



Clinical, laboratory and imaging features of COVID-19: A systematic review and meta-analysis



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本篇研究重點整理

- 針對2020/1/1-2020/2/23共19篇文章，進行系統回顧及分析。
- 665位病人最常見症狀：88.7%發燒(fever)、57.6%咳嗽(cough)、45.6%呼吸困難(dyspnea)。(成人症狀都較兒童症狀明顯)
- 665位病人中，20.3%需要ICU治療、32.8%有ARDS症狀、6.2%休克、13.9%住院病人死亡。
- 新冠病毒帶給醫療系統極大的負擔，尤其是面對多重共病病人。
- 大部分的新冠病毒感染者都因為同時有共病症而需要住院治療，而住院者大約20%需要加護病房治療，另外住院病人的死亡率超過13%，全球各個國家都應該做好人力、物力與醫療資源的準備！

研究目的

- 這是一篇從臨床、實驗室診斷及影像學來進行回顧及統合分析 COVID-19 的研究(非統合隨機分派試驗)。
- 內容包含罹患新冠病毒病人的預後、危險因子、需要加護病房治療的比例以及死亡個案。
- 評估新冠病毒確診個案共病的盛行率。



PRISMA 2009 Flow Diagram

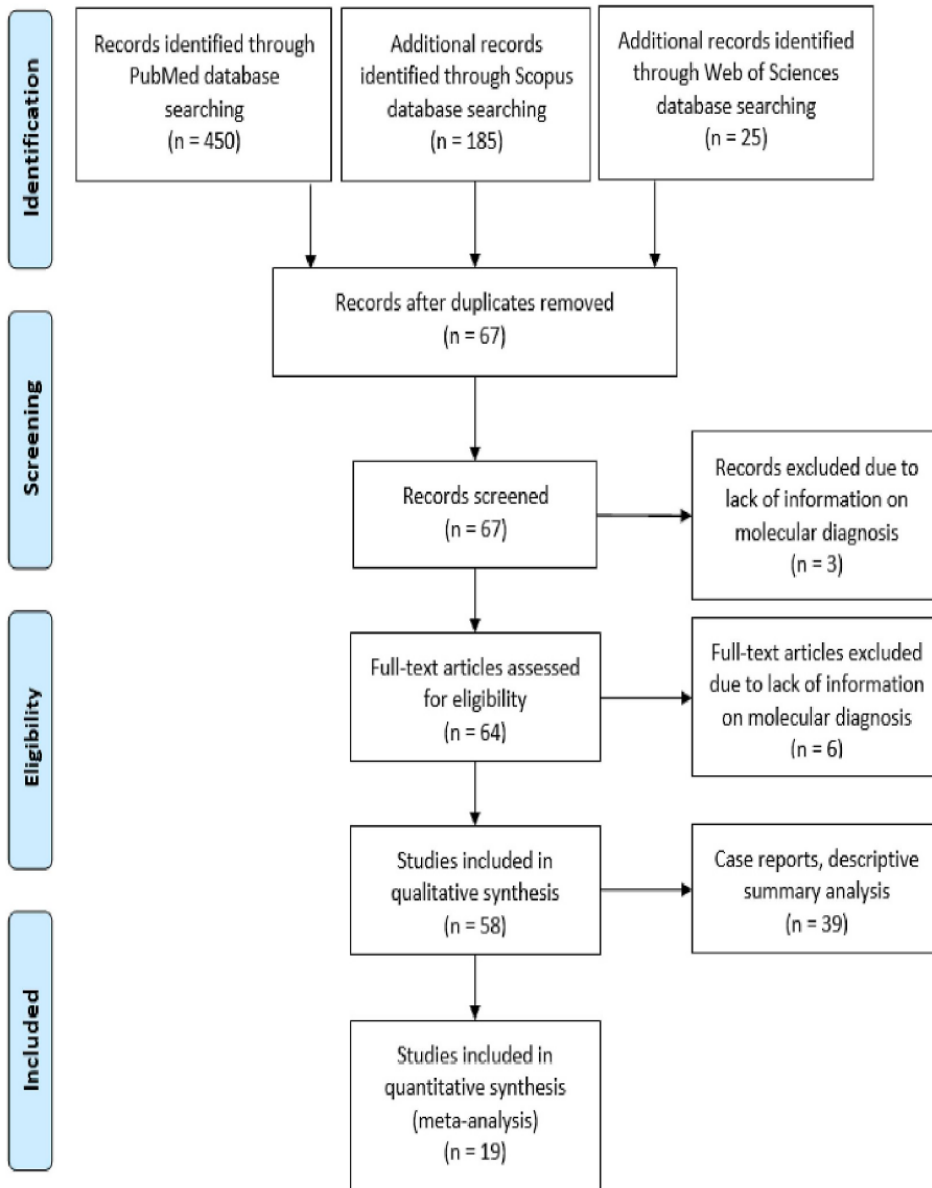


Fig. 1. Study selection and characteristics.

