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Published on: 02 Sep 2020 - medRxiv (Cold Spring Harbor Laboratory Press)

Topics: Anxiety, Psychological intervention, Mental health, Population and CINAHL

Investigating the effect of national government physical distancing measures on depression and anxiety during the COVID-19 pandemic through meta-analysis and meta-regression

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Abstract (following PRISMA statement)

Background: COVID-19 physical distancing measures can potentially increase the likelihood of mental disorders. It is unknown whether these measures are associated with depression and anxiety.

Objectives: To investigate meta-analytic global levels of depression and anxiety during the COVID-19 pandemic and how implementation of mitigation strategies (i.e. public transportation closures, stay-at-home orders, etc.) impacted such disorders.

Data sources: Pubmed, MEDLINE, Web of Science, BIOSIS Citation Index, Current Content Connect, PsycINFO, CINAHL, medRxiv, and PsyArXiv databases for depression and anxiety prevalences; Oxford Covid-19 Government Response Tracker for the containment and closure policies indexes; Global Burden of Disease Study for previous levels of depression and anxiety.

Study eligibility criteria: Original studies conducted during COVID-19 pandemic, which assessed categorical depression and anxiety, using PHQ-9 and GAD-7 scales (cutoff ≥ 10).

Participants and interventions: General population, healthcare providers, students, and patients. National physical distancing measures.

Study appraisal and synthesis methods: Meta-analysis and meta-regresssion.

Results: In total, 226,638 individuals were assessed within the 60 included studies. Global prevalence of both depression and anxiety during COVID-19 pandemic were 24.0% and 21.3%, respectively. There was a wide variance in the prevalence of both anxiety and depression reported in different regions of the world and countries. Asia, and China particularly, had the lowest prevalence of both disorders. Regarding the impact of mitigation strategies on mental health, only public transportation closures increased anxiety prevalence.

Limitations: Country-level data on physical distancing measures and previous anxiety/depression may not necessarily reflect local (i.e., city-specific) contexts.

Conclusions and implications of key findings: Mental health concerns should not be viewed only as a delayed consequence of the COVID-19 pandemic, but also as a concurrent epidemic. Our data provides support for policy-makers to consider real-time enhanced mental health services, and increase initiatives to foster positive mental health outcomes.

Systematic review registration number: https://doi.org/10.17605/OSF.IO/JQGSF

Key-words: COVID-19, depression, anxiety, public transport, social isolation

1. Introduction

COVID-19 is an unprecedented health emergency, affecting millions of individuals across the globe.[1] SARS-Coronavirus-2, the virus which causes COVID-19, is transmitted person-to-person via respiratory droplets.[2] In order to prevent and lessen spread, countries began implementing mitigation strategies, such as: stay-at-home or shelter-in-place orders, international travel constraints, closure of schools and workplaces, and movement limitations[3]. Despite being necessary public health measures, researchers have speculated that these measures could increase feelings of social isolation and loneliness[4]; this is of importance, as previous studies have demonstrated that social isolation could impact the likelihood of mental disorders[5] and physical health outcomes[6]. As of yet, it still remains unclear to what extent the COVID-19 mitigation strategies could impact mental health. Thus, it is imperative to investigate the levels of mental health disorders and the possible impacts of social distancing measures on mental health outcomes[7].

Prior to the pandemic, depression and anxiety were the most prevalent mental health disorders in the world[8]. These mental health disorders have also been connected to social isolation during COVID-19 in local studies[9]. During the COVID-19 pandemic, the levels of such disorders have increased. Pappa et al.[10] conducted a meta-analysis with thirteen studies that included 33,062 healthcare workers during COVID-19, and reported a prevalence of 23.2% and 22.8% of anxiety and depression, respectively. These prevalences are greater than those found in the pre-COVID-19 era.[8] Several studies have assessed depression and anxiety using scales involving self-reporting during the pandemic.[11-70] These studies report a wide range of prevalence estimates, which appear to be dependent on the sub-population of interest (i.e., general population, healthcare providers, students, patients), and the geographic location within which the study is focused.[11-70] There is a need for meta-analytic investigations generating global prevalence measures for both depression and anxiety during the pandemic, with additional exploration via subgroup analysis.

Further, there are mixed findings regarding the effect of mitigation strategies on depression and anxiety during this pandemic. Previous research has demonstrated marked increases in online search trends for mental health topics (i.e., sleep disturbances, negative thoughts, anxiety, suicidal ideation) prior to the implementation of stay-at-home orders in the U.S..[71]

Further, an online qualitative study evaluated focus groups during the beginning of the social distancing measures in the U.K., where they found negative impacts on well-being and mental health after implementation of mitigation strategies.[72] Individuals who had lower pay, or vulnerable employment, were the most affected.[72] Thus, the effects of these physical distancing strategies may be time-sensitive. Moreover, there are varying ongoing physical distancing measures (i.e., school closures, workplace closures, public events cancellations, restrictions on the size of gatherings, public transport closures, stay-at-home orders, restrictions on internal movement between cities and regions within a country, and international travel controls) during different periods, depending on the location.[3] There is a need to explore whether these strategies have lasting impacts on depression and anxiety, taking different time of exposure thresholds to such physical distancing measures into account.

The present study aims to (1) investigate meta-analytic global levels of depression and anxiety during the COVID-19 pandemic, and (2) explore the effects of these mitigation strategies on depression and anxiety.

2. Methods

2.1 Study design

We first conducted a meta-analysis of studies related to the COVID-19 pandemic which assessed depression and anxiety using PHQ-9 and GAD-7 scales. Subgroup analysis for region of the world, country, type of population, and coverage were also carried out. Then, we collected national data regarding the implementation of physical distancing measures and mitigation strategies,[3] along with previous levels of anxiety and depression from a global database.[8] These data were included in meta-regression models for the investigation of time-sensitive effects of mitigation strategies on depression and anxiety, adjusted for previous levels of such disorders and other possible confounders.

2.2. Review Guidelines and Registration

This study followed the PRISMA statement for transparent report of systematic reviews and meta-analysis[73] and MOOSE guidelines for Meta-analysis Of Observational Studies in Epidemiology.[74] Figure S1 and S2 respectively present PRISMA and MOOSE checklists reporting the page of the manuscript in which we consider that each item was addressed. This study was registered at the Center for Open Science/Open Science Framework.[75]

2.2. Search Strategy

We searched Pubmed, MEDLINE, Web of Science, BIOSIS Citation Index, Current Content Connect, PsycINFO, and CINAHL databases. All searches were conducted with an end date of July 29th, 2020. Search terms used were: ((sars-cov-2 OR coronavir* OR alphacoronavirus OR betacoronavirus OR COVID OR COVID-19) AND (PHQ-9 or GAD-7)). As this topic is developing quickly, we accessed pre-print servers medRxiv and PsyArXiv using the above search terms. We also searched the WHO database which includes COVID literature (cite) for studies published by the same date, using the following search terms: (PHQ-9 or GAD-7). In addition to MEDLINE, this database also includes WHO COVID, Elsevier, Lanzhou University/CNKI, LILACS, and WPRIM databases.

2.3. Screening and Eligibility

We first removed duplicates from our search results. Screening and eligibility were performed by three researchers independently (JMCM, MEM, ZL). Studies that were written in Chinese were screened by two researchers (JMCM, ZL). Disagreement on the inclusion of a study based on the title or abstract resulted in the study being retained for the next screening stage. Reasons for exclusion of full texts were collected and presented in the PRISMA Flow Diagram (Figure 1).

We included studies that reported categorical assessment of anxiety and depression using GAD-7 and PHQ-9 scales during the COVID-19 pandemic. Randomized controlled trials, cohort studies, case-control studies, and cross-sectional studies were included. Pre-prints and letters were included if they described original research.

2.4. Data extraction

Data were extracted by two of three independent reviewers (JMCM, MEM, ZL). Descriptive variables extracted were setting (i.e., country), population type (e.g., pregnant women and children), study design (e.g., cohort and case-control), follow-up time, nature of the control group, number of cases, number of controls, age, and gender. Randomized controlled trials, for this review, were treated as cohort studies. The timepoint for data extraction in prospective studies was either before the intervention (i.e., clinical trials) or during the COVID-19 pandemic (i.e., cohort studies). Data was stored in Excel version 16.16.11.

2.5. Quality Assessment

The purpose of this appraisal was to assess the methodological quality of the included studies and to determine the extent to which a study has addressed the possibility of bias in its design, conduct and analysis. All studies included in the present systematic review were subjected to the Joanna Briggs Institute Checklist for Analytical Cross-Sectional Studies,[76] which assesses sample frame, process and size, setting description, data analysis coverage, valid and reliable assessment methods, appropriate statistical analysis, and an adequate response rate.

2.6. Measures

Apart from outcome (depression and anxiety) and exposure (physical distancing measures) variables that are further explained, the present study sought the following data from each included study: the number of individuals enrolled in the study; mean age, standard deviation, and minimum/maximum age range of participants (or median and interquartile range); the proportion of women included; whether the study was nationally representative; whether the study was peer-reviewed; format of data collection (i.e. online); and geographic location, including city, state, and country. Subsequently, we collected data on the previous prevalence of depression and anxiety of each country included in this review.[8]

2.6.1. Anxiety and Depression

The Patient Health Questionnaire-9 (PHQ-9)[77] is a screening instrument for depressive disorders. It is composed of nine basic items based in the DSM-IV diagnostic criteria for major depressive disorder. The questions assess the frequency of depressive symptoms in the last two weeks. The respondents answer on a scale from 0 (not at all) to 3 (nearly every day). Several studies have used the cut-off ≥10 to define clinically relevant depression.[12-17,19,21,24,26,27,29-36,38,40-45,47,50-54,56,57,59,60,62-70] The Generalized Anxiety Disorder-7 (GAD-7) is a screening instrument for anxiety symptoms.[78] The GAD-7 is a validated scale which measures anxiety with seven self-rating items on a four-point scale, similarly to PHQ-9. A cut-off ≥ 10 has been used by several studies to define clinically relevant anxiety.[11,14,16,18-32,35-39,41,42,44-59,61-64,66-69] Both the PHQ-9 and GAD-7 have excellent psychometric properties.[77,78]

2.6.2. Exposure: Implementation of Physical Distancing Strategies

We collected national data from the Oxford Covid-19 Government Response Tracker.[3] All containment and closure policies were included in the present study, as follows:

- School closures (0 - no measures; 1 - recommend closing; 2 - require closing only some levels or categories; 3 - require closing all levels);

- Workplace closures (0 - no measures; 1 - recommend closing or recommend work from home; 2 - require closing or work from home for some sectors or categories of workers; 3 - require closing or work from home for all-but essential workplaces);

- Cancellation of public events (0 - no measures; 1 - recommend cancelling; 2 - require cancelling);

- Restrictions on gatherings (0 - no restrictions; 1 - restrictions on very large gatherings above 1000 people; 2 - restrictions on gatherings between 101-1000 people; 3 - restrictions on gatherings between 11-100 people; 4 - restrictions on gatherings of 10 people or less);

- Public transportation closures (0 - no measures; 1 - recommend closing or significantly reduce volume/route/means of transport available; 2 - require closing or prohibit most citizens from using it);

- Stay at home requirements (0 - no measures; 1 - recommend not leaving house; 2 - require not leaving house with exceptions for daily exercise, grocery shopping, and 'essential' trips; 3 - require not leaving house with minimal exceptions);

- Restrictions on internal movement: record restrictions on internal movement between cities/regions (0 - no measures; 1 - recommend not to travel between regions/cities; 2 - internal movement restrictions in place); and,

- International travel controls: record restrictions on international travel for foreign travelers (0 - no restrictions; 1 - screening arrivals; 2 - quarantine arrivals from some or all regions; 3 - ban arrivals from some regions; 4 - ban on all regions or total border closure).

For each study included in the meta-analysis, we calculated the mean of the daily ordinal score of each of the above indexes, during two timeframes:

- 2-week: weeks before the start date of the study until the end date of the study; and,

- 4-week: weeks before the start date of the study until the end date of the study.

2.7. Statistical Analysis

We included all the rates (crude number cases/total number of individuals) in separate meta-analysis models for depression (PHQ-9 >= 10) and anxiety (GAD-7 >= 10). One study provided weighted rates for the outcomes only.[24] We used a random-effects model because high heterogeneity was expected. We calculated I^2 as a measure of between-study heterogeneity. Data were analyzed using OpenMetanalyst,[79] which makes use of R metafor package.[80] The threshold for significance was set to *p*-values of less than 0.05. In addition, we carried out further subgroup analysis models by population type (general, healthcare providers, students, patients, and mixed), region of the world (Asia, Europe, and Other), country (China and other), income level (high-income, and low- and middle-income), and non-national status (local studies were defined as those restricted to either a city or a state/province/region within a country, versus national studies).

Finally, we investigated the impact of physical distancing measures on depression and anxiety through meta-regression models.[81] Separate models were carried out for different timeframes of physical distancing measures (2 and 4 weeks). Models adjusted for gender, sub-populations, timepoint when study began, region of the world, local status and previous levels of either depression or anxiety, depending on the outcome. Country indicators were not included in these models because of the strong correlation with earlier levels of depression and anxiety variables, which were collected based on previous data by each country. Meta-regression was used instead of subgroup analyses (i.e., different levels of social measures implementation) to allow for the use of continuous and multiple covariates. The random-effects meta-regression used residual restricted maximum likelihood to measure between-study variance ($\tau 2$) with a Knapp-Hartung modification as recommended models.[81]

3. Results

Table S1 presents the key-information of the 60 studies included. Eight studies were split into subsamples, and two studies reported the same sample. We included 67 samples in the meta-analysis models. All studies were conducted in 2020 (compiled date range of study initiation to closure: January 24th-May 31st), with a mean length of 15.4 days. In total, 226,638 individuals were included, with an average of 3,382 individuals per study. The mean age was 33.8 (range: 13-89) among samples that provided data on mean age and range, and the proportion of females included was 61.9% (range: 0-100). Few samples were representative (5.9%, N=4), and local (32.8%, N=22). Most samples were based in China (38.8%, N=26), and Asia in general (52.2%, N=35). General population samples were the most common (40.2%, N=27), followed by healthcare providers (23.8%, N=16), students (16.4%, N=11), and patients (8.9%, N=6). The vast majority of the samples used online methods (91.0%, N=61) and were peer-reviewed (64.1%, N=43). Table S2 presents the results of the quality assessment. All the included studies scored five or higher in such an assessment. Tables S3 and S4 present implementation of physical distancing measures and previous prevalence of depression and anxiety, respectively.

