



What are the signs and symptoms of COVID-19 patients?

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This rapid review summarizes the available evidence on the clinical manifestations of patients with COVID-19. This may change as new evidence emerges.

KEY FINDINGS

Systematic reviews of observational studies have shown that the most common symptoms of COVID-19 are fever, cough and fatigue/myalgia.

- Common presenting symptoms of COVID-19 patients are fever, cough, fatigue/myalgia, dyspnea, shortness of breath, chest tightness/pain, anorexia, arthralgia, sputum production, chills, headache and sore throat. Less common symptoms (<10%) include diarrhea, abdominal pain, dizziness, rhinorrhea, nausea and vomiting, nasal congestion, and hemoptysis.
- Patients presenting with **dyspnea or shortness of breath** are at a higher risk of developing severe case of COVID-19 or death.
- Common clinical manifestations in **children** were fever, cough, tachypnea and tachycardia. Less common symptoms reported (<10%) were fatigue/myalgia, gastrointestinal symptoms, headache, sputum production, nausea and vomiting, and rhinorrhea.
- Common reported symptoms in **pregnant women** with COVID-19 included fever, cough, dyspnea, malaise and sore throat. Other symptoms noted were gastrointestinal symptoms and chills.
- Two prediction models for diagnosing COVID-19 included fever, respiratory symptoms such as cough, expectoration, and dyspnea/shortness of breath, fatigue, sore throat, and headache, but should be used with caution because their predictive performance may be lower in the actual clinical setting.
- The US Center for Disease Control and Philippine Society for Microbiology and Infectious Disease identified cough, fever or chills, and shortness of breath as the most common presenting symptoms of COVID-19. Gastrointestinal symptoms (abdominal pain, diarrhea, nausea, vomiting), respiratory/cardiac symptoms (sputum production, sore throat, nasal congestion, rhinorrhea, chest pain), neurologic symptoms (headache, dizziness, anosmia, dysgeusia, altered sensorium), musculoskeletal (muscle pain) and other constitutional symptoms (fatigue, anorexia) occurred less frequently.

Disclaimer: The aim of these rapid reviews is to retrieve, appraise, summarize and update the available evidence on COVID-related health technology. The reviews have not been externally peer-reviewed; they should not replace individual clinical judgement and the sources cited should be checked. The views expressed represent the views of the authors and not necessarily those of their host institutions. The views are not a substitute for professional medical advice.

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RESULTS

We found 21 systematic reviews on the prevalence of various signs and symptoms of confirmed cases of COVID-19. These reviews included case reports, case series, and epidemiologic/surveillance data of COVID-19 patients. The number of studies reviewed ranges from 3 to 68 studies involving 432 to 50,566 patients. Eight reviews included COVID-19 patients regardless of age, severity and/or comorbidities.[1-8] Five systematic reviews [9-13] looked at the clinical manifestations of children with COVID-19 infection while another five [14-18] were on pregnant women with COVID-19. Four systematic reviews focused on specific sets of clinical manifestations which are upper airway, gastrointestinal, nervous and ophthalmologic in nature. Most of the studies used in these reviews were patients from China. The last date of search ranges between February 2020 and April 2020.

The most common presenting symptoms in COVID-19 patients were **fever** (80% to 89%), **cough** (58% to 72%) and **fatigue/myalgia** (36% to 46%). Other common symptoms of COVID-19 include the following: dyspnea, shortness of breath, chest tightness/pain, anorexia, arthralgia, expectoration, chills, headache and sore throat. Less common symptoms (<10%) include diarrhea, abdominal pain, dizziness, rhinorrhea, nausea and vomiting, nasal congestion, and hemoptysis. [1-7, 19] See Appendix 2

Patients presenting with dyspnea/shortness of breath are at a higher risk of developing severe case or death (O.R. 4.16; 95% C.I.: 3.1- 5.53; p<0.001).[20]

94% of children would present with mild symptoms. [10] The most common symptoms in children were fever (43% to 59%) and cough (22% to 46%). Tachypnea and tachycardia were also common.[9, 11] Less common symptoms reported (<10%) were fatigue/ myalgia, gastrointestinal symptoms, headache, sputum production, nausea and vomiting, and rhinorrhea. See Appendix 3

Common reported symptoms in pregnant women with COVID-19 included fever, cough, dyspnea, malaise and sore throat. Other symptoms noted were GI symptoms and chills. See Appendix 4

Common upper airway symptoms were sore throat and nasal congestion while rhinorrhea was rare. Although reports of smell and taste dysfunction were noted, the reports were not included in the meta-analysis.[19] Among CNS manifestation, the most common is headache and dizziness. Stroke, seizure, ataxia and impaired consciousness were also reported.[21] In another review, rate of conjunctivitis was 1.1% where presence of conjunctivitis is correlated to a more severe COVID-19 infection (O.R. 3.4; 95% C.I.:1.1-10.2; p=0.03). GI manifestations which accounts for 17% of all symptoms include anorexia, nausea/vomiting, diarrhea, and abdominal pain/discomfort. [22]

