Online Data Supplement

Asthma in Adult Patients with COVID-19: Prevalence and Risk of Severe Disease

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Supplemental Table E1. Asthma prevalence in patients with COVID-19

First author, year	Study description	Overall prevalence of asthma	Prevalence of asthma according to COVID-19 severity	Study limitations and comments
North America				
New York City region, USA				
Abrams, 2020[10]	133 patients ≥18 years who died after being admitted to one of three Columbia/NY Presbyterian hospitals with a positive test for COVID-19, 3/1 – 4/3/20	4.5%	Patients were recruited into the study only if they died	This study showed lower prevalence of asthma than the NYC adult population and most of the other studies conducted in the NYC region; these asthma data were not included in the overall pooled prevalence because surviving patients were excluded
Andrikopoulou, 2020[11]	Case series of 158 pregnant women with laboratory-confirmed COVID-19 in New York City, 3/13 - 4/19/20	11.4%	Non-severe: 8.1% (n=124) Severe: 23.5% (n=34)	

Argenziano, 2020[12]	1,000 PCR-confirmed patients with COVID-19 presenting at the Emergency Department at a hospital in New York City, 3/1 - 4/5/20	11.3%	Not hospitalized: 16.7% (n=150) Hospitalized: 10.4% (n=850) No ICU: 9.6% (n=614) ICU: 12.3% (n=236)	No association between presence of asthma and need for intensive care
Clouston, 2020[13]	A retrospective cohort study of 1,387 admitted to a hospital in Long Island, NY, 3/7 – 5/15/20	6.3%	Survived: 6.2% (n=1,176) Died: 6.6% (n=211)	Multivariable RR of mortality for asthma = 0.90 (0.52-1.57)
Cummings, 2020[14]	Prospective cohort of 257 critically ill patients admitted to hospitals in New York City with laboratory-confirmed COVID-19, 3/2 - 4/1/20	8.2%	All patients had severe COVID-19; mortality was not examined with respect to asthma	
Gayam, 2021[15]	A retrospective cohort study of 408 African-American patients hospitalized with COVID-19 in New York City, 3/1 – 4/9/20	13.2%	Survived: 13.8% (n=276) Died: 12.1% (n=132)	
Goyal, 2020[16]	A retrospective case series among 391 adults ≥18 years of age with confirmed COVID-19, admitted to hospitals in New York City in March 2020, 3/3 – 3/27/20	12.5%	No ventilation: 12.2% (n=263) Ventilation: 13.1% (n=130)	
Lieberman-Cribbin, 2020[17]	Anonymous data from 6,245 patients with laboratory-confirmed COVID-19 within a hospital system in New York City with self-reported asthma, 2/29 – 4/24/20	4.4%	In multivariable models, asthma was not associated with higher mortality in patients with COVID-19	Asthma prevalence in patients with COVID-19 was lower than an uninfected comparison group (6.7%)
Lovinsky-Desir, 2020[18]	Data from 1,298 patients ≤65 years of age (95.8% over age 20) with	12.6%	No intubation: 12.4% (n=1,030) Intubation: 13.1% (n=268)	Only 9 participants with asthma died; the observed

	COVID-19 who were hospitalized or died in the emergency department of a New York City hospital network, 2/11 – 5/7/20		Survived: 13.0% (n=1,188) Died: 8.2% (n=110)	lover prevalence of asthma in those who died was observed both with and without several other co-morbidities
Maeda, 2020[19]	A retrospective cohort study of 224 adults hospitalized with COVID-19 in New York City, 3/13 – 3/31/20	10.3%	No ICU: 11.4% (n=167) ICU: 7.0% (n=57)	Only 23 participants had asthma
Mikami, 2020[20]	A retrospective cohort study of 6,493 patients with laboratory-confirmed COVID-19 in New York City, 3/13 – 4/17	4.2%	Not hospitalized: 3.5% (n=2,785) Hospitalized: 4.7% (n=3,708) Survived: 4.8% (n=2,014) Died: 4.5% (n=1,694)	
Marcello, 2020[21]	A retrospective cohort study of 10,143 people with diagnosis histories who tested positive for SARS-CoV-2 within the New York City Public Hospital System, 3/5 – 4/9/20	7%*	Survived: 7.4% (n=4,363) Died: 6% (n=1,717)	Individuals testing negative for SARS-CoV-2 has 11% prevalence of asthma (n=6,464))
Palaiodimos, 2020[22]	A retrospective cohort study of 200 adults admitted to a hospital in New York City with laboratory-confirmed COVID-19, 3/9 – 3/22/20	13.5%	Univariate OR of mortality for asthma was 0.51 (0.17 - 1.56)	
Van Gerwen, 2021[23]	A retrospective cohort study of 3,703 adults with laboratory-confirmed COVID-19 in New York City, 3/1 – 4/1/20	11.6%	Not hospitalized: 11.7% (n=1,688) Hospitalized: 11.5% (n=2,015) Survived: 12.2% (n=1,399) Died: 9.9% (n=616)	
Wang A, 2020[24]	A retrospective cohort study of 7,592 (mostly adult) people with laboratory-confirmed COVID-19 in	4.5%		Multivariable RR of mortality for asthma was 0.63 (0.38-1.04)