Figure 2 presents both the global results of the meta-analysis for depression and a subgroup analysis by region of the world (N=191,519). We found a global prevalence of 24.0% (95% Confidence Interval (CI): 21.0-27.1%) of depression; depression was observed among 17.6% (95%CI:15.4-19.8%) in Asia, among 26.0% (95%CI: 22.9-29.05) in Europe, and among 39.1% (95%CI: 29.2-49.1%) in other regions of the world. A subgroup analysis (Figure S3) demonstrated that China had a lower prevalence of depression (16.2%, 95%CI:13.7-18.2%) than in other countries (29.0%, 95%CI:24.8-33.2). Additional subgroup analyses (Figures S4, S5, and S6) found no significant differences by population type, country income level, or being a local study.

Figure 3 presents the global results for anxiety, with a subgroup analysis by region of the world (N=193,137). We found a global prevalence of anxiety of 21.3% (95%CI:19.0-23.6%). Asia had lower levels of anxiety (17.9%, 95%CI:15.4-20.3) compared to other regions of the world (28.6%, 95%CI:22.6-34.6). Europe did not differ from Asia and the other regions of the world. Subgroup analysis at the country-level (Figure S7) showed that China had a lower prevalence of anxiety (15.5%, 95%CI:13.1-17.9%) compared to all other countries (25.6%,

95%CI:23.1-28.0). The number of studies in each of the other countries was too restrictive to make country-specific comparisons (i.e., U.S. was the second country with more studies having just 4 studies). Further subgroup analysis (Figures S8, S9, and S10) found no significant differences by population type, country income level, or being a local study.

Table 1 shows the results of the meta-regression models for depression. Both in the 2- and 4-week physical distancing models, previous depression, older studies, and other region of the world than Asia/Europe were associated with depression. In addition, patient studies had a higher prevalence of depression in the 2-week physical distancing model. No significant association with physical distancing implementation measures was found in both models.

Table 2 presents the results of the meta-regression models for anxiety. Both in the 2- and 4-week physical distancing models, the closure of public transportation was associated with anxiety. Student studies had lower levels of anxiety in both models. No other significant association between physical distancing measures and depression or anxiety were found.

4. Discussion

This study aimed to investigate levels of depression and anxiety during the COVID-19 pandemic and the effect of physical distancing measures on depression and anxiety. We found high global prevalences of both depression and anxiety during the COVID-19 pandemic (24.0% and 21.3%, respectively); however, there was a wide variance in the prevalence of both anxiety and depression reported at the region- and country-level. Asia, and China especially, presented lower levels of both anxiety and depression, compared to the other r and countries. Closure of public transportation increased levels of anxiety, independently of the timeframe (2 or 4 weeks post- transportation closure enactment).

As discussed by Galea et al.,[82] the global healthcare sector must increase support for prevention and early intervention of depression and anxiety secondary to COVID-19 and physical distancing measures. Within the subgroup of Asian countries, estimates of depression prevalence ranged from 4.2-34.7%, with variance likely due to estimates derived from different Chinese provinces. When comparing to the prevalence of depression in the pre-COVID-19 era, ranging from 3.3-4.2%[83,84], these estimates are demonstrably larger after the initiation of COVID-19. This pattern is upheld for the remaining countries classified within the Asian region.

Prior to the occurrence of COVID-19, the prevalence of depression reported in: Korea was estimated to be 6.1%;[85] Pakistan was 4.5%;[83] Nepal was 16.8%;[86] and Japan was 7.9%.[87] Similarly, pre-COVID rates of depression within the subgroup of countries classified as Other ranged from: 3.9% in Nigeria;[83] 4.0% in Jordan;[83] 4.9% in Iran;[83] 4.5% in Saudi Arabia;[83] 4.2-4.6% in Brazil;[88] and 8% in the United States.[89] Within the European countries, reported prevalences of depression prior to COVID-19 include: 4.5% in the UK;[83] 4.8% in Albania;[83] 3.6-5% in Switzerland;[83,90] 5.1% in Italy and Austria;[83] 5.2% in Spain;[83] 2.6-8.5% in Norway;[91] and 6.1-10.2% in Germany.[92] The only country to report potentially lower depression rates post-COVID-19 is Russia; however, pre-COVID-19 estimates range from 5.5%[83] to 31.2-37.8%,[93] a variation which may be the result of differing scales or methods for assessing depression. Overall, we observe a marked increase in depression prevalence in the post-COVID-19 era.

Similarly, the prevalence of anxiety, as reported in the subgroup of Asian countries is largely greater subsequent to the onset of COVID-19. Rates of anxiety prior to COVID-19 ranged from: 3.0-5.8% in India;[83,94] 3.1% in China;[83] 3.2% in Nepal;[83] 4.1% in Bangladesh;[83] and 4.2% in Pakistan.[83] Japan, however, reported a prevalence of anxiety of 22.6%,[95] which is higher than the prevalence of 10.9% reported post-COVID-19.[56] Increases in anxiety can further be observed in the countries classified within the Other category. Prior to COVID-19, anxiety rates were: 2.7% in Nigeria;[83] 4.1% in the United Arab Emirates;[83] 4.3% in Saudi Arabia and Jordan;[83] 12.1-12.7% in Brazil;[88] and 8.2% in the United States.[96] Among the European countries, estimates of anxiety prevalence prior to COVID were: 3.8% in Serbia;[83] 4.9% in Switzerland;[83] 5% in Italy;[83] 5.1% in Cyprus;[83] 6.5% in Austria;[97] 6.6% in Norway;[98] 7.2% in the United Kingdom;[99] and 9.7% in Spain.[100] Russia and Germany both reported higher anxiety prevalences of 22.0%[93] and 19.0%[101], respectively, in comparison to rates observed subsequent to the occurrence of COVID-19.

Our finding regarding the effect of public transportation closures on anxiety levels points to the importance of these systems to global populations. We understand that anxiety could emerge as a result of two fear/worry dimensions: not being able to achieve the basic needs and/or insecurity. Depending on the setting (i.e., rural, small to large metropolitan areas), there is a significant number of individuals who do not have an alternative way of transport (i.e., car, motorcycle) and are dependent on public transportation.[102] People in many different countries and cultural contexts rely on some method of public transport for getting food, clothing, education, shelter, healthcare, sanitation,[103] such as transport within metropolitan areas to places of employment.[104] It is thus reasonable to theorize that anxious anticipatory thinking could emerge in people dependent on public transport. These are core symptoms of many anxiety disorders,[105] which are captured by our anxiety outcome measure (GAD-7). In addition to worry regarding reliability of public transport, anxiety could grow from increased risk of assault and harassment resultant from fewer bystanders accessing this method of transportation.[106] Considering that mitigation strategies in the COVID era have involved significantly reducing the volume of passengers, the number of routes, and the means of transport available,[107] closures of these systems can work to generate excessive anxiety and worry.[108]

4.1. Strengths and Limitations

Country-level data of physical distancing measures and previous anxiety or depression is an important limitation of the present study. However, we included data from 67 different samples from 26 countries, within five global regions (Asia, Africa, America, Europe, and Middle-East), totaling almost 200,000 individuals in each meta-analysis. In addition, we used just one outcome measure per disorder (PHQ-9 and GAD-7), to avoid outcome measure bias, common in meta-analysis studies. Unfortunately, we were not able to include age as a covariate in the meta-regression models due to lack of descriptive data. A portion of the included samples (35.9%, N=24) were not peer-reviewed. Notably, inclusion of data from pre-print repositories could be seen as both a strength and limitation, in that the inclusion of the most recent data is of utmost importance. Results should be interpreted with caution.

4.2. Conclusion

The COVID-19 pandemic, and the resulting physical distancing measures to mitigate viral spread, has impacted population mental health worldwide. Despite finding a wide variation in anxiety and depression levels across countries and regions of the world, high prevalence of mental health disorders is a considerable concern during the COVID era. Thus, mental health outcomes should not be addressed as a delayed consequence of the COVID-19 pandemic, but rather as an ongoing and concurrent epidemic (i.e., a syndemic). We also observed an association between restrictions and closures of public transportation systems and an increase in anxiety levels. These results have important implications for policymakers. There is an urgent need for the healthcare sector to increase now support for prevention and early intervention of depression and anxiety.

5. Funding

None

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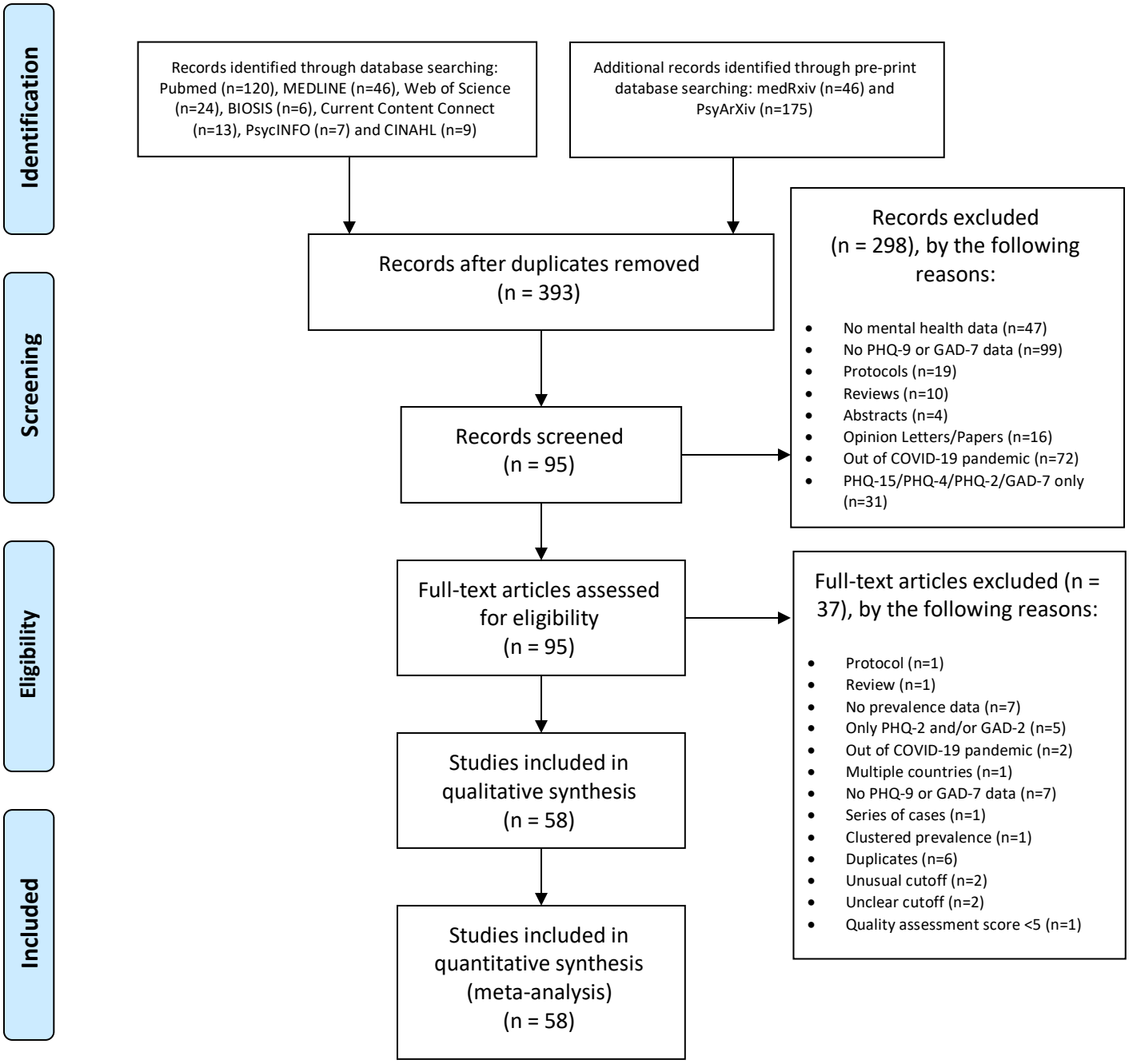
PRISMA 2009 Flow Diagram



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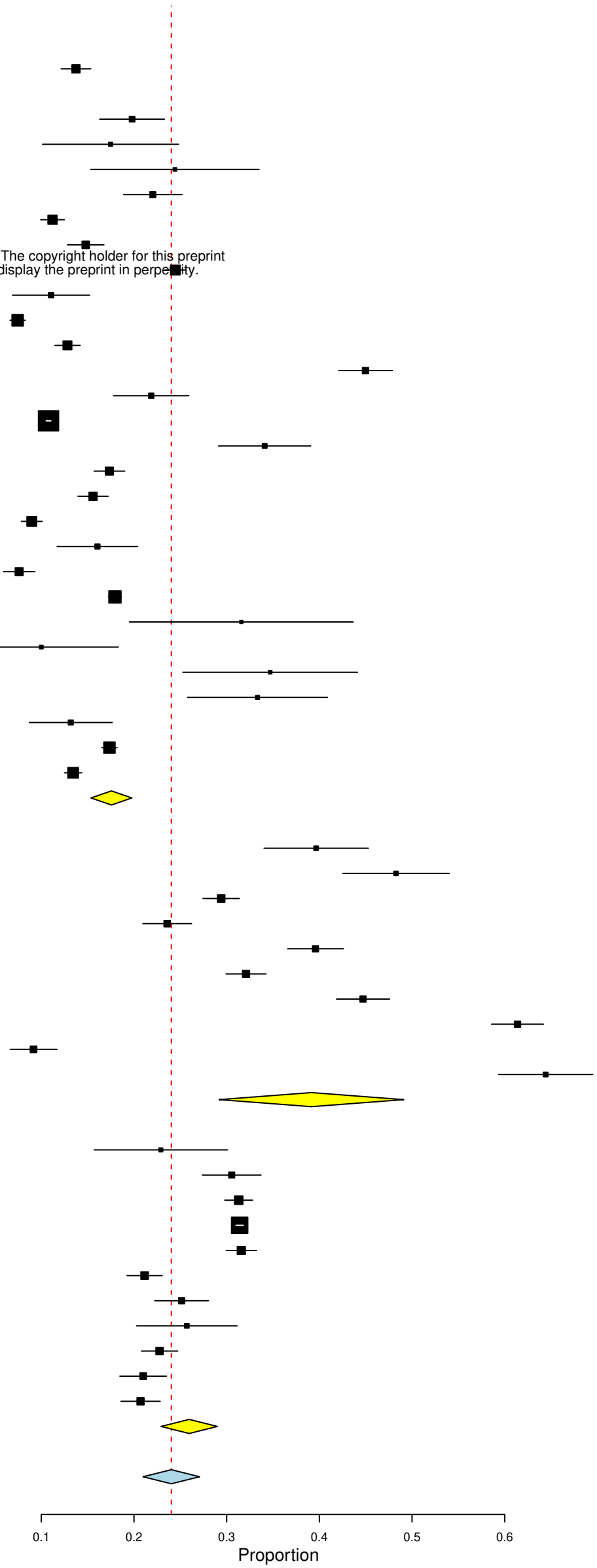
For more information, visit www.prisma-statement.org.

