Supplementary Material for:

Artificial Intelligence for COVID-19 Detection in Medical Imaging—Diagnostic Measures and Wasting—A Systematic Umbrella Review

Paweł Jemioło, Dawid Storman, Patryk Orzechowski
E-mail: pawljmlo@agh.edu.pl

Table S1. Included studies with dates: first received, last received, accepted and published.

ID	Reference date	First received	Last received	Accepted	Published / Available online
[57]	**11.04**	06.04	**11.04**	11.04	16.04
[58]	**12.04**	11.04	**12.04**	11.04	11.04
[59]	**20.04**	12.04	**20.04**	22.04	27.04
[60]	**01.05**	27.04	**01.05**	03.05	20.05
[61]	**03.05**	25.04	**03.05**	04.05	07.05
[62]	**15.05**	25.04	Not Reported	**15.05**	Not Reported
[63]	**27.05**	12.04	**27.05**	01.06	02.06
[64]	**11.06**	Not Reported	Not Reported	Not Reported	**11.06**
[65]	**12.06**	10.05	Not Reported	**12.06**	23.06
[66]	**21.06**	18.02	**21.06**	07.07	28.07
[67]	**27.06**	Not Reported	Not Reported	Not Reported	**27.06**
[68]	**01.07**	Not Reported	Not Reported	**01.07**	03.07
[69]	**04.07**	04.07	**04.07**	04.07	04.07
[70]	**15.07**	Not Reported	Not Reported	Not Reported	**15.07**
[71]	**26.07**	26.07	**26.07**	26.07	26.07
[72]	**26.07**	Not Reported	Not Reported	Not Reported	**26.07**
[73]	**27.07**	27.07	**27.07**	27.07	27.07
[74]	**30.07**	30.07	**30.07**	30.07	30.07
[75]	**03.08**	03.08	**03.08**	03.08	03.08
[76]	**09.08**	09.08	**09.08**	09.08	09.08
[77]	**14.08**	14.08	**14.08**	14.08	14.08
[78]	**22.09**	22.09	Not Reported	**22.09**	12.10

Table S2. Exluded studies with reasons.

ID	Reason
[102]	Wrong Study Design
[103]	Wrong Patient Population
[104]	Wrong Target Condition
[105]	Wrong Outcomes
[106]	Wrong Outcomes
[107]	Wrong Outcomes
[108]	Wrong Outcomes
[109]	Wrong Outcomes
[110]	Wrong Outcomes
[111]	Wrong Outcomes
[112]	Wrong Outcomes

Table S3. Full characteristics of included reviews.

ID	No of interesting studies	No of models	Participants				Control		Index				Outcomes (percentages)	Funding	Conflict of Interest
			No	COVID+	Age	Sex	No	Type	Model	Data type	Data size	Explainablity			
			NR = Not Reported				NR = Not Reported	1 = Viral 2 = Bacterial 3 = Unknown 4 = Unclear 5 = Asymptomatic	NR = Not Reported M = Multiple	1 = X-ray 2 = CT (Computed Tomography) 3 = US (Ultrasound)	NR = Not Reported R = Reported CT = Computed Tomography		Acc = Accuracy AUC = Area Under Curve Cindex = Concordance Index F1 = F-score NPV = Negative Predictive Value Prec = Precision Sens = Sensitivity Spec = Specificity	NR = Not Reported R = Reported N = No Conflict of Interest	
[57]	13	18	14,822	4,295	NR	NR	10,597	1, 2, 3, 4, 5	M	1, 2	X-Rays = 5,941 CT = 4,356	NR	Acc = (73.1; 98) AUC = (95.2; 97.9) Sens = (74; 100) Spec = (67; 96)	R	NR
[58]	5	26	1,028	394	NR	NR	634	5	M	1	X-Rays = 1,028	NR	Acc = (50; 98)	NR	NR
[59]	12	13	14,992	4,939	NR	NR	9,896	1, 2, 3, 4, 5	M	1, 2, 3	CT = 509	NR	Acc = (86.7; 95) AUC = (78; 99.6) Sens = (90.7; 97.4) Spec = (83.3; 92.2)	R	NR
[60]	15	16	13,427	4,017	NR	NR	9,480	1, 2, 3, 4, 5	M	1, 2	X-Rays = 7,499 CT = 10,022	NR	Acc = 89.3 AUC = (94; 99) Sens = (67; 100) Spec = (76; 100)	NR	N

ID	No of interesting studies	No of models	Participants				Control		Index				Outcomes (percentages)	Funding	Conflict of Interest
			No	COVID+	Age	Sex	No	Type	Model	Data type	Data size	Explainablity			
			NR = Not Reported				NR = Not Reported	1 = Viral 2 = Bacterial 3 = Unknown 4 = Unclear 5 = Asymptomatic	NR = Not Reported M = Multiple	1 = X-ray 2 = CT (Computed Tomography) 3 = US (Ultrasound)	NR = Not Reported R = Reported CT = Computed Tomography		Acc = Accuracy AUC = Area Under Curve Cindex = Concordance Index F1 = F-score NPV = Negative Predictive Value Prec = Precision Sens = Sensitivity Spec = Specificity	NR = Not Reported R = Reported N = No Conflict of Interest	
[61]	6	9	19,058	546	NR	NR	1,435	1, 4, 5	M	1, 2	X-Rays= 16,756 CT = 6,039	NR	Acc = (79.3; 98) AUC = 97.91 Sens = (67; 94.06) Spec = (83; 95.47)	NR	N
[62]	1	1	NR	NR	NR	NR	NR	4	NR	1	NR	NR	Sens = 85	R	N
[63]	1	1	NR	NR	NR	NR	NR	4	NR	1	NR	NR	AUC = 96 Sens = 90 Spec = 96	R	N
[64]	1	1	NR	NR	NR	NR	NR	3	NR	2	CT = 4,356	NR	Sens = 90 Spec = 96	R	N
[65]	7	9	NR	160	NR	NR	NR	1, 2, 3, 4, 5	M	1, 2	X-Rays = 150 CT = 768	NR	Acc = (86.7; 99.68) F1 = (91; 95.52)	NR	N
[66]	10	15	NR	NR	NR	NR	NR	3, 4, 5	M	1, 2, 3	NR	NR	Acc = (76; 100) AUC = (81.9; 96) Sens = 96.8	R	N
[67]	6	11	3,680	90	NR	NR	84	1, 2, 3, 4, 5	M	1, 2	X-Rays = 1,427 CT = 4,536	NR	Acc = (73.1; 98.3) AUC = (78; 97) NPV = (81; 88) Sens = (67.1; 98.66) Spec = (76.4; 96.46)	NR	NR

ID	No of interesting studies	No of models	Participants				Control		Index				Outcomes (percentages)	Funding	Conflict of Interest
			No	COVID+	Age	Sex	No	Type	Model	Data type	Data size	Explainablity			
			NR = Not Reported Age = Range of mean ages Sex = Range of percentage of men				NR = Not Reported	1 = Viral 2 = Bacterial 3 = Unknown 4 = Unclear 5 = Asymptomatic	NR = Not Reported M = Multiple	1 = X-ray 2 = CT (Computed Tomography) 3 = US (Ultrasound)	NR = Not Reported R = Reported CT = Computed Tomography		Acc = Accuracy AUC = Area Under Curve Cindex = Concordance Index F1 = F-score NPV = Negative Predictive Value Prec = Precision Sens = Sensitivity Spec = Specificity	NR = Not Reported R = Reported N = No Conflict of Interest	
[68]	42	48	52,540	8,050	(31, 71)	(35, 67)	38,780	1, 2, 4, 5	M	1, 2, 3	NR	NR	Prec = (35; 99) NPV = (66; 97) Sens = (79; 100) Spec = (67; 100) Cindex = (81-99.8)	R	N
[69]	21	21	14,255	371	NR	NR	13,884	1, 2, 4, 5	M	1, 2	X-Rays = 18,184 CT = 48,809	NR	Acc = (73.1; 99.6) Sens = (74; 100) Spec = (67; 96)	R	NR
[70]	8	8	13,870	NR	NR	NR	NR	4, 5	NR	1, 2	X-Rays = 13,975 CT = 630	NR	Acc = (82.9; 99.68) AUC = (99.4; 99.6) Prec = 84 NPV = 98.2 Sens = (84; 98.93) Spec = (80.5; 97.6)	R	NR
[71]	67	68	NR	NR	NR	NR	NR	1, 2, 3, 4, 5	M	1, 2	X-Rays = 299,267 CT = 84,317	R	Acc = (73.1; 99.8) AUC = (31; 99.8) F1 = 89	R	NR
[72]	12	18	19,607	NR	NR	NR	NR	4	M	1, 2	X-Rays = 25,391 CT = 51	NR	Acc = (87; 99.68) F1=97.8 Prec = (96.4; 99.7) Sens = (87; 98.66) Spec = 87.9	NR	N

ID	No of interesting studies	No of models	Participants				Control		Index				Outcomes (percentages)	Funding	Conflict of Interest
			No	COVID+	Age	Sex	No	Type	Model	Data type	Data size	Explainablity			
			NR = Not Reported				NR = Not Reported	1 = Viral 2 = Bacterial 3 = Unknown 4 = Unclear 5 = Asymptomatic	NR = Not Reported M = Multiple	1 = X-ray 2 = CT (Computed Tomography) 3 = US (Ultrasound)	NR = Not Reported R = Reported CT = Computed Tomography		Acc = Accuracy AUC = Area Under Curve Cindex = Concordance Index F1 = F-score NPV = Negative Predictive Value Prec = Precision Sens = Sensitivity Spec = Specificity	NR = Not Reported R = Reported N = No Conflict of Interest	
[73]	106	116	187,976	18,882	NR	NR	122,248	1, 2, 3, 4, 5	M	1, 2	X-Rays = 352,377 CT = 179,951	R	Acc = (71.92; 100) AUC = (70; 99.84) F1 = (64; 100) Prec = (69.89; 100) Sens = (68.91; 100) Spec = (61.5; 100)	NR	NR
[74]	12	13	19,572	789	NR	NR	2,072	1, 2, 3, 4, 5	M	1, 2	X-Rays = 25,743 CT = 8,755	NR	Acc = (79.3; 98.3) AUC = (95.4; 99.6) Sens = (67; 97.91) Spec = (83; 92.2)	NR	NR
[75]	10	12	256	NR	NR	NR	NR	3, 4, 5	M	1, 2, 3	CT = 603	NR	Acc = (73.1; 100) AUC = (96; 99.6) F1 = (89; 100) Prec = 97.63 Sens = (74; 100) Spec = (67; 100)	NR	NR
[76]	45	45	NR	NR	NR	NR	NR	1, 2, 3, 4, 5	M	1, 2	X-Rays = 463,019 CT = 150,989	NR	Acc = (76; 100) AUC = (81; 100) F1 = (63; 100) Prec = (35.27; 100) NPV = (90; 100) Sens = (80; 100) Spec = (61.5; 100)	NR	NR

ID	No of interesting studies	No of models	Participants				Control		Index				Outcomes (percentages)	Funding	Conflict of Interest
			No	COVID+	Age	Sex	No	Type	Model	Data type	Data size	Explainablity			
			NR = Not Reported				NR = Not Reported	1 = Viral 2 = Bacterial 3 = Unknown 4 = Unclear 5 = Asymptomatic	NR = Not Reported M = Multiple	1 = X-ray 2 = CT (Computed Tomography) 3 = US (Ultrasound)	NR = Not Reported R = Reported CT = Computed Tomography		Acc = Accuracy AUC = Area Under Curve Cindex = Concordance Index F1 = F-score NPV = Negative Predictive Value Prec = Precision Sens = Sensitivity Spec = Specificity	NR = Not Reported R = Reported N = No Conflict of Interest	
[77]	24	29	3,238	1,650	NR	NR	1,578	1, 2, 3, 4, 5	M	1, 2	X-Rays = 32,840 CT = 149,078	NR	Acc = (64.4; 99.87) AUC = (67; 100) F1 = (70; 99.8) Prec = (89.8; 100) NPV=100 Sens = (61; 100) Spec = (28; 100)	R	N
[78]	27	31	21,053	2,570	NR	NR	1,678	1, 2, 3, 4, 5	M	1, 2	X-Rays = 194,470 CT = 55,245	NR	Acc = (73.1; 99.68) AUC (92; 99.6) F1 = (87; 97.5) NPV = (84; 93.36) Sens = (8; 100) Spec = (67; 99.99)	R	NR

Table S4. In-depth characteristics of primary studies.

	73 primary studies (included in one review only)			138 primary studies (included in at least one review)					
				Analysis A			Analysis B		
Variable	N (%)	Mean (range)	NOS	N (%)	Mean (range)	NOS	N (%)	Mean (range)	NOS
Number of participants									
Total	62,710	2,613 (60-16,340)	24	63,535	2,444 (60-16,340)	26	174,277	2,954 (45-32,717)	59
COVID-19	10,720 (17%)	466 (33-3,389)	23	10,766 (17%)	449 (33-3,389)	24	19,170 (11%)	369 (33-3,389)	52
Control	51,523 (83%)	3,037 (25-16,232)	17	52,002 (83%)	2,737 (25-16,232)	19	108,268 (62%)	2,578 (25-23,664)	42
CT scans									
Total	45,942	3,282 (10-21,658)	47	45,942	3,282 (10-21,658)	70	282,029	9,401 (10-132,583)	96
COVID-19	29,261 (64%)	2.251 (10-21,658)	46	29,411 (64%)	2,101 (10-21,658)	71	134,312 (48%)	4,631 (10-65,806)	95
X-Ray images									
Total	586,489	22,557 (40-339,271)	53	613,747	21,164 (40-339,271)	77	813,633	18,922 (40-339,271)	102
COVID-19	7,172 (1%)	276 (25-4,273)	53	8858 (1%)	286 (25-1,565)	77	15,759 (2%)	343 (25-4,273)	106
Other images									
Total	6,087	6,087 (6,087-6,087)	64	6,087	6,087 (6,087-6,087)	106	6,287	3,144 (200-6,087)	129
COVID-19	231 (4%)	231 (231-231)	64	231 (4%)	231 (231-231)	107	231 (4%)	231 (231-231)	128
Comparison									
Bacterial pneumonia	8 (11%)	NA	73	10 (9%)	NA	131	10 (9%)	NA	131
Viral pneumonia	9 (12%)	NA	73	11 (10%)	NA	129	11 (10%)	NA	129
Unknown pneumonia	18 (25%)	NA	73	21 (19%)	NA	107	21 (19%)	NA	108
Unclear	21 (29%)	NA	73	32 (23%)	NA	93	32 (23%)	NA	93
Asymptomatic controls			73			92			92
Healthy (normal)	23 (32%)	NA		27 (20%)	NA		27 (20%)	NA	
Non-COVID-19 (negative cases)	18 (25%)	NA		21 (15%)	NA		21 (15%)	NA	
Other	2 (3%)	NA		2 (1%)	NA		2 (1%)	NA	

NA = Not Applicable, NOS = Number of Studies, CT = Computed Tomography, CAM = Class Activation Mapping, Grad-CAM = Gradient-weighted Class Activation Mapping, LIME = Local Interpretable Model-agnostic Explanations, T-SNE = t-distributed stochastic neighbour embedding

	73 primary studies (included in one review only)			138 primary studies (included in at least one review)					
				Analysis A			Analysis B		
Variable	N (%)	Mean (range)	NOS	N (%)	Mean (range)	NOS	N (%)	Mean (range)	NOS
Datasets used			19			21			21
Kaggle's Chest X-Ray Image (Pneumonia) (also dataset, repository)	6 (7%)	NA		6 (4%)	NA		6 (4%)	NA	
COVID-19 X-ray image database	4 (5%)	NA		4 (3%)	NA		4 (3%)	NA	
COVIDx (also X-ray 5k)	2 (2%)	NA		3 (2%)	NA		3 (2%)	NA	
Chest X-Ray Images (Pneumonia)	1 (1%)	NA		1 (1%)	NA		1 (1%)	NA	
Cohen (also JP, Joseph Paul)	1 (1%)	NA		1 (1%)	NA		1 (1%)	NA	
Other	14 (17%)	NA		20 (13%)	NA		20 (13%)	NA	
Architecture			52			66			66
ResNet (also Res2Net, 101, 152, 18, 23, 50, 50V2)	13 (14%)	NA		13 (8%)	NA		13 (8%)	NA	
DenseNet (also 121, 161, 169, 201, 264)	12 (13%)	NA		14 (9%)	NA		14 (9%)	NA	
VGG (also 16, 19)	8 (9%)	NA		18 (11%)	NA		18 (11%)	NA	
Inception (also V1, V2, V3, V4)	6 (6%)	NA		6 (4%)	NA		6 (4%)	NA	
GoogleNet	3 (3%)	NA		3 (2%)	NA		3 (2%)	NA	
AlexNet	2 (2%)	NA		2 (1%)	NA		2 (1%)	NA	
Xception	2 (2%)	NA		2 (1%)	NA		2 (1%)	NA	
MobileNet (also V2)	1 (1%)	NA		2 (1%)	NA		2 (1%)	NA	
SqueezeNet	1 (1%)	NA		1 (1%)	NA		1 (1%)	NA	
UNet (also +, ++)	1 (1%)	NA		2 (1%)	NA		2 (1%)	NA	
Other	22 (24%)	NA		22 (14%)	NA		22 (14%)	NA	

NA = Not Applicable, NOS = Number of Studies, CT = Computed Tomography, CAM = Class Activation Mapping, Grad-CAM = Gradient-weighted Class Activation Mapping, LIME = Local Interpretable Model-agnostic Explanations, T-SNE = t-distributed stochastic neighbour embedding

	73 primary studies (included in one review only)			138 primary studies (included in at least one review)					
				Analysis A			Analysis B		
Variable	N (%)	Mean (range)	NOS	N (%)	Mean (range)	NOS	N (%)	Mean (range)	NOS
Metrics									
Accuracy	51 (70%)	94.02 (71.92-100)	51	68 (49%)	93.88 (71.92-100)	68	93 (67%)	93.81 (71.92-100)	93
Sensitivity	44 (60%)	90.93 (68.91-100)	44	47 (34%)	91.19 (68.91-100)	47	75 (54%)	92.32 (68.91-100)	75
Specificity	33 (45%)	92.82 (78.57-100)	34	37 (27%)	92.16 (78.57-100)	38	49 (36%)	90.65 (28-100)	50
F-score	24 (33%)	89.85 (63.13-100)	24	27 (20%)	89.87 (69.13-100)	27	46 (33%)	90.96 (69.13-100)	46
Precision	22 (30%)	93.92 (69.89-100)	22	23 (17%)	93.91 (69.89-100)	23	49 (36%)	92.89 (54-100)	49
Area Under Curve	18 (25%)	96.27 (90-99.99)	18	26 (19%)	94.58 (70-99.99)	26	44 (32%)	94.77 (67-99.99)	44
Negative Predictive Value	1 (1%)	94.50 (94.50-94.50)	1	1 (1%)	94.50 (94.50-94.50)	1	7 (5%)	93.17 (66-100)	7
Balanced Accuracy	0 (0%)	NA	0	0 (0%)	NA	0	1 (1%)	66 (66-66)	1
Other	11 (15%)	NA	11	12 (9%)	NA	12	21 (15%)	NA	21
Post-processing			21			36			39
Grad-CAM (also ++)	6 (25%)	NA		6 (17%)	NA		8 (20%)	NA	
CAM	3 (13%)	NA		3 (9%)	NA		3 (8%)	NA	
CAM/Grad-CAM (unclear)	2 (8%)	NA		14 (40%)	NA		15 (38%)	NA	
T-SNE	2 (8%)	NA		2 (6%)	NA		2 (5%)	NA	
Saliency Maps	1 (4%)	NA		1 (3%)	NA		1 (3%)	NA	
LIME	1 (4%)	NA		1 (3%)	NA		1 (3%)	NA	
Other	11 (46%)	NA		8 (23%)	NA		10 (25%)	NA	

NA = Not Applicable, NOS = Number of Studies, CT = Computed Tomography, CAM = Class Activation Mapping, Grad-CAM = Gradient-weighted Class Activation Mapping, LIME = Local Interpretable Model-agnostic Explanations, T-SNE = t-distributed stochastic neighbour embedding

Table S5. Non-overlapping of in-depth characteristics variables.