	New York City, up to 4/15/20			
Paranjpe, 2020[25]	2,199 adults with confirmed COVID-19 within the Mount Sinai medical system in New York City, 2/27 – 4/2/20	8.2%	Survived: 8.3% (n=1,889) Inpatient death: 7.4% (n=310)	
Richardson, 2020[26]	5,700 patients hospitalized with laboratory-confirmed COVID-19 in the New York City region, 3/1 – 4/4/20	9%*	COVID-19 severity was not examined	
Singer, 2020[27]	1,651 people presenting to a large academic medical center emergency department, on eastern Long Island, NY, with confirmed COVID-19, 3/13 – 4/14/20	6%*	Not hospitalized: 5.1% (n = 914) Hospitalized: 7.1% (n = 737)	Prevalence of asthma in COVID-19-negative people was 11% (n=1,246)
Toussie, 2020[28]	Retrospective study of 338 adults (age 21-50) with laboratory-confirmed COVID-19 in New York City, 3/3 – 3/26/20	13.6%	Non-severe 14.4% (n=202) Severe: 12.5% (n=136)	
Pujadas, 2020[157]	Prospective study of 1,145 patients hospitalized with laboratory-confirmed COVID-19 in New York City, 3/13 – 5/4/20	N/A	RR of mortality for asthma was 0.92 (0.57 – 1.49) (n=1,145)	
Other Eastern USA				
Fox, 2020[29]	Retrospective analysis of 355 adults with COVID-19 hospitalized in	7.6%		Multivariable OR of morbidity for asthma among

	Philadelphia, PA, 3/1 – 4/24/20			166 patients who also had diabetes was 0.71 (0.08 – 6.67)
Salacup, 2020[30]	A retrospective study of 242 adults who were hospitalized with COVID-19 in Philadelphia, PA, 3/1 – 4/24/20	7.4%	Survived: 10% (n=190) Died: 0% (n=52)	
Dashti, 2020[31]	A retrospective study of 4,140 patients with at least one positive or presumptive positive COVID-19 test results in the Partners system in Boston, MA, 12/1/19 – 4/18/20	12.9%	Not hospitalized: 12.2% (n=2,759) Hospitalized: 14.3% (n=1,194) No ICU: 14.5% (n=619) ICU: 14.1% (n=575) Survived: 12.9% (n=3,953) Died: 13.4% (n=187)	
Hsu, 2020[32]	2,729 adult outpatients and inpatients with laboratory-confirmed COVID-19 seen at a medical center in Boston, Massachusetts, 3/1 – 5/18/20	13.2%	Outpatients: 11.4% (n = 1,543) Inpatients: 15.5% (n=1,186) Non-ICU: 15.6% (n=900) ICU - no ventilation: 8.7% (n=69) ICU - ventilation: 19.3% (n=119) Survived: 15.5% (n=1088) Died: 15.3% (n=98)	
Robinson, 2020[152]	Matched study of 403 patients with COVID-19 in Boston, MA, 3/8 – 4/27/20	N/A	Survived: 20.4% (n=358) Died: 15.6% (n=45)	Relative risk of death for patients with asthma was 0.64 (0.24-1.68)
Garibaldi, 2020[33]	A retrospective cohort of 832 patients admitted to hospitals in Maryland and Washington DC, 3/4 – 4/24/20	9.5%	Not severe: 10.3% (n=523) Severe: 9.4% (n=171) Survived: 10.1% (n=694) Died: 6.1% (n=131)	
Newton, 2020[34]	A case series of 993 patients with	13.5%	Not hospitalized: 12.1% (n=553)	

