 (3.5, 24.7)	0.10 (0.05, 0.20)	96 (24, 379)
SSc-ILD	4.4 (2.4, 8.1)	0.05 (0.01, 0.23)	95 (20, 439)

CTD-ILD: connective tissue disease-related interstitial lung disease; sROC curve: summary receiver operating characteristic curve; RA-ILD: rheumatoid arthritis-related interstitial lung disease; SSc-ILD: systemic sclerosis-related interstitial lung disease.

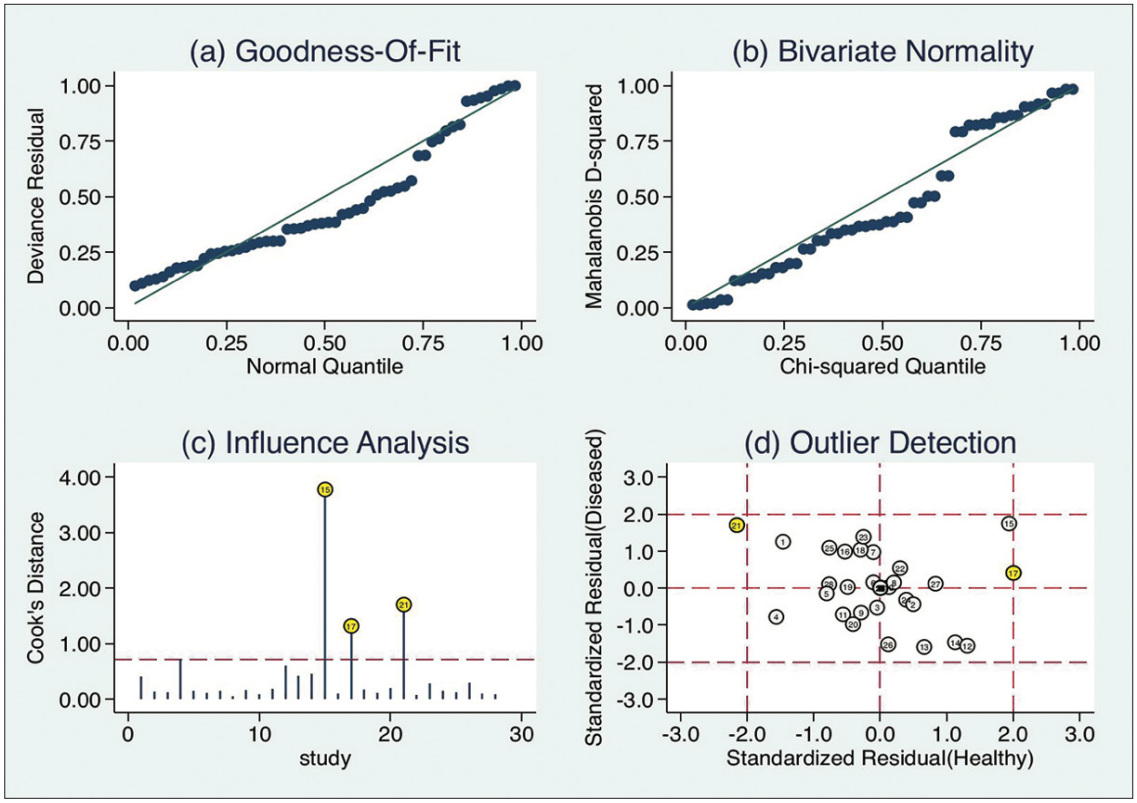
Question: Should lung ultrasound be used to diagnose interstitial lung disease in patients with connective tissue diseases?

Sensitivity	0.92 (95% CI: 0.88 to 0.95)
Specificity	0.88 (95% CI: 0.81 to 0.92)