	138 primary studies (included in at least one review)	
	Analysis A	Analysis B
Variable	N (%)	N (%)
Number of participants		
Total	45 (33%)	12 (9%)
COVID-19	37 (27%)	9 (7%)
Control	33 (24%)	10 (7%)
CT scans		
Total	38 (28%)	12 (9%)
COVID-19	34 (25%)	10 (7%)
X-Ray images		
Total	40 (29%)	15 (11%)
COVID-19	39 (28%)	10 (7%)
Other images		
Total	23 (17%)	0 (0%)
COVID-19	21 (15%)	0 (0%)
Comparison		
Bacterial pneumonia	7 (5%)	7 (5%)
Viral pneumonia	9 (7%)	9 (7%)
Unknown pneumonia	31 (22%)	30 (22%)
Unclear	45 (33%)	45 (33%)
Asymptomatic controls	44 (32%)	44 (32%)
Datasets used	54 (36%)	54 (36%)
Architecture	45 (33%)	45 (33%)
Metrics		
Accuracy	39 (28%)	14 (10%)
Sensitivity	45 (33%)	17 (12%)
Specificity	28 (20%)	16 (12%)
F-score	24 (17%)	5 (4%)
Precision	31 (22%)	5 (4%)
Area Under Curve	26 (19%)	8 (6%)
Negative Predictive Value	6 (4%)	0 (0%)
Balanced Accuracy	1 (1%)	0 (0%)
Other	11 (8%)	2 (1%)
Post processing	9 (7%)	3 (2%)

CT = Computed Tomography

Table S6. Non-reporting of in-depth characteristics variables.

	73 primary studies (included in one review only)	138 primary studies (included in at least one review)
Variable	N (%)	N (%)
Number of participants		
Total	49 (67%)	67 (49%)
COVID-19	50 (68%)	77 (56%)
Control	56 (77%)	86 (62%)
CT scans		
Total	26 (36%)	30 (22%)
COVID-19	27 (37%)	33 (24%)
X-Ray images		
Total	20 (27%)	21 (15%)
COVID-19	20 (27%)	22 (16%)
Other images		
Total	9 (12%)	9 (7%)
COVID-19	9 (12%)	10 (7%)
Datasets used	54 (66%)	63 (41%)
Architecture	22 (24%)	28 (18%)
Metrics		
Accuracy	22 (30%)	31 (22%)
Sensitivity	29 (40%)	46 (33%)
Specificity	39 (53%)	72 (52%)
F-score	49 (67%)	87 (63%)
Precision	51 (70%)	84 (61%)
Area Under Curve	55 (75%)	86 (62%)
Negative Predictive Value	72 (99%)	131 (95%)
Balanced Accuracy	73 (100%)	137 (99%)
Other	62 (85%)	115 (83%)
Post processing	52 (71%)	95 (69%)

CT = Computed Tomography

On next pages, COVID-19 diagnostic metrics are presented in Figures S1, S2, S3, S4, S5, and S6. Larger size of the bubble represents greater sample size of CT scans, X-Ray images and patients, accordingly. Darker colour represents more CT scans of, X-Ray images of and patients with COVID-19.

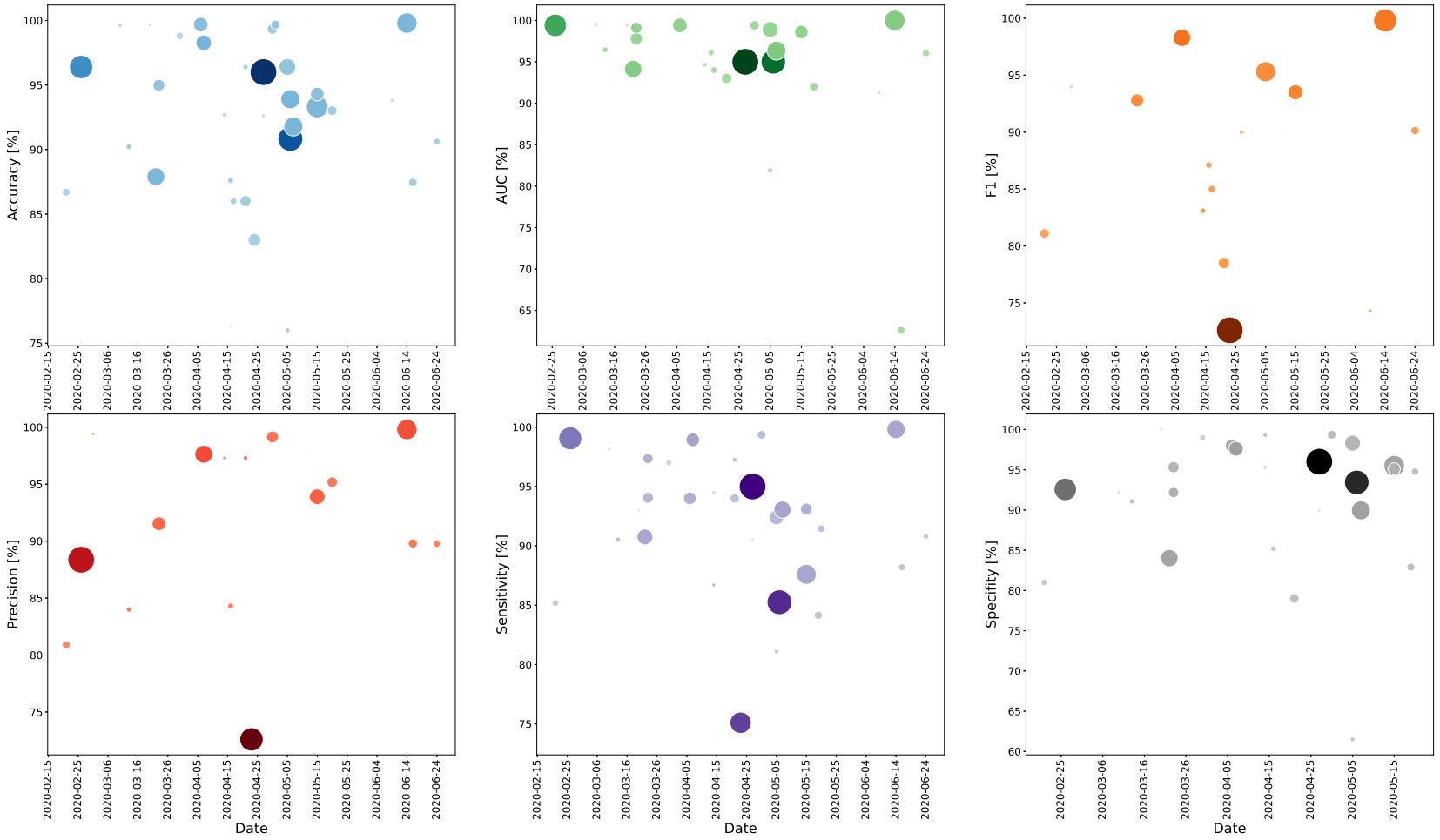


Figure S1. CT-based COVID-19 diagnosis, without imputation.

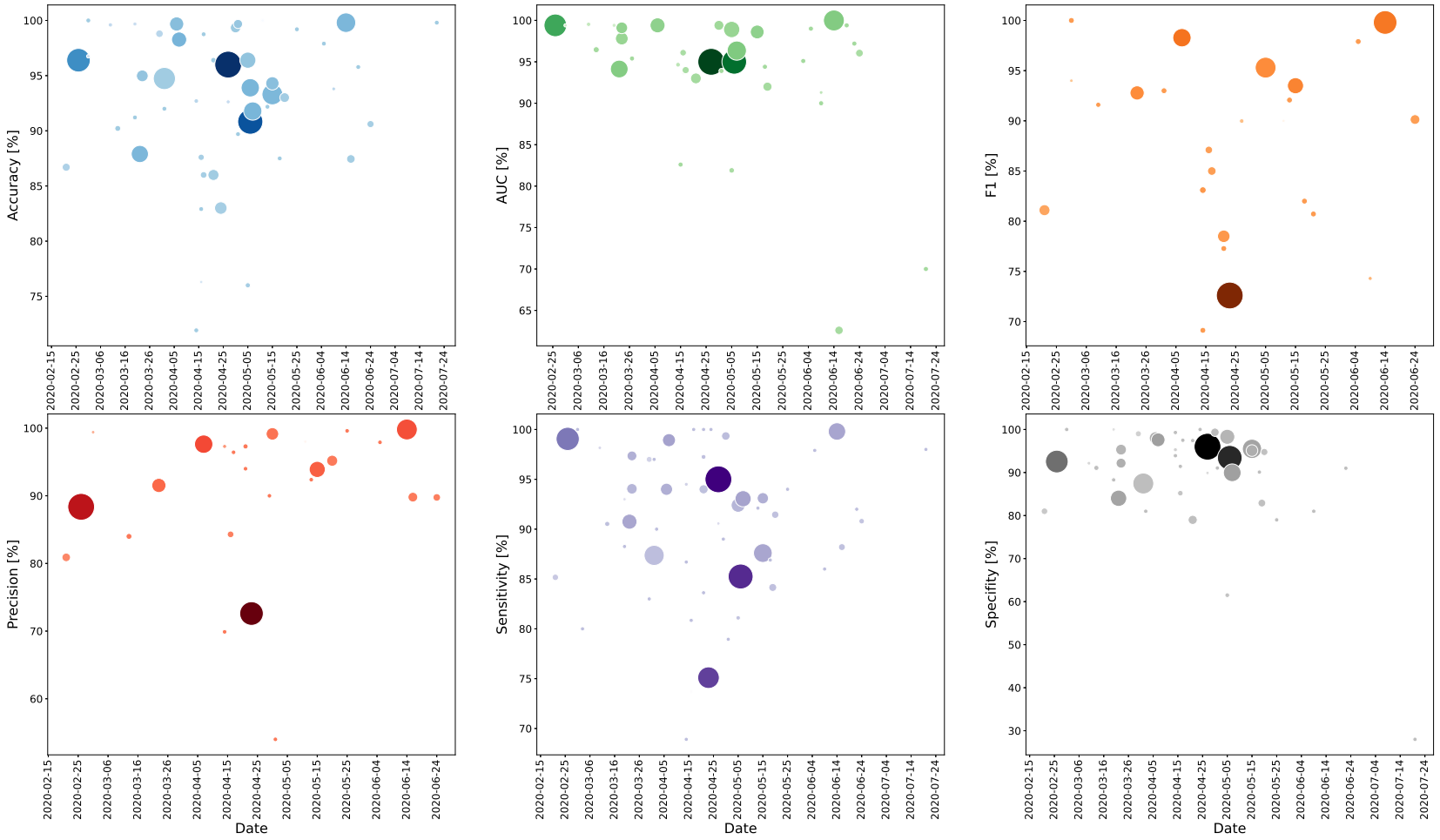


Figure S2. CT-based COVID-19 diagnosis, with modal imputation.

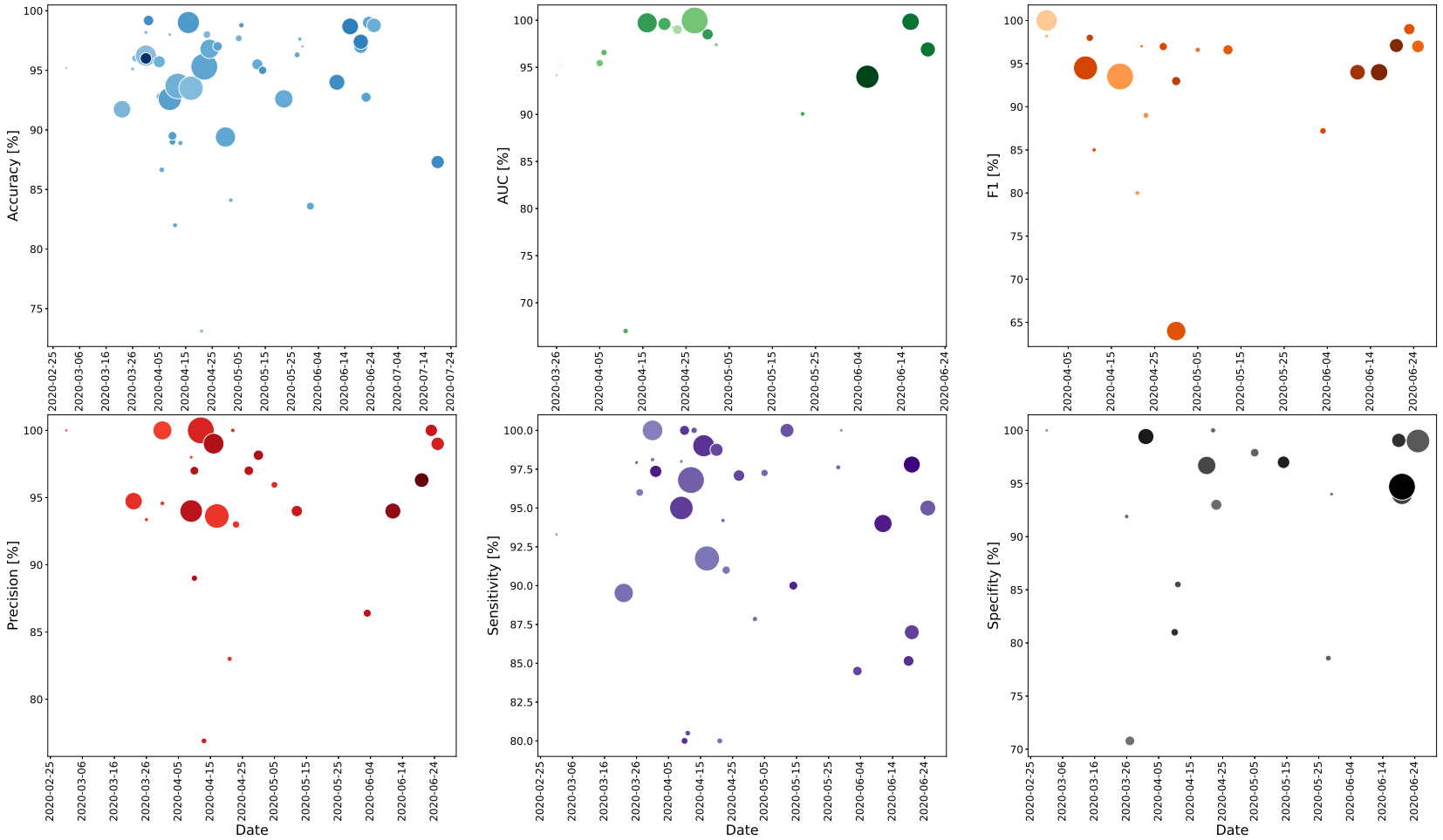


Figure S3. X-Ray-based COVID-19 diagnosis, without imputation.

