Supplementary Table S1. Charlson Comorbidity Index score calculation.

Original Charlson Comorbidity Index		Adaptation	
Item	Score	Item	Score
Cerebrovascular disease	1	Patient-reported stroke/TIA*	1
Congestive heart failure	1	LVEF≤50%*	1
COPD/asthma	1	Patient-reported COPD or asthma	1
Dementia	1	Not recorded; excluded	N/A
Depression	1	Not recorded; excluded	N/A
Hypertension	1	Patient-reported hypertension*	1
Diabetes without end organ dysfunction	1	Patient-reported diabetes*	1
Diabetes with end organ damage	2	Not recorded; excluded	N/A
Liver disease - mild	1	Not recorded; excluded	N/A
Liver disease – moderate or severe	3	Not recorded; excluded	N/A
Myocardial infarction	1	Patient-reported angina or myocardial infarction*	1
Peripheral vascular disease	1	Patient-reported peripheral vascular disease or treatments*	1
Rheumatic disease	1	Applicable to all patients with SSc	1
Peptic ulcer disease	1	Excluded; not recorded independently of other gastrointestinal SSc manifestations	N/A
Hemiplegia	2	Not recorded; excluded	N/A
Moderate to severe renal disease	2	Creatinine>265umol/L ever, or previous dialysis or renal transplantation*	2
Any tumour	2	Patient-reported malignancy (excluding NMSC)	2
Metastatic solid tumour	6	Not recorded; excluded	N/A
Skin ulcers or cellulitis	2	Patient-reported non-hand skin ulcers*	2
Takes warfarin	1	Warfarin or other anticoagulation	1
Leukaemia	2	Patient-reported leukaemia	2
Lymphoma	2	Patient-reported lymphoma	2
HIV/AIDS	6	Not recorded; excluded	N/A
Maximum score	**38**	**Maximum Score**	**19**

AIDS: acquired immunodeficiency syndrome; COPD: chronic obstructive pulmonary disease; HIV: human immunodeficiency virus; LVEF: left ventricular ejection fraction; NMSC: non-melanoma skin cancer; SSc: systemic sclerosis; TIA: transient ischaemic attack; umol/L: micromoles per litre.

Supplementary Table S2. Comparison of disease features in those with incident SSc included in the trajectory modelling (≥2 HAQ-DI scores within 10 years of SSc onset), and those excluded from trajectory modelling (<2 HAQ-DI scores within 10 years of SSc onset).

Variable	Included Participants (n=426, 60.4%)	Excluded Participants (n=279, 39.6%)	*p*-value
Age at SSc onset (years)	53.0 (42.8-60.6)	52.5 (42.9-63.2)	0.53
Female sex	352 (82.6%)	219 (78.8)	0.20
dcSSc	140 (32.9%)	123 (44.1%)	<0.01
Died	46 (10.8%)	62 (22.2%)	<0.01
Disease duration at recruitment (years)	1.8 (0.9-3.2)	1.9 (1.0-3.2)	0.38
Follow-up duration (years)	6.0 (3.5-9.1)	1.8 (0-5.3)	<0.01
Medsger Severity Score (baseline)	5 (3-7)	5 (3-7)	0.04
ANA centromere	168 (39.7%)	87 (34.0%)	0.14
RNA polymerase-3	55 (16.5%)	30 (18.9%)	0.52
ENA			
Scl-70	74 (17.6%)	52 (20.7%)	0.31
U1-RNP	32 (7.6%)	17 (6.8%)	0.70
Scl/PM	12 (2.9%)	5 (2.0%)	0.49

ANA: antinuclear antibody; dcSSc: diffuse cutaneous systemic sclerosis; ENA: extractable nuclear antigen; n: number; SSc: systemic sclerosis.

Supplementary Table S3. Group-based trajectory modelling fit statistics.

Trajectory group	Bayesian information criteria	Akaike information criteria	Number	Average posterior probability of group membership	Odds of correct classification
Group 1: Low-Stable HAQ-DI score	-1687.4	-1679.3	221	0.87	6.9
Group 2: High-Increasing HAQ-DI score			205	0.91	9.8

HAQ-DI: health assessment questionnaire disability index.

