

Risk Factors of Fatal Outcome in Hospitalized Subjects With Coronavirus Disease 2019 From a Nationwide Analysis in China

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e-Table 1. Clinical characteristics of 1590 patients with 2019-nCoV

	Non-Death (n=1540)	Death (n=50)	<i>p</i> value
Age, Median(range)-years	48(1-94)	69(51-86)	<0.001
Sex, male- No/total (%)	865/1528(56.7)	39/50(78.0)	0.003
Smoking history- No/total (%)			0.391
Yes	106(7)	5/50(10)	
No	1434(93.1)	45/50(90)	
Symptoms			
fever	1309/1488(88.0)	42/48(87.5)	0.921
cough	1015/1450(70.0)	37/48(77.1)	0.291
Headache	196/1285(15.3)	9/43(20.9)	0.311
Sputum production	490/1378(35.6)	23/46(50.0)	0.045
Fatigue	565/1322(42.7)	19/43(44.2)	0.850
Dyspnea	294/1540(19.1)	37/50(74.0)	<0.001
Nausea or vomiting	76/1326(5.7)	4/45(8.9)	0.329
Diarrhea	56/1314(4.3)	1/45(2.2)	1
Chill	161/1289(12.5)	2/44(4.5)	0.114
Myalgia or arthralgia	226/1295(17.5)	8/43(18.6)	0.845
Chronic illness-No(%)			
COPD	18/1540(1.2)	6/50(12.0)	<0.001
Diabetes	117/1540(7.6)	13/50(26.0)	<0.001
Hypertension	241/1540(15.6)	28/50(56.0)	<0.001
Coronary heart disease	51/1540(3.3)	8/50(16.0)	<0.001
Cerebrovascular disease	24/1540(1.6)	6/50(12.0)	<0.001
Hepatitis B infection	27/1540(1.8)	1/50(2.0)	0.594
Malignancy	15/1540(1.0)	3/50(6.0)	<0.001
Chronic renal diseases	16/1540(1.0)	5/50(10.0)	0.017
Immunodeficiency	3/1540(0.2)	0/50(0)	1
Radiologic findings			
Abnormal chest X-ray	223/1540(14.5)	20/50(40.0)	<0.001
Abnormal chest CT	1100/1164(94.5)	30/30(100)	0.402
Laboratory findings			
Blood leukocyte count			
>10*10 ⁹ /L	80/1281(6.3)	17/40(42.5)	<0.001
<4*10 ⁹ /L	414/1281(32.3)	4/40(10.0)	0.003
Lymphocyte count			
<1.5*10 ⁹ /L	949/1161(81.7)	40/41(97.6)	0.009
Platelet count			
<150*10 ⁹ /L	401/1116(35.9)	13/38(34.2)	0.828
C-reactive protein level>10/liter- No/total (%)	655/1039(63.0)	33/33(100.0)	<0.001
Procalcitonin level>0.5ng/ml- No/total (%)	34/838(4.1)	14/34(41.2)	<0.001
Lactose dehydrogenase≥250U/liter- No/total (%)	411/884(46.3)	32/35(91.4)	<0.001
Aspartate aminotransferase>40U/liter- No/total (%)	245/985(24.9)	24/35(68.6)	<0.001

Alanine aminotransferase>40U/liter- No/total (%)	229/959(23.9)	19/35(54.3)	<0.001
Total bilirubin≥17.1μmol/liter-No/total (%)	106/9 39(11.0)	14/36(39.0)	<0.001
Creatinine kinase ≥200 U/liter- No/total (%)	126/868(14.5)	10/32(31.3)	0.019
Creatinine ≥ 133μmol/liter- No/total (%)	21/973(2.2)	9/35(25.7)	<0.001
D-dimer≥0.5mg/liter- No/total (%)	384/754(50.9)	34/39(87.2)	<0.001
Treatment			
Antibiotics	867/1015 (85.4)	47/47 (100)	0.009
Oseltamivir	510/1061 (48.1)	13/36 (36.1)	0.21
Other antiviral	824/1107 (74.4)	26/36 (72.2)	0.92
Anti-Fungal	41/907 (4.5)	8/36 (22.2)	<0.001
Glucocorticoid	269/973 (27.6)	18/32 (56.3)	<0.001
NIV	91/946 (9.6)	31/40 (77.5)	<0.001
IMV	25/1135 (2.2)	24/40 (60)	<0.001
ECMO	0/898 (0)	4/37 (10.8)	<0.001
CRRT	9/899 (1)	8/38 (21.1)	<0.001
Globulin	197/908 (21.7)	18/37 (48.6)	<0.001
ICU	75/9(10.1)	24/41 (58.5)	<0.001