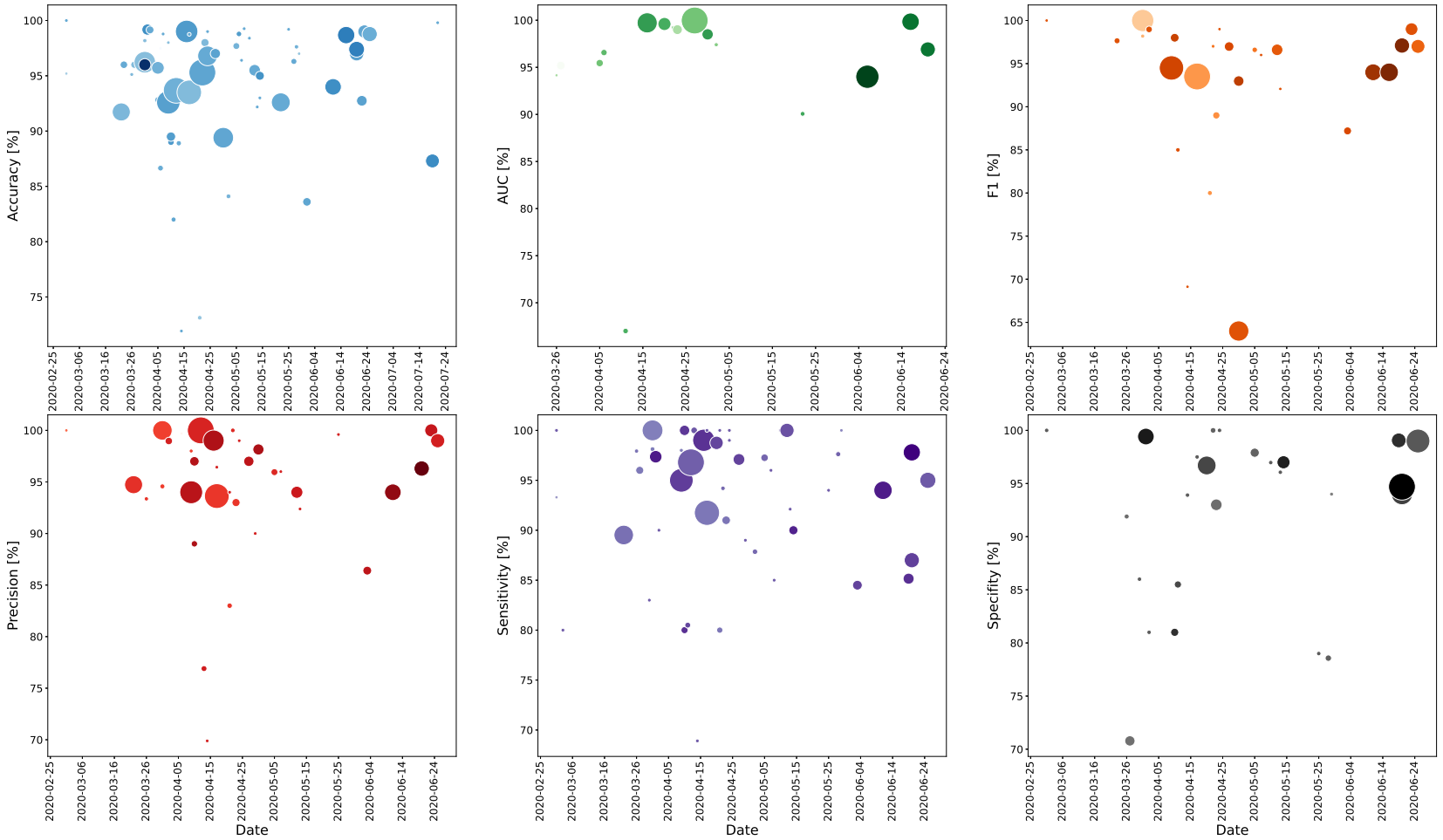


Figure S4. X-Ray-based COVID-19 diagnosis, with modal imputation.

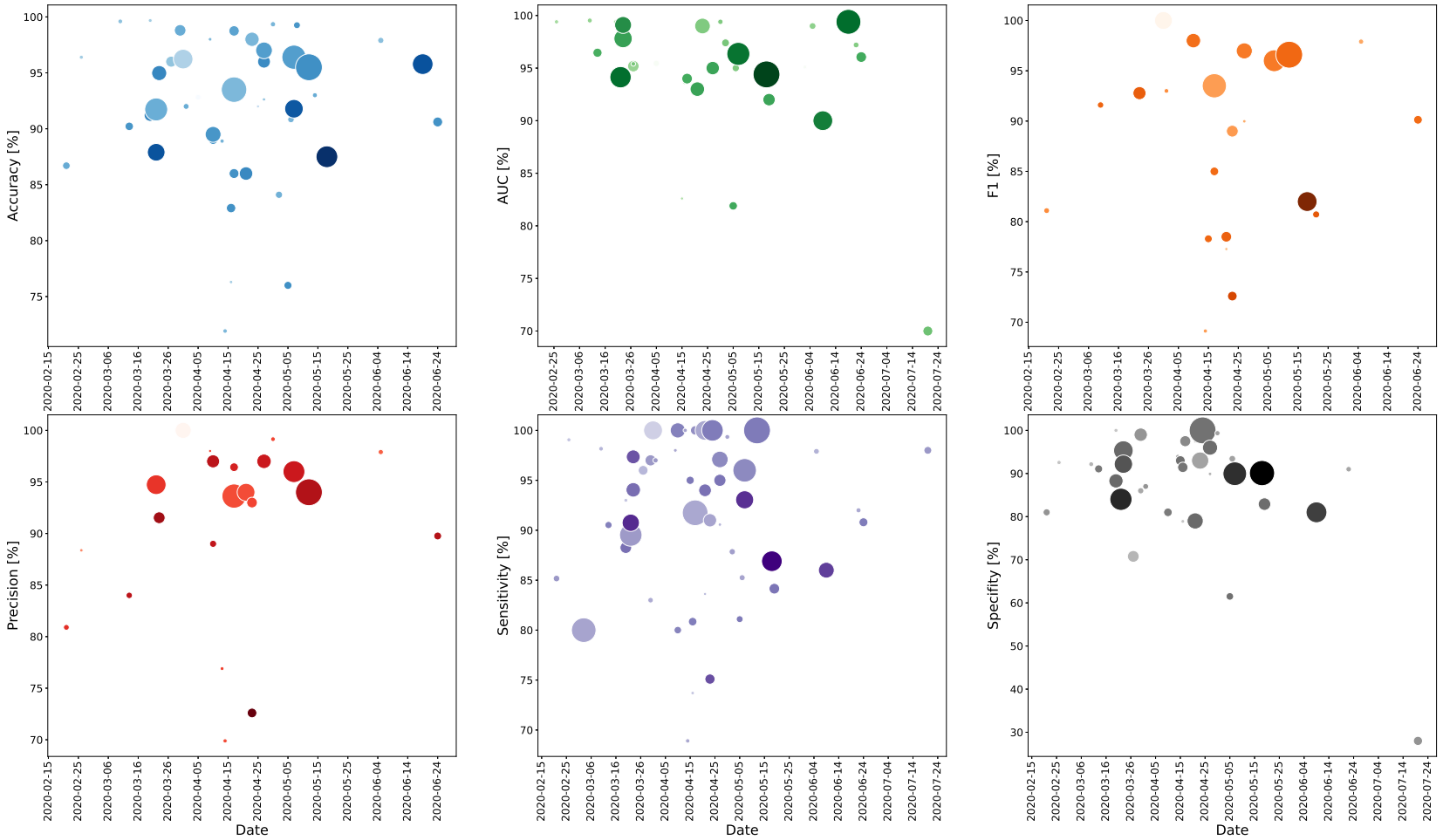


Figure S5. COVID-19 diagnosis with full patients number data provided, without imputation.

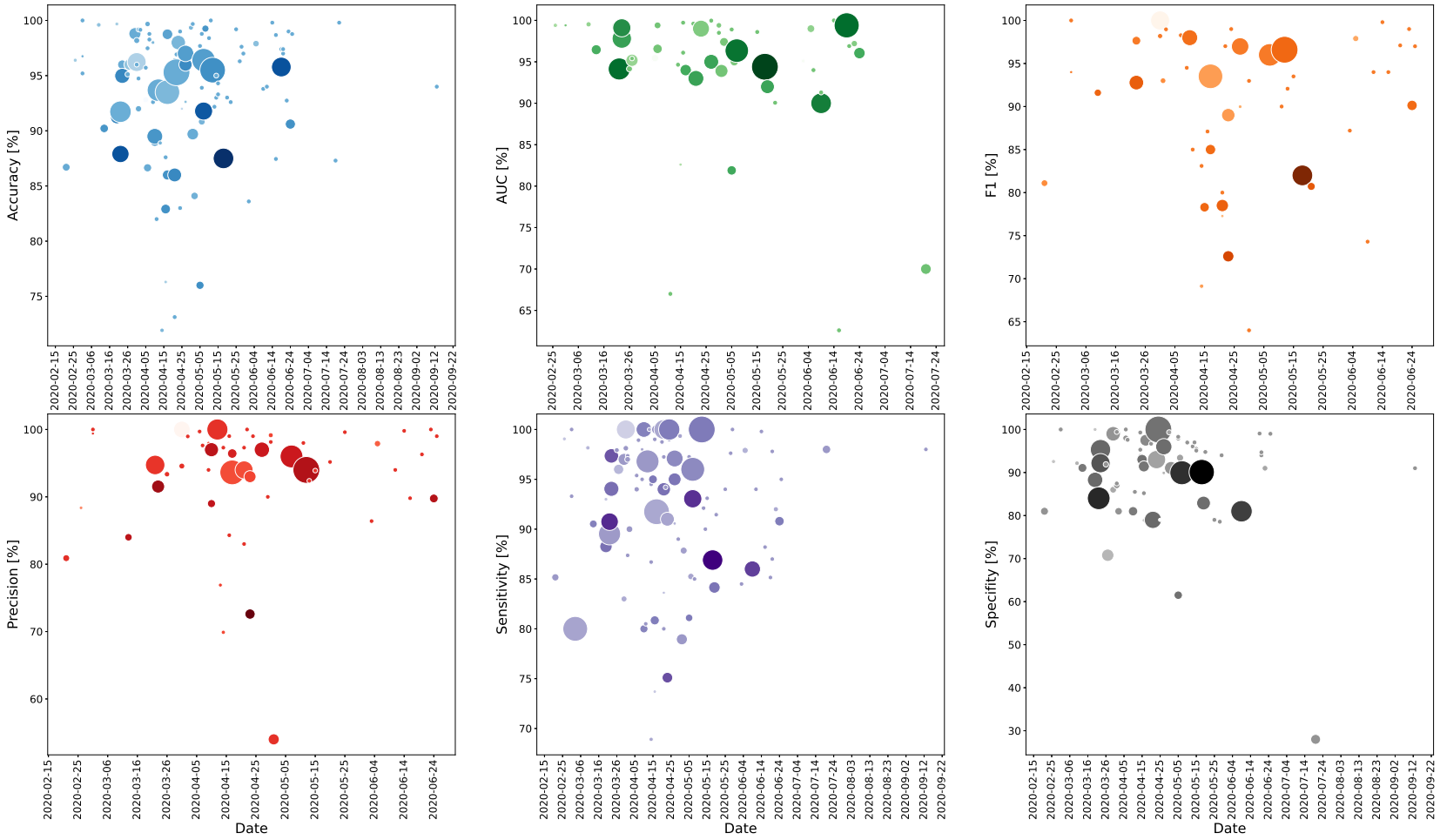


Figure S6. COVID-19 diagnosis with any patients number data provided, with modal imputation.

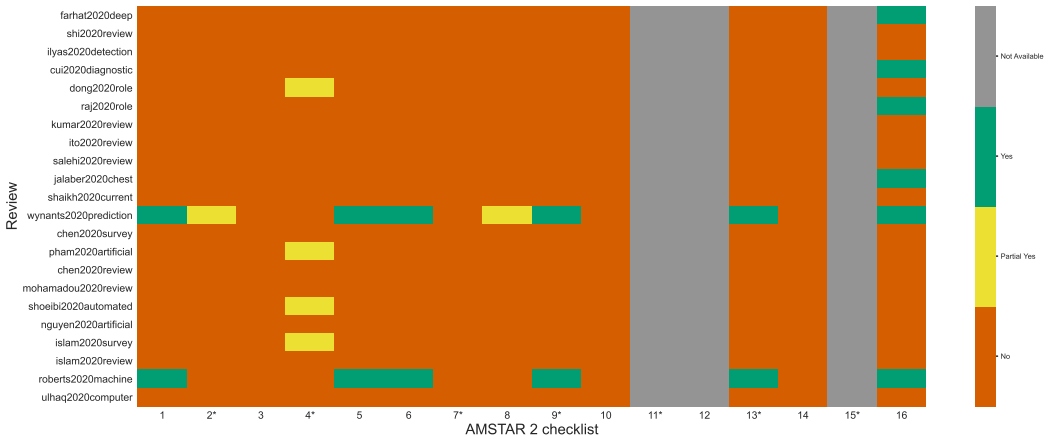


Figure S7. Review authors' judgements about each AMSTAR 2 item across all included studies; * denotes critical items.

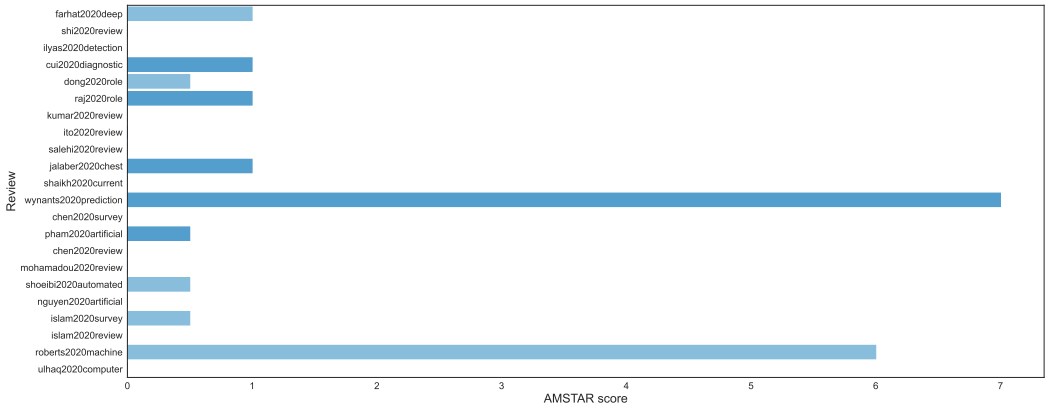


Figure S8. AMSTAR 2 score in each included review.

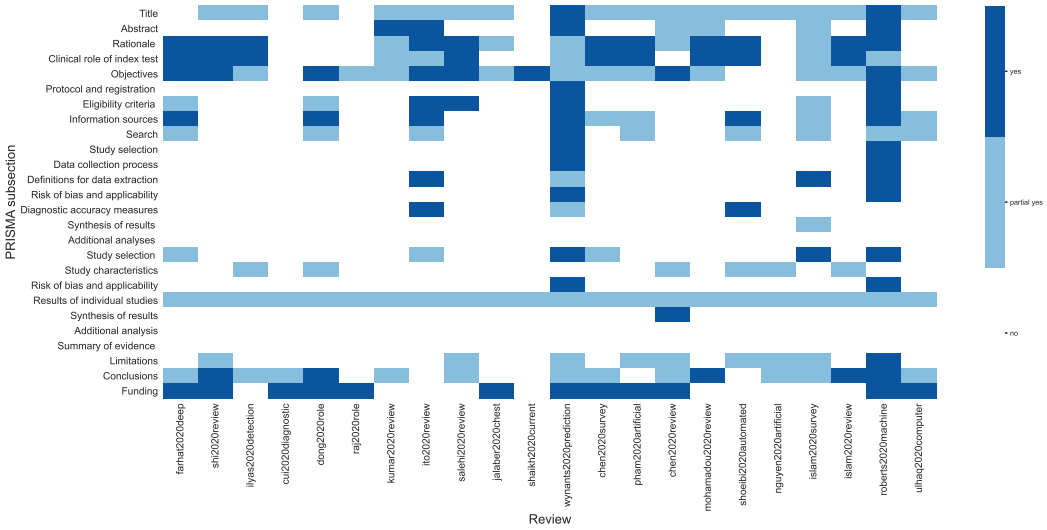


Figure S9. Review authors' judgements about each PRISMA-DTA item across all included studies.

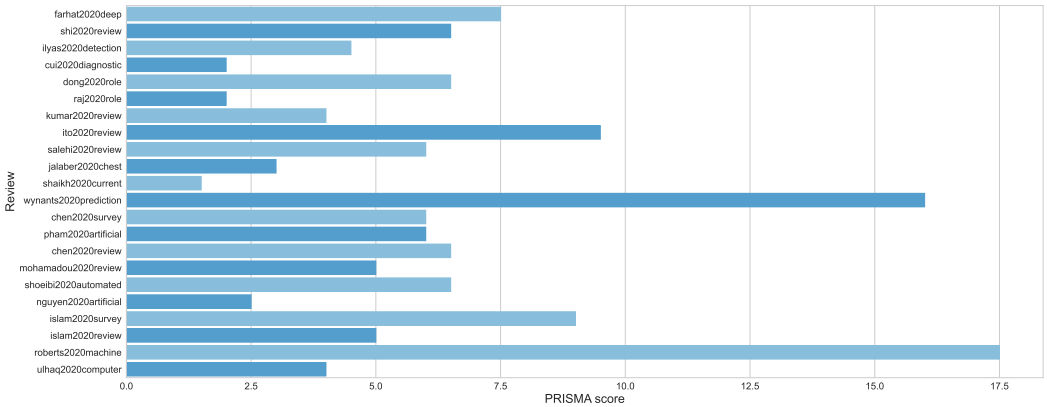


Figure S10. PRISMA-DTA score in each included review.