Studies	Estimate (95% C.I.)	Cases/Total
Ahn	0.137 (0.121, 0.153)	245/1783
Chang	0.042 (0.035, 0.048)	162/3881
Choi	0.198 (0.163, 0.233)	99/500
Guo (Patient)	0.175 (0.101, 0.248)	18/103
Hu	0.244 (0.153, 0.335)	21/86
Juanjuan	0.220 (0.189, 0.252)	145/658
Khana	0.112 (0.099, 0.125)	264/2355
Lai	0.148 (0.128, 0.168)	186/1257
Lin	0.215 (0.202, 0.228)	1236/5761
Liu J	0.111 (0.069, 0.152)	24/217
Nguyen	0.074 (0.066, 0.083)	294/3947
Que	0.128 (0.115, 0.142)	293/2285
Salman (Students)	0.450 (0.421, 0.479)	510/1134
Salman (Healthcare)	0.219 (0.178, 0.259)	87/398
Shi	0.108 (0.105, 0.110)	6110/56679
Sigdel	0.341 (0.291, 0.391)	119/349
Stickley/Ueda	0.173 (0.157, 0.190)	347/2000
Sun	0.156 (0.140, 0.172)	298/1912
Tang W	0.090 (0.079, 0.101)	223/2485
Wang	0.161 (0.117, 0.204)	44/274
Xiao	0.076 (0.059, 0.093)	71/933
Yamamoto	0.179 (0.172, 0.187)	2034/11333
Zhang (Patient)	0.316 (0.195, 0.436)	18/57
Zhang (Quarentine)	0.100 (0.017, 0.183)	5/50
Zhang (General)	0.347 (0.253, 0.441)	34/98
Zhao M	0.333 (0.258, 0.409)	50/150
Zhao R	0.132 (0.087, 0.177)	29/220
Zhou	0.174 (0.165, 0.182)	1402/8079
Zhu Z	0.134 (0.125, 0.144)	680/5062
Subgroup Asia (I^2=9890 % , P=0.000)	**0.176 (0.154, 0.198)**	**15148/113746**
Ahorsu (Female)	0.397 (0.340, 0.453)	115/290
Ahorsu (Male)	0.483 (0.425, 0.540)	140/290
Alyami	0.294 (0.275, 0.314)	612/2081
Kantor	0.236 (0.210, 0.262)	237/1005
Killgore	0.396 (0.366, 0.426)	401/1013
Naser (General)	0.321 (0.299, 0.342)	577/1798
Naser (Healthcare)	0.447 (0.419, 0.476)	520/1163
Naser (Students)	0.614 (0.586, 0.642)	715/1165
Olaseni	0.092 (0.066, 0.117)	46/502
Sartorao Filho	0.644 (0.593, 0.695)	219/340
Subgroup Other (I^2=9915 % , P=0.000)	**0.391 (0.292, 0.491)**	**3582/9647**
Amerio	0.229 (0.157, 0.301)	30/131
Bachilo	0.305 (0.274, 0.337)	248/812
Bauer	0.313 (0.298, 0.328)	1158/3700
Fancourt	0.314 (0.310, 0.318)	16745/53328
Jia	0.316 (0.299, 0.332)	978/3097
Johnson	0.211 (0.192, 0.230)	376/1778
Mechili (Students)	0.251 (0.223, 0.280)	217/863
Mechili (Family)	0.257 (0.203, 0.311)	64/249
Munoz−Navarro	0.228 (0.208, 0.247)	399/1753
Pieh	0.210 (0.185, 0.235)	211/1005
Weilenmann	0.207 (0.186, 0.228)	292/1410
Subgroup Europe (I^2=9697 % , P=0.000)	**0.260 (0.229, 0.290)**	**20718/68126**
Overall (I^2=9965 % , P=0.000)	**0.240 (0.210, 0.271)**	**39448/191519**



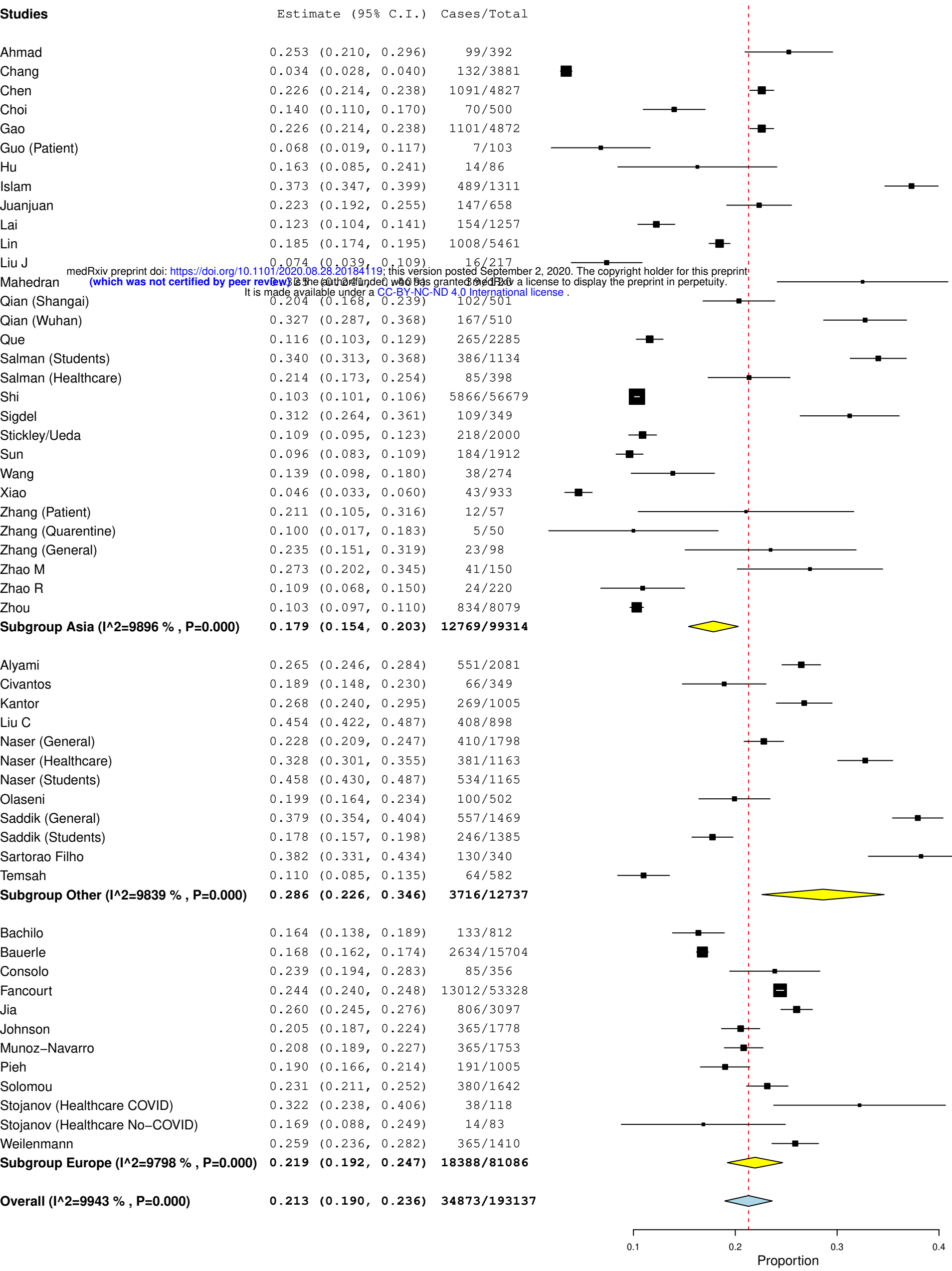


Table 1. Results for the meta-regression models for depression.

Covariate	Coefficient	95%Ci(min)	95%CI (max)	SE	p
2-week model					
School closing (2 weeks)	-0.038	-0.148	0.073	0.057	0.506
Workplace closing (2 weeks)	0.010	-0.096	0.116	0.054	0.852
Cancel public events (2 weeks)	-0.094	-0.257	0.068	0.083	0.253
Restrictions on gatherings (2 weeks)	0.016	-0.026	0.058	0.022	0.465
Close public transport (2 weeks)	0.030	-0.035	0.095	0.033	0.369
Stay-at-home requirements (2 weeks)	0.001	-0.058	0.060	0.030	0.969
Restrictions on internal movement (2 weeks)	0.039	-0.080	0.158	0.061	0.525
International travel controls (2 weeks)	-0.006	-0.032	0.019	0.013	0.626
Female	0.081	-0.072	0.233	0.078	0.302
Previous Depression	**7.202**	**1.058**	**13.346**	**3.135**	**0.022**
Time	**-0.002**	**-0.004**	**-0.001**	**<0.001**	**0.003**
Population Type (Reference = Healthcare)					
General	-0.001	-0.081	0.080	0.041	0.990
Mixed	-0.023	-0.133	0.087	0.056	0.678
Patient	**0.098**	**0.002**	**0.194**	**0.049**	**0.046**
Students	0.051	-0.028	0.131	0.041	0.207
Continent (Reference = Asia)					
Europe	0.057	-0.022	0.137	0.040	0.155
Other	**0.146**	**0.061**	**0.232**	**0.044**	**<0.001**
Regional Status (Reference = National)					
Regional	0.063	-0.003	0.130	0.034	0.061
4-week model					
School closing (4 weeks)	-0.017	-0.152	0.118	0.069	0.804
Workplace closing (4 weeks)	-0.068	-0.185	0.049	0.060	0.257
Cancel public events (4 weeks)	-0.055	-0.202	0.091	0.075	0.458
Restrictions on gatherings (4 weeks)	0.036	-0.018	0.089	0.027	0.191
Close public transport (4 weeks)	0.028	-0.041	0.097	0.035	0.425
Stay-at-home requirements (4 weeks)	0.004	-0.075	0.083	0.040	0.915
Restrictions on internal movement (4 weeks)	0.050	-0.109	0.210	0.081	0.537
International travel controls (4 weeks)	-0.011	-0.045	0.024	0.018	0.543
Female	0.073	-0.078	0.224	0.077	0.345
Previous Depression	**7.475**	**1.369**	**13.581**	**3.115**	**0.016**
Time	**-0.003**	**-0.004**	**-0.001**	**<0.001**	**0.002**
Population Type (Reference = Healthcare)					
General	-0.020	-0.103	0.064	0.043	0.642
Mixed	-0.038	-0.148	0.072	0.056	0.493
Patient	0.088	-0.009	0.184	0.049	0.076
Students	0.046	-0.034	0.126	0.041	0.262
Continent (Reference = Asia)					
Europe	0.042	-0.042	0.126	0.043	0.331
Other	**0.147**	**0.054**	**0.240**	**0.048**	**0.002**
Regional Status (Reference = National)					
Regional	0.059	-0.006	0.124	0.033	0.075

Table 2. Results for the meta-regression models for anxiety.

Covariate	Coefficient	95%CI (min)	95%CI (max)	SE	p
2-week model					
School closing (2 weeks)	0.002	-0.093	0.098	0.049	0.961
Workplace closing (2 weeks)	-0.001	-0.099	0.097	0.050	0.988
Cancel public events (2 weeks)	0.007	-0.195	0.208	0.103	0.949
Restrictions on gatherings (2 weeks)	0.022	-0.065	0.109	0.044	0.615
Close public transport (2 weeks)	**0.071**	**0.007**	**0.134**	**0.032**	**0.029**
Stay-at-home requirements (2 weeks)	-0.029	-0.096	0.038	0.034	0.399
Restrictions on internal movement (2 weeks)	-0.043	-0.173	0.086	0.066	0.512
International travel controls (2 weeks)	0.005	-0.019	0.030	0.013	0.676
Female	0.080	-0.093	0.253	0.088	0.366
Previous Anxiety	1.408	-2.472	5.288	1.980	0.477
Time	-0.001	-0.002	0.001	<0.001	0.286
Population Type (Reference = General)					
Healthcare	-0.040	-0.107	0.026	0.034	0.237
Mixed	-0.039	-0.127	0.049	0.045	0.385
Patient	-0.017	-0.104	0.070	0.044	0.706
Students	**-0.068**	**-0.133**	**-0.003**	**0.033**	**0.041**
Continent (Reference = Asia)					
Europe	0.003	-0.100	0.106	0.053	0.955
Other	0.091	-0.017	0.199	0.055	0.100
Regional Status (Reference = National)					
Regional	0.017	-0.036	0.071	0.027	0.530
4-week model					
School closing (4 weeks)	-0.060	-0.162	0.043	0.052	0.256
Workplace closing (4 weeks)	-0.014	-0.119	0.091	0.054	0.792
Cancel public events (4 weeks)	0.041	-0.095	0.177	0.069	0.551
Restrictions on gatherings (4 weeks)	0.032	-0.038	0.101	0.035	0.368
Close public transport (4 weeks)	**0.066**	**0.004**	**0.128**	**0.032**	**0.038**
Stay-at-home requirements (4 weeks)	-0.031	-0.104	0.043	0.038	0.414
Restrictions on internal movement (4 weeks)	-0.030	-0.166	0.106	0.069	0.669
International travel controls (4 weeks)	0.017	-0.013	0.048	0.016	0.267
Female	0.025	-0.143	0.193	0.086	0.769
Previous Anxiety	1.442	-1.906	4.789	1.708	0.399
Time	-0.001	-0.003	0.000	<0.001	0.060
Population Type (Reference = General)					
Healthcare	-0.059	-0.122	0.004	0.032	0.067
Mixed	-0.031	-0.108	0.046	0.039	0.426
Patient	-0.005	-0.087	0.078	0.042	0.911
Students	**-0.068**	**-0.130**	**-0.006**	**0.032**	**0.033**
Continent (Reference = Asia)					
Europe	-0.022	-0.115	0.072	0.048	0.649
Other	0.061	-0.028	0.151	0.046	0.179
Regional Status (Reference = National)					
Regional	-0.008	-0.060	0.044	0.026	0.766

PRISMA 2009 Checklist

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
ABSTRACT			
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.	2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	4-5
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	5
METHODS			
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.	6
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.	6
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.	6
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	6
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).	7
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.	7
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	8
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.	7
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	8
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.	10

PRISMA 2009 Checklist

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).	7
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	10
RESULTS			
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.	11
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.	11
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).	7
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.	11
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	11
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	7
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	12
DISCUSSION			
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).	13
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).	15
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	16
FUNDING			
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.	16

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(7): e1000097. doi:10.1371/journal.pmed1000097

For more information, visit: **www.prisma-statement.org**.

