

Supplemental materialse

Methods Search Strategies Text S1

PubMed Advance Search

- #1 Search: (COVID-19[MeSH Terms]) OR (SARS-CoV-2[MeSH Terms])
- #2 (((Severe Acute Respiratory Syndrome Coronavirus 2) OR (coronavirus disease 2019)) OR (sars-cov*)) OR (SARS Coronavirus*) OR (covid*)
- #3 ((COVID-19[MeSH Terms]) OR (SARS-CoV-2[MeSH Terms])) OR (((Severe Acute Respiratory Syndrome Coronavirus 2) OR (coronavirus disease 2019)) OR (sars-cov*)) OR (SARS Coronavirus*) OR (covid*))
- #4 Search: ((additional death*) OR (excess death*)) OR (excess mortalit*)
- #5 (((COVID-19[MeSH Terms]) OR (SARS-CoV-2[MeSH Terms])) OR (((Severe Acute Respiratory Syndrome Coronavirus 2) OR (coronavirus disease 2019)) OR (sars-cov*)) OR (SARS Coronavirus*) OR (covid*))) AND (((additional death*) OR (excess death*)) OR (excess mortalit*))
- #6 ("2020/01/01"[Date - Publication] : "2022/05/21"[Date - Publication])
- #7 (((COVID-19[MeSH Terms]) OR (SARS-CoV-2[MeSH Terms])) OR (((Severe Acute Respiratory Syndrome Coronavirus 2) OR (coronavirus disease 2019)) OR (sars-cov*)) OR (SARS Coronavirus*) OR (covid*))) AND (((additional death*) OR (excess death*)) OR (excess mortalit*)) AND ("2020/01/01"[Date - Publication] : "2022/05/21"[Date - Publication])

Embase Advance Search

- #1 'severe acute respiratory syndrome coronavirus 2'/exp
- #2 'coronavirus disease 2019'/exp
- #3 'sars cov*' OR 'sars coronavirus*' OR covid*
- #4 #1 OR #2 OR #3
- #5 'excess mortality'/exp
- #6 'additional death*' OR 'excess death*' OR 'excess mortalit*'
- #7 #5 OR #6
- #8 #4 AND #7

#9 #4 AND #7 AND [embase]/lim AND [01-01-2020]/sd NOT [22-05-2022]/sd

Web of Science Advance Search

TS= (SARS-CoV* OR covid* OR Severe acute respiratory syndrome coronavirus 2
OR coronavirus disease 2019 OR SARS Coronavirus*) AND TS= (additional
death* OR excess death* OR excess mortalit*)