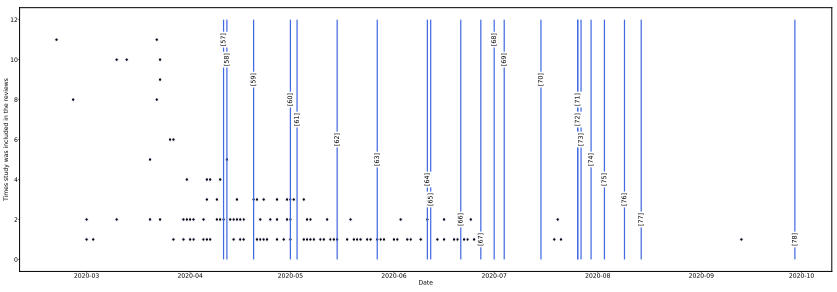
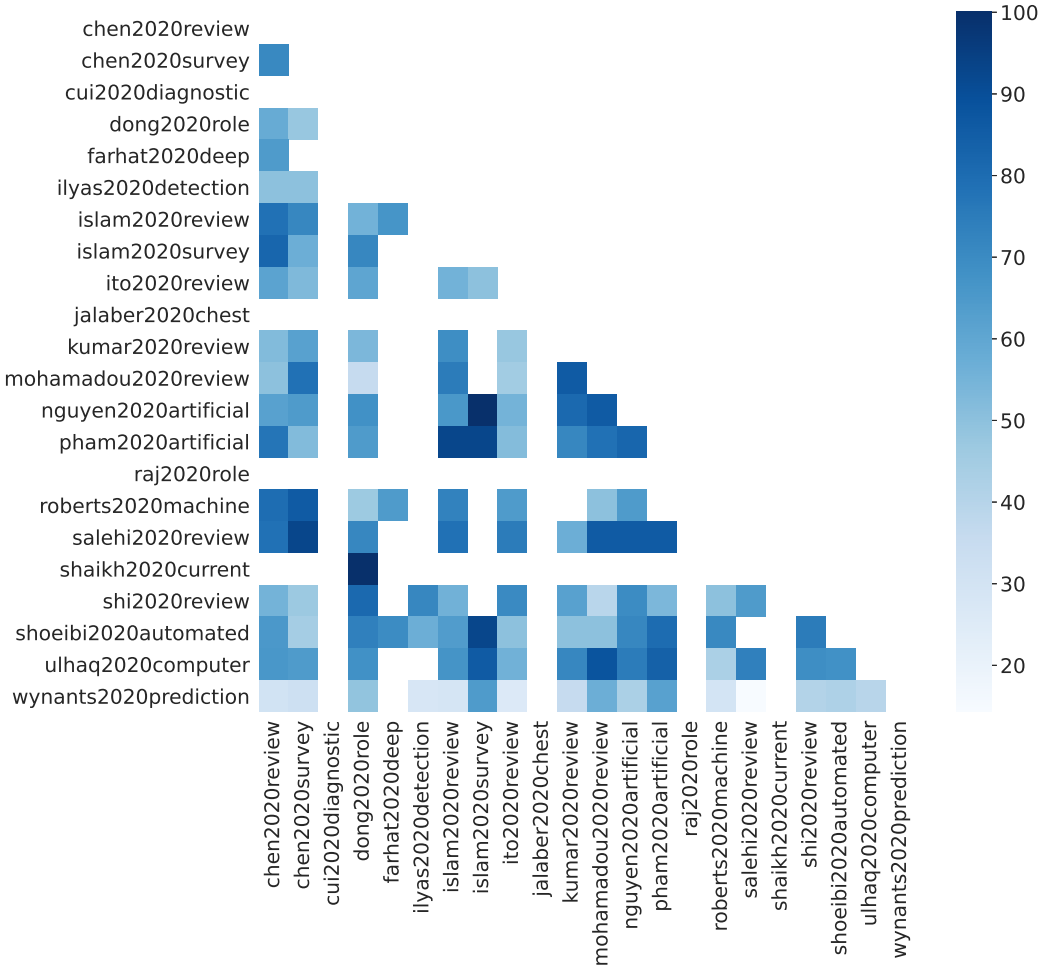


Figure S11. Appearance of included reviews (vertical lines, reference date, see Table S1 and interesting primary studies (dots).

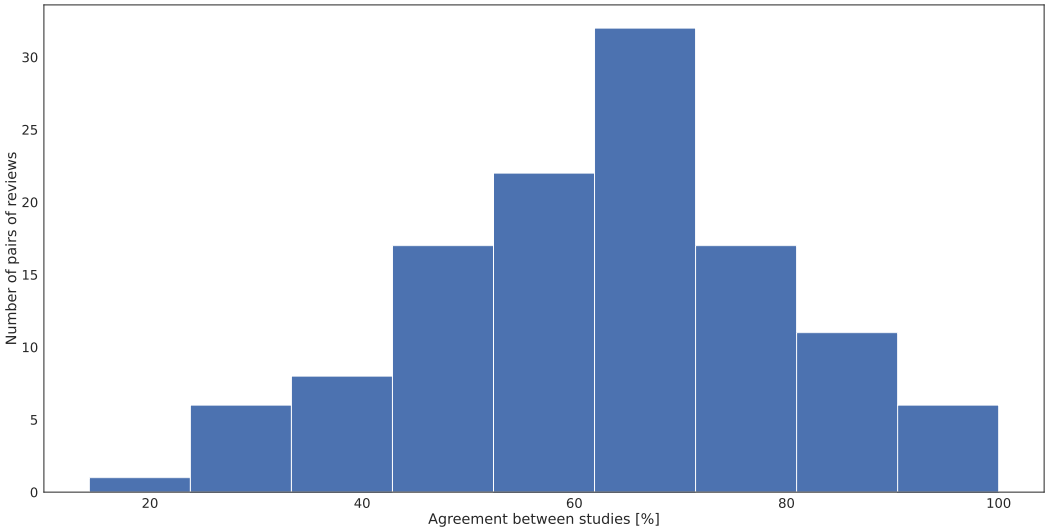
Table S7. Time and resource wasting statistics.

	A	B=A/X	C=A/Y	D	E	E/165	F=D/E	G=D/X	H=D/Y	I=D/A	J	K
[57]	13	13/26=50	13/52=25	13	13	7.88	13/13=100	13/26=50	13/52=25	100	NA	NA
[58]	5	5/26=19.23	5/53=9.43	3	16	9.79	3/16=18.75	3/26=11.54	3/53=5.67	3/5=60	0	0
[59]	12	12/59=20.34	12/72=16.67	3	19	11.51	3/19=15.79	3/59=5.08	3/72=4.17	3/12=25	0	0
[60]	15	15/24=62.50	15/106=14.15	1	20	12.12	1/20=5	1/24=4.17	1/106=0.94	1/15=6.67	0	0
[61]	6	6/21=28.57	6/107=5.61	0	20	12.12	0/20=0	0/21=0	0/106=0	0/6=0	0	1
[62]	1	1/116=0.86	1/127=0.79	1	21	12.73	1/21=4.76	1/116=0.86	1/127=0.79	1/1=100	0	0
[63]	1	1/10=10	1/136=0.73	0	21	12.73	0/21=0	0/10=0	0/136=0	0/1=0	0	0
[64]	1	1/10=10	1/147=0.68	0	21	12.73	0/21=0	0/10=0	0/147=0	0/1=0	0	0
[65]	7	7/32=21.88	7/147=4.76	1	22	13.33	1/22=4.54	1/32=3.13	1/147=0.68	1/7=14.29	0	0
[66]	10	10/113=8.85	10/155=6.45	9	31	18.79	9/31=29.03	9/113=7.96	9/155=5.81	9/10=90	3	4
[67]	6	6/59=10.17	6/160=3.75	1	32	19.39	1/32=3.13	1/59=1.69	1/160=0.63	1/6=16.67	1	1
[68]	42	42/107=39.25	42/161=26.09	27	59	35.76	27/59=45.76	27/107=25.23	27/160=16.88	27/42=64.29	0	0
[69]	21	21/139=15.11	21/161=13.04	2	61	36.97	2/61=3.28	2/139=1.43	2/161=1.24	2/21=9.52	0	0
[70]	8	8/47=17.02	8/161=4.97	1	62	37.58	1/62=1.61	1/47=2.13	1/161=0.62	1/8=12.5	0	0
[71]	67	67/164=40.85	67/164=40.85	37	99	60	37/99=37.37	37/164=22.56	37/164=22.56	37/67=55.22	4	7
[72]	12	12/67=17.91	12/164=7.32	2	101	61.21	2/101=1.98	2/67=2.99	2/164=1.22	2/12=16.67	2	2
[73]	106	106/163=65.03	106/164=64.63	45	146	88.48	45/146=30.82	45/163=27.61	45/164=27.44	45/106=42.45	0	0
[74]	12	12/139=8.63	12/164=7.32	1	147	89.09	1/147=0.68	1/139=0.72	1/164=0.61	1/12=8.33	1	1
[75]	10	10/71=14.08	10/164=6.10	1	148	89.70	1/148=0.68	1/71=1.41	1/164=0.61	1/10=10	1	1
[76]	45	45/125=36.00	45/164=27.44	9	157	95.15	9/157=5.73	9/125=7.2	9/164=5.49	9/45=20	4	5
[77]	24	24/163=14.72	24/164=14.63	7	164	99.39	7/164=4.27	7/163=4.29	7/164=4.27	7/24=29.17	1	1
[78]	27	27/165=16.36	27/165=16.36	1	165	100	1/165=0.61	1/165=0.61	1/165=0.61	1/27=3.70	0	0

A – number of primary studies included in the review (see Figure 4; **D** – number of included primary papers that were introduced (see Figure 3); **E** – cumulative sum of included primary papers that were introduced; **J** – cited reviews that were published; **K** – cited reviews both published and available as preprints; **X** – all primary papers available to the date of publishing last included study; **Y** – all primary papers available to the reference date (see Table S1, see Figure 4)).

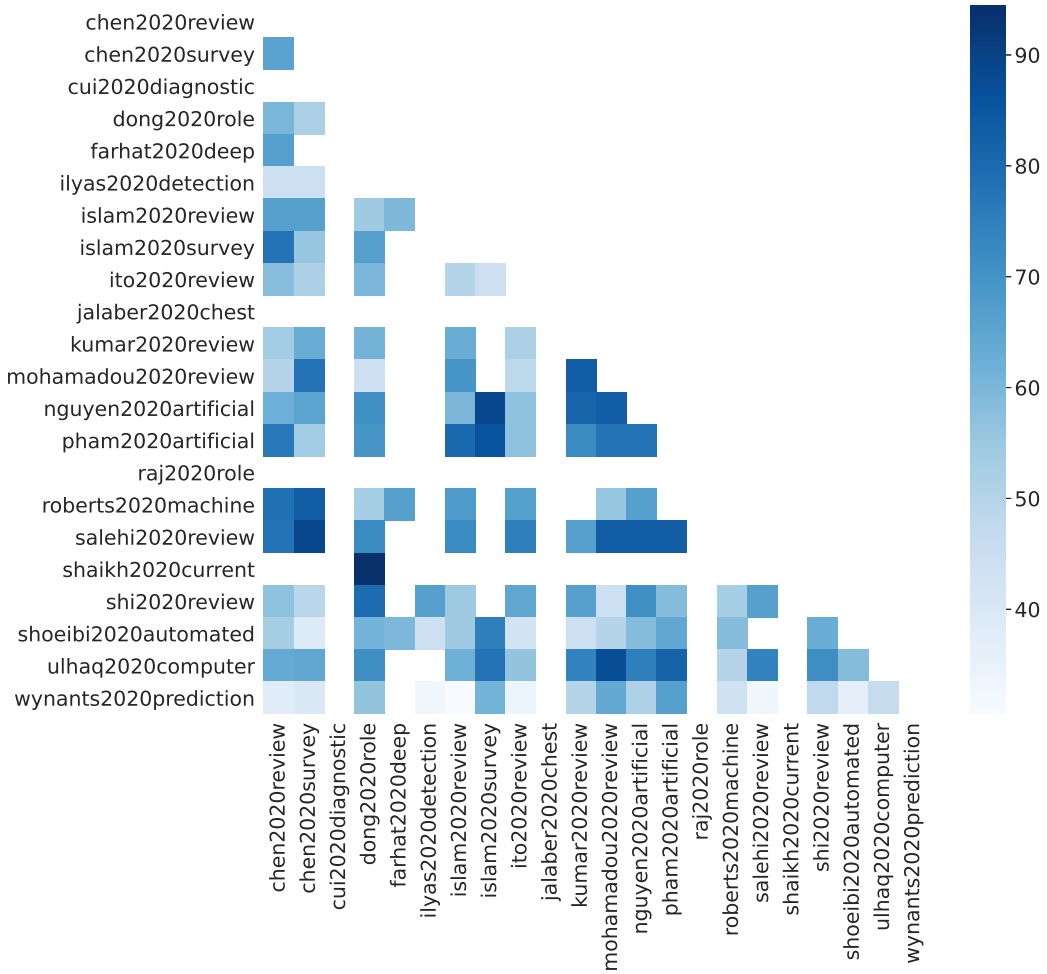


(a) Heatmap.

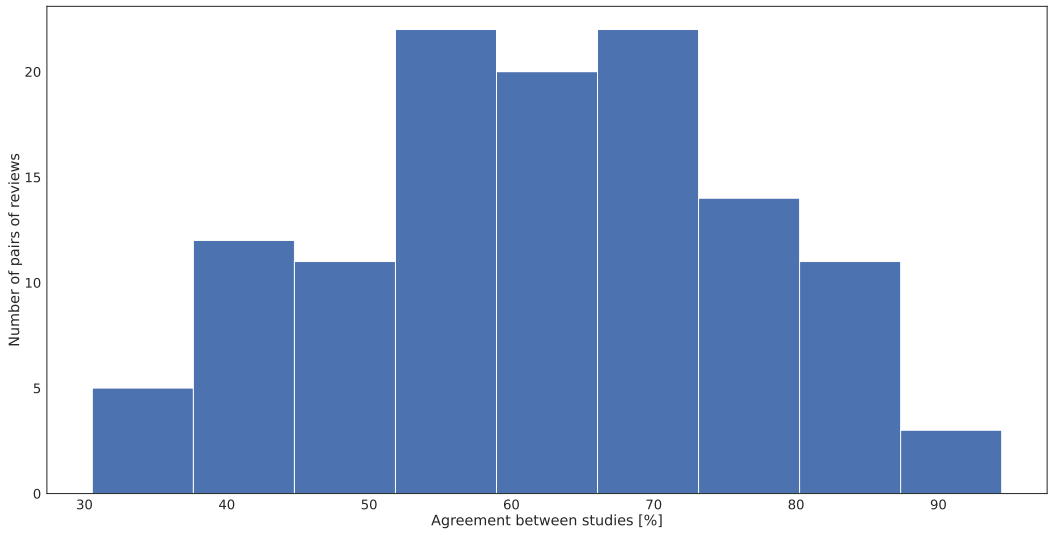


(b) Histogram.

Figure S12. Level of agreement based on overlapping in extracted data (characteristics only, without text data) between included reviews; analysis A.

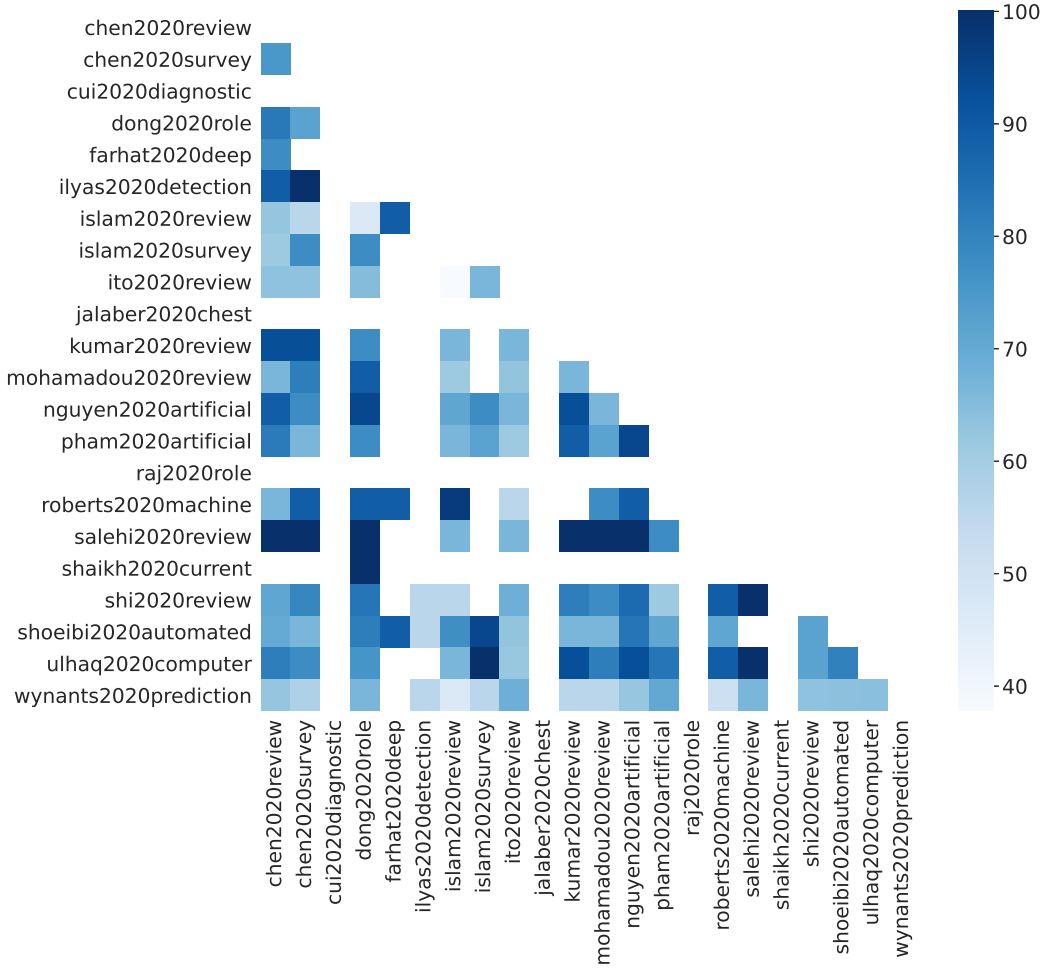


(a) Heatmap.