MOOSE (Meta-analyses Of Observational Studies in Epidemiology) Checklist

A reporting checklist for Authors, Editors, and Reviewers of Meta-analyses of Observational Studies. You must report the page number in your manuscript where you consider each of the items listed in this checklist. If you have not included this information, either revise your manuscript accordingly before submitting or note N/A.

Reporting Criteria	Reported (Yes/No)	Reported on Page No.
Reporting of Background		
Problem definition	Yes	4
Hypothesis statement	Yes	4
Description of Study Outcome(s)	Yes	5
Type of exposure or intervention used	Yes	5
Type of study design used	Yes	6
Study population	Yes	6
Reporting of Search Strategy		
Qualifications of searchers (eg, librarians and investigators)	Yes	7
Search strategy, including time period included in the synthesis and keywords	Yes	6
Effort to include all available studies, including contact with authors	Yes	6
Databases and registries searched	Yes	6
Search software used, name and version, including special features used (eg, explosion)	Yes	7
Use of hand searching (eg, reference lists of obtained articles)	No	N/A
List of citations located and those excluded, including justification	Yes	7
Method for addressing articles published in languages other than English	Yes	7
Method of handling abstracts and unpublished studies	Yes	7
Description of any contact with authors	No	N/A
Reporting of Methods		
Description of relevance or appropriateness of studies assembled for assessing the hypothesis to be tested	Yes	7
Rationale for the selection and coding of data (eg, sound clinical principles or convenience)	Yes	7
Documentation of how data were classified and coded (eg, multiple raters, blinding, and interrater reliability)	Yes	7
Assessment of confounding (eg, comparability of cases and controls in studies where appropriate	Yes	7

Reporting Criteria	Reported (Yes/No)	Reported on Page No.
Assessment of study quality, including blinding of quality assessors; stratification or regression on possible predictors of study results	Yes	7
Assessment of heterogeneity	Yes	10
Description of statistical methods (eg, complete description of fixed or random effects models, justification of whether the chosen models account for predictors of study results, dose-response models, or cumulative meta-analysis) in sufficient detail to be replicated	Yes	10
Provision of appropriate tables and graphics	Yes	10
Reporting of Results		
Table giving descriptive information for each study included	Yes	11
Results of sensitivity testing (eg, subgroup analysis)	Yes	11
Indication of statistical uncertainty of findings	Yes	11
Reporting of Discussion		
Quantitative assessment of bias (eg, publication bias)	No	N/A
Justification for exclusion (eg, exclusion of non–English-language citations)	No	N/A
Assessment of quality of included studies	Yes	7
Reporting of Conclusions		
Consideration of alternative explanations for observed results	Yes	15
Generalization of the conclusions (ie, appropriate for the data presented and within the domain of the literature review)	Yes	15
Guidelines for future research	Yes	15
Disclosure of funding source	Yes	15

Once you have completed this checklist, please save a copy and upload it as part of your submission. DO NOT include this checklist as part of the main manuscript document. It must be uploaded as a separate file.

Table S1. Main findings from the included studies.

Author	Ref	Country	n	Population Type	Initial Date	End Date	Length	Time	Mean Age/ Median	SD/ IQR	Min Age	Max Age	Female	Represent	Regional	PHQ-9 ≧ 10 (n)	PHQ-9 ≧ 10 (%)	GAD-7 ≧ 10 (n)	GAD-7 ≧ 10 (%)
Ahmad	11	India	392	General	3/29/20	4/12/20	14	125	30.30	9.28	18	71	47%	No	No	N.A.	N.A.	99	25.25
Ahn	12	Korea	1783	Healthcare	4/20/20	4/30/20	10	103	N.A.	N.A.	20	65	76%	No	No	245	13.74	N.A.	N.A.
Ahorsu (Female)	13	Iran	290	General	3/7/20	4/21/20	45	147	29.24	5.84	N.A.	N.A.	100%	No	Yes	115	39.7	N.A.	N.A.
Ahorsu (Male)	13	Iran	290	General	3/7/20	4/21/20	45	147	33.61	6.36	N.A.	N.A.	0%	No	Yes	140	48.3	N.A.	N.A.
Alyami	14	Saudi Arabia	2081	General	3/27/20	4/27/20	31	127	N.A.	N.A.	18	N.A.	33%	No	No	612	29.4	551	26.5
Amerio	15	Italy	131	Healthcare	3/15/20	4/15/20	31	139	52.31	12.24	N.A.	N.A.	48%	No	Yes	30	22.9	N.A.	N.A.
Bachilo	16	Russia	812	Mixed	4/21/20	5/18/20	27	102	N.A.	N.A.	20	N.A.	81%	No	No	248	30.54	133	16.38
Bauer	17	Germany	3700	General	4/8/20	4/26/20	18	115	33.13	11.73	18	85	79%	No	No	1158	31.3	N.A.	N.A.
Bauerle	18	Germany	15704	General	3/10/20	5/5/20	56	144	N.A.	N.A.	18	N.A.	71%	No	No	N.A.	N.A.	2634	16.77
Chang	19	China	3881	Students	1/31/20	2/3/20	3	183	20.00	3.00	N.A.	N.A.	63%	No	Yes	162	4.18	132	3.41
Chen	20	China	4827	General	1/31/20	2/2/20	2	183	32.30	10.00	18	85	68%	No	No	N.A.	N.A.	1091	22.6
Choi	21	China	500	General	4/24/20	5/3/20	9	99	47.26	15.82	N.A.	N.A.	55%	No	Yes	99	19.8	70	14
Civantos	22	USA	349	Healthcare	4/14/20	4/25/20	11	109	N.A.	N.A.	26	N.A.	39%	No	No	N.A.	N.A.	66	18.9
Consolo	23	Italy	356	Healthcare	4/2/20	4/21/20	19	121	N.A.	N.A.	N.A.	N.A.	40%	No	Yes	N.A.	N.A.	85	23.9
Fancourt	24	UK	53328	General	3/21/20	5/10/20	50	133	N.A.	N.A.	N.A.	N.A.	48%	No	No	16745	31.4	13012	24.4
Gao	25	China	4872	General	1/31/20	2/2/20	2	183	N.A.	N.A.	18	N.A.	68%	No	No	N.A.	N.A.	1101	22.6
Guo (Patient)	26	China	103	Patient	2/10/20	2/28/20	18	173	42.50	12.53	18	75	43%	No	No	18	17.5	7	6.8
Hu	27	China	86	Patient	3/7/20	3/24/20	17	147	N.A.	N.A.	N.A.	N.A.	50%	No	Yes	21	24.7	14	16.47
Islam	28	Bangladesh	1311	General	3/29/20	4/6/20	8	125	23.54	4.97	13	63	40%	No	No	N.A.	N.A.	489	37.3
Jia	29	UK	3097	Mixed	4/3/20	4/30/20	27	120	44.00	15.00	18	N.A.	85%	No	No	978	31.57	806	26.02
Johnson	30	Norway	1778	Mixed	3/31/20	4/7/20	7	123	N.A.	N.A.	19	N.A.	85%	No	No	376	21.14	365	20.52
Juanjuan	31	China	658	Patient	2/16/20	2/19/20	3	167	N.A.	N.A.	N.A.	N.A.	100%	No	No	145	22.03	147	22.34
Kantor	32	USA	1005	General	3/29/20	3/31/20	2	125	45.00	16.00	18	N.A.	51%	Yes	No	237	23.6	269	26.8
Khana	33	India	2355	Healthcare	4/15/20	4/19/20	4	108	42.50	12.05	25	82	43%	No	No	264	11.23	N.A.	N.A.
Killgore	34	USA	1013	General	4/9/20	4/10/20	1	114	N.A.	N.A.	18	35	44%	Yes	No	401	39.59	N.A.	N.A.
Lai	35	China	1257	Healthcare	1/29/20	2/3/20	5	185	N.A.	N.A.	18	N.A.	77%	No	No	186	14.79	154	12.25
Lin	36	China	5461	General	2/5/20	2/23/20	18	178	N.A.	N.A.	N.A.	N.A.	70%	No	No	1336	24.46	1008	18.46
Liu C	37	USA	898	Mixed	4/13/20	5/19/20	36	110	24.50	N.A.	18	30	81%	No	No	N.A.	N.A.	408	45.4
Liu J	38	China	217	Students	2/23/20	4/2/20	39	160	21.70	1.70	18	27	59%	No	No	24	11.05	16	7.37
Mahedran	39	China	120	Healthcare	1/24/20	2/13/20	20	190	35.00	N.A.	19	63	73%	No	Yes	N.A.	N.A.	39	32.5
Mechili (Students)	40	Albania	863	Students	3/30/20	4/9/20	10	124	N.A.	N.A.	18	N.A.	89%	No	Yes	217	25.14	N.A.	N.A.
Mechili (Family)	40	Albania	249	General	3/30/20	4/9/20	10	124	36.67	4.65	18	85	71%	No	Yes	64	25.6	N.A.	N.A.
Munoz-Navarro	41	Spain	1753	General	3/25/20	4/25/20	31	129	40.40	12.90	N.A.	N.A.	77%	No	No	399	22.76	365	20.8
Naser (General)	42	Jordan	1798	General	3/22/20	3/28/20	6	132	N.A.	N.A.	18	N.A.	64%	No	No	577	32.09	410	22.8
Naser (Healthcare)	42	Jordan	1163	Healthcare	3/22/20	3/28/20	6	132	N.A.	N.A.	18	N.A.	56%	No	No	520	44.71	381	32.76
Naser (Students)	42	Jordan	1165	Students	3/22/20	3/28/20	6	132	N.A.	N.A.	18	N.A.	54%	No	No	715	61.37	534	45.83
Nguyen	43	Vietnam	3947	Patient	2/14/20	3/2/20	17	169	44.40	17.00	18	85	56%	No	No	294	7.44	N.A.	N.A.
Olaseni	44	Nigeria	502	General	3/20/20	4/12/20	23	134	28.75	8.17	18	78	45%	No	No	46	9.16	100	19.92
Pieh	45	Austria	1005	General	4/17/20	4/30/20	13	106	N.A.	N.A.	18	N.A.	53%	Yes	No	211	20.99	191	19
Qian (Shangai)	46	China	501	General	2/1/20	2/10/20	9	182	N.A.	N.A.	18	N.A.	49%	No	Yes	N.A.	N.A.	102	20.35
Qian (Wuhan)	46	China	510	General	2/1/20	2/10/20	9	182	N.A.	N.A.	18	N.A.	50%	No	Yes	N.A.	N.A.	167	32.74
Que	47	China	2285	Healthcare	2/16/20	2/23/20	7	167	31.06	6.99	17	64	69%	No	No	293	12.82	265	11.6
Saddik (General)	48	UAE	1469	General	3/24/20	5/15/20	52	130	N.A.	N.A.	18	N.A.	83%	No	No	N.A.	N.A.	557	37.91
Saddik (Students)	49	UAE	1385	Students	3/11/20	3/21/20	10	143	20.50	2.30	N.A.	N.A.	72%	No	No	N.A.	N.A.	246	17.76
Salman (Students)	50	Pakistan	1134	Students	4/1/20	5/31/20	60	122	21.70	3.50	18	N.A.	71%	No	No	510	45	386	34
Salman (Healthcare)	51	Pakistan	398	Healthcare	4/15/20	5/20/20	35	108	28.67	4.15	N.A.	N.A.	54%	No	Yes	87	21.8	85	21.3

Sartorao Filho	52	Brazil	340	Students	5/18/20	5/19/20	1	75	N.A.	N.A.	18	N.A.	74%	No	Yes	219	64.41	130	38.23
Shi	53	China	56679	General	2/28/20	3/11/20	12	155	35.97	8.22	18	N.A.	52%	No	No	6110	10.78	5866	10.35
Sigdel	54	Nepal	349	General	4/6/20	4/16/20	10	117	27.80	6.60	18	N.A.	46%	No	No	119	34.1	109	31.2
Solomou	55	Cyprus	1642	Mixed	4/3/20	4/9/20	6	120	N.A.	N.A.	18	N.A.	72%	No	No	N.A.	N.A.	380	23.14
Stickley/Ueda	56/57	Japan	2000	General	4/16/20	4/18/20	2	107	N.A.	N.A.	N.A.	N.A.	50%	Yes	No	347	17.35	218	10.9
Stojanov (Healthcare/COVID)	58	Serbia	118	Healthcare	4/20/20	4/20/20	0	103	39.10	7.30	N.A.	N.A.	66%	No	Yes	N.A.	N.A.	38	31.8
Stojanov (Healthcare/No-COVID)	58	Serbia	83	Healthcare	4/20/20	4/20/20	0	103	42.50	9.70	N.A.	N.A.	66%	No	Yes	N.A.	N.A.	14	16.4
Sun	59	China	1912	Students	3/20/20	4/10/20	21	134	20.28	2.10	18	49	70%	No	No	298	15.58	184	9.62
Tang	60	China	2485	Students	2/20/20	2/27/20	7	163	19.81	1.55	16	27	61%	No	No	223	8.97	N.A.	N.A.
Temsah	61	Saudi Arabia	582	Healthcare	2/5/20	2/16/20	11	178	36.02	8.50	N.A.	N.A.	75%	No	Yes	N.A.	N.A.	64	10.99
Wang	62	China	274	Healthcare	2/26/20	3/3/20	6	157	37.00	N.A.	22	64	77%	No	No	44	16.1	38	13.9
Weilenmann	63	Switzerland	1410	Healthcare	3/28/20	4/4/20	7	126	36.45	12.61	N.A.	N.A.	66%	No	No	292	20.7	365	25.88
Xiao	64	China	933	Students	2/4/20	2/12/20	8	179	N.A.	N.A.	17	N.A.	70%	No	No	71	7.6	43	4.6
Yamamoto	65	Japan	11333	General	5/11/20	5/12/20	1	82	46.30	14.60	18	89	52%	No	No	2034	17.95	N.A.	N.A.
Zhang (Patient)	66	China	57	Patient	2/15/20	2/29/20	14	168	46.90	15.37	N.A.	N.A.	49%	No	Yes	18	31.57	12	21.05
Zhang (Quarentine)	66	China	50	Mixed	2/15/20	2/29/20	14	168	36.20	10.91	N.A.	N.A.	46%	No	Yes	5	10	5	10
Zhang (General)	66	China	98	General	2/15/20	2/29/20	14	168	29.60	12.69	N.A.	N.A.	65%	No	Yes	34	34.69	23	23.46
Zhao M	67	China	150	Patient	2/3/20	2/10/20	7	180	N.A.	N.A.	15	N.A.	41%	No	Yes	50	33.33	41	27.33
Zhao R	68	China	220	Mixed	2/10/20	2/15/20	5	173	40.00	10.00	N.A.	N.A.	83%	No	No	29	13.18	24	10.9
Zhou	69	China	8079	Students	3/8/20	3/15/20	7	146	16.00	N.A.	12	18	54%	No	No	1402	17.35	834	10.32
Zhu	70	China	5062	Healthcare	2/8/20	2/10/20	2	175	N.A.	N.A.	19	N.A.	85%	No	Yes	680	13.44	N.A.	N.A.