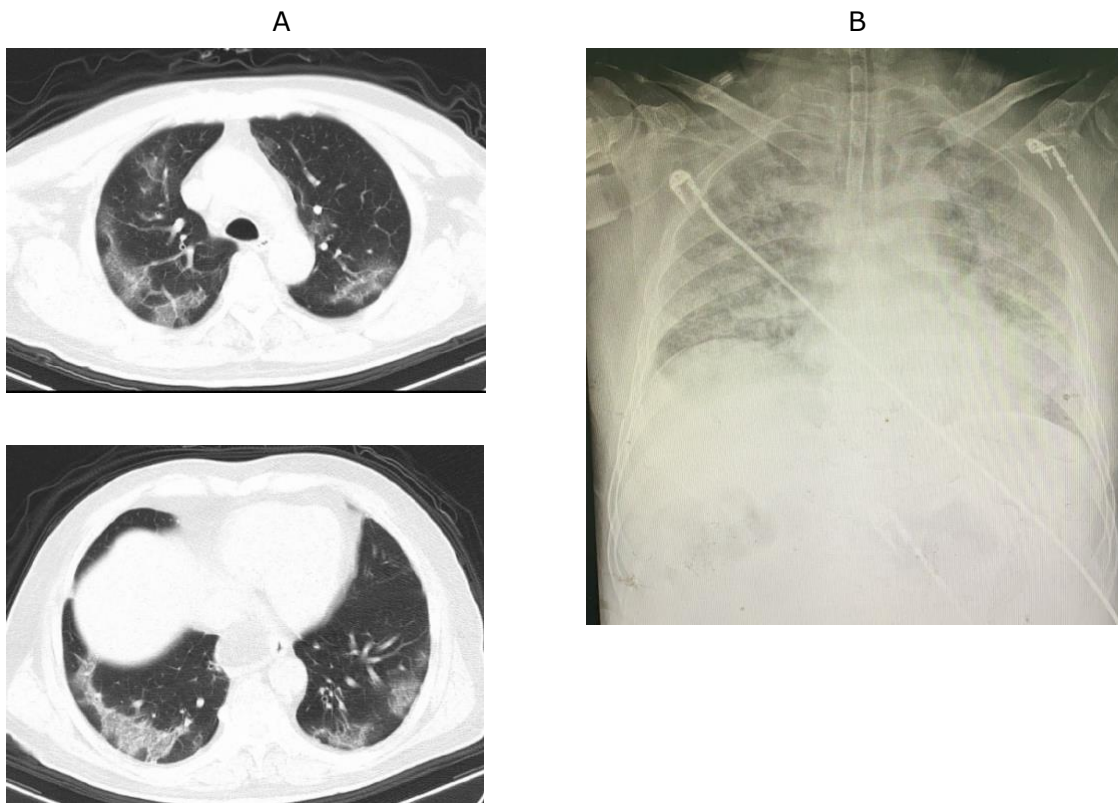
Data are presented as medians (ranges) and n/N (%). Abbreviations: COPD: chronic obstructive pulmonary disease, NIV: noninvasive ventilation, IMV: invasive mechanical ventilation, ECMO: extracorporeal membrane oxygenation, CRRT: continuous renal replacement therapy.