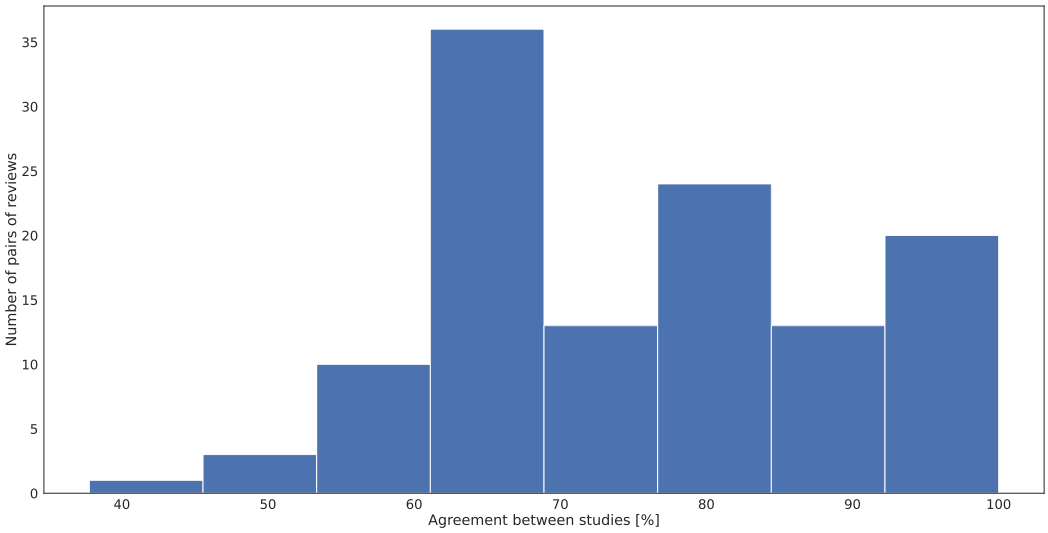


(b) Histogram.

Figure S13. Level of agreement based on overlapping in extracted data (characteristics only) between included reviews; analysis A.

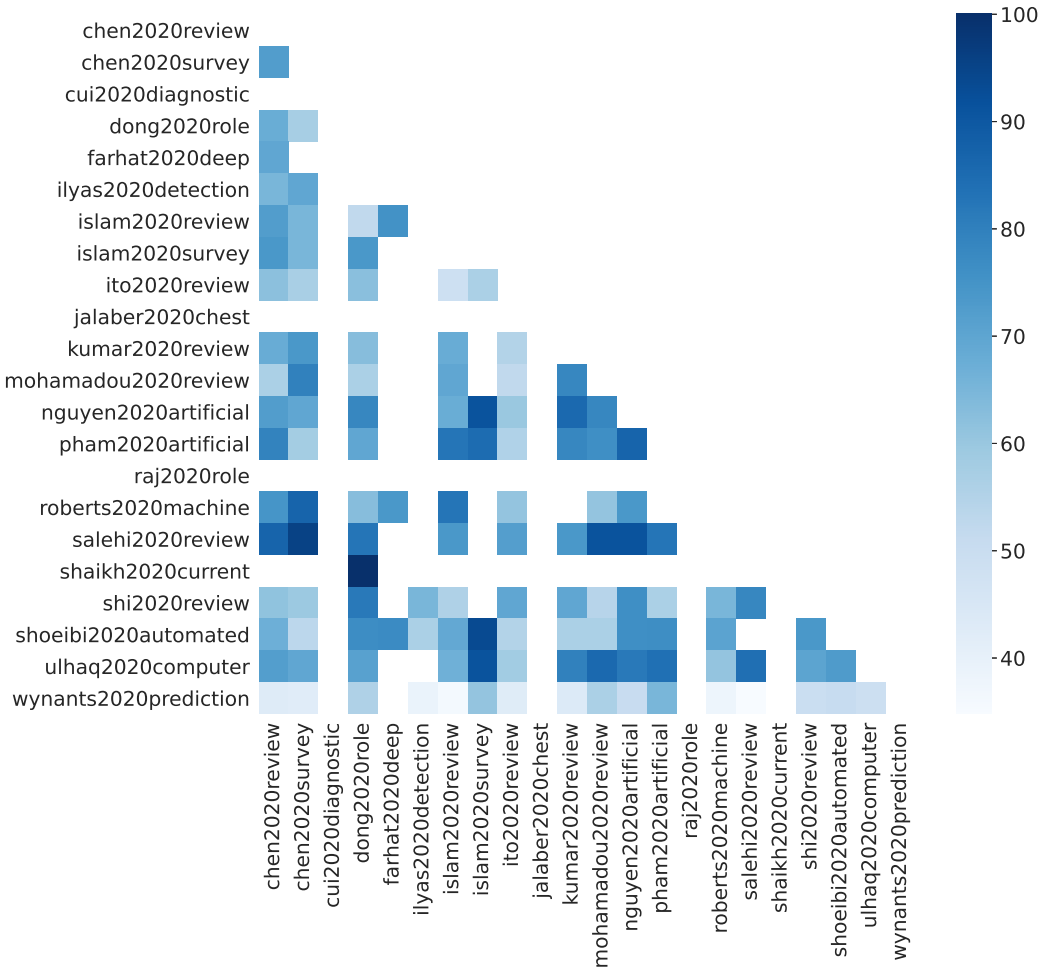


(a) Heatmap.

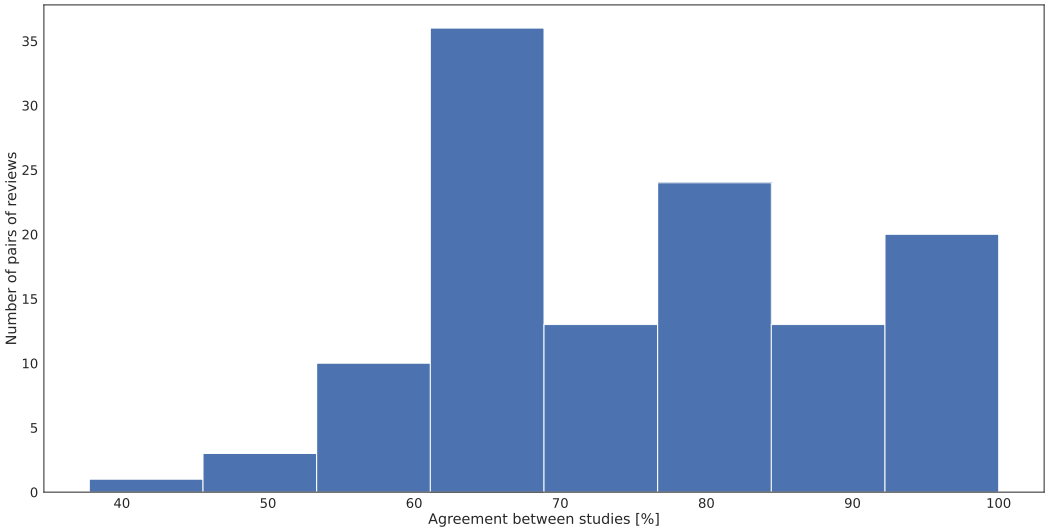


(b) Histogram.

Figure S14. Level of agreement based on overlapping in extracted data (outcomes only) between included reviews; analysis A.

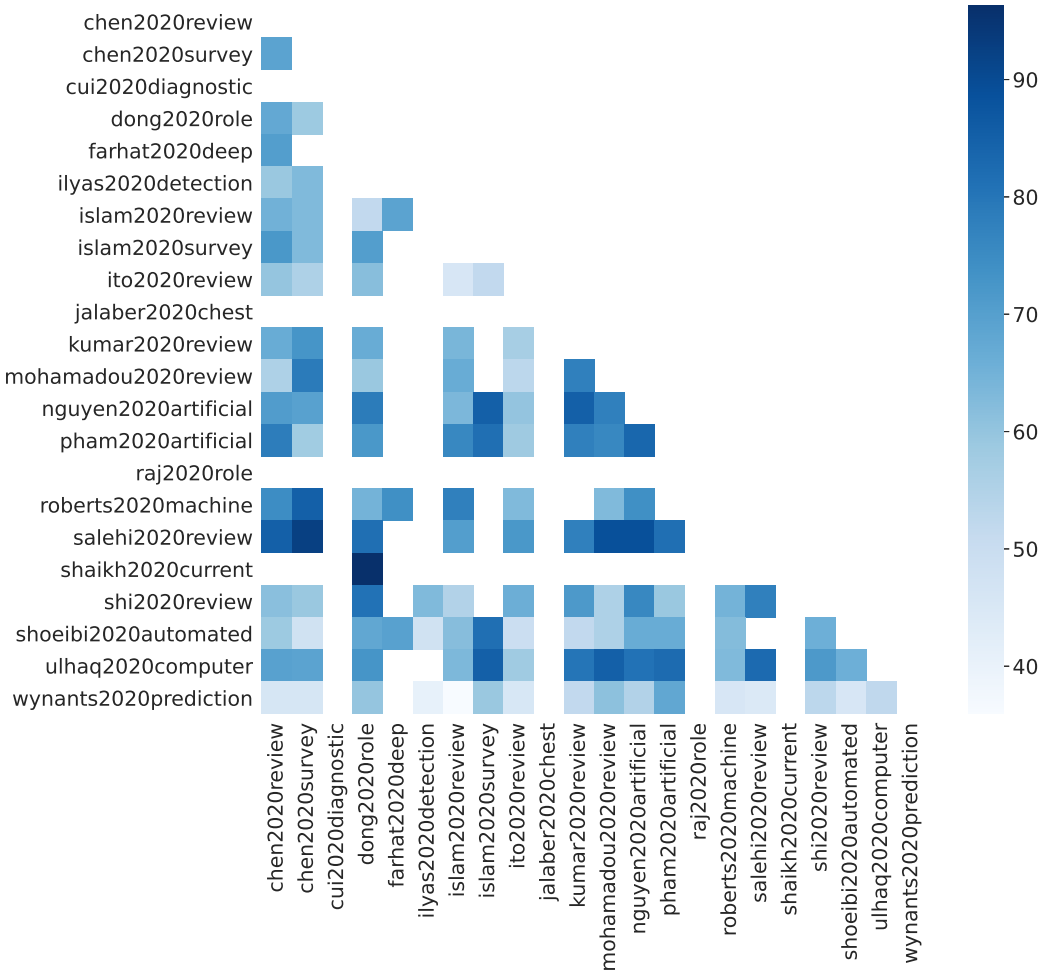


(a) Heatmap.

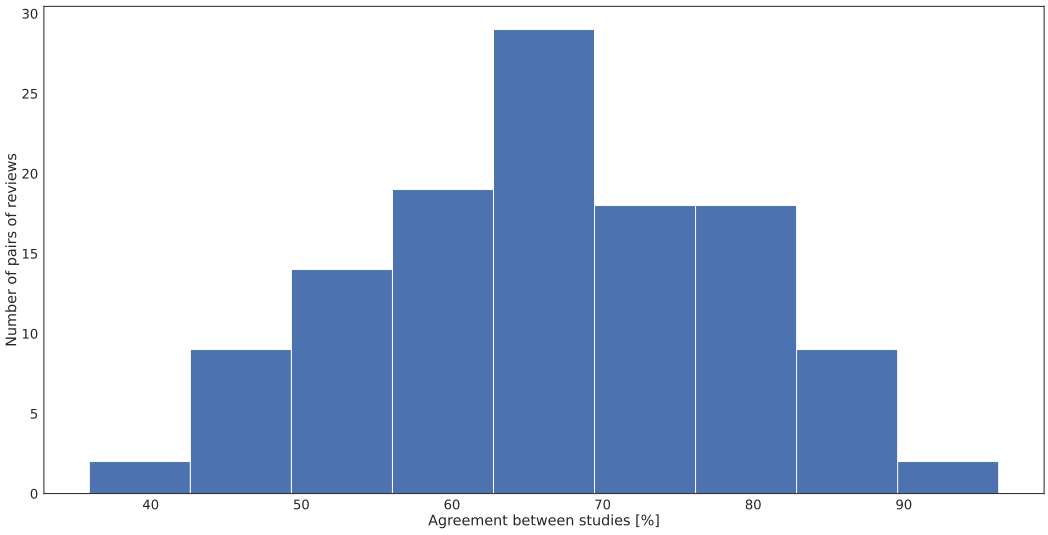


(b) Histogram.

Figure S15. Level of agreement based on overlapping in extracted data (all variables, without text data) between included reviews; analysis A.

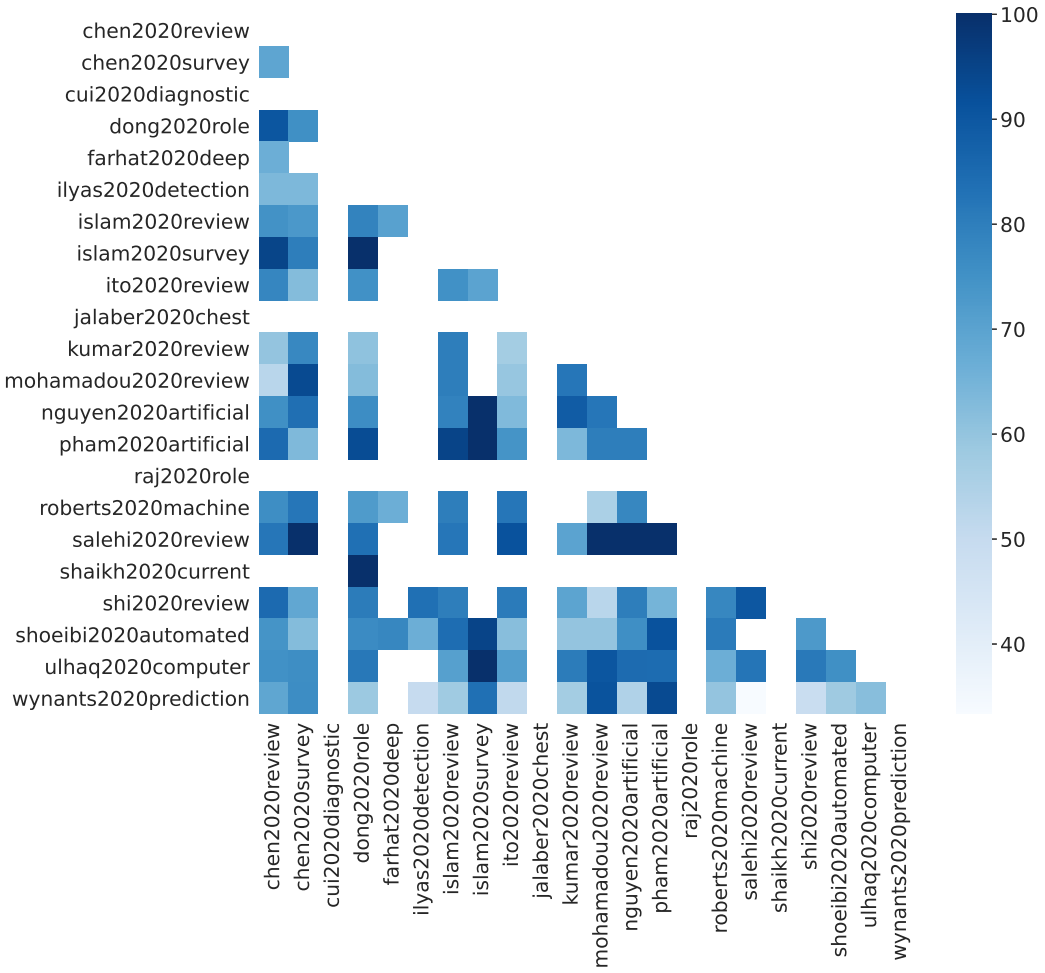


(a) Heatmap.

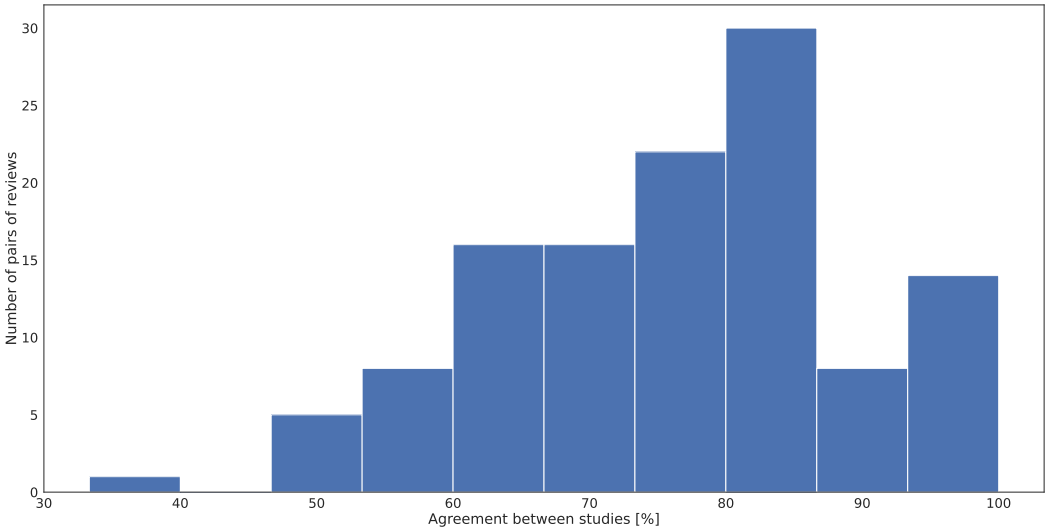


(b) Histogram.

Figure S16. Level of agreement based on overlapping in extracted data (all variables) between included reviews; analysis A.

