



# PRISMA 2009 Checklist

Section/topic	#	Checklist item	Reported on page #
<b>TITLE</b>			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
<b>ABSTRACT</b>			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	3, 4
<b>INTRODUCTION</b>			
Rationale	3	Describe the rationale for the review in the context of what is already known.	6
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	7
<b>METHODS</b>			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	NA
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	8
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	8,9
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	8, supplementary table 1
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	8
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	10
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	10
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	10,11
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	12



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Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., $I^2$ ) for each meta-analysis.	12
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Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	11
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	11,12
<b>RESULTS</b>			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	13
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	13,14,table 1
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	13, 14, supplementary table 2
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	15-18, figures 2-4, supplementary figures 2-4
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	15-18
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	18,19
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	15-18
<b>DISCUSSION</b>			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	19
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	20-23
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	23
<b>FUNDING</b>			



## PRISMA 2009 Checklist

Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	24
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*From:* Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(6): e1000097. doi:10.1371/journal.pmed1000097

For more information, visit: [www.prisma-statement.org](http://www.prisma-statement.org).

## Supplementary Table 1: Detailed search strategy

### OVID

Database(s): **Embase** 1988 to 2020 Week 18, **Ovid MEDLINE(R) 1946 to Present and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Ovid MEDLINE(R) Daily, EBM Reviews - Cochrane Central Register of Controlled Trials** March 2020, **EBM Reviews - Cochrane Database of Systematic Reviews** 2005 to May 1, 2020

Search Strategy:

#	Searches
1	(((("Corona virinae" or "corona virus" or Coronavirinae or coronavirus or COVID or nCoV or hCoV) adj4 ("19" or "2019" or novel or new or nouveau or nuevo)) or (pneumon* adj3 Wuhan) or (("Corona virinae" or "corona virus" or Coronavirinae or coronavirus* or COVID or nCoV or hCoV) and (wuhan or china or chinese or hubei)) or "2019-novel Cov" or "2019-ncov" or "COVID-19" or "COVID2019" or "COVID 2019" or "Corona virinae19" or "Corona virinae2019" or "corona virus19" or "coronavirus-19" or "corona virus2019" or Coronavirinae19 or Coronavirinae2019 or coronavirus19 or coronavirus2019 or "coronavirus-2019" or COVID19 or COVID2019 or nCOV19 or ncov-19 or nCOV2019 or "SARS Corona virus 2" or "SARS-coronavirus2" or "SARS-coronavirus-2" or "SARS-COV-2" or "SARS-COV2" or "Severe Acute Respiratory Syndrome Corona virus 2" or "Severe Acute Respiratory Syndrome Coronavirus 2" or sarscov*).ti,ab,hw,kw,mp. or ((coronavir* or COVID*) adj5 (pandemic* or outbreak or shutdown or "shut down*" or "shut-down*" or quarantin* or (lock* adj down) or "lock-down*" or lockdown* or "stay at home" or "stay-at-home" or "shelter-in-place")).ti. or (Severe Acute Respiratory Syndrome Coronavirus 2 or COVID-19 or COVID-19 drug treatment or COVID-19 serotherapy or COVID-19 diagnostic testing or COVID-19 vaccine or spike glycoprotein, COVID-19 virus).os,ps,rs,ox,px,rx,nm.
2	Nausea/
3	vomiting/
4	exp "nausea and vomiting"/
5	exp constipation/

6	exp diarrhea/
7	dyspepsia/
8	flatulence/
9	exp abdominal pain/
10	(gastrointestinal or gastroenterolog* or gastric or gastritis or intestin* or colon* or cecum or caecum or cecal or gut or ileum or ileal or duoden* or enteric or alimentary or esophag* or oesophag* or stomach or nausea* or vomit* or emesis or "irritable bowel" or crohn* or (abdom* adj2 (disten* or pain* or discomfort or angina)) or feces or fecal* or faecal* or stool* or viscera or visceral or bloat* or flatulen* or flatus or defecat* or "bowel movement*" or constipat* or diarrhea or diarrhoea or indigestion or digestion or digestive or dyspepsia or heartburn).mp.
11	exp gastrointestinal tract/
12	exp digestive system disease/
13	exp liver/
14	exp biliary tract/
15	exp liver diseases/
16	(liver or hepat* or intrahepat* or bile or biliary).mp.
17	or/2-16
18	1 and 17
19	18 not ((exp animals/ or exp nonhuman/) not exp humans/)
20	limit 19 to yr="2019 -Current"
21	remove duplicates from 20

## SCOPUS

1	<p>( TITLE-ABS-KEY ( ( ( "Corona virinae" OR "corona virus" OR coronavirinae OR coronavirus OR covid OR ncov OR hcov ) W/4 ( "19" OR "2019" OR novel OR new OR nouveau OR nuevo ) ) OR ( pneumon* W/3 wuhan ) OR ( ( "Corona virinae" OR "corona virus" OR coronavirinae OR coronavirus* OR covid OR ncov OR hcov ) AND ( wuhan OR china OR chinese OR hubei ) ) OR "2019-novel Cov" OR "2019-ncov" OR "COVID-19" OR "COVID2019" OR "COVID 2019" OR "Corona virinae19" OR "Corona virinae2019" OR "corona virus19" OR "coronavirus-19" OR "corona virus2019" OR coronavirinae19 OR coronavirinae2019 OR coronavirus19 OR coronavirus2019 OR "coronavirus-2019" OR covid19 OR covid2019 OR ncov19 OR ncov-19 OR ncov2019 OR "SARS Corona virus 2" OR "SARS-coronavirus2" OR "SARS-coronavirus-2" OR "SARS-COV-2" OR "SARS-COV2" OR "Severe Acute Respiratory Syndrome Corona virus 2" OR "Severe Acute Respiratory Syndrome Coronavirus 2" OR sarscov* ) ) OR ( TITLE ( ( coronavir* OR covid* ) W/5 ( pandemic* OR outbreak OR shutdown OR "shut down*" OR "shut-down*" OR quarantin* OR ( lock* W/ down ) OR "lock-down*" OR lockdown* OR "stay at home" OR "stay-at-home" OR "shelter-in-place" ) ) ) )</p>
2	<p>TITLE-ABS-KEY ( gastrointestinal OR gastroenterolog* OR gastric OR gastritis OR intestin* OR colon* OR cecum OR caecum OR cecal OR gut OR ileum OR ileal OR duoden* OR enteric OR alimentary OR esophag* OR oesophag* OR stomach OR nausea* OR vomit* OR emesis OR "irritable bowel" OR crohn* OR ( abdom* W/2 ( disten* OR pain* OR discomfort OR angina ) ) OR feces OR fecal* OR faecal* OR stool* OR viscera OR visceral OR bloat* OR flatulen* OR flatus OR defecat* OR "bowel movement*" OR constipat* OR diarrhea OR diarrhoea OR indigestion OR digestion OR digestive OR dyspepsia OR heartburn )</p>
3	1 and 2
4	INDEX(embase) OR INDEX(medline) OR PMID(0* OR 1* OR 2* OR 3* OR 4* OR 5* OR 6* OR 7* OR 8* OR 9*)
5	3 not 4