Table S2. Quality Assessment Results.

Author	Reference number	Country	Sample Framework	Sample Process	Sample Size	Description	Coverage	Validity	Reliability	Statistical Analysis	Response Rate	Quality Score
Ahmad	11	India	Yes	No	No	Yes	Yes	Yes	Yes	Yes	No	6
Ahn	12	Korea	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	7
Ahorsu (Female)	13	Iran	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes	7
Ahorsu (Male)	13	Iran	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes	7
Alyami	14	Saudi Arabia	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Amerio	15	Italy	Yes	No	No	Yes	Yes	Yes	Yes	Yes	No	6
Bachilo	16	Russia	No	No	No	Yes	Yes	Yes	Yes	Yes	No	5
Bauer	17	Germany	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Bauerle	18	Germany	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Chang	19	China	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	9
Chen	20	China	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Choi	21	China	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	8
Civantos	22	USA	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	8
Consolo	23	Italy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	8
Fancourt	24	UK	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	9
Gao	25	China	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Guo (Patient)	26	China	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	8
Hu	27	China	Yes	No	No	No	Yes	Yes	Yes	Yes	No	5
Islam	28	Bangladesh	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Jia	29	UK	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	8
Johnson	30	Norway	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	8
Juanjuan	31	China	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	8
Kantor	32	USA	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	9
Khana	33	India	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Killgore	34	USA	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	8
Lai	35	China	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	8
Lin	36	China	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	8
Liu C	37	USA	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	7
Liu J	38	China	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	7
Mahedran	39	China	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	8
Mechili (Students)	40	Albania	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	9
Mechili (Family)	40	Albania	No	No	No	Yes	Yes	Yes	Yes	Yes	No	5
Munoz-Navarro	41	Spain	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	9
Naser (General)	42	Jordan	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	8
Naser (Healthcare)	42	Jordan	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	8

Naser (Students)	42	Jordan	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	8
Nguyen	43	Viet.m	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	8
Olaseni	44	Nigeria	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	7
Pieh	45	Austria	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Qian (Shangai)	46	China	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	6
Qian (Wuhan)	46	China	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	6
Que	47	China	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	8
Saddik (General)	48	UAE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	8
Saddik (Students)	49	UAE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	8
Salman (Students)	50	Pakistan	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	7
Salman (Healthcare)	51	Pakistan	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	7
Sartorao Filho	52	Brazil	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	7
Shi	53	China	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	8
Sigdel	54	Nepal	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	7
Solomou	55	Cyprus	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	8
Stickley/Ueda	56/57	Japan	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	8
Stojanov (Healthcare/COVID)	58	Serbia	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	7
Stojanov (Healthcare/No-COVID)	58	Serbia	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	7
Sun	59	China	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	8
Tang	60	China	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	9
Temsah	61	Saudi Arabia	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	9
Wang	62	China	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	7
Weilenmann	63	Switzerland	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Xiao	64	China	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	9
Yamamoto	65	Japan	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	8
Zhang (Patient)	66	China	No	No	No	Yes	Yes	Yes	Yes	Yes	No	5
Zhang (Quarentine)	66	China	No	No	No	Yes	Yes	Yes	Yes	Yes	No	5
Zhang (General)	66	China	No	No	No	Yes	Yes	Yes	Yes	Yes	No	5
Zhao M	67	China	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	9
Zhao R	68	China	Yes	No	No	No	Yes	Yes	Yes	Yes	No	5
Zhou	69	China	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Zhu	70	China	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	8

Table S3. Mean of social isolation measures implementation national data based on Oxford Covid-19 Government Response Tracker (Hale et al., 2020), during the period of each study.

Author	Ref	Country	School closing (2 weeks)	Workplace closing (2 weeks)	Cancel public events (2 weeks)	Restrict. on gather. (2 weeks)	Close public transp. (2 weeks)	Stay-at-home requir. (2 weeks)	Restrict. on internal mov. (2 weeks)	Intern. travel controls (2 weeks)	School closing (4 weeks)	Workplace closing (4 weeks)	Cancel public events (4 weeks)	Restrict. on gather. (4 weeks)	Close public transp. (4 weeks)	Stay-at-home requir. (4 weeks)	Restrict. on internal mov. (4 weeks)	Intern. travel controls (4 weeks)
Ahmad	11	India	3.000	2.552	2.000	3.448	1.655	2.517	1.793	3.759	2.581	1.721	1.605	2.326	1.116	2.023	1.209	2.907
Ahn	12	Korea	3.000	2.483	1.621	2.414	0.000	1.172	1.172	3.000	2.997	2.356	1.728	2.591	0.073	1.433	1.396	3.025
Ahorsu (Female)	13	Iran	2.441	1.814	2.000	0.051	0.712	0.576	1.627	0.000	1.973	1.466	1.671	0.041	0.575	0.466	1.315	0.000
Ahorsu (Male)	13	Iran	2.441	1.814	2.000	0.051	0.712	0.576	1.627	0.000	1.973	1.466	1.671	0.041	0.575	0.466	1.315	0.000
Alyami	14	Saudi Arabia	3.000	1.458	1.559	2.220	1.288	1.593	1.729	2.983	2.500	1.506	1.599	1.889	1.210	1.459	1.724	2.479
Amerio	15	Italy	3.000	3.000	2.000	4.000	0.833	2.438	2.000	3.000	2.565	2.613	1.710	3.419	0.645	2.048	1.774	3.000
Bachilo	16	Russia	3.000	2.833	2.000	4.000	1.000	3.000	2.000	4.000	3.000	2.768	2.000	3.893	0.893	2.893	2.000	3.893
Bauer	17	Germany	3.000	2.000	2.000	4.000	0.000	2.000	2.000	4.000	2.894	1.532	2.000	3.362	0.000	1.787	1.681	3.638
Bauerle	18	Germany	2.662	1.268	1.746	2.746	0.000	1.465	1.366	3.085	2.224	1.059	1.459	2.294	0.000	1.224	1.141	2.576
Chang	19	China	1.500	1.500	1.444	2.889	1.333	1.000	1.333	0.000	0.844	0.844	0.813	1.625	0.750	0.563	0.750	0.000
Chen	20	China	1.412	1.412	1.412	2.824	1.294	0.882	1.294	0.000	0.774	0.774	0.774	1.548	0.710	0.484	0.710	0.000
Choi	21	China	3.000	2.000	2.000	4.000	0.000	1.000	1.000	3.000	3.000	2.184	2.000	4.000	0.053	1.632	1.316	3.000
Civantos	22	USA	3.000	3.000	2.000	4.000	1.000	2.000	2.000	3.000	3.000	2.850	2.000	3.800	1.000	2.000	1.950	3.000
Consolo	23	Italy	3.000	3.000	2.000	4.000	1.286	2.600	2.000	3.000	3.000	3.000	2.000	4.000	1.061	2.429	2.000	3.000
Fancourt	24	UK	2.262	1.646	1.631	3.015	0.708	1.508	1.523	0.000	1.861	1.354	1.342	2.481	0.582	1.241	1.253	0.000
Gao	25	China	1.263	1.263	1.263	2.526	1.158	0.789	1.158	0.000	0.774	0.774	0.774	1.548	0.710	0.484	0.710	0.000
Guo (Patient)	26	China	3.000	3.000	2.000	4.000	2.000	2.697	2.000	0.242	2.170	2.170	1.617	3.234	1.574	1.979	1.574	0.170
Hu	27	China	3.000	3.000	2.000	4.000	2.000	3.000	2.000	1.813	3.000	3.000	2.000	4.000	2.000	3.000	2.000	1.261
Islam	28	Bangladesh	2.870	2.478	1.696	3.304	1.652	1.087	1.652	2.261	1.784	1.541	1.054	2.054	1.027	0.676	1.027	1.784
Jia	29	UK	2.786	1.976	1.976	3.714	0.857	1.857	1.881	0.000	2.089	1.554	1.536	2.786	0.643	1.393	1.411	0.000
Johnson	30	Norway	3.000	2.000	1.364	3.364	1.000	0.000	2.000	4.000	2.250	1.556	0.833	2.389	0.750	0.000	1.278	2.722
Juanjuan	31	China	3.000	3.000	2.000	4.000	2.000	3.000	2.000	0.000	2.344	2.344	1.813	3.625	1.750	2.063	1.750	0.000
Kantor	32	USA	3.000	2.294	2.000	3.294	0.882	2.000	1.765	3.000	2.613	1.258	1.645	2.032	0.484	1.097	1.000	2.968
Kha.	33	India	3.000	3.000	2.000	4.000	2.000	3.000	2.000	4.000	3.000	2.818	2.000	3.879	1.879	2.758	1.939	3.879
Killgore	34	USA	3.000	3.000	2.000	4.000	1.000	2.000	2.000	3.000	3.000	2.300	2.000	3.400	0.833	1.800	1.700	3.000
Lai	35	China	1.350	1.350	1.300	2.600	1.200	0.900	1.200	0.000	0.794	0.794	0.765	1.529	0.706	0.529	0.706	0.000
Lin	36	China	2.636	2.636	2.000	4.000	1.939	2.364	1.939	0.000	1.851	1.851	1.404	2.809	1.362	1.660	1.362	0.000
Liu C	37	USA	3.000	3.000	2.000	4.000	1.000	2.000	2.000	3.000	3.000	2.862	2.000	3.846	0.985	2.000	1.954	3.000
Liu J	38	China	3.000	3.000	2.000	4.000	1.778	3.000	2.000	1.556	3.000	3.000	2.000	4.000	1.824	2.824	2.000	1.235
Mahedran	39	China	1.629	1.629	1.314	2.629	1.257	1.371	1.257	0.000	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Mechili (Students)	40	Albania	3.000	2.000	2.000	2.000	2.000	2.000	2.000	3.692	2.462	1.538	1.641	1.641	1.436	1.436	1.436	2.897
Mechili (Family)	40	Albania	3.000	2.000	2.000	2.000	2.000	2.000	2.000	3.692	2.462	1.538	1.641	1.641	1.436	1.436	1.436	2.897
Munoz-.varro	41	Spain	3.000	2.522	2.000	2.761	0.935	1.870	1.000	3.870	2.400	1.967	1.567	2.133	0.717	1.433	0.800	3.017
Naser (General)	42	Jordan	2.000	1.571	1.048	2.095	1.048	1.571	1.048	2.667	1.200	0.943	0.629	1.257	0.629	0.943	0.629	1.600
Naser (Healthcare)	42	Jordan	2.000	1.571	1.048	2.095	1.048	1.571	1.048	2.667	1.200	0.943	0.629	1.257	0.629	0.943	0.629	1.600
Naser (Students)	42	Jordan	2.000	1.571	1.048	2.095	1.048	1.571	1.048	2.667	1.200	0.943	0.629	1.257	0.629	0.943	0.629	1.600
Nguyen	43	Viet.m	1.737	1.474	1.316	2.474	0.789	0.947	0.789	2.211	1.269	1.077	0.962	1.808	0.577	0.692	0.577	1.615
Olaseni	44	Nigeria	3.000	2.292	2.000	4.000	1.000	2.000	1.667	3.000	3.000	2.553	2.000	4.000	1.000	2.000	1.789	3.000
Pieh	45	Austria	2.000	2.000	1.667	3.333	1.583	1.625	1.583	0.000	1.263	1.263	1.053	2.105	1.000	1.026	1.000	0.000
Qian (Shangai)	46	China	3.000	3.000	2.000	4.000	2.000	3.000	2.000	0.000	2.417	2.417	1.833	3.667	1.778	2.167	1.778	0.000
Qian (Wuhan)	46	China	3.000	3.000	2.000	4.000	2.000	3.000	2.000	0.000	2.417	2.417	1.833	3.667	1.778	2.167	1.778	0.000
Que	47	China	3.000	3.000	2.000	4.000	1.000	2.720	2.000	3.000	3.000	3.000	2.000	4.000	0.692	2.462	2.000	3.000
Saddik (General)	48	UAE	3.000	1.800	1.877	3.077	0.985	1.800	1.400	3.800	2.797	1.620	1.544	2.532	0.810	1.481	1.152	3.658