Clinical characteristics used in prediction models in the diagnosis of COVID-19

The systematic review of Wynants et al identified and appraised two prediction models utilizing clinical signs and symptoms in diagnosing patients with COVID-19. The COVID-19 Early Warning Score (COVID-19 EWS) developed by Song et al is a scoring system that identifies patients highly suspected to have COVID-19. Clinical manifestations used in their model were fever, meaningful respiratory symptoms (including cough, expectoration and dyspnea) and highest body temperature equal to or above 37.8°C. Other variables included were pneumonia on CT-scan, history of close contact with confirmed COVID-19 patients, age of 44 and above, being male and neutrophil to lymphocyte ratio of more than or equal to 5.8. A score of 10 or more is considered a highly suspected patient for COVID-19. See Table 1. Its c-index is 0.97 (95 C.I. 0.93 to 1.00). A c-index near one (1) means good discriminatory performance [23].

Table 1. Parameters and its equivalent score of the COVID-19 EWS

Parameters	Assessment	Score
Signs of pneumonia on CT	Yes	5

History of close contact with COVID-19 confirmed patient	Yes	5
Fever	Yes	3
Age	≥ 44 years old	1
Sex	M	1
Highest body temperature	37.8C (100F)	1
Meaningful respiratory symptoms (including cough, expectoration and dyspnea)	≥ 1 symptom	1
Neutrophil-to-lymphocyte ratio	≥ 5.8	1

Another prediction model developed was the COVID-19 diagnosis AID APP. It is an online tool that predicts the diagnosis of COVID-19 using different clinical and laboratory parameters. Available here: <https://intensivecare.shinyapps.io/COVID19/>. Clinical manifestations included in the model were fever and fever classification, fatigue, chills, shortness of breath, headache, sore throat and vital signs (heart rate, temperature, diastolic BP and systolic BP). Other predictors in the model were age, CBC parameters, and IL-6 levels. The model has a relatively good discriminatory performance of C index = 0.94.

However, both studies have high risk of bias which means its predictive performance may be lower in actual clinical setting [24]. In the study of Song, patients without COVID-19 (or a proportion of them) were excluded that could alter the prevalence while the study of Feng included fever, a predictor in the model, as part of the definition of the outcome. Caution should be exercised when using these prediction models.

Recommendations from Other Guidelines

The treatment guidelines of various institutions and societies identified the presenting signs and symptoms of COVID-19. The World Health Organization presented a syndromic approach in recognizing the signs and symptoms of COVID-19 at the triage by classifying the presentations of mild upper respiratory illness, pneumonia, severe pneumonia, acute respiratory distress syndrome, sepsis, and septic shock [25]. Both the US Center for Disease Control (CDC) and Philippine Society for Microbiology and Infectious Disease (PSMID) identified cough, fever or chills, and shortness of breath as the most common presenting symptoms of COVID-19 [26, 27]. Gastrointestinal symptoms (abdominal pain, diarrhea, nausea, vomiting), respiratory/cardiac symptoms (sputum production, sore throat, nasal congestion, rhinorrhea, chest pain), neurologic symptoms (headache, dizziness, anosmia, dysgeusia, altered sensorium), musculoskeletal (muscle pain) and constitutional symptoms (fatigue, anorexia) occurred less frequently [25-27]. Physical findings such as abnormal vital signs (hypotension, tachycardia, tachypnea, bradypnea, desaturations), respiratory distress, cyanosis, mottling, and prolonged capillary refill time were additional signs the WHO specified[25].

CONCLUSION

Systematic reviews of observational studies showed that fever, cough, fatigue / myalgia are common clinical manifestations of COVID-19 patients. Fever and cough being the most common across all age groups and among pregnant women. Other symptoms may include dyspnea, chest pain and chills. Gastrointestinal, nervous, and ophthalmic manifestation may also occur as well as other atypical symptoms like dysosmia and dysgeusia. Presentation of these symptoms would warrant further investigation for COVID-19.