6	DOCTYPE(ed) OR DOCTYPE(bk) OR DOCTYPE(er) OR DOCTYPE(no) OR DOCTYPE(sh) OR DOCTYPE(ch)
7	5 not 6
8	PUBYEAR > 2018
9	7 and 8
10	( TITLE-ABS-KEY ( ( alpaca OR alpacas OR amphibian OR amphibians OR animal OR animals OR antelope OR armadillo OR armadillos OR avian OR baboon OR baboons OR beagle OR beagles OR bee OR bees OR bird OR birds OR bison OR bovine OR buffalo OR buffaloes OR buffalos OR "c elegans" OR "Caenorhabditis elegans" OR camel OR camels OR canine OR canines OR carp OR cats OR cattle OR chick OR chicken OR chickens OR chicks OR chimp OR chimpanze OR chimpanzees OR chimps OR cow OR cows OR "D melanogaster" OR "dairy calf" OR "dairy calves" OR deer OR dog OR dogs OR donkey OR donkeys OR drosophila OR "Drosophila melanogaster" OR duck OR duckling OR ducklings OR ducks OR equid OR equids OR equine OR equines OR feline OR felines OR ferret OR ferrets OR finch OR finches OR fish OR flatworm OR flatworms OR fox OR foxes OR frog OR frogs OR "fruit flies" OR "fruit fly" OR "G mellonella" OR "Galleria mellonella" OR geese OR gerbil OR gerbils OR goat OR goats OR goose OR gorilla OR gorillas OR hamster OR hamsters OR hare OR hares OR heifer OR heifers OR horse OR horses OR insect OR insects OR jellyfish OR kangaroo OR kangaroos OR kitten OR kittens OR lagomorph OR lagomorphs OR lamb OR lambs OR llama OR llamas OR macaque OR macaques OR macaw OR macaws OR marmoset OR marmosets OR mice OR minipig OR minipigs OR mink OR minks OR monkey OR monkeys OR mouse OR mule OR mules OR nematode OR nematodes OR octopus OR octopuses OR orangutan OR "orang-utan" OR orangutans OR "orang-utans" OR oxen OR parrot OR parrots OR pig OR pigeon OR pigeons OR piglet OR piglets OR pigs OR porcine OR primate OR primates OR quail OR rabbit OR rabbits OR rat OR rats OR reptile OR reptiles OR rodent OR rodents OR ruminant OR ruminants OR salmon OR sheep OR shrimp OR slug OR slugs OR swine OR tamarin OR tamarins OR toad OR toads OR

	trout OR urchin OR urchins OR vole OR voles OR waxworm OR waxworms OR worm OR worms OR xenopus OR "zebra fish" OR zebrafish ) AND NOT ( human OR humans OR patient OR patients ) ) )
11	9 not 10



**Supplementary Table 2: Assessment of risk of bias in included studies**

Serial no.	Study	Type of Study	Selection	Ascertainment		Causality				Reporting	Total score	Assessment of ROB
			Selection represents whole experience	Exposure	Outcome	Alternative causes ruled out	Challenge-rechallenge	Dose-response	Follow up adequate	Case description adequate for replication/inference		
1.	An P et. al. (2020) <sup>1</sup>	Case series	N	Y	N	Y	-	-	N	Y	3/6	High
2.	Chan F-W et. al. (2020) <sup>2</sup>	Case series	N	Y	N	Y	-	-	N/A	Y	3/6	High
3.	Chang D et. al. (2020) <sup>3</sup>	Case series	N	Y	N	N	-	-	Y	N	2/6	High
4.	Chen N et. al. (2020) <sup>4</sup>	Case series	Y	Y	Y	Y	-	-	Y	Y	6/6	Low
5.	Chen Q (a) et. al. (2020) <sup>5</sup>	Case series	N	Y	N	Y	-	-	N	N	2/6	High
6.	Chen Q (b) et. al. (2020) <sup>6</sup>	Case series	N	Y	Y	N	-	-	Y	Y	4/6	Medium
7.	Cheung K et. al. (2020) <sup>7</sup>	Case series	N	Y	N	N	-	-	N/A	Y	2/6	High
8.	Cholankeril G et. al. (2020) <sup>8</sup>	Case series	N	Y	N	N	-	-	N/A	Y	2/6	High
9.	COVID National Emergency Response Center (C-NERC; 2020) <sup>9</sup>	Case series	Y	Y	N	N	-	-	N	Y	3/6	High
10.	COVID-19 National	Case series	Y	Y	N	N	-	-	N/A	Y	3/6	High