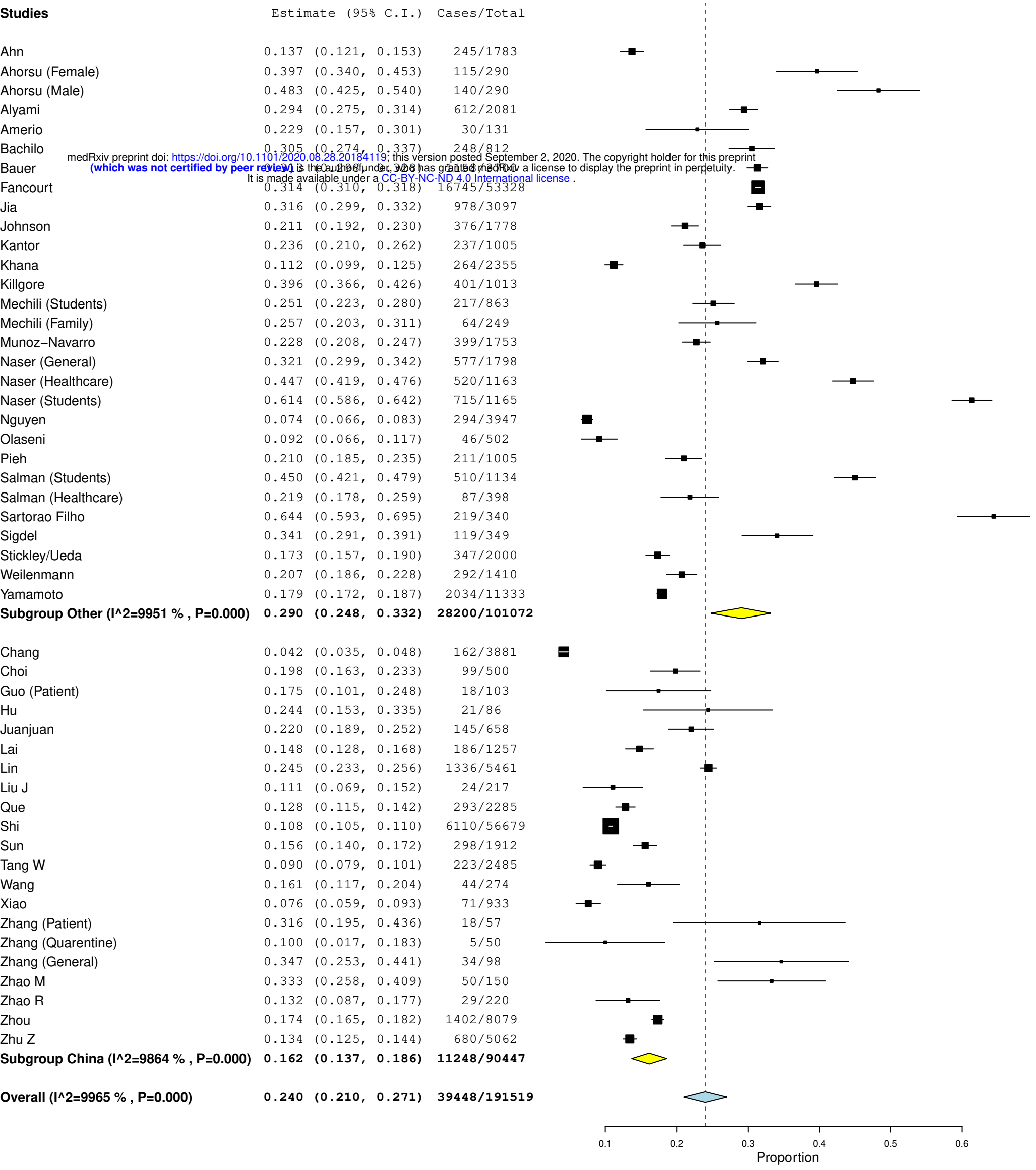
Saddik (Students)	49	UAE	2.240	0.840	0.480	0.000	0.000	0.360	0.000	3.000	1.436	0.538	0.308	0.000	0.000	0.231	0.000	2.385
Salman (Students)	50	Pakistan	3.000	2.173	2.000	4.000	1.867	1.867	1.813	3.813	3.000	1.831	1.798	3.596	1.573	1.573	1.528	3.685
Salman (Healthcare)	51	Pakistan	3.000	2.280	2.000	4.000	2.000	2.000	1.960	4.000	3.000	2.203	2.000	4.000	1.844	1.844	1.781	3.953
Sartorao Filho	52	Brazil	3.000	3.000	2.000	4.000	2.000	1.962	2.000	4.000	3.000	3.000	2.000	3.850	2.000	1.625	2.000	4.000
Shi	53	China	3.000	3.000	2.000	4.000	2.000	3.000	2.000	1.280	3.000	3.000	2.000	4.000	2.000	2.951	2.000	0.780
Sigdel	54	Nepal	3.000	3.000	2.000	4.000	1.920	2.000	2.000	4.000	2.366	1.950	1.592	2.876	0.945	1.539	1.428	2.083
Solomou	55	Cyprus	3.000	2.000	2.000	3.429	1.619	1.619	1.619	4.000	2.400	1.429	1.771	2.057	0.971	0.971	0.971	3.086
Stickley/Ueda	56/57	Japan	3.000	1.000	1.000	0.000	0.000	0.632	1.000	2.842	3.000	1.000	1.000	0.000	0.000	0.387	1.000	2.516
Stojanov (Healthcare/COVID)	58	Serbia	3.000	3.000	2.000	4.000	2.000	3.000	2.000	4.000	3.000	3.000	2.000	4.000	2.000	3.000	2.000	4.000
Stojanov (Healthcare/No-COVID)	58	Serbia	3.000	3.000	2.000	4.000	2.000	3.000	2.000	4.000	3.000	3.000	2.000	4.000	2.000	3.000	2.000	4.000
Sun	59	China	3.000	2.778	2.000	4.000	1.222	2.833	1.917	2.444	3.000	2.840	2.000	4.000	1.440	2.880	1.940	2.160
Tang W	60	China	3.000	3.000	2.000	4.000	2.000	3.000	2.000	0.273	2.750	2.750	2.000	4.000	2.000	2.500	2.000	0.167
Temsah	61	Saudi Arabia	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Wang	62	China	3.000	3.000	2.000	4.000	2.000	3.000	2.000	0.727	3.000	3.000	2.000	4.000	2.000	2.778	2.000	0.444
Weilenmann	63	Switzerland	3.000	2.591	2.000	3.591	0.000	0.864	0.864	3.000	1.917	1.583	2.000	2.583	0.000	0.528	0.528	1.917
Xiao	64	China	2.348	2.348	1.913	3.826	1.826	1.957	1.826	0.000	1.459	1.459	1.189	2.378	1.135	1.216	1.135	0.000
Yamamoto	65	Japan	3.000	1.000	1.000	0.000	0.000	1.000	1.000	3.000	3.000	1.000	1.000	0.000	0.000	1.000	1.000	3.000
Zhang (Patient)	66	China	3.000	3.000	2.000	4.000	2.000	3.000	2.000	0.000	2.273	2.273	1.758	3.515	1.697	2.000	1.697	0.000
Zhang (Quarentine)	66	China	3.000	3.000	2.000	4.000	2.000	3.000	2.000	0.000	2.273	2.273	1.758	3.515	1.697	2.000	1.697	0.000
Zhang (General)	66	China	3.000	3.000	2.000	4.000	2.000	3.000	2.000	0.000	2.273	2.273	1.758	3.515	1.697	2.000	1.697	0.000
Zhao M	67	China	2.182	2.182	1.818	3.636	1.727	1.773	1.727	0.000	1.333	1.333	1.111	2.222	1.056	1.083	1.056	0.000
Zhao R	68	China	3.000	3.000	2.000	4.000	2.000	2.500	2.000	0.000	1.853	1.853	1.471	2.941	1.412	1.588	1.412	0.000
Zhou	69	China	3.000	3.000	2.000	4.000	2.000	3.000	2.000	1.818	3.000	3.000	2.000	4.000	2.000	3.000	2.000	1.111
Zhu Z	70	China	2.824	2.824	2.000	4.000	2.000	2.176	2.000	0.000	1.548	1.548	1.290	2.581	1.226	1.258	1.226	0.000

Table S4. Previous prevalence of depression and anxiety based on the most recent published database of the Global Burden of Disease Study (GBD 2017 Disease and Injury Incidence and Prevalence Collaborators, 2018)

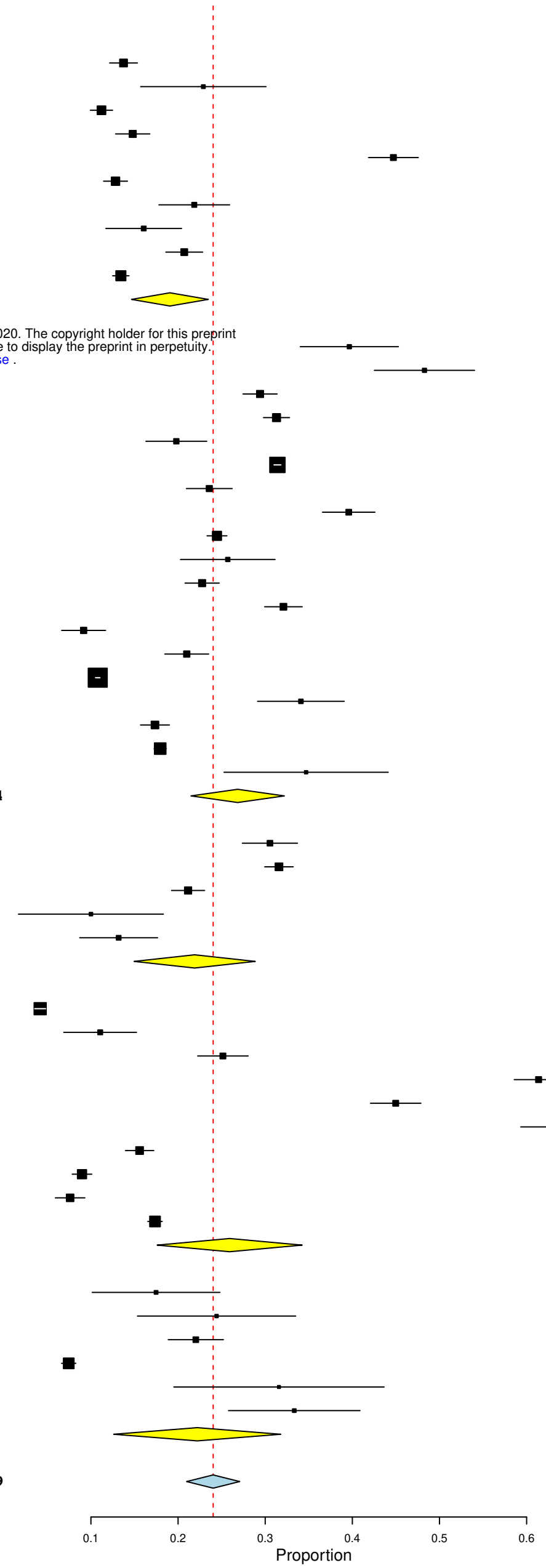
Author	Ref	Country	Depression Cases* (2017)	Anxiety Cases* (2017)	Country Population* (2017)	Depression Prevalence (2017)	Anxiety Prevalence (2017)
Ahmad	11	India	30017	44873	1,338,659	2.24%	3.35%
Ahn	12	Korea	1222	2002	51,362	2.38%	3.90%
Ahorsu (Female)	13	Iran	3461	5754	80,674	4.29%	7.13%
Ahorsu (Male)	13	Iran	3461	5754	80,674	4.29%	7.13%
Alyami	14	Saudi Arabia	1257	1735	33,099	3.80%	5.24%
Amerio	15	Italy	1453	3379	60,537	2.40%	5.58%
Bachilo	16	Russia	3838	4398	144,497	2.66%	3.04%
Bauer	17	Germany	2043	5265	82,657	2.47%	6.37%
Bauerle	18	Germany	2043	5265	82,657	2.47%	6.37%
Chang	19	China	28672	44745	1,386,395	2.07%	3.23%
Chen	20	China	28672	44745	1,386,395	2.07%	3.23%
Choi	21	China	28672	44745	1,386,395	2.07%	3.23%
Civantos	22	USA	9611	20965	324,986	2.96%	6.45%
Consolo	23	Italy	1453	3379	60,537	2.40%	5.58%
Fancourt	24	UK	1809	2956	66,059	2.74%	4.47%
Gao	25	China	28672	44745	1,386,395	2.07%	3.23%
Guo (Patient)	26	China	28672	44745	1,386,395	2.07%	3.23%
Hu	27	China	28672	44745	1,386,395	2.07%	3.23%
Islam	28	Bangladesh	4294	6575	159,671	2.69%	4.12%
Jia	29	UK	1809	2956	66,059	2.74%	4.47%
Johnson	30	Norway	127	388	5,277	2.40%	7.36%
Juanjuan	31	China	28672	44745	1,386,395	2.07%	3.23%
Kantor	32	USA	9611	20965	324,986	2.96%	6.45%
Kha.	33	India	30017	44873	1,338,659	2.24%	3.35%
Killgore	34	USA	9611	20965	324,986	2.96%	6.45%
Lai	35	China	28672	44745	1,386,395	2.07%	3.23%
Lin	36	China	28672	44745	1,386,395	2.07%	3.23%
Liu C	37	USA	9611	20965	324,986	2.96%	6.45%
Liu J	38	China	28672	44745	1,386,395	2.07%	3.23%
Mahedran	39	China	28672	44745	1,386,395	2.07%	3.23%
Mechili (Students)	40	Albania	41	98	2,873	1.42%	3.40%
Mechili (Family)	40	Albania	41	98	2,873	1.42%	3.40%
Munoz-.varro	41	Spain	1824	2397	46,593	3.91%	5.14%
Naser (General)	42	Jordan	244	495	9,779	2.49%	5.06%