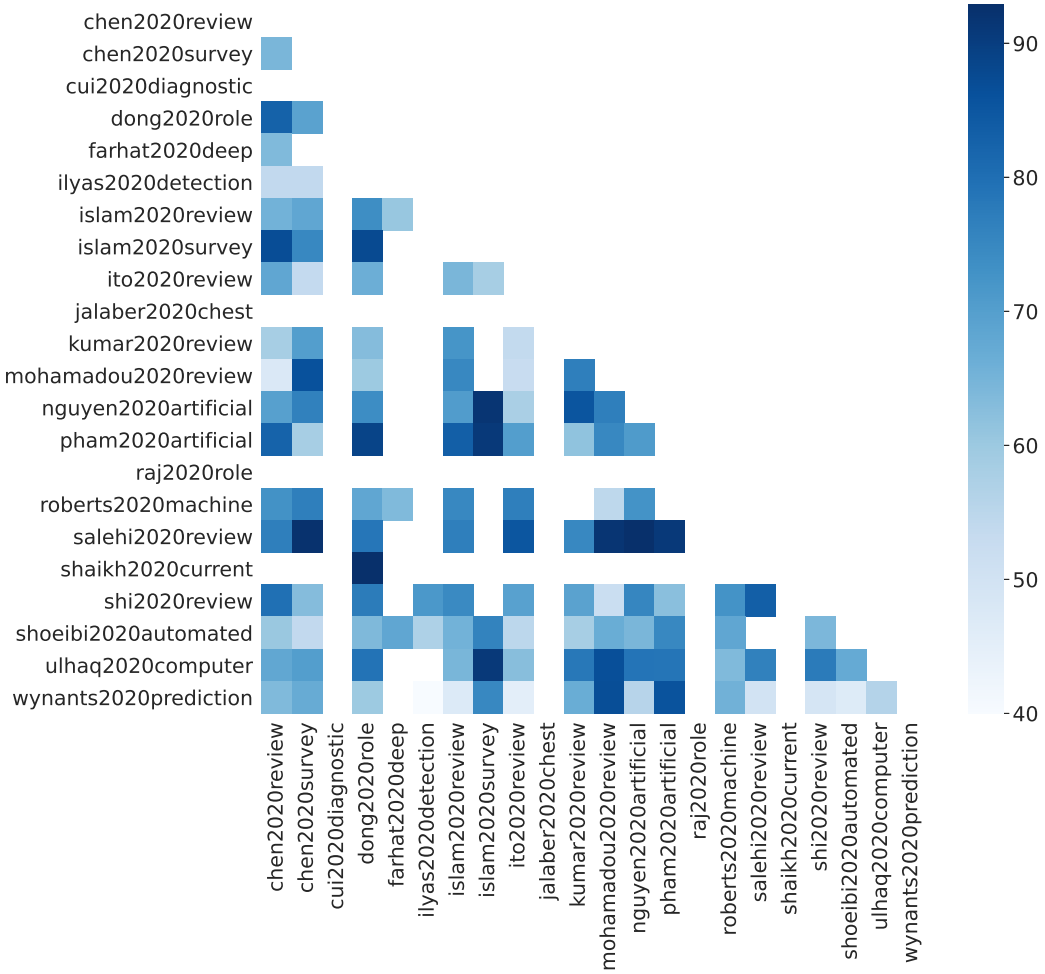


(a) Heatmap.

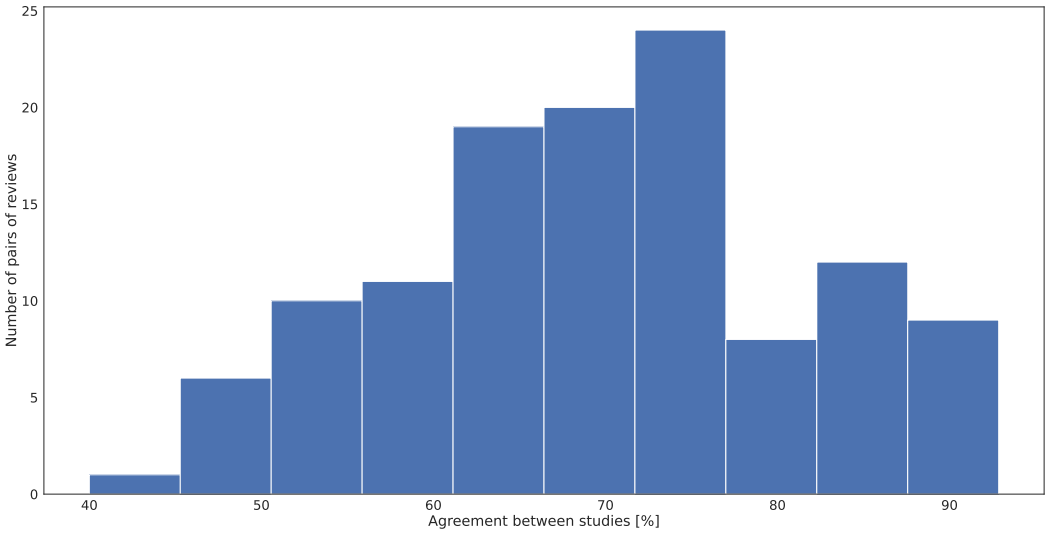


(b) Histogram.

Figure S17. Level of agreement based on overlapping in extracted data (characteristics only, without text data) between included reviews; analysis B.

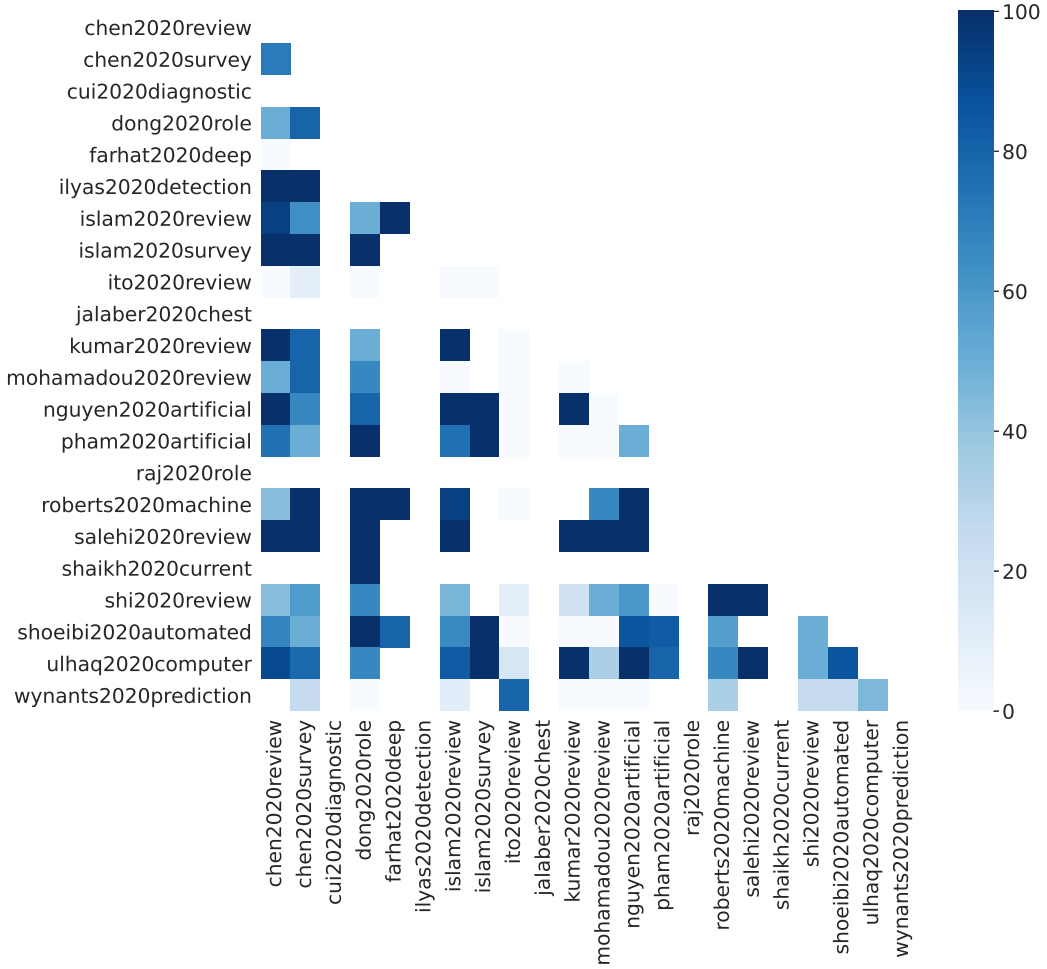


(a) Heatmap.

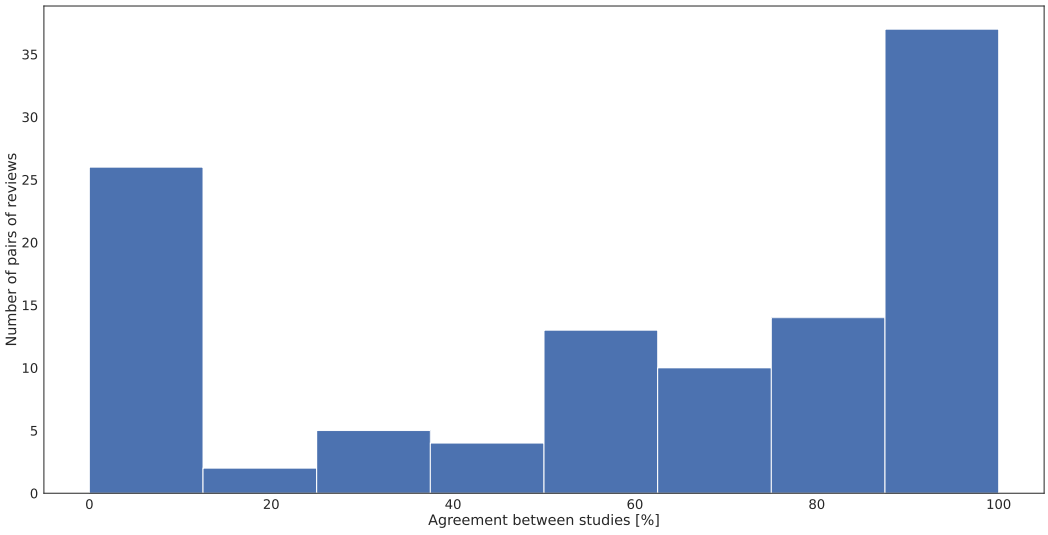


(b) Histogram.

Figure S18. Level of agreement based on overlapping in extracted data (characteristics only) between included reviews; analysis B.

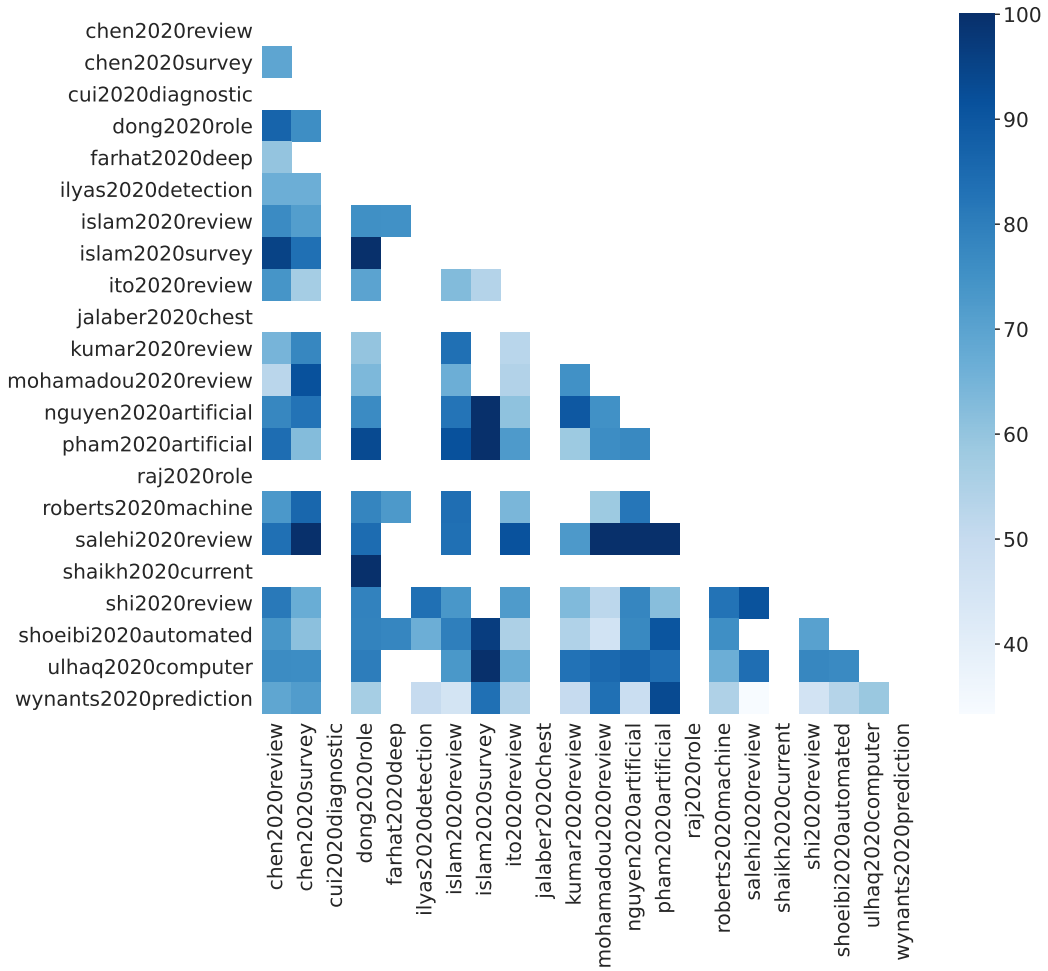


(a) Heatmap.

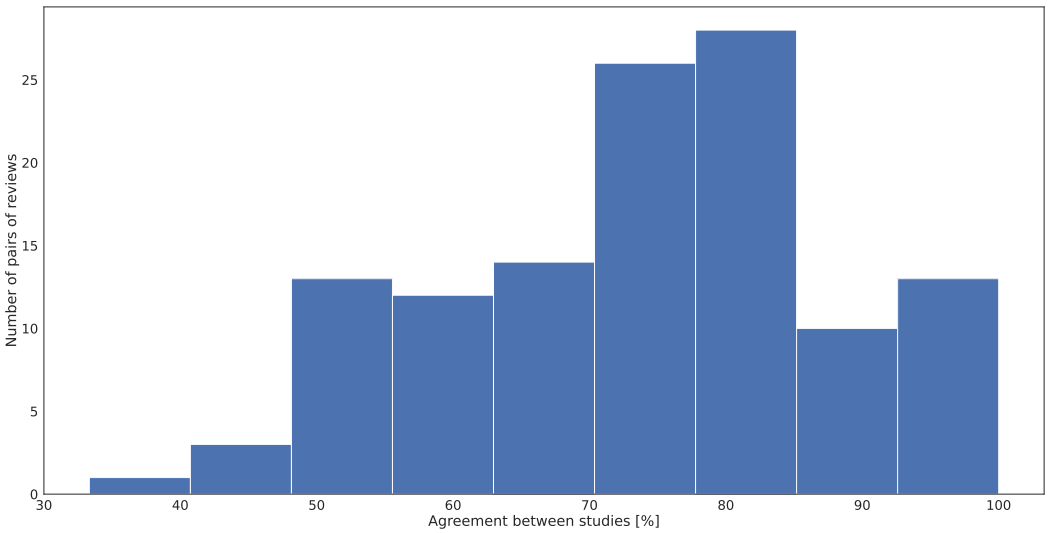


(b) Histogram.

Figure S19. Level of agreement based on overlapping in extracted data (outcomes only) between included reviews; analysis B.

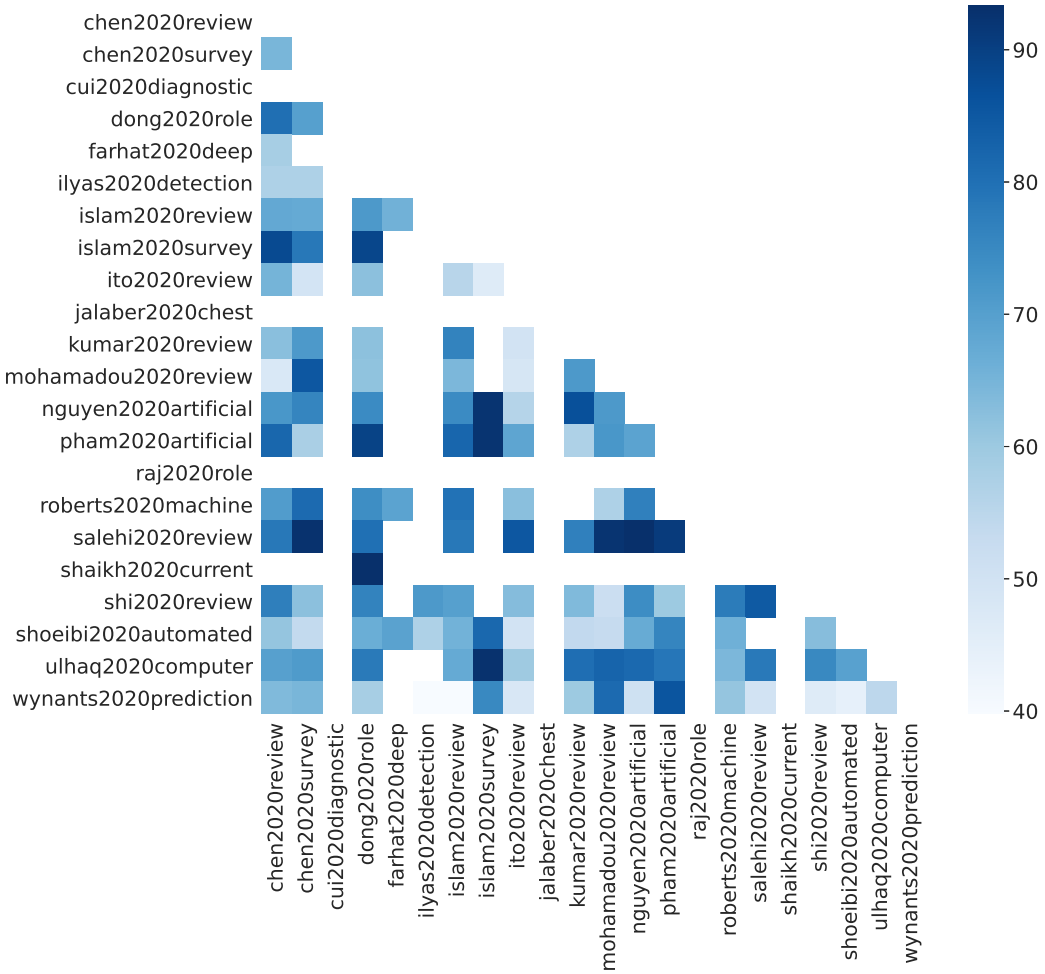


(a) Heatmap.