Serial no.	Study	Type of study	Selection	Ascertainment		Causality				Reporting	Total score	Assessment of ROB
			Selection represents whole experience	Exposure	Outcome	Alternative causes ruled out	Challenge-rechallenge	Dose-response	Follow up adequate	Case description adequate for replication/inference		
	Incident Room Surveillance Team. (C-NIRST; 2020) <sup>10</sup>	(national data base)										
11.	Fan H et. al. (2020) <sup>11</sup>	Case series	Y	Y	N	N	-	-	N/A	Y	3/6	High
12.	Fernandez-Ruiz et. al. (2020) <sup>12</sup>	Case series	N	Y	Y	N	-	-	N/A	Y	3/6	High
13.	Gritti G et al (2020) <sup>13</sup>	Case series	N	N	N	N	-	-	N	Y	1/6	High
14.	Guan W-j et. al. (2020) <sup>14</sup>	Retrospective cohort	Y	Y	Y	N	-	-	N	Y	4/6	Medium
15.	Hajifathalian K et. al. (2020) <sup>15</sup>	Case series	N	Y	Y	N	-	-	Y	Y	4/6	Medium
16.	Han C et. al. (2020) <sup>16</sup>	Retrospective cohort	Y	Y	Y	N	-	-	Y	Y	5/6	Low
17.	Hsieh W-H et. al. (2020) <sup>17</sup>	Case series	Y	Y	N	Y	-	-	Y	Y	5/6	Medium
18.	Huang C et. al. (2020) <sup>18</sup>	Prospective cohort	N	Y	Y	N	-	-	N/A	Y	3/6	High
19.	Huang R et. al. (2020) <sup>19</sup>	Case series	N	Y	N	N	-	-	N/A	Y	2/6	High

Serial no.	Study	Type of study	Selection	Ascertainment		Causality				Reporting	Total score	Assessment of ROB
			Selection represents whole experience	Exposure	Outcome	Alternative causes ruled out	Challenge-rechallenge	Dose-response	Follow up adequate	Case description adequate for replication/inference		
20.	Huang WH et. al. (2020) <sup>20</sup>	Case series	N	Y	N	N	-	-	N	Y	2/6	High
21.	Huang Y et. al. (2020) <sup>21</sup>	Case series	N	Y	Y	N	-	-	N/A	N	2/6	High
22.	Jin X et. al. (2020) <sup>22</sup>	Case series	Y	Y	Y	N	-	-	N/A	Y	4/6	High
23.	Kim ES et. al. (2020) <sup>23</sup>	Case series	Y	Y	Y	N	-	-	Y	Y	5/6	Low
24.	Klopfenstein T et. al. (2020) <sup>24</sup>	Case series	N	Y	N	N	-	-	N/A	N	1/6	High
25.	Kluytmans M et al. (2020) <sup>25</sup>	Case series	Y	Y	N	N	-	-	N	Y	3/6	High
26.	Kuang Y et. al. (2020) <sup>26</sup>	Retrospective cohort	Y	Y	Y	N	-	-	N/A	Y	4/6	Medium
27.	Liu K et. al. (2020) <sup>27</sup>	Case series	N	Y	N	N	-	-	N/A	Y	2/6	High
28.	Kujawski S et al. (2020) <sup>28</sup>	Case series	N	Y	N	N	-	-	N/A	Y	2/6	High
29.	Lechien J et. al. (2020) <sup>29</sup>	Case series	N	Y	Y	N	-	-	N/A	Y	3/6	High
30.	Li K et al (2020) <sup>30</sup>	Case series	Y	Y	N	N	-	-	N/A	Y	3/6	High
31.	Lin L et. al. (2020) <sup>31</sup>	Case series	N	Y	N	N	-	-	N/A	Y	2/6	High

Serial no.	Study	Type of study	Selection	Ascertainment		Causality				Reporting	Total score	Assessment of ROB
			Selection represents whole experience	Exposure	Outcome	Alternative causes ruled out	Challenge-rechallenge	Dose-response	Follow up adequate	Case description adequate for replication/inference		
32.	Liu Y et. al. (2020) <sup>32</sup>	Case series	N	Y	N	N	-	-	N/A	Y	2/6	High
33.	Luo S et. al. (2020) <sup>33</sup>	Case series	Y	Y	N	N	-	-	N/A	Y	3/6	High
34.	Nobel Y et. al. (2020) <sup>34</sup>	Case control	Y	Y	Y	N	-	-	N	Y	4/6	Medium
35.	Pan F et. al. (2020) <sup>35</sup>	Retrospective cohort	N	Y	Y	N	-	-	Y	Y	4/6	Medium
36.	Pan L et. al. (2020) <sup>36</sup>	Retrospective cohort	N	Y	Y	N	-	-	Y	Y	4/6	Medium
37.	Pung R et al (2020) <sup>37</sup>	Case series	N	Y	Y	N	-	-	Y	Y	4/6	Medium
38.	Redd W et. al. (2020) <sup>38</sup>	Retrospective cohort	Y	Y	N	N	-	-	N/A	Y	3/6	High
39.	Ren L et. al. (2020) <sup>39</sup>	Case series	N	Y	N	N	-	-	Y	Y	3/6	High
40.	Shi H et. al. (2020) <sup>40</sup>	Retrospective cohort	N	Y	Y	N	-	-	N/A	Y	3/6	High
41.	Shi S et. al. (2020) <sup>41</sup>	Retrospective cohort	Y	Y	Y	N	-	-	N/A	Y	4/6	Medium

Seri al no.	Study	Type of study	Selection	Ascertainment		Causality				Reporting	Tot al score	Assessment of ROB
			Selection represent s whole experience	Exposure	Outcome	Alternative causes ruled out	Challenge-rechallenge	Dose-response	Follow up adequate	Case description adequate for replication/ inference		
42.	Shu L et. al. (2020) <sup>42</sup>	Retros pective cohort	N	Y	Y	N	-	-	N/A	Y	3/6	High
43.	Siegel A et. al. (2020) <sup>43</sup>	Case series	Y	Y	Y	N	-	-	N	Y	4/6	Medium
44.	Song F et. al. (2020) <sup>44</sup>	Case series	Y	Y	N	N	-	-	N	Y	3/6	High
45.	Spiteri G et. al. (2020) <sup>45</sup>	Case series	Y	Y	N	N	-	-	Y	Y	4/6	Medium
46.	Tabata S et al (2020) <sup>46</sup>	Case series	Y	Y	Y	N	-	-	N	Y	4/6	Medium
47.	Wan Y et. al. (2020) <sup>47</sup>	Case series	N	Y	Y	N	-	-	N/A	Y	3/6	High
48.	Wang D et. al. (2020) <sup>48</sup>	Case series	Y	Y	Y	N	-	-	N/A	Y	4/6	Medium
49.	Wang L (a) et. al. (2020) <sup>49</sup>	Case series	N	Y	Y	N	-	-	N	Y	3/6	High
50.	Wang L (b) et. al. (2020) <sup>50</sup>	Case series	N	N	Y	N	-	-	N/A	Y	2/6	High
51.	Wang L (c) et. al. (2020) <sup>51</sup>	Case series	N	Y	Y	N	-	-	Y	Y	4/6	Medium
52.	Wang X et. al. (2020) <sup>52</sup>	Case series	Y	Y	Y	N	-	-	Y	N	4/6	Medium
53.	Wang Z et. al. (2020) <sup>53</sup>	Case series	N	Y	Y	N	-	-	N/A	N	2/6	High