Supplementary Table S4. Univariable logistic regression modelling for characteristics associated with high-increasing disability trajectory group membership.

	Odds Ratio	95% Confidence Interval	*p*-value
Age at SSc onset (n=422)	1.5	1.0-2.2	0.04
Male sex (n=426)	0.8	0.5-1.4	0.45
dcSSc (n=426)	3.7	2.4-5.7	<0.01
ANA centromere (n=423)	0.5	0.3-0.8	<0.01
ENA Scl70+ (n=421)	1.6	0.9-2.6	0.09
Baseline characteristics[1]			
Multimorbidity (CCI≥4; n=407)	4.3	1.7-10.9	<0.01
Diabetes (n=403)	2.0	0.9-4.6	0.11
HTN (n=405)	2.1	1.4-3.3	<0.01
IHD (n=405)[2]	4.6	1.5-13.9	<0.01
Stroke or transient ischaemic attack (n=397)	2.5	0.8-8.3	0.13
Peripheral vascular disease (n=299)	7.2	0.9-60.3	0.70
DLCO<70% (n=368)	2.4	1.6-3.7	<0.01
FVC<80% (n=387)	1.9	1.1-3.0	0.01
RVSP ≥40mmHg[3] (n=320)	3.5	1.7-6.9	<0.01
Digital Ulceration (n=407)	1.2	0.8-1.8	0.49
Proximal weakness[4] (n=399)	9.0	3.1-26.2	<0.01
Joint contractures (n=404)	3.8	2.3-6.3	<0.01
Synovitis (n=407)	2.0	1.3-3.1	<0.01
Tendon friction rubs (n=400)	4.5	1.5-13.8	<0.01
Gastrointestinal symptoms[5] (n=407)	2.0	1.2-3.2	<0.01
CRP >5IU/L (n=395)	3.0	1.9-4.8	<0.01
CK >140IU/L (n=384)	0.8	0.5-1.4	0.49

CRP: C-reactive protein; dcSSc: diffuse cutaneous SSc; DLCO: diffusing capacity for carbon monoxide; FVC: forced vital capacity; IU/L: international units per litre; n: number; SSc: systemic sclerosis.
[1]Baseline defined as first-recorded value within 5 years of SSc onset.
[2]IHD defined by composite endpoint of patient-reported angina or acute myocardial infarction, or abnormal coronary angiogram.
[3]RVSP≥40mmHg not included in final multivariable model due to higher frequency of missing data.
[4]Proximal weakness defined as scores <5/5 on manual muscle testing. [5]Gastrointestinal symptoms defined as either upper (dysphagia, reflux or vomiting) or lower (history of bowel dysmotility, pseudo-obstruction, constipation, faecal incontinence, diarrhoea or bloating) gastrointestinal symptoms.

Supplementary Table S5. Univariable Cox proportional hazard modelling for all-cause mortality from SSc onset.

	Hazard Ratio	95% Confidence Interval	*p*-value
High/Increasing HAQ-DI trajectory group	2.8	1.5-5.3	<0.01
Baseline HAQ-DI score	1.8	1.2-2.6	<0.01
Age at SSc onset	1.1	1.0-1.1	<0.01
Male sex	3.5	1.9-6.4	<0.01
dcSSc*	2.0	1.1-3.6	0.02
PAH*	8.4	4.6-15.2	<0.01
ILD*	1.9	1.1-3.4	0.03
IHD*[1]	3.3	1.7-6.3	<0.01
Multimorbidity*[2]	1.5	0.8-2.9	0.23
Digital ulcers*	1.6	0.9-3.0	0.130

[1]IHD defined by composite endpoint of patient-reported angina or acute myocardial infarction, or abnormal coronary angiogram.
[2]Multimorbidity defined as Charlson Comorbidity Index Scores≥4.
dcSSc: diffuse cutaneous systemic sclerosis; HAQ-DI: health assessment questionnaire disability index; IHD: ischaemic heart disease; PAH: pulmonary arterial hypertension; SSc: systemic sclerosis.