遵循”Preferred Reporting Items for Systematic Reviews and Meta-Analyses”(PRISMA) statement規範。

延伸閱讀

搜尋的文獻須符合下列條件

1. 通過同儕審核
2. 經rRT-PCR確診感染新冠病毒的病人
3. 文獻研究方式包含: case-control cohort study、case reports、case series。若是危險因子和預後分析，觀察性研究也列入。
4. 發表文章介於2020/1/1-2/23

Medline/PubMed, Scopus, Web of Science 搜尋關鍵字:

“Novel Coronavirus”; “2019 nCoV”,
“Novel coronavirus 2019”; “COVID-19”,
“Wuhan coronavirus”; SARS-CoV-2”

結果

Table 1
Characteristics of the included studies on COVID-19, 2020. All patients confirmed by real-time RT-PCR.

Author	Journal	Date (MM/DD)	Country	Study type	N	Quality score ^a	Reference
WMCHHPNCI	Commission Report	01/20	China	Cross-sectional	136	12	[64]
Chaolin et al.	Lancet	01/24	China	Cross-sectional	41	19	[5]
Li et al.	NEJM	01/29	China	Cross-sectional	425	19	[11]
Chen et al.	Lancet	01/30	China	Cross-sectional	99	19	[4]
Chung et al.	Radiology	02/04	China	Cross-sectional	21	12	[65]
Chen et al.	Chin J Tuberc Respir Dis	02/06	China	Cross-sectional	29	12	[66]
Wang et al.	JAMA	02/07	China	Cross-sectional	138	19	[67]
Kui et al.	Chin Med J	02/07	China	Cross-sectional	137	12	[68]
Chang et al.	JAMA	02/07	China	Cross-sectional	13	14	[69]
To et al.	Clin Infect Dis	02/12	China	Cross-sectional	12	14	[70]
COVID-19 team Australia	Team Report	02/12	Australia	Cross-sectional	15	12	[71]
Yueying et al.	Eur Radiol	02/13	China	Cross-sectional	63	14	[72]
Li et al.	Preprint Lancet	02/13	China	Case series	24	14	[73]
Feng et al.	Radiology	02/13	China	Case series	21	12	[74]
Liang et al.	Lancet Oncology	02/14	China	Cross-sectional	1590	17	[41]
Zhang et al.	Chin J Tuberc Respir Dis	02/15	China	Case series	9	12	[40]
Feng et al.	Chin J Pediatr	02/17	China	Case series	15	12	[75]
Wang et al.	Chin J Pediatr	02/17	China	Cross-sectional	34	12	[76]
Xiaobo et al.	Lancet Respir Med	02/21	China	Cross-sectional	52	17	[52]

WMCHHPNCI, Wuhan Municipal Commission of Health and Health on Pneumonia of New Coronavirus Infection. MM/DD, Month, Day.

^a Quality score ranged, 0–20. Based on the Appraisal Tool for Cross-Sectional Studies, AXIS [36].

- 文獻回顧最終包含19篇，18篇中國發表，1篇澳洲發表；共收案2874人(最少樣本case-series:9人～最大樣本cross-sectional study:1590人)。
- 統合分析分析了42個變項。
- Funnel plot及Egger test皆顯示並無顯著publication bias。

結果

平均年齡51.97歲
(95%CI: 46.06-57.89)

55.9% 為男性

Table 6
Meta-analysis outcomes (random-effects model).^a

Variable	Number of Studies	Mean (y-old) / Prevalence (%)	95%CI	n	Q ^b	I ² ^c	t ² ^d	P
Age	18	51.97	46.06-57.89	2626	1193.28	98.56	145.687	< 0.001
Male	22	55.9	51.6-60.1	2874	61.98	66.12	0.005	< 0.001
ICU	6	20.3	10.0-30.6	1883	49.49	89.89	0.013	< 0.001
<i>Comorbidities</i>	7	36.8	24.7-48.9	505	47.75	87.44	0.022	< 0.001
Hypertension	5	18.6	8.1-29.0	363	23.989	83.33	0.011	< 0.001
Cardiovascular disease	6	14.4	5.7-23.1	485	45.29	88.96	0.01	< 0.001
Diabetes	8	11.9	9.1-14.6	523	4.065	0.00	0.00	0.772
Chronic obstructive pulmonary disease	6	1.8	0.6-3.0	485	4.413	0.00	0.00	0.492
Malignancies	6	2.5	0.7-4.2	496	7.59	34.16	0.00	0.180
Chronic liver disease	3	3.0	0.7-5.4	208	0.744	0.00	0.00	0.689