e-Table 2. Univariate Cox Analysis of risk factors related to the fatal outcome

Variables	Level	HR	95%CI	p value
Sex	Female vs Male	0.41	0.21-0.81	0.01
Smoke history	Yes vs No	1.3	0.51-3.29	0.58
Age	65-74 vs <65	7.14	3.44-14.81	<0.001
Age	≥75 vs <65	14.94	6.93-32.23	<0.001
Symptom				
fever	Yes vs No	0.92	0.39-2.16	0.84
cough	Yes vs No	1.31	0.66-2.59	0.44
Headache	Yes vs No	1.42	0.68-2.97	0.36
Sputum production	Yes vs No	1.34	0.75-2.41	0.32
Fatigue	Yes vs No	1	0.55-1.84	1
Dyspnea	Yes vs No	6.93	3.65-13.16	<0.001
Nausea or vomiting	Yes vs No	1.16	0.41-3.26	0.78
Diarrhea	Yes vs No	0.48	0.07-3.48	0.47
Chill	Yes vs No	0.33	0.08-1.37	0.13
Mylgia or arthralgia	Yes vs No	0.88	0.41-1.91	0.75
Chronic illness				
COPD	Yes vs No	6.07	2.57-14.36	<0.001
Diabetes	Yes vs No	2.45	1.28-4.68	<0.001
Hypertension	Yes vs No	4.21	2.38-7.43	<0.001
Coronary heart disease	Yes vs No	3.12	1.44-6.75	0.004
Cerebrovascular disease	Yes vs No	5.94	2.51-14.04	<0.001
Hepatitis B infection	Yes vs No	1.06	0.15-7.69	0.95
Malignancy	Yes vs No	4.234	1.31-13.64	0.016
Chronic renal diseases	Yes vs No	4	1.51-10.59	0.005
Immunodeficiency	Yes vs No	8.20E-7	(0,Inf)	1
Radiologic findings				
Abnormal chest X-ray	Yes vs No	2.57	1.45-4.56	<0.001
Abnormal chest CT	Yes vs No	2.60E+7	(0,Inf)	1
Laboratory findings				
Blood leukocyte count (10 ⁹ /L)	>10 vs ≤10	1.48	0.79-2.77	0.22
Lymphocyte count (10 ⁹ /L)	<1.5 vs ≥1.5	6.4	0.88-46.75	0.067
Platelet count (10 ⁹ /L)	<150 vs ≥150	0.97	0.49-1.9	0.92
C-reactive protein level(/liter)	>10 vs ≤10	1.10E+8	(0,Inf)	1
Procalcitonin level(ng/ml)	>0.5 vs ≤0.5	8.03	3.94-16.38	<0.001
Lactose dehydrogenase(U/liter)	≥250 vs <250	5.8	1.75-19.19	0.004
Aspartate aminotransferase(U/liter)	>40 vs ≤40	4.49	2.13-9.44	<0.001
Alanine aminotransferase(U/liter)	>40 vs ≤40	2.55	1.29-5.06	0.007
Total bilirubin(μmol/liter)	≥17.1 vs <17.1	3.31	1.67-6.53	<0.001
Creatinine kinase (U/liter)	≥200 vs <200	2.37	1.11-5.04	0.025
Creatinine ≥ (μmol/liter)	≥133 vs <133	5.29	2.31-12.15	<0.001
D-dimer(mg/liter)	≥0.5 vs <0.5	4.07	1.58-10.49	0.004

e-Figure 1. The disease progression of a 63-year-old patient with COVID-19.

A 63-year-old male with a history of cardiac arrhythmia developed a dry cough and chest tightness, and a fever (peak temperature: 38.7°C) since January 15. He was admitted to hospital by walking without oxygen on January 17 and received the treatments of anti-infection, anti-virus(oseltamivir), methylprednisolone, gamma globulin and oxygen therapy. Since January 23, the patient complained unbearable dyspnea even with the high flow nasal cannula. On January 25, he was transferred to the ICU and then received endotracheal intubation and ventilator-assisted breathing therapy on January 27. However, the patient's hypoxaemia remained unresolved even treated with ECMO. On January 28, the eleventh day of admission, the patient died of respiratory failure and septic shock.



January 22, chest CT: Bilateral ground glass opacity and flocculent shadows were observed, mainly located nearby the pleura.