Serial no.	Study	Type of study	Selection	Ascertainment		Causality				Reporting	Total score	Assessment of ROB
			Selection represents whole experience	Exposure	Outcome	Alternative causes ruled out	Challenge-rechallenge	Dose-response	Follow up adequate	Case description adequate for replication/inference		
54.	Wei X-S et al. (2020) <sup>54</sup>	Case series	N	Y	Y	N	-	-	N	Y	3/6	High
55.	Wolfel R et al. (2020) <sup>55</sup>	Case series	N	Y	N	N	-	-	N/A	Y	2/6	High
56.	Wu J (a) et al. (2020) <sup>56</sup>	Retrospective cohort	N	Y	Y	N	-	-	Y	Y	4/6	Medium
57.	Wu J (b) et al. (2020) <sup>57</sup>	Case series	N	Y	Y	N	-	-	N/A	Y	3/6	High
58.	Wu Y et al. (2020) <sup>58</sup>	Case series	N	Y	Y	N	-	-	N/A	N	2/6	High
59.	Xia X et al. (2020) <sup>59</sup>	Case series	Y	Y	Y	N	-	-	N/A	N	3/6	Medium
60.	Xiao F et al. (2020) <sup>60</sup>	Case series	N	Y	N	N	-	-	Y	N	2/6	High
61.	Xie H et al. (2020) <sup>61</sup>	Case series	N	Y	Y	N	-	-	N	Y	3/6	High
62.	Xiong Y et al. (2020) <sup>62</sup>	Case series	N	Y	Y	N	-	-	Y	Y	4/6	Medium
63.	Xu X et al. (2020) <sup>63</sup>	Case series	N	Y	N	N	-	-	N/A	Y	2/6	High
64.	Xu X-W et al. (2020) <sup>64</sup>	Case series	N	Y	Y	N	-	-	Y	Y	4/6	Medium
65.	Yang F et al. (2020) <sup>65</sup>	Case series	Y	Y	Y	N	-	-	Y	Y	5/6	Low

<b>Seri al no.</b>	<b>Study</b>	<b>Type of study</b>	<b>Selection</b>	<b>Ascertainment</b>		<b>Causality</b>				<b>Reporting</b>	<b>Tot al score</b>	<b>Assessment of ROB</b>
			<b>Selection represent s whole experience</b>	<b>Exposure</b>	<b>Outcome</b>	<b>Alternative causes ruled out</b>	<b>Challenge-rechallenge</b>	<b>Dose-response</b>	<b>Follow up adequate</b>	<b>Case description adequate for replication/ inference</b>		
66.	Yang X et. al. (2020) <sup>66</sup>	Case series	Y	Y	Y	N	-	-	Y	Y	5/6	Low
67.	Young B et. al. (2020) <sup>67</sup>	Case series	Y	Y	Y	N	-	-	Y	Y	5/6	Low
68.	Yu P et. al. (2020) <sup>68</sup>	Case series	N	Y	N	N	-	-	Y	Y	3/6	High
69.	Zhang G et. al. (2020) <sup>69</sup>	Case series	N	Y	Y	N	-	-	N	Y	3/6	High
70.	Zhang J (a) et. al. (2020) <sup>70</sup>	Case series	Y	Y	Y	N	-	-	N/A	Y	4/6	Medium
71.	Zhang J (b) et. al. (2020) <sup>71</sup>	Case series	N	Y	Y	N	-	-	N	N	2/6	High
72.	Zhao D et. al. (2020) <sup>72</sup>	Retros pective cohort	N	Y	Y	Y	-	-	N/A	Y	4/6	High
73.	Zhao W et. al. (2020) <sup>73</sup>	Case series	N	Y	Y	N	-	-	N/A	N	2/6	High
74.	Zhao X-Y et. al. (2020) <sup>74</sup>	Case series	N	Y	Y	N	-	-	N	Y	3/6	High
75.	Zhou F et. al. (2020) <sup>75</sup>	Retros pective cohort	Y	Y	Y	N	-	-	N/A	Y	4/6	Mediu m
76.	Zhou S et. al. (2020) <sup>76</sup>	Case series	N	Y	Y	N	-	-	Y	Y	4/6	Medium
77.	Zhou Z et. al. (2020) <sup>77</sup>	Case Series	Y	Y	Y	N	-	-	N/A	Y	4/6	Medium
78.	Zou L et. al. (2020) <sup>78</sup>	Case series	N	Y	N	N	-	-	N/A	N	1/6	High

**Supplementary Table 3: Gastrointestinal symptoms and mortality in COVID-19 patients**

Serial no.	Study	Diarrhea	Vomiting	Nausea	Loss of appetite	Abdominal pain	Symptom onset	Mortality in patients with GI symptoms	Overall Mortality
1.	An P et. al. (2020) <sup>1</sup>	1	1	1	6	()	()	()	()
2.	Chan F-W et. al. (2020) <sup>2</sup>	2	()	()	()	()	()	()	()
3.	Chang D et. al. (2020) <sup>3</sup>	1	()	()	()	()	()	()	()
4.	Chen N et. al. (2020) <sup>4</sup>	2	1	1	()	()	()	()	()
5.	Chen Q (a) et. al. (2020) <sup>5</sup>	2	()	()	()	()	()	()	()
6.	Chen Q (b) et. al. (2020) <sup>6</sup>	39	6	24	()	()	At hospital admission	()	()
7.	Cheung K et. al. (2020) <sup>7</sup>	13	1	()	()	7	()	()	()
8.	Cholankeril G et. al. (2020) <sup>8</sup>	12	12	12	22	10	At onset of illness	0	0
9.	COVID National Emergency Response Center (C-NERC; 2020) <sup>9</sup>	2	()	()	()	1	()	()	()
10.	COVID-19 National Incident Room Surveillance Team. (C-NIRST; 2020) <sup>10</sup>	48	34 (nausea or vomiting)		()	()	()	()	3