20.3%
加護病房治療

36.8%有共病症
其中 18.6%有高血壓
14.4%有心血管疾病
11.9%有糖尿病

結果

Table 6
Meta-analysis outcomes (random-effects model).^a

Variable	Number of Studies	Mean (y-old) / Prevalence (%)	95%CI	n	Q ^b	I ² ^c	t ² ^d	P
<i>Clinical manifestations</i>								
Fever	15	88.7	84.5-92.9	784	128.73	89.12	0.04	< 0.001
Adult	13	92.8	89.4-96.2	735	68.25	82.42	0.002	< 0.001
Children	2	43.9	28.2-59.6	49	1.25	20.2	0.003	0.263
Cough	15	57.6	40.8-74.4	784	657.76	97.87	0.102	< 0.001
Adult	13	63.4	48.0-78.8	735	413.05	97.09	0.072	< 0.001
Children	2	22.0	0.0-52.9	49	8.983	88.87	0.044	0.003
Dyspnea	8	45.6	10.9-80.4	656	1346.86	99.48	0.248	< 0.001
Myalgia or fatigue	11	29.4	19.8-39.0	446	46.53	80.66	0.017	< 0.001
Sputum production	6	28.5	10.8-46.3	379	94.94	94.73	0.044	< 0.001
Sore throat	5	11.0	2.8-19.2	308	28.24	85.39	0.006	< 0.001
Headache	9	8.0	5.7-10.2	554	5.048	0.00	0.00	0.752
Diarrhea	6	6.1	2.4-9.7	457	13.19	62.11	0.001	0.022

最常見臨床症狀:

發燒: 88.7% , 尤其成年人(92.8%)比小孩(43.9%)更常以發燒來表現。

咳嗽: 57.6%

呼吸困難: 45.6%

其他臨床症狀:

肌肉痠痛或倦怠: 29.4%、痰: 28.5%、喉嚨痛: 11.0%、頭痛: 8.0%、腹瀉: 6.1%

結果

Table 6
Meta-analysis outcomes (random-effects model).^a

Variable	Number of Studies	Mean (y-old) / Prevalence (%)	95%CI	n	Q ^b	I ² ^c	t ² ^d	P
<i>Laboratory findings</i>								
Decreased Albumin	2	75.8	30.5-100.0	128	24.29	95.88	0.103	< 0.001
High C-reactive protein	6	58.3	21.8-94.7	332	472.34	98.94	0.200	< 0.001
High LDH	5	57.0	38.0-76.0	341	54.03	92.59	0.043	< 0.001
Lymphopenia	8	43.1	18.9-67.3	511	349.18	97.99	0.117	< 0.001
High Erythrocyte sedimentation rate	3	41.8	0.0-92.8	157	118.55	98.31	0.199	< 0.001
High AST	3	33.3	26.3-40.4	169	1.7	0.00	0.00	0.427
High ALT	2	24.1	13.5-34.6	128	1.749	42.84	0.003	0.186
High Creatinine Kinase	2	21.3	3.2-39.4	140	5.36	81.36	0.014	0.021
Leukopenia	8	18.7	8.5-28.8	517	126.80	94.48	0.018	< 0.001
Leukocytosis	7	16.8	5.5-28.0	487	87.47	93.14	0.019	< 0.001
High Bilirubin	2	10.7	0.0-25.1	128	8.19	87.79	0.01	0.004
High Creatinine	3	4.5	1.0-8.0	169	2.23	10.17	0.00	0.328

最常見實驗室檢查發現:

白蛋白降低(75.8%)、發炎指數上升(high CRP)(58.3%)、LDH上升(57%)、淋巴球減少(lymphopenia)(43.1%)、ESR上升(41.8%)。

Table 6
Meta-analysis outcomes (random-effects model).^a

Variable	Number of Studies	Mean (y-old) / Prevalence (%)	95%CI	n	Q ^b	I ² ^c	t ² ^d	P
<i>Chest X-Ray Pneumonia Compromise</i>								
Unilateral	7	25.0	5.2-44.8	316	165.31	96.37	0.065	< 0.001
Bilateral	9	72.9	58.6-87.1	557	463.64	98.28	0.042	< 0.001
Adult	7	70.7	50.4-91.0	508	451.59	98.67	0.070	< 0.001
Children	2	77.7	33.5-100.0	49	12.04	91.69	0.094	< 0.001
<i>Image findings</i>								
Ground-glass opacity	10	68.5	51.8-85.2	584	992.3	99.09	0.068	< 0.001