	symptomatic COVID-19 presenting to an emergency department in Washington, DC, 3/12 – 8/9/20		Hospitalized: 15.2% (n=440) No ICU: 14.6% (n=370) ICU: 18.6% (n=70)	
Rosenthal, 2021[151]	Retrospective study of 727 with COVID-19 in Washington DC, March-May, 2020	N/A	Not hospitalized: 14.6% (n=453) Hospitalized: 14.2% (n=274) No ICU: 14.3% (659) ICU: 16.2% (n=68) Survived: 14.3% (n=666) Died: 16.4% (n=61)	Patients with other lung diseases were excluded
O'Keefe, 2020[35]	A retrospective cohort study of 496 adults with laboratory-confirmed COVID-19 in Atlanta, GA, 3/24 – 5/26/20	14.7%	Not hospitalized: 14.5% (n=461) Hospitalized: 17.1% (n=35)	
Western USA				
Arentz, 2020[36]	A series of 21 incident cases (case series) of COVID-19 admitted to the ICU at a hospital in Washington state, 2/20 – 3/5/20	9.1%	All had severe disease requiring admission to ICU	Only 2 participants with asthma
Azar, 2020[37]	A retrospective cohort study of 1,052 adults with confirmed COVID-19 in Northern California, 1/1 – 4/8/20	11.3%	Not admitted: 9.6% (n=796) Admitted: 11.3% (n=356) No ICU: 15.8% (n=146) ICU: 18.2% (n=110) Survived: 17.1% (n-59) Died: 19.6% (n=51)	Prevalence of asthma was higher (we calculated 15.7%) among 12,984 patients who tested negative for COVID-19; values for "survived," "no ICU," and "not admitted" were estimated
Shah, 2020[38]	A retrospective cohort study of 316 adults with laboratory-confirmed	12.1%	COVID-19 severity was not examined	The prevalence of asthma in 283 participants who tested

	COVID-19 in San Francisco, CA, 2/3 – 3/31/20			negative for COVID-19 was 13.4%
Yan, 2020[39]	A retrospective cohort study of 128 adults with laboratory-confirmed COVID-19 in San Diego, CA, 3/3 – 4/8/20	10.2%	Not hospitalized: 9.8% (n=102) Hospitalized: 11.5% (n=26)	
Bhatraju, 2020[40]	24 patients from nine Seattle-area hospitals who were admitted to the ICU with confirmed COVID-19, 2/24 – 3/9/20	14%*	All had severe disease requiring admission to ICU	Only 3 participants with asthma
Bruckner, 2020[41]	Retrospective chart review of 105 adults with laboratory-confirmed COVID-19 admitted to one of three hospitals in Seattle, Washington, 3/2 – 3/26/20	9.5%	Not severe: 13.0% (n=54) Severe: 5.9% (n=51)	Only 3 participants with asthma had severe COVID-19
Lokken, 2020[42]	Retrospective study of 46 pregnant patients hospitalized with a laboratory-confirmed severe acute COVID-19 in Washington State, 1/21 – 4/17/20	8.7%	COVID-19 severity was not examined	Only 2 participants with asthma
Duanmu, 2020[43]	Retrospective study of 100 adults presenting at an emergency room (ER) in Northern California with laboratory-confirmed COVID-19, 3/4 - 3/23/20	10.0%	Not hospitalized: 9% (n=76) Hospitalized: 13% (n=24)	Only 10 participants had asthma
Ferguson, 2020[44]	Retrospective study of 72 adults with laboratory-confirmed COVID-19 in	9.7%	COVID-19 severity was not examined	Only 7 participants had asthma