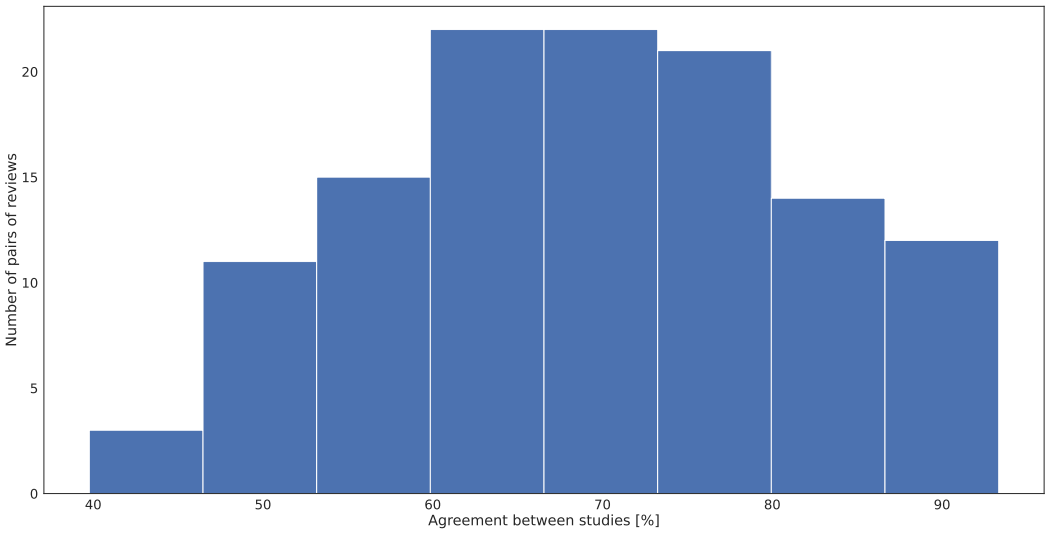


(b) Histogram.

Figure S20. Level of agreement based on overlapping in extracted data (all variables, without text data) between included reviews; analysis B.



(a) Heatmap.



(b) Histogram.

Figure S21. Level of agreement based on overlapping in extracted data (all variables) between included reviews; analysis B.

Text S1. Search Strategies

MEDLINE

1. exp Coronavirus Infections/ or exp Coronavirus/ or exp Betacoronavirus/ or ("Coronavirus Infection*" or "Coronavirus" or "Betacoronavirus").ti,ab. or (("corona*" or "corono*") adj1 ("virus*" or "viral*" or "virinae*")).ti,ab. or ("coronavirus*" or "Severe acute respiratory syndrome related coronavirus" or "Severe acute respiratory syndrome coronavirus 2" or "coronovirus*" or "coron?virinae*" or "2019-nCoV" or "2019nCoV" or "2019-CoV" or "nCoV2019" or "nCoV-2019" or "COVID-19" or "COVID19" or "CORVID-19" or "CORVID19" or "WN-CoV" or "WNCoV" or "HCoV-19" or "HCoV19" or "CoV" or "2019 novel*" or "2019 novel coronavirus" or "2019 nCoV" or "Ncov" or "n-cov" or "SARS-CoV-2" or "SARSCoV-2" or "SARSCoV2" or "SARS-CoV2" or "SARSCov19" or "SARS-Cov19" or "SARSCov-19" or "SARS-Cov-19" or "SARSr-cov" or "Ncovor" or "Ncorona*" or "Ncorono*" or "NcovWuhan*" or "NcovHubei*" or "NcovChina*" or "NcovChinese*" or "Wuhan virus*" or "novel CoV" or "CoV 2" or "CoV2" or "betacoron?vir*").ti,ab. or ((("respiratory*" adj2 ("acute*" or "symptom*" or "disease*" or "illness*" or "condition*")) or "sea-food market*" or "seafood market*" or "food market*" or "foodmarket*") adj10 ("Wuhan*" or "Hubei*" or "China*" or "Chinese*" or "Huanan*")).ti,ab. or (("outbreak*" or "wildlife*" or "wild-life" or "pandemic*" or "epidemic*") adj3 ("Wuhan*" or "Hubei*" or "China*" or "Chinese*" or "Huanan*")).ti,ab. or ("anti-flu*" or "anti-influenza*" or "antiflu*" or "antinfluenza*").ti,ab.
2. ("influenza" or "AIDS" or "immunodeficiency virus" or "HIV" or "sexually transmitted disease" or "sexually transmitted infections" or "STD" or "STI").ti,ab.
3. ("recogni*" or "classif*" or "regress*" or "clusteri*" or "discriminat*" or "detect*" or "categori*" or "estimat*").ti,ab.
4. ("Machine Learning" or "DL" or "Deep Learning" or "Representation Learning" or "Transfer Learning" or "AI" or "Artificial intelligen*" or "Computational Intelligen*").ti,ab.
5. ("MLP" or (("multi-layer" or "multi layer") and "perceptron") or "LSTM" or "BLSTM" or "GAN" or "generative adversarial" or "RNN" or "ANN" or "DNN" or "CNN" or "NN" or "Neural Network*" or "SVM" or "SVC" or "support vector*" or "LDA" or "QDA" or "discriminant analysis" or "naive bayes*" or "knn" or "nearest neighb*" or "Decision*" or "Expert*" or (("Logistic" or "Linear") AND "Regress*") or "Random Forest" or "Gradient Boost*" or "AdaBoost" or "XGBoost" or "LightGBM" or "classifier*" or "regressor*").ti,ab.
6. exp diagnostic imaging/ or exp diagnosis computer assisted/ or exp Tomography, Emission Computed/ or exp Tomography, X-ray computed/ or exp echography/ or exp magnetic resonance imaging/ or ("diagnostic imaging" or "computer assisted" or "computer-assisted" or "Tomography" or "Emission Computed" or "Emission-Computed" or "X-ray computed" or "X ray computed" or "X-ray-computed" or "echography" or "magnetic resonance imaging" or "mri" or "magnetic resonance imaging" or "microscop*" or "photograph*" or "holograph*" or "radiograph*" or "spectroscop*" or "stroboscop*" or "subtraction technique*" or "thermograph*" or "tomograph*" or "transilluminat*" or "ultrasonograph*" or "ultrasound" or "imaging" or "scan*" or "X-Ray" or "X Ray" or "CT Scan" or "Computed Tomography" or "CT" or "PET" or "PET-CT" or "positron emission tomograph*" or "MRI" or "fMRI" or "NMRI" or "scintigraph*" or "Doppler echography" or "sonograph*" or "ultraso*" or "doppler" or "magnetic resonance imag*").ti,ab.
7. ("overview*" or "review*" or "survey*").af. or exp review/
8. (1 not 2) and (3 or 4 or 5) and 6 and 7

EMBASE

1. 'coronavirus infections'/exp OR 'coronavirus'/exp OR 'betacoronavirus'/exp OR 'coronavirus infection*':ti,ab OR 'coronavirus':ti,ab OR 'betacoronavirus':ti,ab OR ((('corona*' OR 'corono*') NEAR/1 ('virus*' OR 'viral*' OR 'virinae*')):ti,ab) OR 'coronavirus*':ti,ab OR 'severe acute respiratory syndrome related coronavirus':ti,ab OR 'severe acute respiratory syndrome coronavirus 2':ti,ab OR 'coronovirus*':ti,ab OR 'coron?virinae*':ti,ab OR '2019-ncov':ti,ab OR '2019ncov':ti,ab OR '2019-cov':ti,ab OR 'ncov2019':ti,ab OR 'ncov-2019':ti,ab OR 'covid-19':ti,ab OR 'covid19':ti,ab OR 'corvid-19':ti,ab OR 'corvid19':ti,ab OR 'wn-cov':ti,ab OR 'wncov':ti,ab OR 'hcov-19':ti,ab OR 'hcov19':ti,ab OR 'cov':ti,ab OR '2019 novel*':ti,ab OR '2019 novel coronavirus':ti,ab OR '2019 ncov':ti,ab OR 'ncov':ti,ab OR 'n-cov':ti,ab OR 'sars-cov-2':ti,ab OR 'sarscov-2':ti,ab OR 'sarscov2':ti,ab OR 'sars-cov2':ti,ab OR 'sarscov19':ti,ab OR 'sars-cov19':ti,ab OR 'sarscov-19':ti,ab OR 'sars-cov-19':ti,ab OR 'sarsr-cov':ti,ab OR 'ncovor':ti,ab OR 'ncorona*':ti,ab OR 'ncorono*':ti,ab OR 'ncovwuhan*':ti,ab OR 'ncovhubei*':ti,ab OR 'ncovchina*':ti,ab OR 'ncovchinese*':ti,ab OR 'wuhan virus*':ti,ab OR 'novel cov':ti,ab OR 'cov 2':ti,ab OR 'cov2':ti,ab OR 'betacoron?vir*':ti,ab OR ((('outbreak*' OR 'wildlife*' OR 'wild-life' OR 'pandemic*' OR 'epidemic*') NEAR/3 ('wuhan*' OR 'hubei*' OR 'china*' OR 'chinese*' OR 'huanan*')):ti,ab) OR 'anti-flu*':ti,ab OR 'anti-influenza*':ti,ab OR 'antiflu*':ti,ab OR 'antinfluenza*':ti,ab OR

((('respiratory*' OR 'sea-food market*' OR 'seafood market*' OR 'food market*' OR 'foodmarket*') NEAR/10 ('wuhan*' OR 'hubei*' OR 'china*' OR 'chinese*' OR 'huanan*')):ti,ab)

2. 'influenza':ti,ab OR 'aids':ti,ab OR 'immunodeficiency virus':ti,ab OR 'hiv':ti,ab OR 'sexually transmitted disease':ti,ab OR 'sexually transmitted infections':ti,ab OR 'std':ti,ab OR 'sti':ti,ab
3. 'recogni*':ti,ab OR 'classif*':ti,ab OR 'regress*':ti,ab OR 'clusteri*':ti,ab OR 'discriminat*':ti,ab OR 'detect*':ti,ab OR 'categori*':ti,ab OR 'estimat*':ti,ab
4. 'machine learning':ti,ab OR 'dl':ti,ab OR 'deep learning':ti,ab OR 'representation learning':ti,ab OR 'transfer learning':ti,ab OR 'ai':ti,ab OR 'artificial intelligen*':ti,ab OR 'computational intelligen*':ti,ab
5. 'mlp':ti,ab OR (('multi-layer':ti,ab OR 'multi layer':ti,ab) AND 'perceptron':ti,ab) OR 'lstm':ti,ab OR 'blstm':ti,ab OR 'gan':ti,ab OR 'generative adversarial':ti,ab OR 'rnn':ti,ab OR 'ann':ti,ab OR 'dnn':ti,ab OR 'cnn':ti,ab OR 'nn':ti,ab OR 'neural network*':ti,ab OR 'svm':ti,ab OR 'svc':ti,ab OR 'support vector*':ti,ab OR 'lda':ti,ab OR 'qda':ti,ab OR 'discriminant analysis':ti,ab OR 'naive bayes*':ti,ab OR 'knn':ti,ab OR 'nearest neighb*':ti,ab OR 'decision*':ti,ab OR 'expert*':ti,ab OR (('logistic':ti,ab OR 'linear':ti,ab) AND 'regress*':ti,ab) OR 'random forest':ti,ab OR 'gradient boost*':ti,ab OR 'adaboost':ti,ab OR 'xgboost':ti,ab OR 'lightgbm':ti,ab OR 'classifier*':ti,ab OR 'regressor*':ti,ab
6. 'diagnostic imaging'/exp OR 'diagnosis computer assisted'/exp OR 'tomography, emission computed' /exp OR 'tomography, x-ray computed'/exp OR 'echography'/exp OR 'magnetic resonance imaging'/exp OR 'diagnostic imaging':ti,ab OR 'computer assisted':ti,ab OR 'computer-assisted':ti,ab OR 'tomography':ti,ab OR 'emission computed':ti,ab OR 'emission-computed':ti,ab OR 'x-ray computed': ti,ab OR 'x ray computed':ti,ab OR 'x-ray-computed':ti,ab OR 'echography':ti,ab OR 'magnetic resonance imaging':ti,ab OR 'microscop*':ti,ab OR 'photograph*':ti,ab OR 'holograph*':ti,ab OR 'radiograph*':ti,ab OR 'spectroscop*':ti,ab OR 'stroboscop*':ti,ab OR 'subtraction technique*':ti,ab OR 'thermograph*':ti,ab OR 'tomograph*':ti,ab OR 'transilluminat*':ti,ab OR 'ultrasonograph*':ti,ab OR 'ultrasound':ti,ab OR 'imaging':ti,ab OR 'scan*':ti,ab OR 'x-ray':ti,ab OR 'x ray':ti,ab OR 'ct scan':ti,ab OR 'computed tomography':ti,ab OR 'ct':ti,ab OR 'pet':ti,ab OR 'pet-ct':ti,ab OR ('positron':ti,ab AND 'emission':ti,ab AND 'tomograph*':ti,ab) OR 'mri':ti,ab OR 'fmri':ti,ab OR 'nmri':ti,ab OR 'scintigraph*':ti,ab OR ('doppler':ti,ab AND 'echography':ti,ab) OR 'sonograph*':ti,ab OR 'ultraso*': ti,ab OR 'doppler':ti,ab OR ('magnetic':ti,ab AND 'resonance':ti,ab AND 'imag*':ti,ab)
7. overview* OR review* OR survey* OR 'review'/exp
8. (#1 not #2) and (#3 or #4 or #5) and #6 and #7

Web of Science

1. TS=('Coronavirus Infection*' or 'Coronavirus' or 'Betacoronavirus') or TS=(('corona*' or 'corono*') NEAR/1 ('virus*' or 'viral*' or 'virinae*')) or TS=('coronavirus*' or 'Severe acute respiratory syndrome related coronavirus' or 'Severe acute respiratory syndrome coronavirus 2' or 'coronovirus*' or 'coron?virinae*' or '2019-nCoV' or '2019nCoV' or '2019-CoV' or 'nCoV2019' or 'nCoV-2019' or 'COVID-19' or 'COVID19' or 'CORVID-19' or 'CORVID19' or 'WN-CoV' or 'WNCoV' or 'HCoV-19' or 'HCoV19' or 'CoV' or '2019 novel*' or '2019 novel coronavirus' or '2019 nCoV' or 'Ncov' or 'n-cov' or 'SARS-CoV-2' or 'SARSCoV-2' or 'SARSCoV2' or 'SARS-CoV2' or 'SARSCov19' or 'SARS-Cov19' or 'SARSCov-19' or 'SARS-Cov-19' or 'SARSr-cov' or 'Ncovor' or 'Ncorona*' or 'Ncorono*' or 'NcovWuhan*' or 'NcovHubei*' or 'NcovChina*' or 'NcovChinese*' or 'Wuhan virus*' or 'novel CoV' or 'CoV 2' or 'CoV2' or 'betacoron?vir*') or TS=(((('respiratory*' NEAR/2 ('acute*' or 'symptom*' or 'disease*' or 'illness*' or 'condition*')) or 'sea-food market*' or 'seafood market*' or 'food market*' or 'foodmarket*') NEAR/10 ('Wuhan*' or 'Hubei*' or 'China*' or 'Chinese*' or 'Huanan*')) or TS=(('outbreak*' or 'wildlife*' or 'wild-life' or 'pandemic*' or 'epidemic*') NEAR/3 ('Wuhan*' or 'Hubei*' or 'China*' or 'Chinese*' or 'Huanan*')) or TS=('anti-flu*' or 'anti-influenza*' or 'antiflu*' or 'antinfluenza*')
2. TS=('influenza' or 'AIDS' or 'immunodeficiency virus' or 'HIV' or 'sexually transmitted disease' or 'sexually transmitted infections' or 'STD' or 'STI')
3. TS=('recogni*' or 'classif*' or 'regress*' or 'clusteri*' or 'discriminat*' or 'detect*' or 'categori*' or 'estimat*')
4. TS=('Machine Learning' or 'DL' or 'Deep Learning' or 'Representation Learning' or 'Transfer Learning' or 'AI' or 'Artificial intelligen*' or 'Computational Intelligen*')
5. TS=('MLP' or (('multi-layer' or 'multi layer') and 'perceptron') or 'LSTM' or 'BLSTM' or 'GAN' or 'generative adversarial' or 'RNN' or 'ANN' or 'DNN' or 'CNN' or 'NN' or 'Neural Network*' or 'SVM' or 'SVC' or 'support vector*' or 'LDA' or 'QDA' or 'discriminant analysis' or 'naive bayes*' or 'knn' or 'nearest neighb*' or 'Decision*' or 'Expert*' or (('Logistic' or 'Linear') AND 'Regress*') or 'Random Forest' or 'Gradient Boost*' or 'AdaBoost' or 'XGBoost' or 'LightGBM' or 'classifier*' or 'regressor*')

6. TS=('diagnostic imaging' or 'computer assisted' or 'computer-assisted' or 'Tomography' or 'Emission Computed' or 'Emission-Computed' or 'X-ray computed' or 'X ray computed' or 'X-ray-computed' or 'echography' or 'magnetic resonance imaging' or 'mri' or 'magnetic resonance imaging' or 'microscop*' or 'photograph*' or 'holograph*' or 'radiograph*' or 'spectroscop*' or 'stroboscop*' or 'subtraction technique*' or 'thermograph*' or 'tomograph*' or 'transilluminat*' or 'ultrasonograph*' or 'ultrasound' or 'imaging' or 'scan*' or 'X-Ray' or 'X Ray' or 'CT Scan' or 'Computed Tomography' or 'CT' or 'PET' or 'PET-CT' or 'positron emission tomograph*' or 'MRI' or 'fMRI' or 'NMRI' or 'scintigraph*' or 'Doppler echography' or 'sonograph*' or 'ultraso*' or 'doppler' or 'magnetic resonance imag*')
7. ALL=('overview*' or 'review*' or 'survey*')
8. (#1 not #2) and (#3 or #4 or #5) and #6 and #7