胸部X光: 雙側肺炎: 72.9% ; 影像呈現: Ground-glass opacity: 68.5%

結果

Table 6
Meta-analysis outcomes (random-effects model).^a

Variable	Number of Studies	Mean (y-old) / Prevalence (%)	95%CI	n	Q ^b	I ² ^c	t ² ^d	P
<i>Complications</i>								
RNAemia	18	96.8	94.9-98.7	1096	241.19	92.95	0.001	< 0.001
Adult	16	96.6	94.6-98.6	1047	240.59	93.77	0.001	< 0.001
Children	2	98.3	94.7-100.0	49	0.125	0.00	0.00	0.723
Acute respiratory distress syndrome	4	32.8	13.7-51.8	330	49.49	93.93	0.035	< 0.001
Acute cardiac injury	3	13.0	4.1-21.9	231	6.72	70.22	0.004	0.035
Acute kidney injury	4	7.9	1.8-14.0	330	16.5	81.85	0.003	< 0.001
Shock	3	6.2	3.1-9.3	278	2.34	14.67	0.00	0.310
Secondary infections	2	5.6	0.3-10.9	93	1.22	18.16	0.00	0.269
Hospitalization	15	87.9	84.2-91.6	2211	390.76	96.42	0.004	< 0.001
<i>Outcome</i>								
Discharged	7	52.9	23.9-81.8	477	548.77	98.91	0.15	< 0.001
Death	7	13.9	6.2-21.5	632	107.17	91.4	0.009	< 0.001

^a 95% CI = 95% confidence interval; ICU, intensive care unit. y-old, years old. AST, Aspartate transaminase. ALT, Alanine transaminase.

^b Cochran's Q statistic for heterogeneity.

^c I² Index for the degree of heterogeneity.

^d Tau-squared measure of heterogeneity.

20.3%需要加護病房治療，32.8%有急性呼吸窘迫(ARDS)，13%急性心肌損傷、7.9%急性腎臟損傷、6.2%休克、13.9%死亡。

所有患者中，96.8%在血液中可以偵測到病毒RNA，同時在鼻咽抽吸也可以發現。

Table 7

Summary of the case report findings.^a

Variables	N (126)	%	Variables	N (126)	%
Age (y-old) (mean, SD) (n = 118)	47.9	22.2	<i>Images</i>		
Sex (Male/Female) (n = 71)	49	69.01	Ground-glass opacity at chest X- ray	58	46.0
ICU (Yes)	11	8.7	Chest X-Ray	50	39.7
<i>Comorbidities</i>			Bilateral Pneumonia		
			Chest X-Ray	13	10.3
			Unilateral Pneumonia		
Hypertension	13	10.3	<i>Complications</i>		
Chronic liver disease	5	4.0	RNAemia	126	100.0
Cardiovascular disease	3	2.4	Acute respiratory distress syndrome	9	7.1
Chronic obstructive pulmonary disease	2	1.6	Secondary infection	2	1.6
Malignancy or cancer	1	0.8	Acute kidney injury	1	0.8
<i>Clinical features</i>			Shock	1	0.8
Fever	97	77.0	Hospitalization	94	74.6
Cough	70	55.6	<i>Outcomes</i>		
Myalgia or fatigue	39	31.0	Discharge	48	38.1
Dyspnoea	27	21.4	Death	20	15.9
Sputum production	16	12.7			
Sore Throat	13	10.3	<i>Countries of the case report articles (39)</i>		
Diarrhoea	8	6.3	China	25	64.1
Headache	7	5.6	South Korea	4	10.3
Haemoptysis	1	0.8	Australia	1	2.6
<i>Laboratory findings</i>			Canada	1	2.6
Lymphopenia	30	23.8	France	1	2.6
High C-reactive protein	28	22.2	Germany	1	2.6
High AST	10	7.9	Japan	1	2.6
Leukopenia	9	7.1	Nepal	1	2.6
High ALT	9	7.1	Taiwan	1	2.6
High LDH	8	6.3	Thailand	1	2.6
High Erythrocyte sedimentation rate	6	4.8	United States of America	1	2.6
Leukocytosis	4	3.2	Vietnam	1	2.6
Anemia	4	3.2	<i>Countries of the cases reported (n = 126)</i>		
Decreased Albumin	3	2.4	China	101	80.2
High Creatinine	2	1.6	South Korea	6	4.8
High Creatine kinase	2	1.6	Germany	5	4.0
High Bilirubin	1	0.8	France	3	2.4
			Australia	2	1.6
			Taiwan	2	1.6
			Vietnam	2	1.6
			Canada	1	0.8
			Japan	1	0.8
			Nepal	1	0.8
			Thailand	1	0.8
			United States of America	1	0.8

^a The list of case reports is available at Table S1—supplemental materials.