	Northern California, 3/13 – 4/11/20			
Monteiro, 2020[45]	A retrospective cohort study of 112 adults hospitalized with COVID-19 in Los Angeles, CA, 3/12 – 6/16/20	11.6%	Not intubated: 10.7% (n=84) Intubated: 14.3% (n=28)	Only 13 participants with asthma
Tartof, 2020[46]	A retrospective cohort study of 6,916 mostly adult members of Kaiser Permanente Southern California with COVID-19 diagnosis (code or laboratory), 2/13 – 5/2/20	18.4%	Survived: 18.3% (n=6,710) Died: 21.4% (n=206)	Multivariable RR of death for asthma patients was 0.81 (0.54–1.21)
Dai, 2020[47]	A retrospective cohort study of 863 patients from California, Oregon, and Washington with COVID-19, 3/1 – 8/30/20	4.8%	COVID-19 severity was not examined	Among 305,588 people in the cohort who tested negative for COVID-19, the prevalence of asthma was approximately 7.1%
Broadhurst, 2020[48]	436 patients with COVID-19 admitted to a hospital in Denver, Colorado (exact dates of assessment were not specified)	12.2%	No ICU: 13.7% (n=212) ICU: 10.8% (n=139) Not intubated: 13.7% (n=227) Intubated: 10.8% (n=111)	
Barasa, 2020[49]	A retrospective chart review of 117 adults with laboratory-confirmed COVID-19 in Oregon, 2/2 – 10/21/20	12.0%	COVID-19 severity was not examined	The prevalence of asthma in 277 participants who tested negative for COVID-19 was 13.1%
Midwestern USA				
Campioli, 2020[50]	Retrospective analysis of 251 adults with laboratory-confirmed COVID-19	18.3%	Not hospitalized: 18.0% (n=189) Hospitalized: 19.4% (n=62)	

	in Minnesota, both ambulatory and hospitalized, who subsequently tested negative for the disease, 2/1 – 3/15/20			
Chhiba, 2020[51]	1,526 patients with laboratory-confirmed COVID-19 in Illinois, 3/1 – 4/15/20	14.4%	Not Hospitalized: 15.6% (n=853) Hospitalized: 13.5% (n=853)	Obesity, hypertension, coronary artery disease, COPD and GERD were co-morbid with asthma; control of these and other risk factors (age, gender, race, smoking, diabetes, sleep apnea) did not show an association between asthma and hospitalization for COVID-19
Mahadavinia, 2020[52]	Retrospective study of 935 patients hospitalized with laboratory-confirmed severe acute COVID-19 in Illinois, 3/12 – 4/3/20	25.8%	Duration of intubation longer in patients with asthma. No statistically significant difference by asthma status in percent or duration of hospitalization, ARDS, or need for intubation.	Association with length of intubation was not observed in patients with allergic asthma
Nguyen, 2020[53]	A retrospective analysis of data from 689 (mostly adult) patients with laboratory-confirmed COVID-19 in Chicago, Illinois, 3/16 – 4/16/20	17.3%	Not hospitalized: 19.3% (n=306) Hospitalized: 15.2% (n=302) Survived: 16.5% (n=266) Died: 5.9% (n=34)	Most participants were African-American
Jehi, 2020[54]	A retrospective cohort study of 4,536 patients hospitalized with COVID-19 in the Cleveland Clinic system in Ohio and Florida, 3/8/20 – 6/5/20	14.4%	Not hospitalized: 12.9% (3,578) Hospitalized: 19.7% (n=958)	

Meyers, 2020[55]	A cohort study of 91 adults with laboratory-confirmed COVID-19 in Indianapolis, IN, 4/6 – 5/26/20	5.5%	COVID-19 severity was not examined	Among 2,862 in the cohort who tested negative for COVID-19, the prevalence of asthma was 9.0%
Mendy, 2020[56]	Retrospective study of 689 adults with laboratory-confirmed COVID-19 in Ohio, Kentucky, and Indiana, 3/13 – 5/31/20	10.2%	Not hospitalized: 7.2% (n=473) Hospitalized: 16.7% (n=216) Not severe: 7.9% (n=598) Severe: 25.3% (n=91)	Asthma was associated with COVID-19 severity in multivariable models
Keswani, 2020[57]	1,043 patients with confirmed COVID-19 in Washington DC and Chicago (exact dates of assessment were not specified)	25.4%	Non-allergic (but not allergic) asthma was associated with increased intubation time	Neither mortality nor treatment regimen differed meaningfully between the two types of asthma
Arshad, 202[58]	A retrospective cohort study of 2,541 patients hospitalized and treated for COVID-19 in Southeast Michigan	9.9%		Multivariable HR mortality for asthma = 0.916 (0.632 – 1.327)
Suleyman, 2020[59]	A case series of 463 consecutive patients with COVID-19 evaluated (but not all hospitalized) at several hospitals and emergency departments in metropolitan Detroit, Michigan, 3/9 – 3/27/20	15.8%	Discharged home: 18.5% (n=108) Hospitalized: 14.8% (n=355) No ICU: 15.9% (n=214) ICU: 13.5% (n=141)	
Southern USA				
Gold, 2020[60]	Data were from a convenience sample of 305 hospitalized patients in metropolitan Atlanta, GA, 3/1 – 3/30/20	10.5%	COVID-19 severity was not examined	Most patients were African-American

