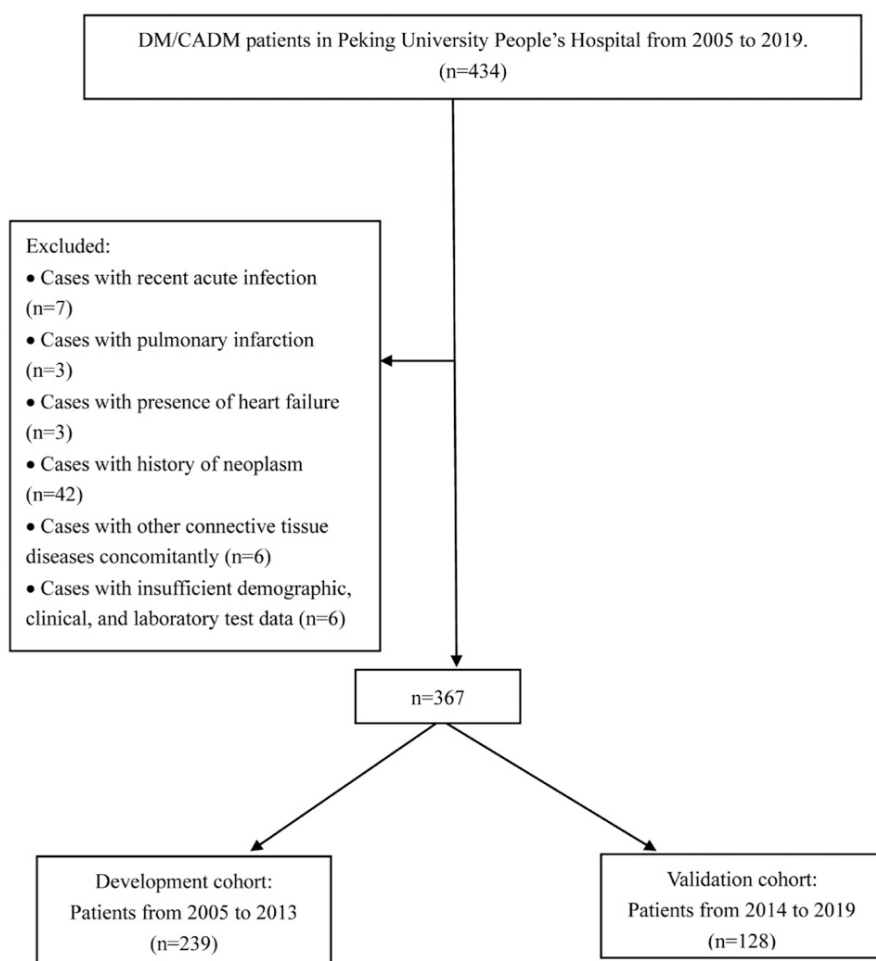
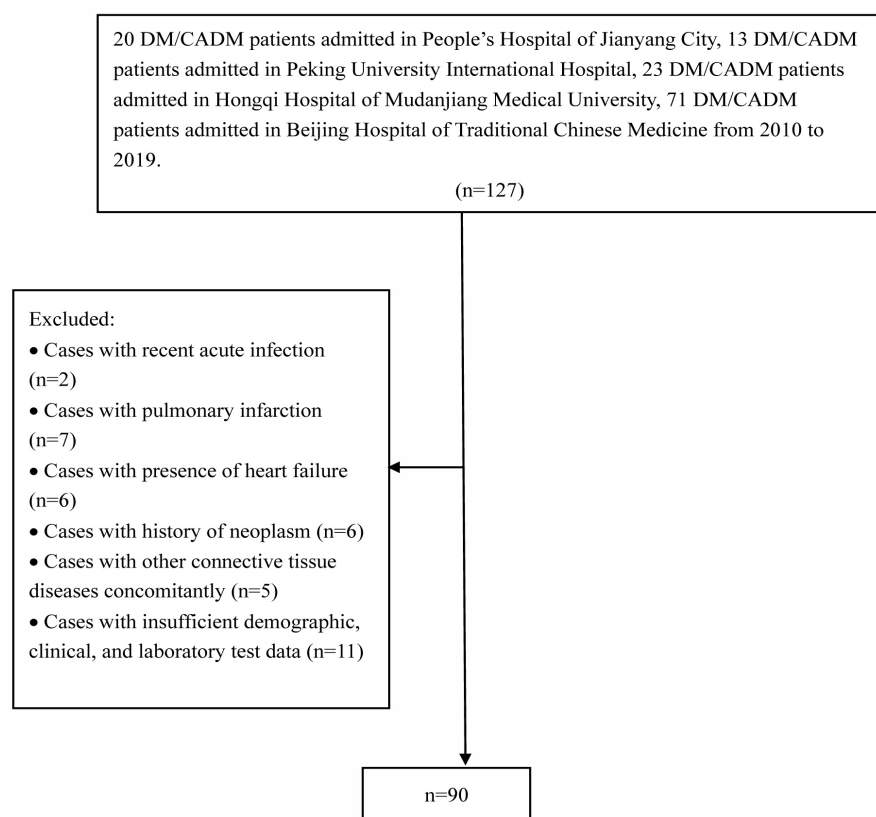