結果

- 另外39篇Case reports共整理了126位病人。
- 平均年齡: 47.9歲、男性佔了69.01%。
- 10.3%有高血壓。
- 最常見症狀: 發燒(77.0%)、咳嗽(55.6%)、肌肉痠痛(31.0%)
- 實驗室檢查發現: 最常見:淋巴球指數下降(23.8%)、發炎指數(CRP)上升(22.2%)、肝指數(AST)上升(7.9%)
- 胸部X光: 46%有毛玻璃狀陰影(Ground-glass opacity)、39.7%雙側同時有肺炎。
- 所有病人血液都檢測得到病毒RNA。
- 7.1%有急性呼吸窘迫(ARDS)、1.6%造成次發性感染。
- 74.6%有住院接受治療，15.9%死亡。

討論

- 最近這兩個月，全世界有超過156,000感染新冠病毒。
- 在這一次大流行中，可以發現新冠病毒感染者從無症狀、輕微症狀、嚴重症狀、需要住院治療到致死案例都有。
- 不論是中國一開始的個案，或是後續的研究都發現成年人的症狀都較兒童嚴重，例如成年人常以發燒和咳嗽的症狀為主，同樣的呼吸困難、肌肉痠痛及其他表現也是如此(兒童症狀較輕微)。
- 新冠病毒感染發燒的比例和SARS及MERS感染者類似；但是咳嗽症狀在SARS和新冠病毒感染者較多，在MERS咳嗽則比較少；腹瀉症狀則以感染SARS及MERS比例較高(20-25%)，新冠病毒感染者腹瀉比例小於7%。
- 在個案報告中，肌肉痠痛是僅次於發燒和咳嗽第三常見的症狀。
- 大部分的新冠病毒感染者都因為同時有共病症而需要住院治療，而住院者大約20%需要加護病房治療。
- 新冠病毒感染和SARS感染的病程(SARS: two stage clinical course)不同，需要進一步研究定義。

討論

- 新冠病毒感染者的實驗室檢查異常發現有: 白蛋白降低、發炎指數、LDH及ESR上升、淋巴球指數下降。淋巴球指數下降可能因為新冠病毒作用在淋巴球，特別是T細胞，造成CD4及CD8的消耗。
- 病毒經由呼吸道上皮細胞ACE2接受器散播，進而感染其他細胞，可能誘發細胞激素風暴(cytokine storm)，進而造成一連串的免疫反應。

延伸閱讀:

與SARS感染者比較，新冠病毒感染者沒有明顯血小板低下、低血鈉及低血鉀的症狀。

討論

- 罹患新冠病毒病患者有1/3有急性呼吸窘迫症狀(ARDS)、急性心臟損傷、急性腎臟損傷以及休克，最終可能造成多重器官衰竭。因此對於嚴重及危急病患，及早發現及早治療十分重要。本研究從七個研究(632位住院病人)發現，死亡率超過13%。另外兩個中國研究死亡率則為15%及11%。
- 於此篇文章發表的同時，也有其他團隊進行不同的文獻回顧及系統性分析，其他團隊研究的症狀和共病症和此篇研究結果差異不大，但他們缺少實驗室及影像學的統合分析。
- 雖然本研究發表，但仍需要更多短、長期追蹤性研究以及發生在中國外的研究，甚至是郵輪上的案例來進行更完整的分析。

結論

- 有慢性疾病共病症患者若罹患新冠病毒有明顯的死亡率。
- 至少1/5病人需要加護病房治療，而加護病房資源在發展中國家較缺乏。
- 和其他呼吸道病毒類似，新冠病毒感染者有會有快速的發燒、咳嗽及呼吸困難的疾病病程，但需要注意的是新冠病毒感染者有淋巴球下降及快速進展至ARDS的特性。
- 近期旅遊史或和新冠病毒確診個案接觸史都需要特別注意，可能需啟動隔離措施並且採檢確認。
- 嚴重或死亡個案的病毒和宿主危險因子需要進一步研究。

Table 2

Demographical characteristics, ICU requirement, and comorbidities of the study subjects.