Serial no.	Study	Diarrhea	Vomiting	Nausea	Loss of appetite	Abdominal pain	Symptom onset	Mortality in patients with GI symptoms	Overall Mortality
11.	Fan H et. al. (2020) <sup>11</sup>	2	7 (nausea or vomiting)		( )	( )	At hospital admission	9	101
12.	Fernandez-Ruiz et. al. (2020) <sup>12</sup>	3	( )	( )	( )	1	At hospital admission	( )	5
13.	Gritti G et al (2020) <sup>13</sup>	5	( )	( )	2	( )	At hospital admission	( )	1
14.	Guan W-j et. al. (2020) <sup>14</sup>	42	55	55	( )	( )	( )	( )	( )
15.	Hajifathalian K et. al. (2020) <sup>15</sup>	234	91	168	( )	72	At admission	( )	100
16.	Han C et. al. (2020) <sup>16</sup>	67	24	( )	32	9	13 at onset of illness, 54 at hospital admission	0	0
17.	Hsieh W-H et. al. (2020) <sup>17</sup>	1	( )	( )	( )	1	1 at onset of illness, 1 at hospital admission	0	0
18.	Huang C et. al. (2020) <sup>18</sup>	1	( )	( )	( )	( )	( )	0	6
19.	Huang R et. al. (2020) <sup>19</sup>	1	( )	( )	( )	( )	( )	( )	( )
20.	Huang WH et. al. (2020) <sup>20</sup>	( )	( )	( )	2	( )	At hospital admission	0	0
21.	Huang Y et. al. (2020) <sup>21</sup>	5	( )	( )	( )	( )	At hospital admission	( )	( )
22.	Jin X et. al. (2020) <sup>22</sup>	74	( )	74	( )	( )	At hospital admission	0	0
23.	Kim ES et. al.	3	( )	( )	( )	1	( )	0	0

Serial no.	Study	Diarrhea	Vomiting	Nausea	Loss of appetite	Abdominal pain	Symptom onset	Mortality in patients with GI symptoms	Overall Mortality
	(2020) <sup>23</sup>								
24.	Klopfenstein T et. al. (2020) <sup>24</sup>	55	9	25	( )	19	( )	( )	( )
25.	Kluytmans M Et al. (2020) <sup>25</sup>	16	( )	15 (nausea and anorexia)		5	( )	( )	( )
26.	Kuang Y et. al. (2020) <sup>26</sup>	21	( )	( )	( )	( )	At hospital admission	0	0
27.	Liu K et. al. (2020) <sup>27</sup>	11	( )	( )	( )	( )	( )	( )	( )
28.	Kujawski S et al. (2020) <sup>28</sup>	4	( )	1	( )	2	( )	0	0
29.	Lechien J et. al. (2020) <sup>29</sup>	208	91	91	( )	125	( )	( )	( )
30.	Li K et al (2020) <sup>30</sup>	7	( )	( )	( )	( )	( )	( )	( )
31.	Lin L et. al. (2020) <sup>31</sup>	23	4	17	17	2	11 at onset of illness, 47 during hospital admission	0	0
32.	Liu Y et. al. (2020) <sup>32</sup>	2	2 (nausea and vomiting)		( )	( )	At hospital admission	( )	0
33.	Luo S et. al. (2020) <sup>33</sup>	68	119	134	180	45	At onset of illness	7	( )
34.	Nobel Y et. al. (2020) <sup>34</sup>	58	( )	63	( )	( )	( )	( )	9
35.	Pan F et. al. (2020) <sup>35</sup>	( )	( )	( )	9	( )	( )	0	0
36.	Pan L et. al.	35	4	( )	81	2	( )	( )	( )



Serial no.	Study	Diarrhea	Vomiting	Nausea	Loss of appetite	Abdominal pain	Symptom onset	Mortality in patients with GI symptoms	Overall Mortality
51.	Wang L (c) et. al. (2020) <sup>51</sup>	43	()	13	94	()	()	()	4
52.	Wang X et. al. (2020) <sup>52</sup>	152	36	()	()	37	()	()	0
53.	Wang Z et. al. (2020) <sup>53</sup>	0	()	()	()	()	()	()	()
54.	Wei X-S et. al. (2020) <sup>54</sup>	26	6	16	()	2	At hospital admission	0	0
55.	Wolfel R et al. (2020) <sup>55</sup>	2	()	()	()	()	At onset of illness	()	()
56.	Wu J (a) et. al. (2020) <sup>56</sup>	1	1	1	()	()	()	()	()
57.	Wu J (b) et al (2020) <sup>57</sup>	7	()	()	()	()	()	()	()
58.	Wu Y et. al. (2020) <sup>58</sup>	26	()	()	()	()	()	0	1
59.	Xia X et. al. (2020) <sup>59</sup>	1	()	1	()	()	()	0	()
60.	Xiao F et. al. (2020) <sup>60</sup>	26	()	()	()	()	()	()	()
61.	Xie H et. al. (2020) <sup>61</sup>	7	()	()	()	()	()	()	()
62.	Xiong Y et. al. (2020) <sup>62</sup>	10	()	()	()	()	()	()	1
63.	Xu X et al (2020) <sup>63</sup>	5	2	5	()	()	At hospital admission	()	()
64.	Xu X-W et. al. (2020) <sup>64</sup>	3	()	()	()	()	At onset of illness	()	()
65.	Yang F et. al. (2020) <sup>65</sup>	1	()	()	()	()	()	()	11
66.	Yang X et. al.	()	2	()	()	()	()	()	()

