Supplement

Test datasets

Test 1: from China Resources Wuhan Iron and Steel Hospital, Wuhan, China (non-severe patients: 20, severe patients: 16). Test 2: from Huangshi Central Hospital, Huangshi, China (non-severe patients: 41, severe patients: 49). Test 3: from Shaoyang Central Hospital, Shaoyang, China (non-severe patients: 16, severe patients: 3), Southern Hospital of Southern Medical University, Guangzhou, China (non-severe patients: 5, severe patients: 1), and Affiliated Zhongshan Hospital Dalian University, Dalian, China (non-severe patients: 4, severe patients: 3). Test 4: from National Institute for Infectious Diseases – IRCCS, Roma, Italy (non-severe patients: 18, severe patients: 16) and from IRCCS Ospedale Policlinico San Martino, Genoa, Italy (non-severe patients: 22, severe patients: 34). Test 5: from CHU of Liège, Liège, Belgium ((non-severe patients: 80 severe patients: 98).

CT acquisition and reconstruction parameters

Chest CT scans were performed using one of the CT scanners (uCT 780, United Imaging, China and Brilliance iCT 128, Philips Medical Systems, the Netherlands) with patients in the supine position. The scanning range was from the level of the upper thoracic inlet to the inferior level of the costophrenic angle. For CT acquisition, the tube voltage was 120kVp with automatic tube current modulation, a field of view (FOV) of 350×350 mm, and a matrix size of 512×512. All images were reconstructed into a slice thickness of 1 mm and an interval of 1 mm.

Table S1. A list of R packages

Purposes	Functions	Packages	Versions
Demographic statistics	'fisher.test', 'wilcox.test'	'stats'	3.6.3
Spearman's rank correlation	'cor'	'stats'	3.6.3
Sample balance	'ADAS'	'smotefamily'	1.3.1
Feature selection	'Boruta', 'rfe'	'caret', 'Boruta'	6.0-86, 6.0.0
Modeling, nomogram	'lrm', 'nomogram'	'rms'	5.1-4
ROC plots, AUC values, and test	'roc'	'pROC'	1.16.2, 3.3.0
Diagnosis values	'confusionMatrix'	'caret'	6.0-86
Calibration	'plotCalibration'	'PredictABEL'	1.2-4

ROC, receiver operating characteristic curve; AUC, area under the roc curve.