Author	Date (MM/DD)	N	Mean Age (y-old)	Age Range	Sex (Male)	N at ICU	N (%)							Reference
							Comorbidities	Diabetes	Hypertension	Cardiovascular disease	Chronic obstructive pulmonary disease	Malignancies	Chronic liver disease	
WMCHHPNCI	01/20	136	-	25-89	66	-	-	-	-	-	-	-	-	[64]
Chaolin et al.	01/24	41	49	41-58	30	13 (31.7)	13 (31.7)	8 (19.5)	6 (14.6)	6 (14.6)	1 (2.4)	1 (2.4)	1 (2.4)	[5]
Li et al.	01/29	425	56	26-82	240	-	-	-	-	-	-	-	-	[11]
Chen et al.	01/30	99	55.5	21-82	67	23 (23.2)	50 (50.5)	12 (12.1)	-	40 (40.4)	1 (1.0)	1 (1.0)	-	[4]
Chung et al.	02/04	21	51	29-77	13	-	-	-	-	-	-	-	-	[65]
Chen et al.	02/06	29	56	26-79	21	-	16 (55.2)	5 (17.2)	8 (27.6)	-	-	1 (3.4)	2 (6.9)	[66]
Wang et al.	02/07	138	56	42-68	75	36 (26.1)	64 (46.4)	14 (10.1)	43 (31.2)	20 (14.5)	4 (2.9)	10 (7.2)	4 (2.9)	[67]
Kui et al.	02/07	137	57	20-83	61	-	27 (19.7)	14 (10.2)	13 (9.5)	10 (7.3)	2 (1.5)	2 (1.5)	-	[68]
Chang et al.	02/07	13	34	34-48	10	-	-	-	-	-	-	-	-	[69]
To et al.	02/12	12	62.5	37-75	7	-	-	-	-	-	-	-	-	[70]
COVID-19 team	02/12	15	43	8-66	9	1 (6.7)	-	-	-	-	-	-	-	[71]
Australia														
Yueying et al.	02/13	63	-	15.2 - 44.9	33	-	-	-	-	-	-	-	-	[72]
Li et al.	02/13	24	43	12 - 84	8	-	-	-	-	-	-	-	-	[73]
Feng et al.	02/13	21	40.9	25-63	6	-	-	-	-	-	-	-	-	[74]
Liang et al.	02/14	1590	-	-	911	130 (8.2)	18 (1.1)	2 (0.1)	2 (0.1)	-	1 (0.06)	-	-	[41]
Zhang et al.	02/15	9	36	15-49	5	-	1 (11.1)	1 (11.1)	-	-	-	-	-	[40]
Feng et al.	02/17	15	-	4 - 14	5	-	-	-	-	-	-	-	-	[75]
Wang et al.	02/17	34	8	-	14	-	-	-	-	-	-	-	-	[76]
Xiaobo et al.	02/21	52	59.7	33.6-85.8	35	-	21 (40.4)	9 (17.3)	-	5 (9.6)	4 (7.7)	2 (3.8)	-	[52]

WMCHHPNCI, Wuhan Municipal Commission of Health and Health on Pneumonia of New Coronavirus Infection. MM/DD, Month, Day. ICU, intensive care unit requirement. y-old, years old. -, Not available, not reported.

Table 3

Clinical characteristics of the study subjects.

Author	Date (MM/ DD)	N	N (%)									Reference
			Fever	Cough	Sore Throat	Myalgia or fatigue	Sputum production	Headache	Haemoptysis	Diarrhoea	Dyspnoea	
WMCHHHPNCI	01/20	136	136 (100.0)	136 (100.0)	-	-	-	-	-	-	136 (100.0)	[64]
Chaolin et al.	01/24	41	40 (97.6)	31 (75.6)	0 (0.0)	18 (43.9)	11 (26.8)	3 (7.3)	2 (4.9)	1 (2.4)	22 (53.7)	[5]
Li et al.	01/29	425	-	-	-	-	-	-	-	-	-	[11]
Chen et al.	01/30	99	82 (82.8)	81 (81.8)	5 (5.1)	11 (11.1)	-	8 (8.1)	-	2 (2.0)	31 (31.3)	[4]
Chung et al.	02/04	21	14 (66.7)	9 (42.9)	-	6 (28.6)	-	3 (14.3)	-	-	-	[65]
Chen et al.	02/06	29	28 (96.6)	21 (72.4)	-	12 (41.4)	21 (72.4)	2 (6.9)	-	4 (13.8)	17 (58.6)	[66]
Wang et al.	02/07	138	136 (98.6)	82 (59.4)	24 (17.4)	138 (100.0)	37 (26.8)	9 (6.5)	-	14 (10.1)	43 (31.2)	[67]
Kui et al.	02/07	137	112 (81.8)	66 (48.2)	-	44 (32.1)	6 (4.4)	13 (9.5)	7 (5.1)	11 (8.0)	26 (19.0)	[68]
Chang et al.	02/07	13	12 (92.3)	6 (46.2)	-	3 (23.1)	2 (15.4)	3 (23.1)	-	1 (7.7)	-	[69]
To et al.	02/12	12	-	-	-	-	-	-	-	-	-	[70]
COVID-19 team Australia	02/12	15	14 (93.3)	11 (73.3)	-	-	-	-	-	-	-	[71]
Yueying et al.	02/13	63	-	-	-	-	-	-	-	-	-	[72]
Li et al.	02/13	24	19 (79.2)	6 (25.0)	-	6 (25.0)	-	4 (16.7)	-	-	2 (8.3)	[73]
Feng et al.	02/13	21	18 (85.7)	12 (57.1)	4 (19.0)	11 (52.4)	6 (28.6)	-	-	-	-	[74]
Liang et al.	02/14	1590	-	-	-	-	-	-	-	-	-	[41]
Zhang et al.	02/15	9	8 (88.9)	5 (55.6)	4 (44.4)	4 (44.4)	-	-	-	-	-	[40]
Feng et al.	02/17	15	5 (33.3)	1 (6.7)	-	-	-	-	-	-	-	[75]
Wang et al.	02/17	34	17 (50.0)	13 (38.2)	-	-	-	-	-	-	-	[76]
Xiaobo et al.	02/21	52	51 (98.1)	40 (76.9)	-	6 (76.9)	-	3 (11.5)	-	-	33 (63.5)	[52]