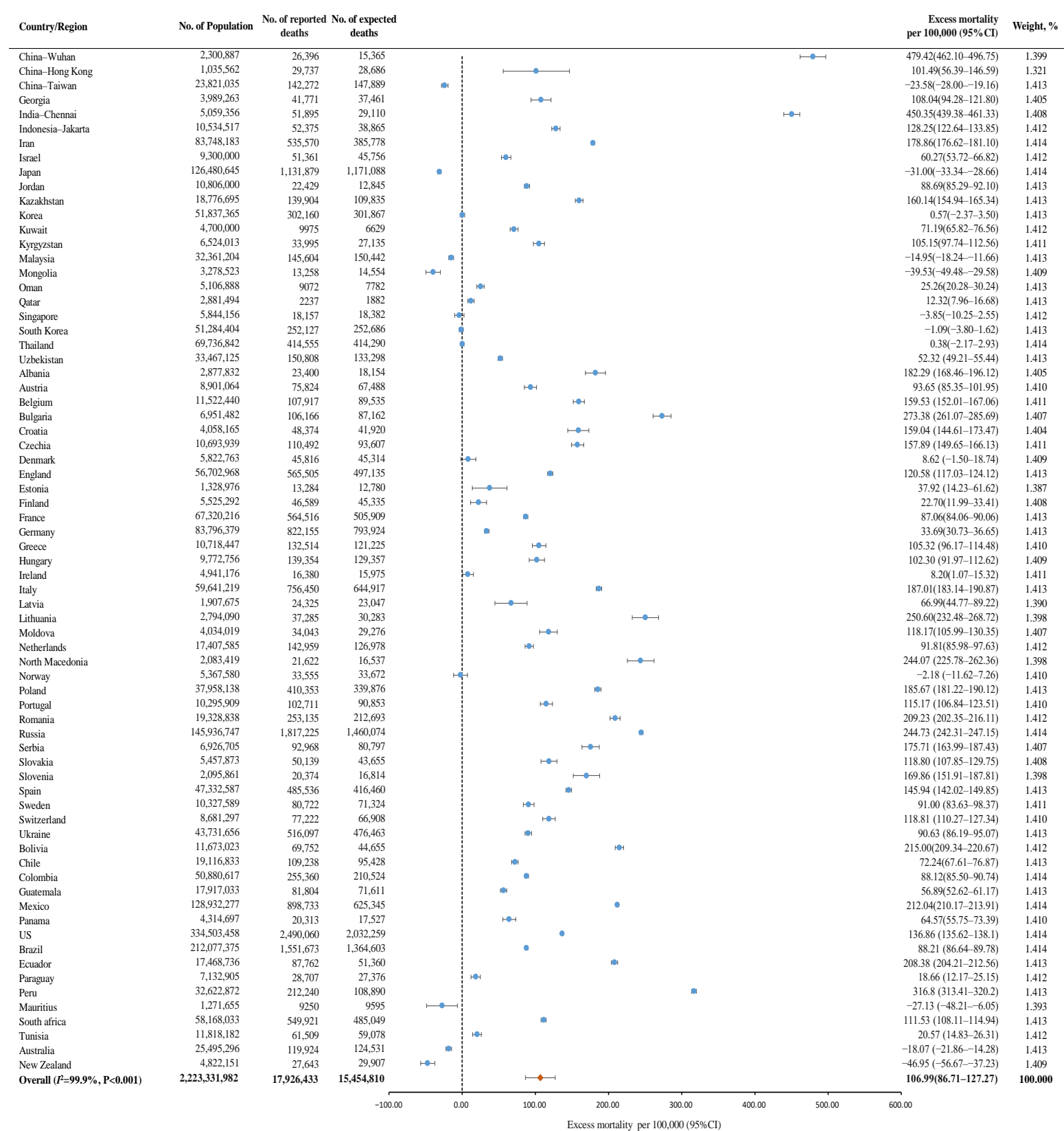


Figure S1 Sensitive analysis of excess mortality among 71 countries/regions
Orange dot: the pooled excess mortality; Blue dot: excess mortality in different countries; CI: confidence interval.

Table S1. Risk of bias of all included cross-sectional studies using the Agency for Healthcare Research and Quality scale (AHRQ-Tool) (n=18)

Author	1) Define the source of information	2) List definition for expected and reported deaths	3) Indicate time period used for identifying death	4) Indicate whether or not subjects were consecutive if not population-based	5) Indicate if evaluators of subjective components of study were masked to other aspects of the status of the participants	6) Describe any assessments undertaken for quality assurance purposes (at least 3 years data)	7) Explain any deaths exclusions from analysis	8) Describe how confounding was assessed (gender, age, etc.)	9) If applicable, explain how missing data were handled in the analysis	10) Summarize completeness of death data collection	11) Clarify reported time and recorded time of deaths and the time lag of deaths for which incomplete data or follow-up was obtained	Total scores	Article quality
Santos et al	yes	yes	yes	yes	yes	yes	yes	yes	unclear	yes	no	9	High
Bogos et al	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	10	High
Alahmad et al	yes	yes	yes	yes	yes	yes	yes	no	yes	yes	no	9	High
Bradshaw et al	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	10	High
Achilleos et al	yes	yes	yes	yes	yes	yes	yes	no	yes	yes	yes	10	High
Aytemur et al	yes	yes	yes	yes	yes	no	yes	no	no	yes	no	7	Moderate
Shin et al	yes	yes	yes	yes	yes	yes	yes	yes	unclear	yes	no	9	High
Ramírez-Soto et al	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	10	High
Safavi-Naini et al	yes	yes	yes	yes	yes	yes	yes	yes	unclear	yes	no	9	High
Rangachev et al	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	10	High
Wijaya et al	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	no	9	High
Peretz et al	yes	yes	yes	yes	yes	yes	yes	yes	unclear	yes	yes	10	Hhigh
Sanmarchi et al	yes	yes	yes	yes	yes	yes	yes	no	yes	yes	no	9	Hhigh
Konstantinoudis et al	yes	yes	yes	yes	yes	yes	yes	yes	unclear	yes	unclear	9	High
Lewnard et al	yes	yes	yes	yes	yes	yes	yes	yes	unclear	yes	no	9	High
Liu et al	yes	yes	yes	yes	yes	yes	yes	yes	unclear	yes	yes	10	High
Khader et al	yes	yes	yes	yes	yes	yes	yes	yes	unclear	yes	no	9	High

Cue´llar et al	yes	yes	yes	yes	yes	yes	yes	yes	unclear	yes	no	9	High
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Note: low quality = 0–3; moderate quality = 4–7; high quality = 8–11

Table S2. Risk of bias of all included cohort studies using the Newcastle-Ottawa quality assessment scale (n=2)

Author	Selection				Comparability	Outcome			Total	Risk level
	Representativeness of the Exposed Cohort	Selection of the Non-Exposed Cohort	Ascertainment of Exposure	Demonstration That Outcome of Interest Was Not Present at Start of Study	Comparability of Cohorts on the Basis of the Design or Analysis	Assessment of Outcome	Was Follow-Up Long Enough for Outcomes to Occur	Adequacy of Follow Up of Cohorts (28days at least)		
Wai et al	1	1	1	0	2	1	1	1	8	Low
Jacobson et al	1	1	1	1	2	1	1	0	8	Low

Note: low (≥7 scores), moderate (5–6 scores), and high risk of bias (≤4 scores)