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Appendix 1. Characteristics of included studies

Description	Participants	Number of Studies	Study Design Included	Database Searched	Date of Search	Number of Participants
Borges2020	COVID-19 Patients	60	Case reports, case series, epidemiological reports	MEDLINE, CENTRAL, EMBASE, Scopus and LILACS databases	01 January 2019 to 24 February 2020	104,345
Cao 2020	COVID-19 Patients	31	Case series, retrospective studies	PubMed, Cochrane Library, Embase, National Knowledge Infrastructure [CNKI] and China Biology Medicine disc [CBMdisc].	March 1 2020	46 959
Castagnoli 2020	COVID-19 patients < 20 age	18	Case report, case series, retrospective studies	Pubmed, Cochrane Library, CINAHL	01 Dec 2019 - 03 March 2020	1065 pediatric cases; 444 age < 10; 553 age 10-19; 2 newborns
Chang 2020	COVID-19 patients < 18 age	9	Case series	Pubmed, Embase, Chinese journals, Google Scholar	January 2020 - 15 March 2020	112 pediatric cases; 19 newborns; 93 age 1-17
Cheung 2020	COVID-19 patients	69	NM	MEDLINE, EMBASE, Cochrane Library, CQVIP, Wanfang Data, and Chinese National Knowledge Infrastructure [CNKI]	1 Dec 2019 until 11 March 2020	4,243
Della Gatta 2020	COVID-19 pregnant patients	6	retrospective studies	Pubmed, Scopus, CINAHL	16-Mar-20	51
Di Mascio2020	COVID-19 pregnant patients	19	Case report, case series, retrospective studies	Medline, EMBASE, CINAHL, Clinicaltrials.gov	13-Mar-20	79 pregnancies - 41 COVID-19; 12 MERS; 26 SARS
Elshafeey 2020	COVID-19 pregnant patients	33	Case report, case series, case-control	LitCOVID, EBSCO, Medline, CENTRAL, CINAHL, Web of Science, SCOPUS	19-Apr-20	385
Fu 2020	COVID-19 patients	43	retropsective case series, prospective study, surveillance data	PubMed, EMBASE, Web of Science and CNKI (Chinese Database)	March 2, 2020	3600
Hu 2020	COVID-19 patients	21	Retropective study	Medline, Sino Med, EMBASE, and Cochrane Library	January1, 1980 to March 10, 2020	
Li 2020	COVID-19 patients	10	Case studies	Medline, Embase, Web of Science, WanFang Data, and CNKI	December 2019 to February 2020	432
Loffredo 2020	COVID 19	3			April 5, 2020	1167
Lovato 2020	COVID 19	5	Case series	PubMed, Web of Science	February 24, 2020 to March 1, 2020	1556
Ludvigsson 2020	COVID-19 patients < 19 years	45 scientific papers & letters	Case series	Medline, Embase	January 2020 - 19 March 2020	Not clearly indicated
Pooya 2020	COVID-19 patients	8	Case series	MEDLINE, Scopus	December 01, 2019 to March 26, 2020	765
Morales 2020	COVID-19 patients	58 (19 for quantitative analysis; 39 for qualitative analysis)	Case series, cross-sectional studies	Medline, Scopus, Web of Scienc	January 1, 2020, and February 21, 2020,	2874
Sun 2020	COVID-19 patients	10	Retrospective studies	PubMed, Cochrane Library, Embase	February 24, 2020.	50 466
Wynants 2020	Prediction models onf COVID-19	27	Prediction model development and/or validation studies	PubMed and Embase through Ovid, bioRxiv, medRxiv, and arXiv	March 24, 2020	31 prediction models

Yang2020	COVID-19 pregnant patients	18	case reports/case series, 1 case-control	pubmed, google scholar, CNKI, Wanfang data, VIP, CBMdisc	Jan 1 to mar 26	114
Zaigham 2020	COVID-19 pregnant patients	18	Case reports, case series	Medline, EMBASE, Google Scholar	08 Dec 2019 - 04 Apr 2020	108
Zheng 2020	COVID 19 patients	13	Retrospective studies	Pubmed, Embase, Web of Science, and CNKI.	Jan 1, 2020 to Mar 20, 2020	3027
Zhu 2020	COVID-19 patients	38	Case series	PubMed, Foreign Medical Literature Retrieval Service (FMRS),The Cochrane Library, EMBASE, Wanfang, VIP and CNKI database	1 January 2020 to 28 February 2020.	3062

Appendix 2. Prevalence of clinical manifestations in patients with COVID-19

Study	Fever		Cough		Fatigue/Myalgia		Dyspnea		Anorexia		Shortness of breath		Chest Tightness/Distress	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Borges2020	82	56 to 99	61	39 to 81	36	18 to 55	26	12 to 41						
Cao2020	87.3	83.8 to 90.9	58.1	50.2 to 66	35.5	25.3 to 45.6	38.3	24.6 to 52					31.2	(2.4) to 64.8
Hu2020	85.6	81.3 to 89.9	65.7	60.1 to 71.4	42.4	32.2 to 52.6					21.4	15.3 to 27.5		
Li 2020	88.5	NR	68.6	NR	35.8	NR	21.9	NR						
Lovato2020	85.6	83.8 to 87.3	68.7	66.3 to 71.0	39.4	37 to 41.9					21.4	19.4 to 23.5		
Sun2020	89.1	81.8 to 94.5	72.2	65.7 to 78.2	42.5	65.7 to 78.2								
Zhu2020	80.4	73 to 86.9	63.1	57.9 to 68.2	46	38.2 to 54	33.9	24.2 to 44.3	38.8	14.1 to 67.1	35	21 to 50	35.7	23.2 to 49.3
Fu2020	83.3	78.4 to 87.7	60.3	54.2 to 66.3	38	29.8 to 46.5					24.9	16.6 to 34.4		