Hussein, 2020[61]	Data from 495 patients with COVID-19 hospitalized in various locations in Louisiana, 3/15 – 6/9/20	14.5%	Survived: 15.1% (n=431) Died: 10.9% (n=64)	
Price-Haywood, 2020[62]	Retrospective cohort study of 3,481 adults with laboratory-confirmed COVID-19; 39.7% of the total sample were hospitalized with COVID-19 in New Orleans, Louisiana, 3/1 – 4/11/20	4.1%	COVID-19 severity was not examined	
Silver, 2020[63]	Retrospective study of 249 patients admitted to a hospital in New Orleans, Louisiana, with a positive test for COVID-19, 3/9 – 3/31/20	19.7%	COVID-19 severity was not examined	Most patients were African-American
Other USA				
Bajaj, 2020[64]	A multicenter study of inpatients with COVID-19, including 108 patients without cirrhosis at various centers in the U.S. and Toronto, Canada, 3/23 – 5/21/20	8.3%	COVID-19 severity was not examined	Only 9 participants had asthma in the "non-cirrhosis" category
Bramante, 2020[65]	A retrospective analysis of 6,256 individuals' claims data from UnitedHealth Group's Clinical Discovery Database, 1/1 – 6/7/20	4.2%	COVID-19 severity was not examined	
Cates, 2020[66]	Electronic health records of 3,948 patients in the national Veterans Health Administration hospitalized with COVID-19, 3/1 – 5/31/20	6.9%	COVID-19 severity was not examined	The prevalence of asthma in patients with COVID-19 was significantly lower than that in patients hospitalized with

				influenza (p<0.001)
Garg, 2020[5]	COVID-NET database of laboratory-confirmed COVID-19–associated hospitalizations of 159 adults ≥ 18 years old in 14 U.S. states	17.0%	COVID-19 severity was not examined	Prevalence of asthma higher than in the general U.S. population of 7.7% for asthma
Gupta, 2020[67]	Multicenter cohort study assessed 2,215 adults with laboratory-confirmed COVID-19 admitted to ICUs at 65 hospitals across the U.S. 3/4 – 4/4/20	11.6%	Survived: 13.1% (n=1,431) Died: 8.9% (n=784)	All patients had severe COVID-19
Kim L, 2020[68]	COVID-NET database of laboratory-confirmed COVID-19–associated hospitalizations of 2,484 adults ≥ 18 years old in 14 U.S. states, 3/1 – 5/2/20	12.6%	COVID-19 severity was not examined	13.7% of patients with asthma were discharged with a diagnosis of asthma exacerbation
Ko, 2020[69]	Data from 5,416 people in the COVID-NET database, an all-age population-based surveillance system of laboratory-confirmed COVID-19-associated hospitalizations in various locations in the U.S., 3/1 – 6/23/20	13.0%	Asthma was associated with COVID-19-related hospitalization in a multivariable model	
Burn, 2020[70]	International study with 3,105 patients hospitalized with COVID-19 at various locations in the U.S., 3/1 – 4/20/20	12.6%	COVID-19 severity was not examined	
Burn, 2020[71]	A cohort study 240,392 patients	13.5%	COVID-19 severity was not	There may be small overlap

	hospitalized with COVID-19 in six databases in the U.S.: HealthVerity, Premier, IQVIA Open Claims, Optum EHR, and Optum SES, up to 10/1/2020		examined	of this study population with that of Burn et al[70] above.
Canada				
Sundaram, 2020[126]	An observational study of 25,030 adults with laboratory-confirmed COVID-19 using population-based laboratory and health administrative databases from Ontario, Canada, 3/1 – 6/20/20	15.5%	COVID-19 severity was not examined	The prevalence of asthma among 733,661 people who tested negative for COVID-19 was 18.6%
Mexico				
Bello-Chavolla, 2020[72]	Data from 101,238 individuals in the General Directorate of Epidemiology of the Mexican Ministry of Health, an open-source data set (prior to 6/3/20 - exact dates of assessment were not specified)	2.9%	COVID-19 severity was not examined	
Giannouchos, 2020[73]	Retrospective case of 89,756 individuals (97.9% were adults) with confirmed COVID-19 in a publicly available nation-level dataset from the Mexican Ministry of Health (prior to 5/31/20 - exact dates of assessment were not specified)	2.9%	Not hospitalized:3.2% (n=58,485) Hospitalized: 2.4% (n=31,271) No adverse outcome: 3.0% (n=78,050) Adverse outcome: 2.3% (n=11,706)	Differences between prevalence of asthma in all comparisons shown were statistically significant; asthma was inversely associated with COVID-19 diagnosis and severity in multivariable models