Serial no.	Study	Diarrhea	Vomiting	Nausea	Loss of appetite	Abdominal pain	Symptom onset	Mortality in patients with GI symptoms	Overall Mortality
	(2020) <sup>66</sup>								
67.	Young B et. al. (2020) <sup>67</sup>	3	()	()	()	()	()	()	()
68.	Yu P et. al. (2020) <sup>68</sup>	()	()	()	1	()	()	()	1
69.	Zhang G et. al. (2020) <sup>69</sup>	25	()	()	80	5	()	()	12
70.	Zhang J (a) et. al. (2020) <sup>70</sup>	18	7	24	17	8	()	()	()
71.	Zhang J (b) et. al. (2020) <sup>71</sup>	0	0	()	()	()	At hospital admission	()	()
72.	Zhao D et. al. (2020) <sup>72</sup>	1	()	()	()	()	()	0	0
73.	Zhao W et. al. (2020) <sup>73</sup>	3	2	2(nausea and vomiting)		()	()	()	()
74.	Zhao X-Y et. al. (2020) <sup>74</sup>	13	()	10	10	2	()	()	2
75.	Zhou F et. al. (2020) <sup>75</sup>	9	7 (Nausea or vomiting)		()	()	At hospital admission	2	54
76.	Zhou S et. al. (2020) <sup>76</sup>	9 (abdominal pain or diarrhea)	()	()	()	9 (abdominal pain or diarrhea)	At hospital admission	()	()
77.	Zhou Z et. al. (2020) <sup>77</sup>	46	15	21	()	3	()	5	16
78.	Zou L et. al. (2020) <sup>78</sup>	1	()	1	1	()	()	()	()

<sup>a</sup>Represented as median (range) or mean (standard deviation), unless otherwise specified. <sup>b</sup> represented as median (interquartile range)

<sup>c</sup>S, severe; NS, non-severe; B, both

( ), missing

**Supplementary Table 4: Assessment of quality of evidence for outcomes**

<b>Outcome</b>	<b>No of studies</b>	<b>Risk of Bias</b>	<b>Inconsistency</b>	<b>Indirectness</b>	<b>Imprecision</b>	<b>Publication bias</b>	<b>Quality per GRADE</b>
Prevalence of Diarrhea	74	Serious	Serious	Not serious	Not serious	Serious	Low
Prevalence of Nausea/vomiting	42	Serious	Serious	Not serious	Not serious	Serious	Low
Prevalence of Abdominal pain	27	Serious	Serious	Not serious	Not Serious	Serious	Low
Prevalence of Loss of appetite	20	Serious	Serious	Not serious	Not Serious	Serious	Low
Overall Mortality	42	Serious	Serious	Serious	Serious	Serious	Very low
Mortality among patients with GI symptoms	21	Serious	Serious	Serious	Serious	serious	Very low

GRADE Working Group grades of evidence

High certainty: We are very confident that the true effect lies close to that of the estimate of the effect

Moderate certainty: We are moderately confident in the effect estimate: The true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different

Low certainty: Our confidence in the effect estimate is limited: The true effect may be substantially different from the estimate of the effect

Very low certainty: We have very little confidence in the effect estimate: The true effect is likely to be substantially different from the estimate of effect