**Supplementary Fig. S1.** Flow chart of inclusion/exclusion criteria applied to Peking University People's hospital patients.



**Supplementary Fig. S2.** Flow chart of external validation set.



**Supplementary Table S1.** Comparison of clinical and laboratory manifestations between the development cohort and the validation cohort, the external validation cohort.

	DC (n=239)	IVC (n=128)	EVC(n=90)	<i>P</i> DC vs IVC	<i>P</i> DC vs. EVC	<i>P</i> IVC vs. EVC
<b>Demographics</b>						
Age at onset, years	48.0 ± 14.3	48.7 ± 13.5	57.4 ± 12.1	0.617	0.000	0.000
Female (n, %)	188 (78.7)	97 (75.8)	60 (66.7)	0.528	0.024	0.140
<b>Subtype of IIM</b>						
DM (n, %)	113 (47.3)	64 (50.0)	77 (85.6)	0.619	0.000	0.000
CADM (n, %)	126 (52.7)	64 (50.0)	13 (14.4)			
<b>Clinical characteristics</b>						
RP-ILD (n, %)	70 (29.3)	40 (31.3)	18 (20.0)	0.696	0.090	0.064
Gottron's sign/papules (n, %)	173 (72.4)	90 (70.3)	37 (41.1)	0.675	0.000	0.000
Mechanic's hands (n, %)	76 (31.8)	46 (35.9)	38 (42.2)	0.423	0.077	0.348
Heliotrope rash (n, %)	120 (50.2)	56 (43.8)	28 (31.1)	0.238	0.002	0.059
V sign (n, %)	113 (47.3)	52 (40.6)	22 (24.4)	0.222	0.000	0.013
Shawl sign (n, %)	64 (26.8)	28 (21.9)	19 (21.1)	0.302	0.291	0.893
Skin ulceration (n, %)	11 (4.6)	10 (7.8)	4 (4.4)	0.207	1.000	0.473
Periungual erythema (n, %)	48 (20.1)	17 (13.3)	7 (7.8)	0.104	0.008	0.201
Myalgia (n, %)	26 (10.9)	16 (12.5)	28 (31.1)	0.642	0.000	0.001
Myasthenia (n, %)	117 (49.0)	62 (48.4)	43 (47.8)	0.925	0.849	0.924
Velcro rales (n, %)	38 (15.9)	23 (18.0)	77 (85.6)	0.612	0.000	0.000
Fever (n, %)	100 (41.8)	53 (41.4)	15 (16.7)	0.936	0.000	0.000
Dysphagia (n, %)	4 (1.7)	1 (0.8)	8 (8.9)	0.818	0.005	0.009
Arthralgia (n, %)	111 (46.4)	65 (50.8)	13 (14.4)	0.428	0.000	0.000
Raynaud's phenomenon	10 (4.2)	7 (5.5)	4 (4.4)	0.577	1.000	0.979
<b>Myositis-specific antibodies</b>						
Anti-ARS positivity	53 (22.2)	29 (22.7)	57 (63.3)	0.916	0.000	0.000
Anti-Jo-1 positivity	19 (7.9)	6 (4.7)	14 (15.6)	0.237	0.041	0.006
Anti-MDA5 positivity	32 (13.4)	17 (13.3)	19 (21.1)	0.977	0.084	0.125
<b>Myositis-associated antibodies</b>						
Anti-Ro-52 positivity	68 (28.5)	42 (32.8)	30 (33.3)	0.385	0.388	0.936
Anti-PM/Scl-75/100 positivity	1 (0.4)	1 (0.8)	6 (6.7)	1.000	0.002	0.042
ANA	159 (66.5)	88 (68.8)	35 (38.9)	0.665	0.000	0.000
<b>Laboratory features</b>						