WMCHHHPNCI, Wuhan Municipal Commission of Health and Health on Pneumonia of New Coronavirus Infection. MM/DD, Month, Day. -, Not available, not reported.

Table 4

Laboratory characteristics of the study subjects.

Author	Date (MM/ DD)	N	N (%)															Reference
			Leucocytosis	Leukopenia	Lymphopenia	High AST	High Creatinine	High Creatine kinase	High LDH	High Troponin I, > 99th perc	Anemia	Decreased Albumin	High ALT	High Bilirubin	Erythrocyte sedimentation rate elevated	C-reactive protein, high	Serum ferritin	
WMCHHPNCI	01/20	136	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	[64]
Chaolin et al.	01/24	41	12 (29.3)	10 (24.4)	26 (63.4)	15 (36.6)	4 (9.8)	13 (31.7)	29 (70.7)	5 (12.2)	-	-	-	-	-	-	-	[5]
Li et al.	01/29	425	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	[11]
Chen et al.	01/30	99	24 (24.2)	9 (9.1)	35 (35.4)	35 (35.4)	3 (3.0)	13 (13.1)	75 (75.8)	-	50 (50.5)	97 (98.0)	28 (28.3)	18 (18.2)	84 (84.8)	63 (63.6)	62 (62.6)	[4]
Chung et al.	02/04	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	[65]
Chen et al.	02/06	29	6 (20.7)	6 (20.7)	20 (69.0)	7 (24.1)	2 (6.9)	-	20 (69.0)	-	-	15 (51.7)	5 (17.2)	1 (3.4)	-	27 (93.1)	-	[66]
Wang et al.	02/07	138	0 (0.0)	0 (0.0)	97 (70.3)	-	-	-	55 (39.9)	-	-	-	-	-	-	-	-	[67]
Kui et al.	02/07	137	26 (19.0)	51 (37.2)	99 (72.3)	-	-	-	-	-	-	-	-	-	-	115 (83.9)	-	[68]
Chang et al.	02/07	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	[69]
To et al.	02/12	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	[70]
COVID-19 team Australia	02/12	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	[71]
Yueying et al.	02/13	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	[72]
Li et al.	02/13	24	-	5 (20.8)	2 (8.3)	-	-	-	-	-	-	-	-	-	6 (25.0)	12 (50.0)	-	[73]
Feng et al.	02/13	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	[74]
Liang et al.	02/14	1590	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	[41]
Zhang et al.	02/15	9	1 (11.1)	-	2 (22.2)	-	-	-	-	-	-	-	-	-	-	5 (55.6)	-	[40]
Feng et al.	02/17	15	-	8 (53.3)	-	-	-	-	-	-	-	-	-	-	-	-	-	[75]
Wang et al.	02/17	34	5 (14.7)	1 (2.9)	1 (2.9)	-	-	-	10 (29.4)	-	-	-	-	-	5 (14.7)	1 (2.9)	-	[76]
Xiaobo et al.	02/21	52	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	[52]

WMCHHPNCI, Wuhan Municipal Commission of Health and Health on Pneumonia of New Coronavirus Infection. MM/DD, Month, Day. LDH, Lactate dehydrogenase. AST, Aspartate transaminase. ALT, Alanine transaminase. -, Not available, not reported.

Table 5
Imaging and complications of the study subjects.