January 27, chest X-rays: The brightness of lungs were decreased and diffuse patchy shadows were observed. Tracheal intubation was seen in the trachea

e-Appendix 1.

List of hospitals reporting cases

Wuhan Jinyintan hospital, Union Hospital Affiliated to Tongji Medical College of Huazhong University of science and technology, Wuhan Central Hospital, Wuhan first hospital, Chengdu Public Health Clinical Medical Center, Huangshi Central Hospital, Shenzhen Third People's Hospital, Wuhan Pulmonary Hospital, Tianyou Hospital Affiliated to Wuhan University of science and technology, Changsha First Hospital, The third people's Hospital of Hainan Province, Huanggang Central Hospital, Wenling first people's Hospital, Yichang Third People's Hospital, Taihe Hospital Affiliated to Hubei Medical College, Xiantao first people's Hospital, Wuhan Huangpi District People's Hospital, Jingzhou Chest Hospital, Jingzhou first people's Hospital, Shanghai Public Health Clinical Center, Beijing You'an Hospital Affiliated to Capital Medical University, Zhengzhou Sixth People's Hospital, Chongqing Three Gorges Central Hospital, The ninth Affiliated Hospital of Guangxi Medical University, Hangzhou Xixi hospital, Nanjing Second Hospital, Suzhou Fifth People's Hospital, The first hospital of Zhejiang Province, The Fifth Affiliated Hospital of Zhongshan University, Huangshi traditional Chinese medicine hospital, Yangjiang people's Hospital, Zhongxian hospital, the First Affiliated Hospital of Chongqing Medical University, Anqing Municipal Hospital, Changzhou Third People's Hospital, Guangzhou first people's Hospital, Harbin infectious diseases hospital, Tianmen first people's Hospital, Wuxi People's Hospital, Wuhan fifth hospital, Xishuangbanna Dai Autonomous Prefecture People's Hospital, Chongqing Iron and Steel General Hospital, Daye people's Hospital, Nanxishan Hospital of Guangxi Zhuang Autonomous Region, Jiaxing First Hospital, Jiangling people's Hospital, Jinzhong infectious disease hospital, Lanzhou Pulmonary Hospital, Liuzhou people's Hospital, Ma'anshan He county people's Hospital, The First Affiliated Hospital of Nanchang University, Ningbo Yinzhou people's hospital medical community, Shaoxing people's Hospital, Shijiazhuang fifth hospital, Taizhou Enze Medical Center, Xinyang Central Hospital, Yueyang No.1 People's Hospital, Zhanjiang Central People's Hospital, The First Affiliated Hospital of Zhengzhou University, Shenzhen Hospital of Chinese Academy of Sciences, Chongqing Kaizhou District People's Hospital, Chongqing Changshou District People's Hospital, Chongqing Yunyang County People's Hospital, Ankang Central Hospital, Chenzhou Second People's Hospital, Datong Fourth People's Hospital, Dengzhou people's Hospital, Fengjie people's Hospital, Foshan first people's Hospital, Fuyang Second People's Hospital, Gongyi people's Hospital, Guangshan people's Hospital, Guoyao Dongfeng General Hospital, Hainan people's Hospital, The Second Affiliated Hospital of Hainan Medical College, The first people's Hospital of Xiaoshan District, Hangzhou, Huaihua first people's Hospital, Jiashan first people's Hospital, Lu'an people's Hospital, Affiliated Hospital of Qingdao University, Qingyuan people's Hospital, Quanzhou County People's Hospital, Rizhao people's Hospital, Shaodong people's Hospital, Shiyan Xiyuan Hospital, Tongling people's Hospital, Wenzhou People's Hospital, Wenzhou Central Hospital, The Second Affiliated Hospital of Wenzhou Medical University, Wuxi Fifth People's Hospital, Wuhan Youfu hospital, Xi'an eighth hospital, Xinxiang infectious disease hospital, Yangxin County People's Hospital, Yuebei Second People's Hospital, Yunnan infectious diseases hospital, Zhaoqing first people's Hospital, Zhaozhou County People's Hospital, Shao Yifu Hospital Affiliated to Zhejiang