Naser (Healthcare)	42	Jordan	244	495	9,779	2.49%	5.06%
Naser (Students)	42	Jordan	244	495	9,779	2.49%	5.06%
Nguyen	43	Vietnam	1269	2006	94,597	1.34%	2.12%
Olaseni	44	Nigeria	4080	5341	190,873	2.14%	2.80%
Pieh	45	Austria	168	460	8,798	1.91%	5.23%
Qian (Shangai)	46	China	28672	44745	1,386,395	2.07%	3.23%
Qian (Wuhan)	46	China	28672	44745	1,386,395	2.07%	3.23%
Que	47	China	28672	44745	1,386,395	2.07%	3.23%
Saddik (General)	48	UAE	226	458	9,487	2.38%	4.82%
Saddik (Students)	49	UAE	226	458	9,487	2.38%	4.82%
Salman (Students)	50	Pakistan	3559	7345	207,897	1.71%	3.53%
Salman (Healthcare)	51	Pakistan	3559	7345	207,897	1.71%	3.53%
Sartorao Filho	52	Brazil	5031	13197	207,834	2.42%	6.35%
Shi	53	China	28672	44745	1,386,395	2.07%	3.23%
Sigdel	54	Nepal	948	1100	27,627	3.43%	3.98%
Solomou	55	Cyprus	24	66	1,180	2.05%	5.61%
Stickley/Ueda	56/57	Japan	2992	4305	126,786	2.36%	3.40%
Stojanov (Healthcare/COVID)	58	Serbia	182	318	7,021	2.59%	4.53%
Stojanov (Healthcare/No-COVID)	58	Serbia	182	318	7,021	2.59%	4.53%
Sun	59	China	28672	44745	1,386,395	2.07%	3.23%
Tang W	60	China	28672	44745	1,386,395	2.07%	3.23%
Temsah	61	Saudi Arabia	1257	1735	33,099	3.80%	5.24%
Wang	62	China	28672	44745	1,386,395	2.07%	3.23%
Weilenmann	63	Switzerland	204	446	8,452	2.41%	5.28%
Xiao	64	China	28672	44745	1,386,395	2.07%	3.23%
Yamamoto	65	Japan	2992	4305	126,786	2.36%	3.40%
Zhang (Patient)	66	China	28672	44745	1,386,395	2.07%	3.23%
Zhang (Quarentine)	66	China	28672	44745	1,386,395	2.07%	3.23%
Zhang (General)	66	China	28672	44745	1,386,395	2.07%	3.23%
Zhao M	67	China	28672	44745	1,386,395	2.07%	3.23%
Zhao R	68	China	28672	44745	1,386,395	2.07%	3.23%
Zhou	69	China	28672	44745	1,386,395	2.07%	3.23%
Zhu Z	70	China	28672	44745	1,386,395	2.07%	3.23%

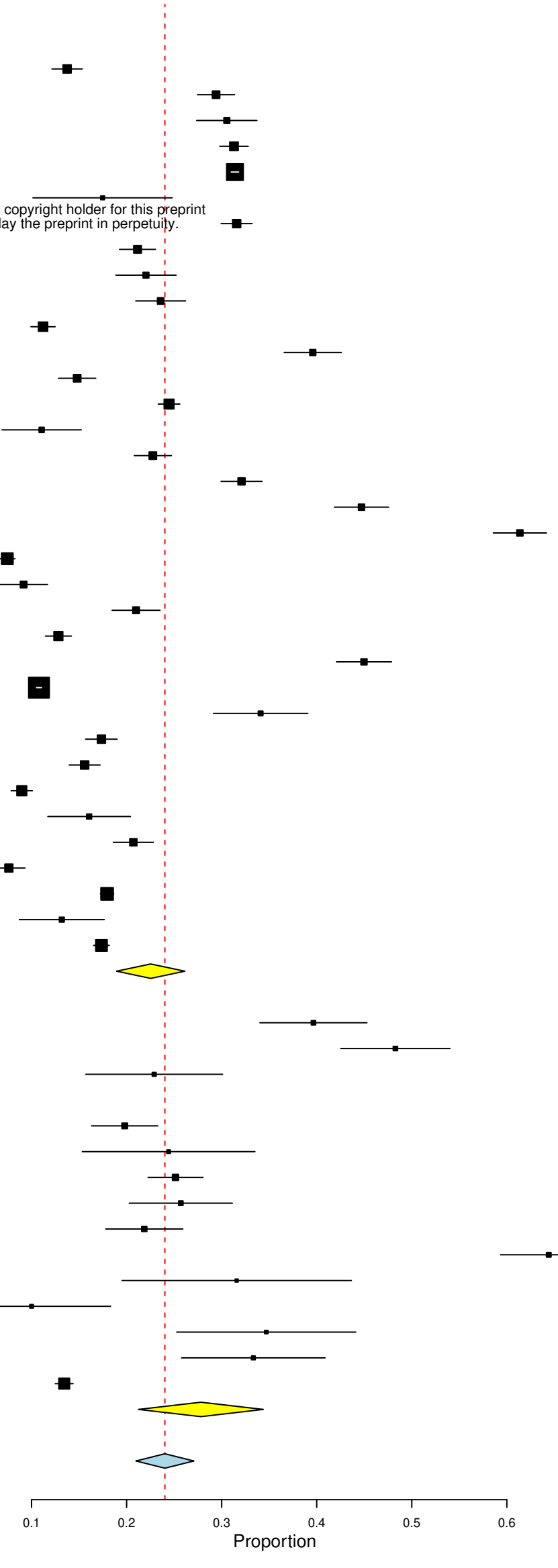
**in thousands*



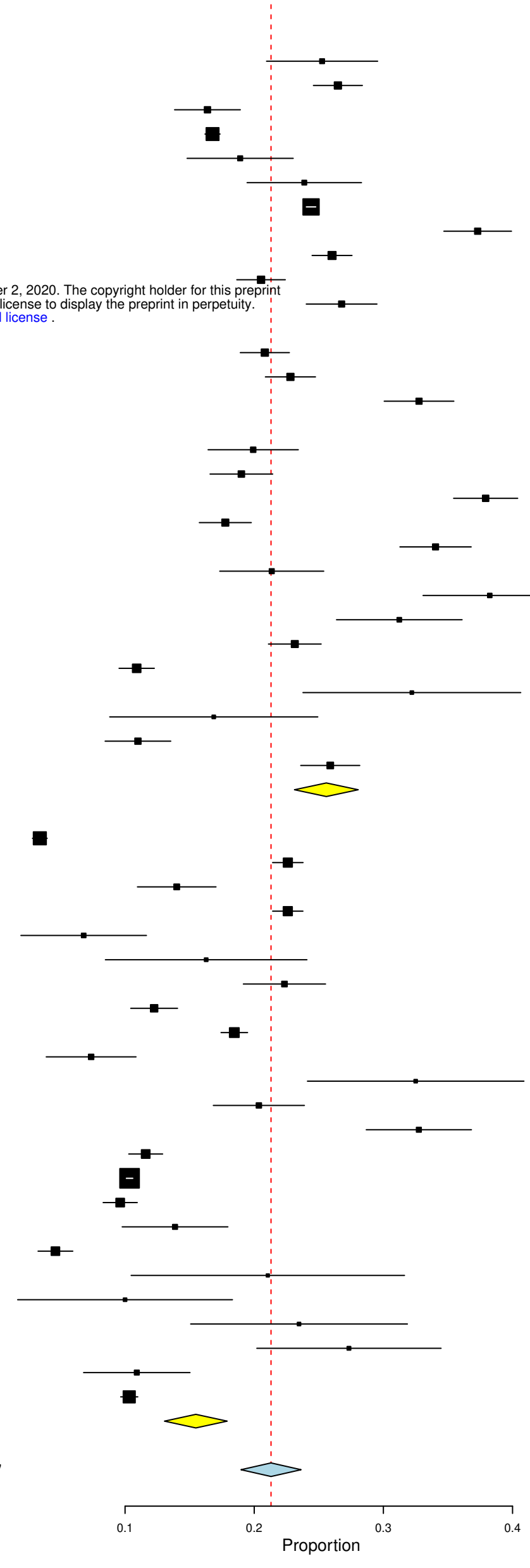
Studies	Estimate (95% C.I.)	Cases/Total
Ahn	0.137 (0.121, 0.153)	245/1783
Amerio	0.229 (0.157, 0.301)	30/131
Khana	0.112 (0.099, 0.125)	264/2355
Lai	0.148 (0.128, 0.168)	186/1257
Naser (Healthcare)	0.447 (0.419, 0.476)	520/1163
Que	0.128 (0.115, 0.142)	293/2285
Salman (Healthcare)	0.219 (0.178, 0.259)	87/398
Wang	0.161 (0.117, 0.204)	44/274
Weilenmann	0.207 (0.186, 0.228)	292/1410
Zhu Z	0.134 (0.125, 0.144)	680/5062
Subgroup Healthcare (I^2=9826 % , P=0.000)	**0.191 (0.147, 0.235)**	**2641/16118**
Ahorsu (Female)	0.397 (0.345, 0.453)	115/290
Ahorsu (Male)	0.483 (0.425, 0.540)	140/290
Alyami	0.294 (0.275, 0.314)	612/2081
Bauer	0.313 (0.298, 0.328)	1158/3700
Choi	0.198 (0.163, 0.233)	99/500
Fancourt	0.314 (0.310, 0.318)	16745/53328
Kantor	0.236 (0.210, 0.262)	237/1005
Killgore	0.396 (0.366, 0.426)	401/1013
Lin	0.245 (0.233, 0.256)	1336/5461
Mechili (Family)	0.257 (0.203, 0.311)	64/249
Munoz−Navarro	0.228 (0.208, 0.247)	399/1753
Naser (General)	0.321 (0.299, 0.342)	577/1798
Olaseni	0.092 (0.066, 0.117)	46/502
Pieh	0.210 (0.185, 0.235)	211/1005
Shi	0.108 (0.105, 0.110)	6110/56679
Sigdel	0.341 (0.291, 0.391)	119/349
Stickley/Ueda	0.173 (0.157, 0.190)	347/2000
Yamamoto	0.179 (0.172, 0.187)	2034/11333
Zhang (General)	0.347 (0.253, 0.441)	34/98
Subgroup General (I^2=9979 % , P=0.000)	**0.268 (0.215, 0.322)**	**30784/143434**
Bachilo	0.305 (0.274, 0.337)	248/812
Jia	0.316 (0.299, 0.332)	978/3097
Johnson	0.211 (0.192, 0.230)	376/1778
Zhang (Quarentine)	0.100 (0.017, 0.183)	5/50
Zhao R	0.132 (0.087, 0.177)	29/220
Subgroup Mixed (I^2=9675 % , P=0.000)	**0.219 (0.150, 0.289)**	**1636/5957**
Chang	0.042 (0.035, 0.048)	162/3881
Liu J	0.111 (0.069, 0.152)	24/217
Mechili (Students)	0.251 (0.223, 0.280)	217/863
Naser (Students)	0.614 (0.586, 0.642)	715/1165
Salman (Students)	0.450 (0.421, 0.479)	510/1134
Sartorao Filho	0.644 (0.593, 0.695)	219/340
Sun	0.156 (0.140, 0.172)	298/1912
Tang W	0.090 (0.079, 0.101)	223/2485
Xiao	0.076 (0.059, 0.093)	71/933
Zhou	0.174 (0.165, 0.182)	1402/8079
Subgroup Students (I^2=9970 % , P=0.000)	**0.259 (0.176, 0.342)**	**3841/21009**
Guo (Patient)	0.175 (0.101, 0.248)	18/103
Hu	0.244 (0.153, 0.335)	21/86
Juanjuan	0.220 (0.189, 0.252)	145/658
Nguyen	0.074 (0.066, 0.083)	294/3947
Zhang (Patient)	0.316 (0.195, 0.436)	18/57
Zhao M	0.333 (0.258, 0.409)	50/150
Subgroup Patient (I^2=9663 % , P=0.000)	**0.222 (0.126, 0.318)**	**546/5001**
Overall (I^2=9965 % , P=0.000)	**0.240 (0.210, 0.271)**	**39448/191519**



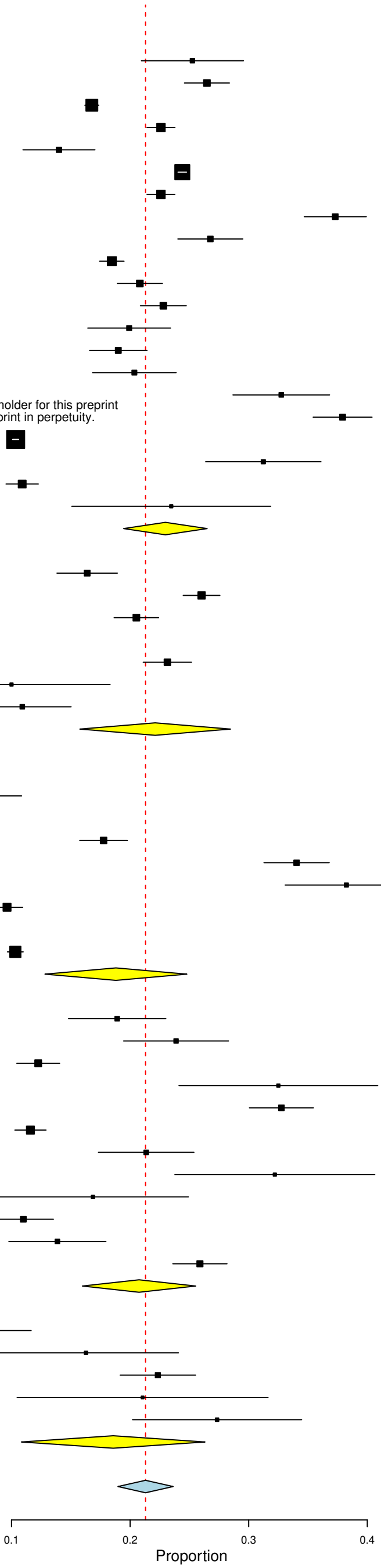
Studies	Estimate (95% C.I.)	Cases/Total
Ahn	0.137 (0.121, 0.153)	245/1783
Alyami	0.294 (0.275, 0.314)	612/2081
Bachilo	0.305 (0.274, 0.337)	248/812
Bauer	0.313 (0.298, 0.328)	1158/3700
Fancourt	0.314 (0.310, 0.318)	16745/53328
Guo (Patient)	0.175 (0.101, 0.248)	18/103
Jia	0.316 (0.310, 0.322)	9748/30837
Johnson	0.211 (0.192, 0.230)	376/1778
Juanjuan	0.220 (0.189, 0.252)	145/658
Kantor	0.236 (0.210, 0.262)	237/1005
Khana	0.112 (0.099, 0.125)	264/2355
Killgore	0.396 (0.366, 0.426)	401/1013
Lai	0.148 (0.128, 0.168)	186/1257
Lin	0.245 (0.233, 0.256)	1336/5461
Liu J	0.111 (0.069, 0.152)	24/217
Munoz−Navarro	0.228 (0.208, 0.247)	399/1753
Naser (General)	0.321 (0.299, 0.342)	577/1798
Naser (Healthcare)	0.447 (0.419, 0.476)	520/1163
Naser (Students)	0.614 (0.586, 0.642)	715/1165
Nguyen	0.074 (0.066, 0.083)	294/3947
Olaseni	0.092 (0.066, 0.117)	46/502
Pieh	0.210 (0.185, 0.235)	211/1005
Que	0.128 (0.115, 0.142)	293/2285
Salman (Students)	0.450 (0.421, 0.479)	510/1134
Shi	0.108 (0.105, 0.110)	6110/56679
Sigdel	0.341 (0.291, 0.391)	119/349
Stickley/Ueda	0.173 (0.157, 0.190)	347/2000
Sun	0.156 (0.140, 0.172)	298/1912
Tang W	0.090 (0.079, 0.101)	223/2485
Wang	0.161 (0.117, 0.204)	44/274
Weilenmann	0.207 (0.186, 0.228)	292/1410
Xiao	0.076 (0.059, 0.093)	71/933
Yamamoto	0.179 (0.172, 0.187)	2034/11333
Zhao R	0.132 (0.087, 0.177)	29/220
Zhou	0.174 (0.165, 0.182)	1402/8079
Subgroup National (I^2=9971 % , P=0.000)	**0.225 (0.189, 0.261)**	**37507/179074**
Ahorsu (Female)	0.397 (0.340, 0.453)	115/290
Ahorsu (Male)	0.483 (0.425, 0.540)	140/290
Amerio	0.229 (0.157, 0.301)	30/131
Chang	0.042 (0.035, 0.048)	162/3881
Choi	0.198 (0.163, 0.233)	99/500
Hu	0.244 (0.153, 0.335)	21/86
Mechili (Students)	0.251 (0.223, 0.280)	217/863
Mechili (Family)	0.257 (0.203, 0.311)	64/249
Salman (Healthcare)	0.219 (0.178, 0.259)	87/398
Sartorao Filho	0.644 (0.593, 0.695)	219/340
Zhang (Patient)	0.316 (0.195, 0.436)	18/57
Zhang (Quarentine)	0.100 (0.017, 0.183)	5/50
Zhang (General)	0.347 (0.253, 0.441)	34/98
Zhao M	0.333 (0.258, 0.409)	50/150
Zhu Z	0.134 (0.125, 0.144)	680/5062
Subgroup Regional (I^2=9899 % , P=0.000)	**0.278 (0.213, 0.344)**	**1941/12445**
Overall (I^2=9965 % , P=0.000)	**0.240 (0.210, 0.271)**	**39448/191519**