Scopus

((TITLE-ABS-KEY ("Coronavirus Infection*" OR "Coronavirus" OR "Betacoronavirus") OR TITLE-ABS-KEY (("corona*" OR "corono*") W/1 ("virus*" OR "viral*" OR "virinae*")) OR TITLE-ABS-KEY ("coronavirus*" OR "Severe acute respiratory syndrome related coronavirus" OR "Severe acute respiratory syndrome coronavirus 2" OR "coronovirus*" OR "coron?virinae*" OR "2019-nCoV" OR "2019nCoV" OR "2019-CoV" OR "nCoV2019" OR "nCoV-2019" OR "COVID-19" OR "COVID19" OR "CORVID-19" OR "CORVID19" OR "WN-CoV" OR "WNCoV" OR "HCoV-19" OR "HCoV19" OR "CoV" OR "2019 novel*" OR "2019 novel coronavirus" OR "2019 nCoV" OR "Ncov" OR "n-cov" OR "SARS-CoV-2" OR "SARSCoV-2" OR "SARSCoV2" OR "SARS-CoV2" OR "SARSCov19" OR "SARS-Cov19" OR "SARSCov-19" OR "SARS-Cov-19" OR "SARSr-cov" OR "Ncovor" OR "Ncorona*" OR "Ncorono*" OR "NcovWuhan*" OR "NcovHubei*" OR "NcovChina*" OR "NcovChinese*" OR "Wuhan virus*" OR "novel CoV" OR "CoV 2" OR "CoV2" OR "betacoron?vir*") OR TITLE-ABS-KEY ((("respiratory*" W/2 ("acute*" OR "symptom*" OR "disease*" OR "illness*" OR "condition*")) OR "sea-food market*" OR "seafood market*" OR "food market*" OR "foodmarket*") W/10 ("Wuhan*" OR "Hubei*" OR "China*" OR "Chinese*" OR "Huanan*")) OR TITLE-ABS-KEY (("outbreak*" OR "wildlife*" OR "wild-life" OR "pandemic*" OR "epidemic*") W/3 ("Wuhan*" OR "Hubei*" OR "China*" OR "Chinese*" OR "Huanan*")) OR TITLE-ABS-KEY ("anti-flu*" OR "anti-influenza*" OR "antiflu*" OR "antinfluenza*")) AND NOT (TITLE-ABS-KEY ("influenza" OR "AIDS" OR "immunodeficiency virus" OR "HIV" OR "sexually transmitted disease" OR "sexually transmitted infections" OR "STD" OR "STI"))) AND ((TITLE-ABS-KEY ("recogni*" OR "classif*" OR "regress*" OR "clusteri*" OR "discriminat*" OR "detect*" OR "categori*" OR "estimat*")) OR (TITLE-ABS-KEY ("Machine Learning" OR "DL" OR "Deep Learning" OR "Representation Learning" OR "Transfer Learning" OR "AI" OR "Artificial intelligen*" OR "Computational Intelligen*")) OR (TITLE-ABS-KEY ("MLP" OR "multi-layer perceptron" OR "multi layer perceptron" OR "LSTM" OR "BLSTM" OR "GAN" OR "generative adversarial" OR "RNN" OR "ANN" OR "DNN" OR "CNN" OR "NN" OR "Neural Network*" OR "SVM" OR "SVC" OR "support vector*" OR "LDA" OR "QDA" OR "discriminant analysis" OR "naive bayes*" OR "knn" OR "nearest neighb*" OR "Decision*" OR "Expert*" OR "Logistic Regress*" OR "Linear Regress*" OR "Random Forest" OR "Gradient Boost*" OR "AdaBoost" OR "XGBoost" OR "LightGBM" OR "classifier*" OR "regressor*"))) AND (TITLE-ABS-KEY ("diagnostic imaging" OR "computer assisted" OR "computer-assisted" OR "Tomography" OR "Emission Computed" OR "Emission-Computed" OR "X-ray computed" OR "X ray computed" OR "X-ray-computed" OR "echography" OR "magnetic resonance imaging" OR "mri" OR "magnetic resonance imaging" OR "microscop*" OR "photograph*" OR "holograph*" OR "radiograph*" OR "spectroscop*" OR "stroboscop*" OR "subtraction technique*" OR "thermograph*" OR "tomograph*" OR "transilluminat*" OR "ultrasonograph*" OR "ultrasound" OR "imaging" OR "scan*" OR "X-Ray" OR "X Ray" OR "CT Scan" OR "Computed Tomography" OR "CT" OR "PET" OR "PET-CT" OR "positron emission tomograph*" OR "MRI" OR "fMRI" OR "NMRI" OR "scintigraph*" OR "Doppler echography" OR "sonograph*" OR "ultraso*" OR "doppler" OR "magnetic resonance imag*")) AND (ALL("overview*" OR "review*" OR "survey*"))

Cochrane Library

1. MeSH descriptor: [Coronavirus Infections] explode all trees
2. MeSH descriptor: [Coronavirus] explode all trees
3. MeSH descriptor: [Betacoronavirus] explode all trees
4. "coronavirus*" or "Severe acute respiratory syndrome related coronavirus" or "Severe acute respiratory syndrome coronavirus 2" or "coronovirus*" or "coron?virinae*" or "2019-nCoV" or "2019nCoV" or "2019-CoV" or "nCoV2019" or "nCoV-2019" or "COVID-19" or "COVID19" or "CORVID-19" or "CORVID19" or "WN-CoV" or "WNCoV" or "HCoV-19" or "HCoV19" or "CoV" or "2019 novel*" or "2019 novel coronavirus" or "2019 nCoV" or "Ncov" or "n-cov" or "SARS-CoV-2" or "SARSCoV-2" or "SARSCoV2" or "SARS-CoV2" or "SARSCov19" or "SARS-Cov19" or "SARSCov-19"

or "SARS-Cov-19" or "SARSr-cov" or "Ncovor" or "Ncorona*" or "Ncorono*" or "NcovWuhan*" or "NcovHubei*" or "NcovChina*" or "NcovChinese*" or "Wuhan virus*" or "novel CoV" or "CoV 2" or "CoV2" or "betacoron?vir*"

5. ((("respiratory*" NEAR/2 ("acute*" or "symptom*" or "disease*" or "illness*" or "condition*")) or "sea-food market*" or "seafood market*" or "food market*" or "foodmarket*") NEAR/10 ("Wuhan*" or "Hubei*" or "China*" or "Chinese*" or "Huanan*"))
6. (("outbreak*" or "wildlife*" or "wild-life" or "pandemic*" or "epidemic*") NEAR/3 ("Wuhan*" or "Hubei*" or "China*" or "Chinese*" or "Huanan*"))
7. ("anti-flu*" or "anti-influenza*" or "antiflu*" or "antinfluenza*")
8. #1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7
9. "influenza" or "AIDS" or "immunodeficiency virus" or "HIV" or "sexually transmitted disease" or "sexually transmitted infections" or "STD" or "STI"
10. "recogni*" or "classif*" or "regress*" or "clusteri*" or "discriminat*" or "detect*" or "categori*" or "estimat*"
11. "Machine Learning" or "DL" or "Deep Learning" or "Representation Learning" or "Transfer Learning" or "AI" or "Artificial intelligen*" or "Computational Intelligen*"
12. "MLP" or (("multi-layer" or "multi layer") and "perceptron") or "LSTM" or "BLSTM" or "GAN" or "generative adversarial" or "RNN" or "ANN" or "DNN" or "CNN" or "NN" or "Neural Network*" or "SVM" or "SVC" or "support vector*" or "LDA" or "QDA" or "discriminant analysis" or "naive bayes*" or "knn" or "nearest neighb*" or "Decision*" or "Expert*" or (("Logistic" or "Linear") AND "Regress*") or "Random Forest" or "Gradient Boost*" or "AdaBoost" or "XGBoost" or "LightGBM" or "classifier*" or "regressor*"
13. MeSH descriptor: [Diagnostic Imaging] explode all trees
14. MeSH descriptor: [Diagnosis, Computer-Assisted] explode all trees
15. MeSH descriptor: [Tomography, X-Ray Computed] explode all trees
16. MeSH descriptor: [Tomography, Emission-Computed] explode all trees
17. MeSH descriptor: [Ultrasonography] explode all trees
18. MeSH descriptor: [Magnetic Resonance Imaging] explode all trees
19. #13 or #14 or #15 or #16 or #17 or #18
20. ("diagnostic imaging" or "computer assisted" or "computer-assisted" or "Tomography" or "Emission Computed" or "Emission-Computed" or "X-ray computed" or "X ray computed" or "X-ray-computed" or "echography" or "magnetic resonance imaging" or "mri" or "magnetic resonance imaging" or "microscop*" or "photograph*" or "holograph*" or "radiograph*" or "spectroscop*" or "stroboscop*" or "subtraction technique*" or "thermograph*" or "tomograph*" or "transilluminat*" or "ultrasonograph*" or "ultrasound" or "imaging" or "scan*" or "X-Ray" or "X Ray" or "CT Scan" or "Computed Tomography" or "CT" or "PET" or "PET-CT" or "positron emission tomograph*" or "MRI" or "fMRI" or "NMRI" or "scintigraph*" or "Doppler echography" or "sonograph*" or "ultraso*" or "doppler" or "magnetic resonance imag*")
21. (("overview*" or "review*" or "survey*"))
22. MeSH descriptor: [Review] explode all trees
23. #21 or #22
24. (#8 not #9) and (#10 or #11 or #12) and (#19 or #20) and #23

IEEE Xplore

(("Coronavirus Infection" OR "Coronavirus" OR "Betacoronavirus") OR (("corona" OR "corono") NEAR/1 ("virus" OR "viral" OR "virinae")) OR ("Abstract":"coronavirus" OR "Severe acute respiratory syndrome related coronavirus" OR "Severe acute respiratory syndrome coronavirus 2" OR "coronovirus" OR "coron?virinae" OR "2019-nCoV" OR "2019nCoV" OR "2019-CoV" OR "nCoV2019" OR "nCoV-2019" OR "COVID-19" OR "COVID19" OR "CORVID-19" OR "CORVID19" OR "WN-CoV" OR "WNCoV" OR "HCoV-19" OR "HCoV19" OR "CoV" OR "2019 novel" OR "2019 novel coronavirus" OR "2019 nCoV" OR "Ncov" OR "n-cov" OR "SARS-CoV-2" OR "SARSCoV-2" OR "SARSCoV2" OR "SARS-CoV2" OR "SARSCov19" OR "SARS-Cov19" OR "SARSCov-19" OR "SARS-Cov-19" OR "SARSr-cov" OR "Ncovor" OR "Ncorona" OR "Ncorono" OR "NcovWuhan" OR "NcovHubei" OR "NcovChina" OR "NcovChinese" OR "Wuhan virus" OR "novel CoV" OR "CoV 2" OR "CoV2" OR "betacoron?vir") OR ("Document title":"coronavirus" OR "Severe acute respiratory syndrome related coronavirus" OR "Severe acute respiratory syndrome coronavirus 2" OR "coronovirus" OR "coron?virinae" OR "2019-nCoV" OR "2019nCoV" OR "2019-CoV" OR "nCoV2019" OR "nCoV-2019" OR "COVID-19" OR "COVID19" OR "CORVID-19" OR "CORVID19" OR "WN-CoV" OR "WNCoV" OR "HCoV-19" OR "HCoV19" OR "CoV" OR "2019 novel" OR "2019 novel coronavirus" OR "2019 nCoV" OR "Ncov" OR "n-cov" OR "SARS-CoV-2" OR "SARSCoV-2" OR "SARSCoV2" OR "SARS-CoV2" OR "SARSCov19" OR "SARS-Cov19" OR "SARSCov-19" OR "SARS-Cov-19" OR "SARSr-cov" OR

"Ncovor" OR "Ncorona" OR "Ncorono" OR "NcovWuhan" OR "NcovHubei" OR "NcovChina" OR "NcovChinese" OR "Wuhan virus" OR "novel CoV" OR "CoV 2" OR "CoV2" OR "betacoron?vir") OR ((("respiratory" NEAR/2 ("acute" OR "symptom" OR "disease" OR "illness" OR "condition")) OR "sea-food market" OR "seafood market" OR "food market" OR "foodmarket") NEAR/10 ("Wuhan" OR "Hubei" OR "China" OR "Chinese" OR "Huanan")) OR (("outbreak" OR "wildlife" OR "wild-life" OR "pandemic" OR "epidemic") NEAR/3 ("Wuhan" OR "Hubei" OR "China" OR "Chinese" OR "Huanan")) OR ("anti-flu" OR "anti-influenza" OR "antiflu" OR "antinfluenza")) AND (("overview*" OR "review*" OR "survey*") OR "Mesh_Terms":"review")

dblp

1. review|overview|survey
2. covid|corona|corono|ncov|wuhan|sars|betaco|corvid|hcov|ncov|hubei|virus|antin|pandem

arXiv

1. AND abstract=covid* OR coronavirus; AND abstract=review* OR overview* OR survey*
2. AND title=covid* OR coronavirus; AND abstract=review* OR overview* OR survey*
3. AND abstract=covid* OR coronavirus; AND title=review* OR overview* OR survey*
4. AND title=covid* OR coronavirus; AND title=review* OR overview* OR survey*

OSF Preprints

(("Coronavirus Infection*" OR "Coronavirus" OR "Betacoronavirus" OR"corona*" OR "corono*" OR "coronavirus*" OR "Severe acute respiratory syndrome related coronavirus" OR "Severe acute respiratory syndrome coronavirus 2" OR "coronovirus*" OR "coron?virinae*" OR "2019-nCoV" OR "2019nCoV" OR "2019-CoV" OR "nCoV2019" OR "nCoV-2019" OR "COVID-19" OR "COVID19" OR "CORVID-19" OR "CORVID19" OR "WN-CoV" OR "WNCoV" OR "HCoV-19" OR "HCoV19" OR "CoV" OR "2019 novel*" OR "2019 novel coronavirus" OR "2019 nCoV" OR "Ncov" OR "n-cov" OR "SARS-CoV-2" OR "SARSCoV-2" OR "SARSCoV2" OR "SARS-CoV2" OR "SARSCov19" OR "SARS-Cov19" OR "SARSCov-19" OR "SARS-Cov-19" OR "SARSr-cov" OR "NcovOR " OR "Ncorona*" OR "Ncorono*" OR "NcovWuhan*" OR "NcovHubei*" OR "NcovChina*" OR "NcovChinese*" OR "Wuhan virus*" OR "novel CoV" OR "CoV 2" OR "CoV2" OR "betacoron?vir*" OR "respiratory*" OR "sea-food market*" OR "seafood market*" OR "food market*" OR "foodmarket*" OR "outbreak*" OR "wildlife*" OR "wild-life" OR "pandemic*" OR "epidemic*" OR "anti-flu*" OR "anti-influenza*" OR "antiflu*" OR "antinfluenza*") NOT ("influenza" OR "AIDS" OR "immunodeficiency virus" OR "HIV" OR "sexually transmitted disease" OR "sexually transmitted infections" OR "STD" OR "STI")) AND ("review*" OR "overview*" OR "survey*") AND ("diagnostic imaging" OR "computer assisted" OR "computer-assisted" OR "Tomography" OR "Emission Computed" OR "Emission-Computed" OR "X-ray computed" OR "X ray computed" OR "X-ray-computed" OR "echography" OR "magnetic resonance imaging" OR "mri" OR "magnetic resonance imaging" OR "microscop*" OR "photograph*" OR "holograph*" OR "radiograph*" OR "spectroscop*" OR "stroboscop*" OR "subtraction technique*" OR "thermograph*" OR "tomograph*" OR "transilluminat*" OR "ultrasonograph*" OR "ultrasound" OR "imaging" OR "scan*" OR "X-Ray" OR "X Ray" OR "CT Scan" OR "Computed Tomography" OR "CT" OR "PET" OR "PET-CT" OR "positron emission tomograph*" OR "MRI" OR "fMRI" OR "NMRI" OR "scintigraph*" OR "Doppler echography" OR "sonograph*" OR "ultraso*" OR "doppler" OR "magnetic resonance imag*") AND ("recogni*" OR "classif*" OR "regress*" OR "clusteri*" OR "discriminat*" OR "detect*" OR "categori*" OR "estimat*" OR "Machine Learning" OR "DL" OR "Deep Learning" OR "Representation Learning" OR "Transfer Learning" OR "AI" OR "Artificial intelligen*" OR "Computational Intelligen*" OR "MLP" OR "multi-layer perceptron" OR "multi layer perceptron" OR "LSTM" OR "BLSTM" OR "GAN" OR "generative adversarial" OR "RNN" OR "ANN" OR "DNN" OR "CNN" OR "NN" OR "Neural Network*" OR "SVM" OR "SVC" OR "support vector*" OR "LDA" OR "QDA" OR "discriminant analysis" OR "naive bayes*" OR "knn" OR "nearest neighb*" OR "Decision*" OR "Expert*" OR "Logistic Regress*" OR "Linear Regress*" OR "Random Forest" OR "Gradient Boost*" OR "AdaBoost" OR "XGBoost" OR "LightGBM" OR "classifier*" OR "regressor*")

PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	p. 1
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	p. 1
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	pp. 1, 2
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	pp. 1, 2
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	p. 3
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	p. 3
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	S16
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	p. 3
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	p. 3
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	p. 3
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	p. 3
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	pp. 3, 4
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	p. 3
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	pp. 3, 4, 5
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	pp. 3, 4, 5
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	pp. 3, 4, 5
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	pp. 4, 5
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	pp. 4, 5
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	pp. 4, 5
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	p. 4
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	NA

PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	p. 5, S1
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	S3
Study characteristics	17	Cite each included study and present its characteristics.	p. 7, S2, S4
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	p. 6, S9, S10
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	pp. 5, 6, 7, 8
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	pp. 5, 6, 7, 8
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	NA
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	NA
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	NA
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	NA
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	NA
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	pp. 8, 9, 10
	23b	Discuss any limitations of the evidence included in the review.	p. 10
	23c	Discuss any limitations of the review processes used.	p. 10
	23d	Discuss implications of the results for practice, policy, and future research.	pp. 9, 10
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	p. 3
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	p. 3
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	NA
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	p. 11
Competing interests	26	Declare any competing interests of review authors.	p. 11
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	p. 11