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University School of Medicine, Zhijiang people's Hospital, People's Hospital of Dianjiang County, Chongqing, Chongqing Jiulongpo first people's Hospital, Chongqing Shizhu Tujia Autonomous County People's Hospital, The first people's Hospital of Wanzhou District, Chongqing, Yongchuan Hospital Affiliated to Chongqing Medical University, Anguo hospital, The Third Hospital of Peking University, peking university shenzhen hospital , BOLUO people's Hospital, Changde Lixian people's Hospital, Changde Second People's Hospital, Chenzhou Central Hospital, Chengjiang people's Hospital, Dalian Central Hospital, Danzhou people's Hospital, Dengzhou Central Hospital, Feidong County People's Hospital, Fuzhou Nanfeng County Hospital, Ganzhou Fifth People's Hospital, Gao'an people's Hospital, Public Security County People's Hospital, Affiliated Hospital of Guangdong Medical University, The Sixth Affiliated Hospital of Guangzhou Medical University, Affiliated Hospital of Guizhou Medical University, Hangzhou first people's Hospital, Hangzhou Lin'an District People's Hospital, Nanpi County Hospital of traditional Chinese medicine of Hebei Province, Henan people's Hospital, Hefeng County Central Hospital, Hohhot First Hospital, Huludao Central Hospital, The First Affiliated Hospital of Hunan Medical College, Shenzhen Union Hospital of Huazhong University of science and technology, Huaibei people's Hospital, Huangshi Second Hospital, Huangchuan people's Hospital, Huizhou Zhongda Huiya hospital, Huizhou Central People's Hospital, Jining first people's Hospital, Jianshi County People's Hospital, Fengcheng people's Hospital of Jiangxi Province, Jiangyou infectious diseases hospital, Jieyang people's Hospital, Jinhua Central Hospital, Jinzhong Pingyao people's Hospital, Jingjiang people's Hospital, The Second Affiliated Hospital of Kunming Medical University, Laifeng County Central Hospital, Yueqing people's Hospital, Lijiang people's Hospital, Lixin people's Hospital, The Fourth People's Hospital of Lianyungang, Linqu County People's Hospital, Linyi people's Hospital, Longxi first people's Hospital, Min Da Hospital, Mingqing County General Hospital, Nantong Third People's Hospital, Nanyang Central Hospital, The First Affiliated Hospital of Nanyang Medical College, Nanyang Oilfield General Hospital, Ningbo First Hospital, The Fourth People's Hospital of Ningxia, Pingxiang Second People's Hospital, Quzhou Kecheng District People's Hospital, Qujing maternal and child hospital, Ruian people's Hospital, The First Affiliated Hospital of Xiamen University, Shangcheng County People's Hospital, Shanghai Baoshan Dachang hospital, Shanghai Pudong New Area Gongli Hospital , People's Hospital of Yushan County, Jiangxi Province, Shangrao City, Xuanwu Hospital of Capital Medical University, Sichuan Mianyang 404 hospital, Sixian Hospital of traditional Chinese Medicine, Suihua First Hospital, Suiping County People's Hospital, Tianjin Fourth Central Hospital, Tianjin Haihe hospital, Tiantai County People's Hospital, Tongchuan Mining Bureau Central Hospital, Tongren people's Hospital, Weihai Central Hospital, The First Affiliated Hospital of Wenzhou Medical University, Wuzhou Third People's Hospital, Armed police Hubei provincial general team hospital, Xixian people's Hospital, Longshan County People's Hospital in Western Hunan, Xiangcheng first people's Hospital, The Sixth People's Hospital of Xinjiang Uygur Autonomous Region, The First Affiliated Hospital of Xinjiang Medical University, Xinmi Hospital of traditional Chinese Medicine, Xinxiang County People's Hospital, Xinye people's Hospital, Xinyang first people's Hospital, Xinyang Hospital of traditional Chinese Medicine, Xuanen County People's Hospital, Xinhua Hospital, Yili Prefecture, Yongzhou Central Hospital, Yuyao people's Hospital,

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