Studies	Estimate (95% C.I.)	Cases/Total
Ahmad	0.253 (0.210, 0.296)	99/392
Alyami	0.265 (0.246, 0.284)	551/2081
Bachilo	0.164 (0.138, 0.189)	133/812
Bauerle	0.168 (0.162, 0.174)	2634/15704
Civantos	0.189 (0.148, 0.230)	66/349
Consolo	0.239 (0.194, 0.283)	85/356
Fancourt	0.244 (0.240, 0.248)	13012/53328
Islam	0.373 (0.347, 0.399)	489/1311
Jia	0.260 (0.245, 0.276)	806/3097
Johnson	0.205 (0.187, 0.224)	365/1778
Kantor	0.246 (0.240, 0.252)	2769/11255
Liu C	0.454 (0.422, 0.487)	408/898
Munoz−Navarro	0.208 (0.189, 0.227)	365/1753
Naser (General)	0.228 (0.209, 0.247)	410/1798
Naser (Healthcare)	0.328 (0.301, 0.355)	381/1163
Naser (Students)	0.458 (0.430, 0.487)	534/1165
Olaseni	0.199 (0.164, 0.234)	100/502
Pieh	0.190 (0.166, 0.214)	191/1005
Saddik (General)	0.379 (0.354, 0.404)	557/1469
Saddik (Students)	0.178 (0.157, 0.198)	246/1385
Salman (Students)	0.340 (0.313, 0.368)	386/1134
Salman (Healthcare)	0.214 (0.173, 0.254)	85/398
Sartorao Filho	0.382 (0.331, 0.434)	130/340
Sigdel	0.312 (0.264, 0.361)	109/349
Solomou	0.231 (0.211, 0.252)	380/1642
Stickley/Ueda	0.109 (0.095, 0.123)	218/2000
Stojanov (Healthcare COVID)	0.322 (0.238, 0.406)	38/118
Stojanov (Healthcare No−COVID)	0.169 (0.088, 0.249)	14/83
Temsah	0.110 (0.085, 0.135)	64/582
Weilenmann	0.259 (0.236, 0.282)	365/1410
Subgroup Other (I^2=9843 % , P=0.000)	**0.256 (0.231, 0.280)**	**23490/99407**
Chang	0.034 (0.028, 0.040)	132/3881
Chen	0.226 (0.214, 0.238)	1091/4827
Choi	0.140 (0.110, 0.170)	70/500
Gao	0.226 (0.214, 0.238)	1101/4872
Guo (Patient)	0.068 (0.019, 0.117)	7/103
Hu	0.163 (0.085, 0.241)	14/86
Juanjuan	0.223 (0.192, 0.255)	147/658
Lai	0.123 (0.104, 0.141)	154/1257
Lin	0.185 (0.174, 0.195)	1008/5461
Liu J	0.074 (0.039, 0.109)	16/217
Mahedran	0.325 (0.241, 0.409)	39/120
Qian (Shangai)	0.204 (0.168, 0.239)	102/501
Qian (Wuhan)	0.327 (0.287, 0.368)	167/510
Que	0.116 (0.103, 0.129)	265/2285
Shi	0.103 (0.101, 0.106)	5866/56679
Sun	0.096 (0.083, 0.109)	184/1912
Wang	0.139 (0.098, 0.180)	38/274
Xiao	0.046 (0.033, 0.060)	43/933
Zhang (Patient)	0.211 (0.105, 0.316)	12/57
Zhang (Quarentine)	0.100 (0.017, 0.183)	5/50
Zhang (General)	0.235 (0.151, 0.319)	23/98
Zhao M	0.273 (0.202, 0.345)	41/150
Zhao R	0.109 (0.068, 0.150)	24/220
Zhou	0.103 (0.097, 0.110)	834/8079
Subgroup China (I^2=9885 % , P=0.000)	**0.155 (0.131, 0.179)**	**11383/93730**
Overall (I^2=9943 % , P=0.000)	**0.213 (0.190, 0.236)**	**34873/193137**



Studies	Estimate (95% C.I.)	Cases/Total
Ahmad	0.253 (0.210, 0.296)	99/392
Alyami	0.265 (0.246, 0.284)	551/2081
Bauerle	0.168 (0.162, 0.174)	2634/15704
Chen	0.226 (0.214, 0.238)	1091/4827
Choi	0.140 (0.110, 0.170)	70/500
Fancourt	0.244 (0.240, 0.248)	13012/53328
Gao	0.226 (0.214, 0.238)	1101/4872
Islam	0.373 (0.347, 0.399)	489/1311
Kantor	0.268 (0.240, 0.295)	269/1005
Lin	0.185 (0.174, 0.195)	1008/5461
Munoz−Navarro	0.208 (0.189, 0.227)	365/1753
Naser (General)	0.228 (0.209, 0.247)	410/1798
Olaseni	0.199 (0.164, 0.234)	100/502
Pieh	0.190 (0.166, 0.214)	191/1005
Qian (Shangai)	0.204 (0.168, 0.239)	102/501
Qian (Wuhan)	0.327 (0.287, 0.368)	167/510
Saddik (General)	0.152 (0.150, 0.154)	5479/36041
Shi	0.103 (0.101, 0.106)	5866/56679
Sigdel	0.312 (0.264, 0.361)	109/349
Stickley/Ueda	0.109 (0.095, 0.123)	218/2000
Zhang (General)	0.235 (0.151, 0.319)	23/98
Subgroup General (I^2=9962 % , P=0.000)	**0.230 (0.195, 0.265)**	**28432/156145**
Bachilo	0.164 (0.138, 0.189)	133/812
Jia	0.260 (0.245, 0.276)	806/3097
Johnson	0.205 (0.187, 0.224)	365/1778
Liu C	0.454 (0.422, 0.487)	408/898
Solomou	0.231 (0.211, 0.252)	380/1642
Zhang (Quarentine)	0.100 (0.017, 0.183)	5/50
Zhao R	0.109 (0.068, 0.150)	24/220
Subgroup Mixed (I^2=9778 % , P=0.000)	**0.221 (0.158, 0.285)**	**2121/8497**
Chang	0.034 (0.028, 0.040)	132/3881
Liu J	0.074 (0.039, 0.109)	16/217
Naser (Students)	0.458 (0.430, 0.487)	534/1165
Saddik (Students)	0.178 (0.157, 0.198)	246/1385
Salman (Students)	0.340 (0.313, 0.368)	386/1134
Sartorao Filho	0.382 (0.331, 0.434)	130/340
Sun	0.096 (0.083, 0.109)	184/1912
Xiao	0.046 (0.033, 0.060)	43/933
Zhou	0.103 (0.097, 0.110)	834/8079
Subgroup Students (I^2=9949 % , P=0.000)	**0.188 (0.128, 0.248)**	**2505/19046**
Civantos	0.189 (0.148, 0.230)	66/349
Consolo	0.239 (0.194, 0.283)	85/356
Lai	0.123 (0.104, 0.141)	154/1257
Mahedran	0.325 (0.241, 0.409)	39/120
Naser (Healthcare)	0.328 (0.301, 0.355)	381/1163
Que	0.116 (0.103, 0.129)	265/2285
Salman (Healthcare)	0.214 (0.173, 0.254)	85/398
Stojanov (Healthcare COVID)	0.322 (0.238, 0.406)	38/118
Stojanov (Healthcare No−COVID)	0.169 (0.088, 0.249)	14/83
Temsah	0.110 (0.085, 0.135)	64/582
Wang	0.139 (0.098, 0.180)	38/274
Weilenmann	0.259 (0.236, 0.282)	365/1410
Subgroup Healthcare (I^2=9680 % , P=0.000)	**0.208 (0.160, 0.255)**	**1594/8395**
Guo (Patient)	0.068 (0.019, 0.117)	7/103
Hu	0.163 (0.085, 0.241)	14/86
Juanjuan	0.223 (0.192, 0.255)	147/658
Zhang (Patient)	0.211 (0.105, 0.316)	12/57
Zhao M	0.273 (0.202, 0.345)	41/150
Subgroup Patient (I^2=8832 % , P=0.000)	**0.186 (0.108, 0.263)**	**221/1054**
Overall (I^2=9943 % , P=0.000)	**0.213 (0.190, 0.236)**	**34873/193137**



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Bauerle	0.168 (0.162, 0.174)	2634/15704
Chen	0.226 (0.214, 0.238)	1091/4827
Civantos	0.189 (0.148, 0.230)	66/349
Fancourt	0.244 (0.240, 0.248)	13012/53328
Gao	0.226 (0.214, 0.238)	1101/4872
Guo (Patient)	0.068 (0.019, 0.117)	7/103
Islam	0.373 (0.347, 0.399)	489/1311
Jia	0.260 (0.246, 0.275)	806/3097
Johnson	0.205 (0.187, 0.224)	365/1778
Juanjuan	0.223 (0.192, 0.255)	147/658
Kantor	0.268 (0.240, 0.295)	269/1005
Lai	0.123 (0.104, 0.141)	154/1257
Lin	0.185 (0.174, 0.195)	1008/5461
Liu C	0.454 (0.422, 0.487)	408/898
Liu J	0.074 (0.039, 0.109)	16/217
Munoz−Navarro	0.208 (0.189, 0.227)	365/1753
Naser (General)	0.228 (0.209, 0.247)	410/1798
Naser (Healthcare)	0.328 (0.301, 0.355)	381/1163
Naser (Students)	0.458 (0.430, 0.487)	534/1165
Olaseni	0.199 (0.164, 0.234)	100/502
Pieh	0.190 (0.166, 0.214)	191/1005
Que	0.116 (0.103, 0.129)	265/2285
Saddik (General)	0.379 (0.354, 0.404)	557/1469
Saddik (Students)	0.178 (0.157, 0.198)	246/1385
Salman (Students)	0.340 (0.313, 0.368)	386/1134
Shi	0.103 (0.101, 0.106)	5866/56679
Sigdel	0.312 (0.264, 0.361)	109/349
Solomou	0.231 (0.211, 0.252)	380/1642
Stickley/Ueda	0.109 (0.095, 0.123)	218/2000
Sun	0.096 (0.083, 0.109)	184/1912
Wang	0.139 (0.098, 0.180)	38/274
Weilenmann	0.259 (0.236, 0.282)	365/1410
Xiao	0.046 (0.033, 0.060)	43/933
Zhao R	0.109 (0.068, 0.150)	24/220
Zhou	0.103 (0.097, 0.110)	834/8079
Subgroup National (I^2=9949 % , P=0.000)	**0.213 (0.187, 0.239)**	**33852/185307**
Chang	0.034 (0.028, 0.040)	132/3881
Choi	0.140 (0.110, 0.170)	70/500
Consolo	0.239 (0.194, 0.283)	85/356
Hu	0.163 (0.085, 0.241)	14/86
Mahedran	0.325 (0.241, 0.409)	39/120
Qian (Shangai)	0.204 (0.168, 0.239)	102/501
Qian (Wuhan)	0.327 (0.287, 0.368)	167/510
Salman (Healthcare)	0.214 (0.173, 0.254)	85/398
Sartorao Filho	0.382 (0.331, 0.434)	130/340
Stojanov (Healthcare COVID)	0.322 (0.238, 0.406)	38/118
Stojanov (Healthcare No−COVID)	0.169 (0.088, 0.249)	14/83
Temsah	0.110 (0.085, 0.135)	64/582
Zhang (Patient)	0.211 (0.105, 0.316)	12/57
Zhang (Quarentine)	0.100 (0.017, 0.183)	5/50
Zhang (General)	0.235 (0.151, 0.319)	23/98
Zhao M	0.273 (0.202, 0.345)	41/150
Subgroup Regional (I^2=9804 % , P=0.000)	**0.214 (0.150, 0.279)**	**1021/7830**
Overall (I^2=9943 % , P=0.000)	**0.213 (0.190, 0.236)**	**34873/193137**