<b>Arterial blood gas</b>						
PaO <sub>2</sub> , mean ± SD mmHg	85.0 ± 14.4	71.3 ± 14.8	80.8 ± 26.8	0.000	0.401	0.050
<b>HRCT</b>						
NSIP	5 (2.1)	9 (7.0)	6 (6.7)			
OP	215 (90)	69 (53.9)	47 (52.2)			
NSIP+OP	19 (7.9)	46 (35.9)	24 (26.7)			
UIP	0 (0)	3 (2.3)	3 (3.3)			
DAD	0 (0)	0 (0)	0 (0)			
<b>Pulmonary function tests<sup>a</sup></b>						
FVC % predicted	83.9 ± 17.5	67.0 ± 18.1	85.2 ± 17.8	0.000	0.776	0.000
DLco % predicted	67.4 ± 19.6	53.5 ± 18.2	78.3 ± 22.1	0.000	0.032	0.000
TLC % predicted	85.7 ± 16.9	73.3 ± 17.3	102.3 ± 45.7	0.000	0.003	0.000
<b>Bronchoalveolar lavage<sup>b</sup></b>						
Total cell number, 10 <sup>5</sup> /ml	0.40 ± 0.37	0.30 ± 0.28	0.17 ± 0.03	0.068	0.234	0.502
Macrophage, %	63.7 ± 21.6	48.0 ± 22.2	57.0 ± 13.7	0.000	0.606	0.484
Lymphocyte, %	27.4 ± 20.0	37.8 ± 23.1	36.0 ± 17.0	0.005	0.503	0.886
Neutrophil, %	7.4 ± 10.1	12.9 ± 18.3	5.7 ± 4.7	0.033	0.848	0.418
Eosinophil, %	1.5 ± 2.7	1.2 ± 2.8	1.3 ± 1.5	0.429	0.902	0.915
Elevated ALT (n, %)	95 (39.7)	54 (42.2)	34 (37.8)	0.650	0.744	0.514
Elevated AST (n, %)	106 (44.4)	66 (51.6)	38 (42.2)	0.187	0.729	0.174
Elevated LDH (n, %)	159 (66.5)	88 (68.8)	60 (66.7)	0.665	0.981	0.746
ESR	29.7 ± 25.4	29.2 ± 22.9	24.7 ± 21.5	0.834	0.094	0.180
Death	70 (29.3)	40 (31.3)	18 (20.0)	0.907	0.012	0.023
OS, years	5.2 ± 5.7	5.0 ± 5.5	2.3 ± 1.1	0.647	0.000	0.000

<sup>a</sup>Number of subjects with DC, n=106, Number of subjects with IVC, n=58, Number of subjects with EVC, n=17; <sup>b</sup>Number of subjects with DC, n=62, Number of subjects with IVC, n=80, Number of subjects with EVC, n=3. The LSD of analysis of variance and chi square test were used in a pair-wise post-hoc analysis. *P* values were two-sided, and values of < 0.05 were considered statistically significant.

DC: development cohort; IVC: internal validation cohort; EVC: external validation cohort; RP-ILD: rapidly progressive interstitial lung disease; DM: dermatomyositis; CADM: clinically amyopathic dermatomyositis; ARS include Jo-1, EJ, OJ, PL-7, PL-12, KS. ARS: aminoacyl-tRNA synthetase; MDA5: melanoma differentiation-associated 5; PM/Scl: polymyositis/scleroderma; ANA: antinuclear antibodies; RF: rheumatoid factor; ALT: alanine transaminase; AST: aspartate aminotransferase; ESR: erythrocyte sedimentation rate; LDH: lactate dehydrogenase.