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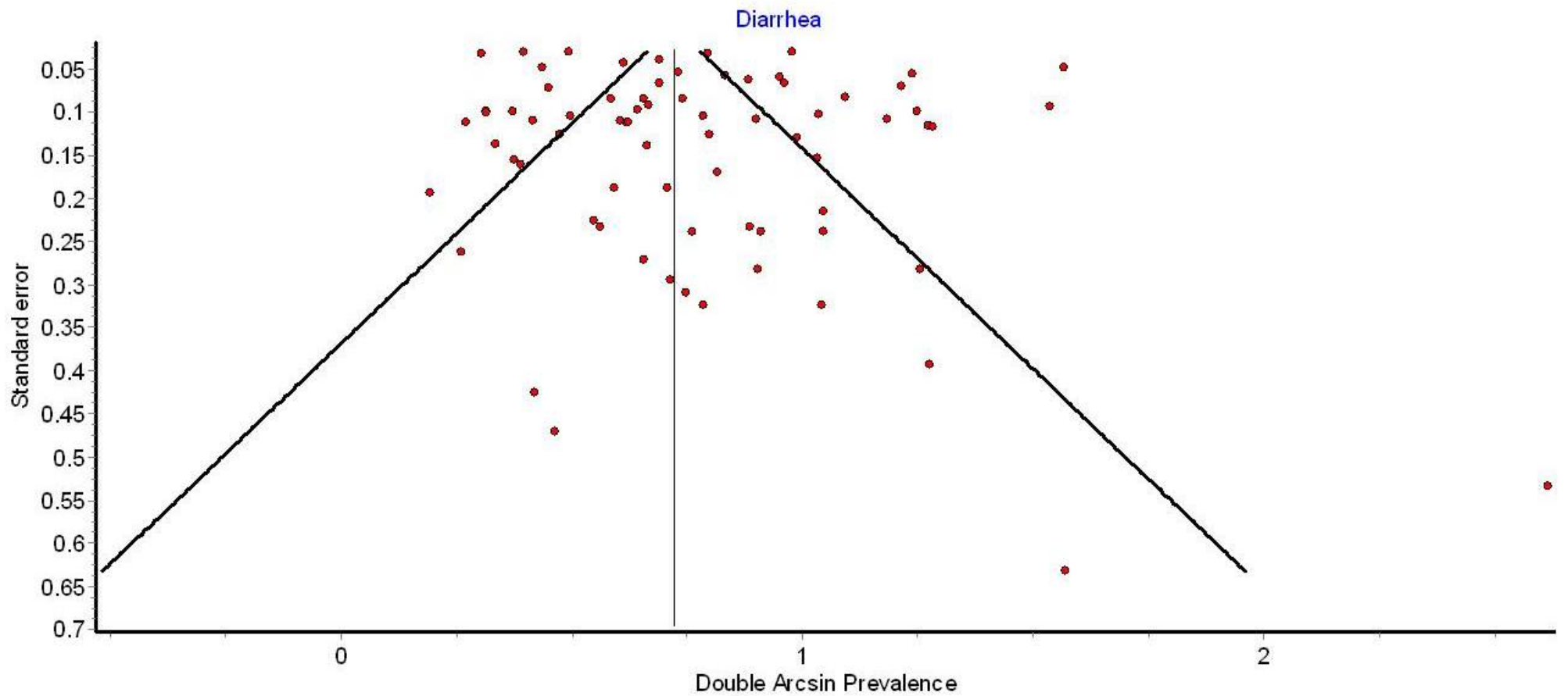
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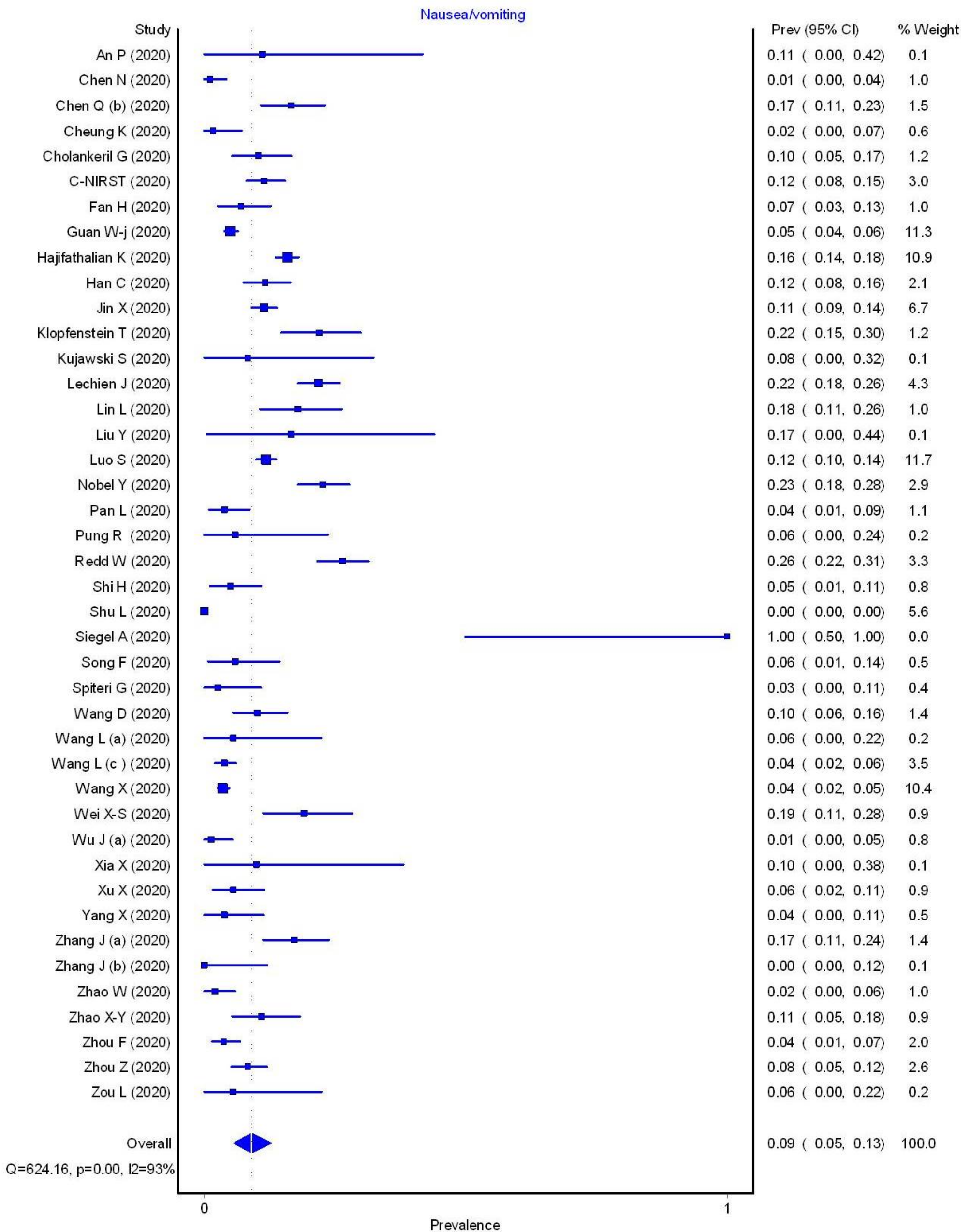
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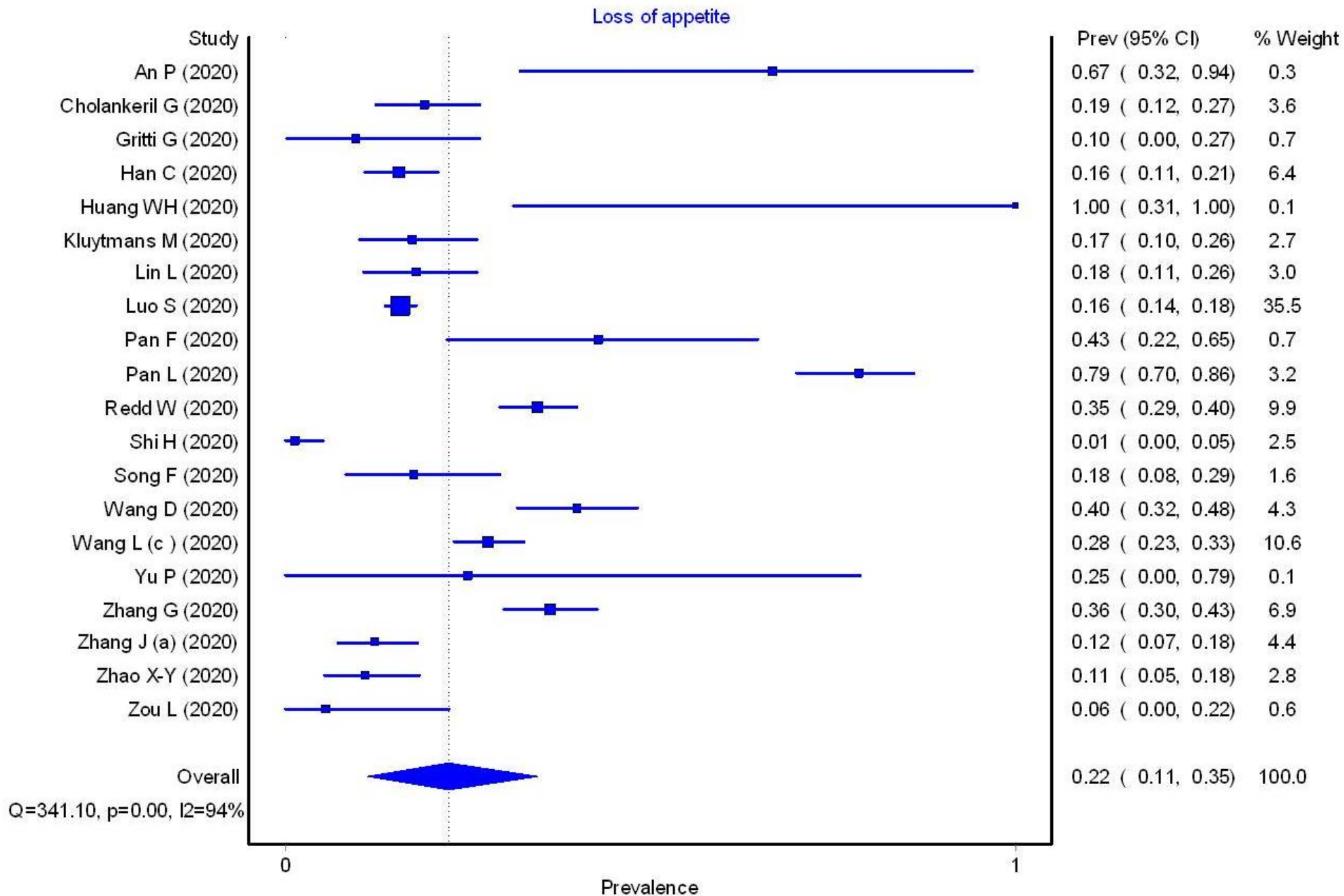
**Supplementary Figure 1:** Funnel plot showing publication bias in included studies describing prevalence of diarrhea in COVID-19 patients