Author	Date (MM/ DD)	N	N (%)												Reference
			Imaging		Complications										
			Chest Ray Unilateral Pneumonia	Chest Ray Bilateral Pneumonia	Ground- glass opacity	Acute respiratory distress syndrome	RNAemia	Acute cardiac injury	Acute kidney injury	Secondary infection	Shock	Hospitalization	Discharge	Death	
WMCHHPNCI	01/20	136	-	-	-	-	-	-	-	-	-	-	-	1 (0.7)	[64]
Chaolin et al.	01/24	41	-	40 (97.6)	40 (97.6)	12 (29.3)	6 (14.6)	5 (12.2)	3 (7.3)	4 (9.8)	3 (7.3)	7 (17.1)	28 (68.3)	6 (14.6)	[5]
Li et al.	01/29	425	-	-	-	-	425 (100.0)	-	-	-	-	-	-	-	[11]
Chen et al.	01/30	99	25 (25.3)	74 (74.7)	14 (14.1)	17 (17.2)	99 (100.0)	-	3 (3.0)	-	4 (4.0)	57 (57.6)	31 (31.3)	11 (11.1)	[4]
Chung et al.	02/04	21	2 (1.5)	16 (11.8)	18 (13.2)	-	21 (15.4)	-	-	-	-	21 (15.4)	-	-	[65]
Chen et al.	02/06	29	-	-	29 (100.0)	-	29 (100.0)	-	-	-	-	27 (93.1)	-	2 (6.9)	[66]
Wang et al.	02/07	138	0 (0.0)	138 (100.0)	138 (100.0)	27 (19.6)	138 (100.0)	10 (7.2)	5 (3.6)	-	12 (8.7)	138 (100.0)	47 (34.1)	6 (4.3)	[67]
Kui et al.	02/07	137	-	36 (26.3)	55 (40.1)	-	137 (100.0)	-	-	-	-	77 (56.6)	44 (32.4)	16 (11.8)	[68]
Chang et al.	02/07	13	1 (7.7)	-	6 (46.2)	-	13 (100.0)	-	-	-	-	12 (92.3)	1 (7.7)	-	[69]
To et al.	02/12	12	-	-	-	-	12 (100.0)	-	-	-	-	12 (100.0)	-	-	[70]
COVID-19 team Australia	02/12	15	-	-	-	-	15 (100.0)	-	-	-	-	11 (73.3)	-	-	[71]
Yueying et al.	02/13	63	-	38 (60.3)	14 (22.2)	-	63 (100.0)	-	-	-	-	-	-	-	[72]
Li et al.	02/13	24	-	-	-	-	24 (100.0)	-	-	-	-	-	-	-	[73]
Feng et al.	02/13	21	18 (85.7)	-	-	-	21 (100.0)	-	-	-	-	21 (100.0)	-	-	[74]
Liang et al.	02/14	1590	-	-	-	-	-	-	-	-	-	1590 (100.0)	-	-	[41]
Zhang et al.	02/15	9	2 (22.2)	5 (55.6)	7 (77.8)	-	9 (100.0)	-	-	-	-	9 (100.0)	-	-	[40]
Feng et al.	02/17	15	4 (26.7)	8 (53.3)	-	-	15 (100.0)	-	-	-	-	-	15 (100.0)	-	[75]
Wang et al.	02/17	34	-	34 (100.0)	34 (100.0)	-	34 (100.0)	-	-	-	-	34 (100.0)	34 (100.0)	-	[76]
Xiaobo et al.	02/21	52	-	-	-	35 (67.3)	-	12 (23.1)	15 (28.8)	2 (3.8)	-	52 (100.0)	-	32 (61.5)	[52]

WMCHHPNCI, Wuhan Municipal Commission of Health and Health on Pneumonia of New Coronavirus Infection. MM/DD, Month, Day. ICU, intensive care unit. y-old, years old. AST, Aspartate transaminase. ALT, Alanine transaminase. -, Not available, not reported.

延伸閱讀 PRISMA

- 任何一個好的系統性文獻回顧都是從方案開始的，根據美國國立衛生研究院 (National Institutes of Health, NIH)，protocol 就像是文獻回顧的路徑圖，定義文獻回顧的目標、方法還有主要意圖的結果。文獻回顧需要有 protocol 的用意是促進研究方法透明度。
- Protocol定義搜索詞、需要包含以及排除的條件、要分析的數據等，需要和文章一起遞交給期刊。大部分的期刊希望系統文獻回顧的作者使用 PRISMA 聲明或類似的指引來撰寫 protocol。
- PRISMA 聲明 (PRISMA Statement)：所有寫系統性文獻回顧的人應該都熟悉 PRISMA 聲明，PRISMA 聲明是包含27 個項目的清單和1 個流程圖的檔案，指導作者如何發展系統性文獻回顧的實驗方案，並明確標明該有哪些訊息。

延伸閱讀 publication bias

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M. Egger, G. Davey Smith, M. Schneider, and C. Minder

BMJ. 1997 Sep 13; 315(7109): 629–634. doi: 10.1136/bmj.315.7109.629

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