Study	Chest Pain		Myalgia/Arthralgia		Expectoration		Headache		Sore Throat		Shivering/Chills	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Zhu2020	28.3	1 to 72.9	33	26 to 40.5	41.8	34 to 50	15.4	11.6 to 19.6			11	0.058 to 0.17
Fu2020	14.9	4.9 to 28.4	28.5	21.2 to 36.2	26.9	18.3 to 36.4	14	9.9 to 18.6	12.3	8.5 to 16.5	15	0.3 to 41.4
Borges2020							12	4 to 23	10	5 to 17		
Cao2020							9.4	6.3 to 12.6	12	6.2 to 17.7		
Li 2020					28.2	NR	12.1	NR				
Lovato2020			15.63	13.9 to 17.5			11.4	9.9 to 13.1	12.4	10.9 to 14.2		

Study	GI symptoms		Diarrhea		Nausea and vomiting		Nasal Congestion		Abdominal Pain	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Borges2020	9	3 to 17								
Cao2020			6.8	4.4 to 9.2						
Li 2020			4.8	NR	3.9	NR				
Lovato2020			5.27	4.3 to 6.5	6.8	5.7 to 8.2	3.71	2.88 to 4.78		
Zhu2020			12.9	9.0 to 17.4	10.2	5.4 to 16.3			4.4	2.5 to 6.9
Fu2020			8.4	4.8 to 12.6	3.6	1.0 to 7.4	1.8	0.4 to 3.9		

Study	Dizziness		Rhinorrhea		Hemoptysis		No obvious symptoms	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Zhu2020							11.9	2.9 to 26
Fu2020	7.6	0 to 23.5	3.5	0.8 to 7.4	2	0 to 11.4	5.6	1.4 to 11.6

Appendix 3. Prevalence of clinical manifestations in children with COVID-19

Study	Fever		Cough		Tachypnea		Tachycardia		Sputum production		Dyspnea		Fatigue/Myalgia	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Morales 2020	43.9	28.2 to 59.6	22	0.0 to 52.9										
Chang2020	59	41 to 72	46	27 to 66										
de Souza 2020	47.5	NR	41.5	NR	13..8	NR	18.6	NR	1.5				5	
Ludvigsson2020	41.5 (Lu 2020) ; 80 (Cai 2020) ; 76.1 (Yang 2020)		48.5 (Lu 2020) ; 60 (Cai 2020)		28.7 (Lu 2020)		42.1 (Lu 2020)						7.6 (Lu 2020)	
Wang 2020	48	39 to 56	39	30 to 48					19	0 to 44	9	0 to 19	8	5 to 12

Study	Sore Throat		GI symptoms		Diarrhea		Headache		Nausea and vomiting		Abdominal Pain	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Chang2020			12	6 to 32								
Ludvigsson2020			8.8 (Lu 2020)						6.4 (Lu 2020)			
Wang 2020	6	2 to 10			7	5 to 9	4	1 to 6	6	4 to 9		
de Souza 2020	2.5				8.1				7.1	NR	0.5	

Study	Rhinorrhea	Nasal obstruction	Sneezing	Cyanosis	Lymphadenopathy	Respiratory distress	Nasal symptoms

	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Ludvigsson2020	7.6 (Lu 2020)											
Wang 2020	9	6 to 12	6	3 to 9								
de Souza 2020					0.5		0.5		0.2		3.5	11.2

Appendix 4. Prevalence of clinical manifestations in pregnant women with COVID-19

Study	Fever		Cough		Dyspnea		Fatigue/Myalgia		Sore Throat		GI symptoms		Myalgia/Arthralgia		Malaise		Shivering/Chills	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Della Gatta 2020	48.6	NR	45.7	NR	11.4	NR	8.6	NR	14.3	NR	5.7	NR	8.6	NR	5.7			
DiMascio2020	75.56	61.9 to 87.0	42.02	28.0 to 56.7	8.89	2.4 to 19												
Elshafey2020	67.3	NR	65.7	NR	7.3	NR	7	NR	7	NR	7.3	NR	6.2	NR			5.5	
Yang2020	87.5	NR	53.8	NR	11.3	NR	22.5	NR	7.5	NR	8.8	NR	16.3	NR				
Zaigham2020	68	NR	34	NR	12	NR					6	NR			13			