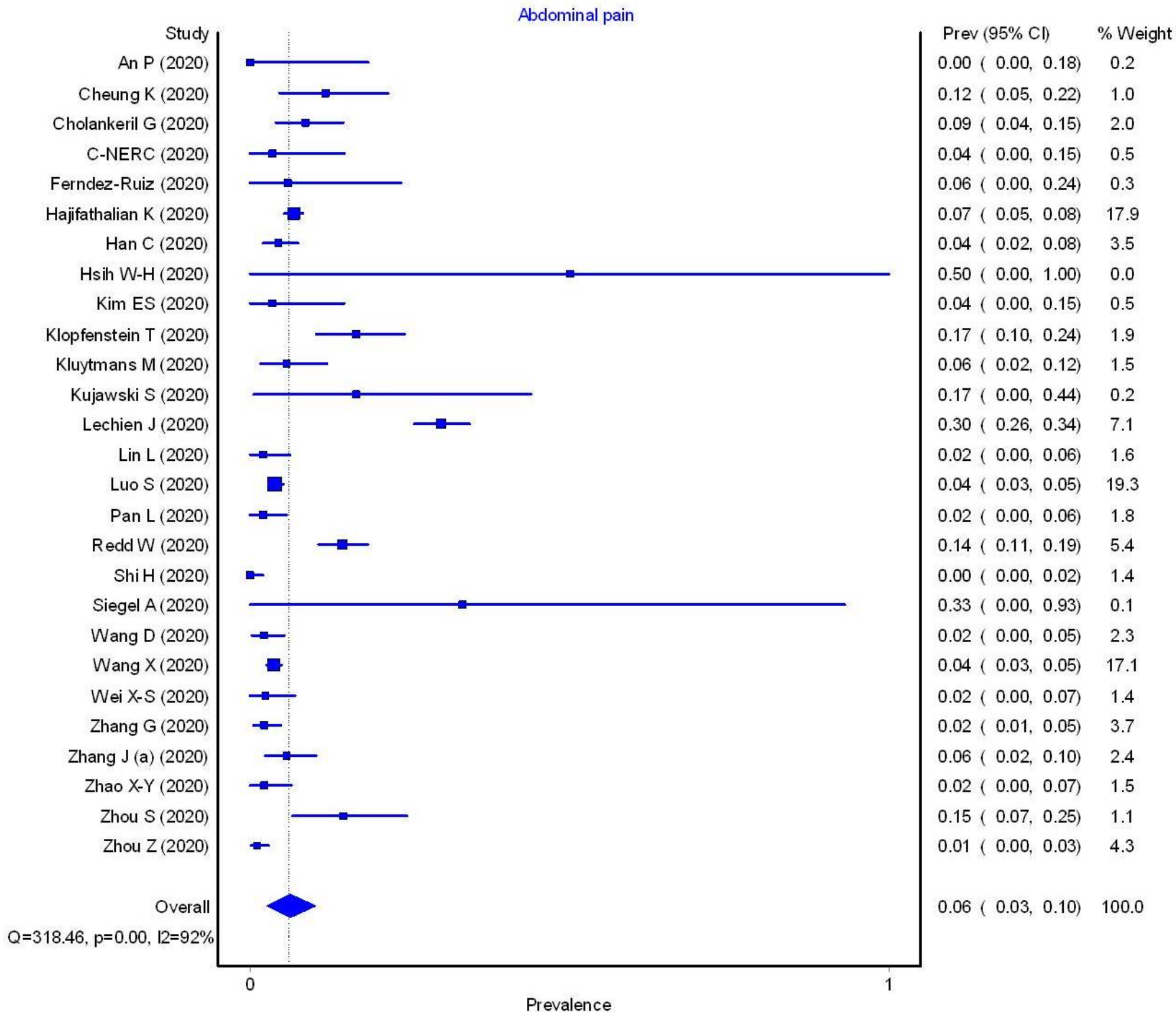


**Supplementary Figure 2:** Forest plot showing weighted pooled prevalence of nausea and/or vomiting in patients with COVID-19 infection





**Supplementary Figure 3:** Forest plot showing weighted pooled prevalence of loss of appetite in patients with COVID-19 infection



**Supplementary Figure 4:** Forest plot showing weighted pooled prevalence of abdominal pain in patients with COVID-19 infection