Hernandez-Galdamez, 2020[74]	Cross-sectional study of 211,003 people with laboratory-confirmed COVID-19 reported by the Mexican Ministry of Health (prior to 6/27/20 - exact dates of assessment were not specified)	2.8%	Ambulatory: 3.0% (n=145,508) Hospitalized: 2.3% (n=65,495) No ICU: 2.3% (n=59,987) ICU: 2.6% (n=5,508) No Intubation: 2.3% (n=59,346) Intubation: 1.9% (n=6,149) Survived: 2.9% (n=185,075) Died: 2.1% (n=25,928)	In multivariable models, asthma was a statistically significant protective factor for hospitalization (OR 0.83), intubation (OR 0.73) and death (OR 0.82)
Murillo-Zamora, 2020[156]	A nationwide retrospective cohort study of 66,123 adults with laboratory-confirmed COVID-19 in a web-based system for the epidemiological surveillance of viral respiratory diseases, 3/4 – 8/15/20	N/A	N/A	Relative risk of death for asthma was 0.92 (0.85-0.99)
Ortiz-Brizuela 2020[75]	Prospective cohort study of 309 patients with laboratory-confirmed COVID-19 in a tertiary care center in Mexico City, Mexico, 2/26 – 4/11/20	2.9%	Outpatients: 4.1% (n=169) Inpatients: 1.4% (n=140) No ICU: 1.8% (n=111) ICU: 0% (n=29)	Only 9 participants had asthma
Solis, 2020[76]	Retrospective study of 7,497 who sought medical attention and tested positive for COVID-19 in Mexico (prior to 4/18/20 - exact dates of assessment were not specified)	3.6%	Asthma was inversely associated with COVID-19 mortality in multivariable analyses (not statistically significant)	
South America				
Bisso, 2020[153]	Retrospective analysis of data from	N/A	Survived: 6.6% (n=122)	Only 9 participants had

	168 adults in the ICU with COVID-19 in Buenos Aries, Argentina, 3/15 – 9/15/20		Died: 2.2% (n=46)	asthma
Baqui, 2020[154]	A cross-sectional study of COVID-19 hospital mortality using data from 7,371 patients in the SIVEP-Gripe dataset in Brazil, 2/27 – 5/4/20	N/A	Survived: 4.5% (n=4,043) Died: 3.0% (n=3,328)	
de Souza, 2020[127]	A retrospective analysis of data from 63,873 people with COVID-19 and information on asthma in the Brazilian Ministry of Health Database, 2/26 – 8/10/20	7.2%	N/A	Multivariate RR of mortality for asthma was 0.82 (0.76-0.88)
Porto, 2020[128]	410 in Brazil, 3/18 – 4/8/20	6.3%	COVID-19 severity was not examined	Asthma prevalence among 763 participants testing negative for COVID-19 was 8.9%
Sardinha, 2020[129]	A cross-sectional study of 1,207 people of indigenous ethnicity with confirmed COVID-19 in Brazil, 1/1 - 8/31/20	1.9%	Survived: 1.8% (n=737) Died: 2.1% (n=470)	
Santos, 2020[158]	A retrospective, multicenter cohort study of 46,285 hospitalized patients with COVID-19 in the public national epidemiological surveillance system in Brazil, 2/20 – 6/2/20	N/A	Asthma prevalence by category of COVID-19 severity was not provided	Multivariable OR of mortality for asthma was 0.66 (0.61-0.73)