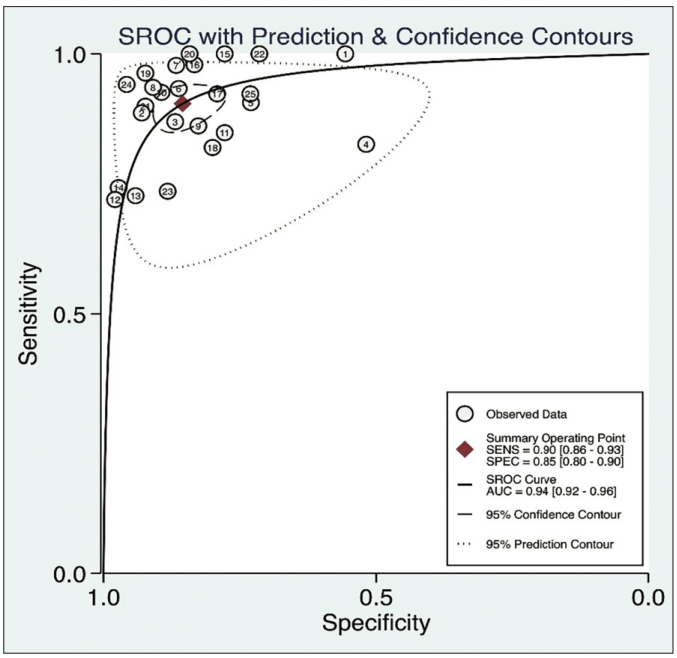
Prevalences	50.87%							

Outcome	№ of studies (№ of patients)	Study design	Factors that may decrease certainty of evidence					Effect per 1,000 patients tested	Test accuracy CoE
			Risk of bias	Indirectness	Inconsistency	Imprecision	Publication bias	pre-test probability of 50.87%	
True positives (patients with interstitial lung disease)	28 studies 1182 patients	cohort & case-control type studies	serious	not serious	not serious	not serious	publication bias strongly suspected	468 (448 to 483)	⨁⨁◯◯ Low
False negatives (patients incorrectly classified as not having interstitial lung disease)								41 (26 to 61)	
True negatives (patients without interstitial lung disease)	28 studies 1014 patients	cohort & case-control type studies	serious	not serious	not serious	not serious	publication bias strongly suspected	432 (398 to 452)	⨁⨁◯◯ Low
False positives (patients incorrectly classified as having interstitial lung disease)								59 (39 to 93)	

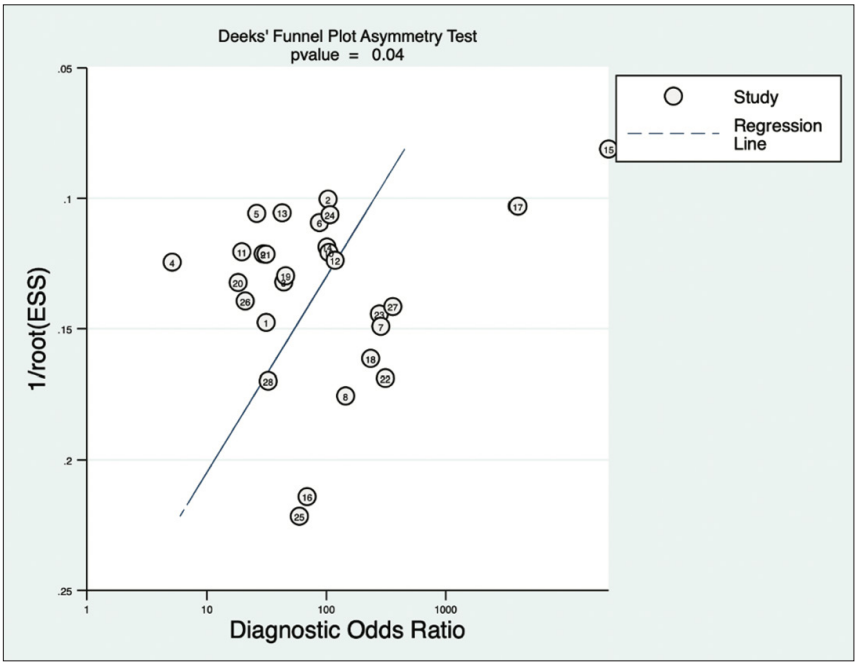
Supplementary Fig. S1. The certainty of evidence for LUS in detecting ILD among patients with CTD.
LUS: lung ultrasound; ILD: interstitial lung disease; CTD: connective tissue diseases.



Supplementary Fig. S2. Sensitivity analysis of LUS performance in detecting ILD among patients with CTD.
LUS: lung ultrasound; ILD: interstitial lung disease; CTD: connective tissue diseases



Supplementary Fig. S3. ROC curve analyses after excluding outliers.



Supplementary Fig. S4. Publication bias assessments.