Europe				
UK / Ireland				
Alkundi, 2020[77]	A retrospective cross-sectional study of 232 patients hospitalized in Ashford, UK, 3/10 – 5/10/20 with laboratory-confirmed severe COVID-19	2.6%	Survived: 3.2% (n=63) Died: 0% (n=24)	Only 6 cases with asthma; severity analyses included only patients with diabetes
Atkins, 2020[155]	507 adults > 65 hospitalized with confirmed COVID-19 in the UK Biobank cohort, 3/16 – 4/26/20	N/A	Multivariable RR of mortality for asthma was 0.59 (0.33–1.04)	This study used data from the same underlying study population as Chudasama et al[79] (below)
Cavallaro, 2020[78]	A cohort study of 13,954 patients hospitalized with laboratory-confirmed COVID-19 in the UK, dates of testing unclear	8.4%		Adjusted OR of mortality for asthma was 0.87 (0.75 – 1.01)
Chudasama, 2020[79]	A prospective cohort study of 1,706 adult participants in the UK Biobank Study with confirmed COVID-19, 3/16 – 7/26/20	13.2%	COVID-19 severity was not examined	Among 358,577 UK Biobank participants, either testing negative or untested (presumed mostly negative for COVID-19), the asthma prevalence was 11.5%
Goodacre, 2020[80]	A retrospective cohort of 5,768 patients seen at emergency departments in UK who tested positive for COVID-19, 3/26 – 5/28/20	13.3%	COVID-19 severity was not examined	Among 8,229 patients who tested negative for COVID-19 or who were not tested, the prevalence of asthma was 15.5%

Sapey, 2020[81]	A retrospective cohort study of 2,217 patients with laboratory-confirmed COVID-19 in the UK, 3/10 – 4/17/20	19.8%	Survived: 20.4% (n=1,448) Died: 18.6% (n=769)	
Thompson, 2020[82]	A retrospective cohort study of 470 adults admitted with laboratory-confirmed COVID-19 in the UK, 3/12 – 5/19/20	10.0%	Survived: 12.0% (n=301) Died: 6.5% (n=169)	Multivariable RR of mortality for asthma was 0.51 (0.25 – 1.04)
Docherty, 2020[83]	Data from a prospective observational cohort of 16,749 adults hospitalized in the UK, 2/6 – 4/18/20	14%*	Asthma not associated with inpatient death from COVID-19	3.1% were under the age of 18
Butler, 2020[84]	Retrospective analysis of 193 consecutive hospital admissions with COVID-19 in Ireland (exact dates of assessment were not specified)	8.8%	COVID-19 severity was not examined	Most had a "milder clinical course" and none required mechanical ventilation. There was one death related to COVID-19
Spain				
Berenguer, 2020[85]	A retrospective cohort study of 4,000 patients admitted to hospitals across Spain with laboratory-confirmed COVID-19, through 3/17/20	7.5%	Survived: 8.0% (n=2,884) Died: 6.2% (n=1,116)	
Bermejo-Martin, 2020[86]	A prospective study of 250 adults with laboratory-confirmed COVID-19 in Spain, 3/16 – 4/15/20	4.8%	Not hospitalized: 8.0% (n=50) Hospitalized: 4.0% (n=200) No ICU: 6.0% (n=100) ICU: 2.0% (n=100)	

Soria, 2020[87]	A retrospective cohort of 448 people with laboratory-confirmed COVID-19 in Spain; the time period of data collection was not clear	6.5%	Not severe: 7.8% (n=102) Severe: 6.1% (n=346)	
Borobia, 2020[88]	A cohort of 2,226 hospitalized adults with confirmed COVID-19 in Madrid, Spain, 2/25 – 4/19/20	5.2%	Survived: 5.5% (n=1,766) Died: 3.7% (n=460)	
Garcia-Pachon, 2020[89]	Retrospective study of 376 people over age 14 with laboratory-confirmed COVID-19 in Spain, 3/3 – 4/12/20	2.7%	Not hospitalized: 2.8% (n=218) Hospitalized: 2.5% (n=158)	A total of 10 participants with asthma; COVID-19 did not appear to be related to asthma exacerbation
Poblador-Plou, 2020[90]	Retrospective cohort study of 771 people with laboratory-confirmed infection by SARS-CoV-2 in the Spanish region of Aragon, 3/4 – 4/17/20	3.2%	Multivariable analyses showed asthma was associated with a statistically non-significant 55% and 32% decreased risk of mortality from COVID-19 in men and women, respectively	Only 25 participants with asthma
Prieto-Alhambra, 2020[91]	121,263 people ≥15 years with confirmed COVID-19 obtained from population-based registries in Catalonia, Spain, 3/15 – 4/24/20	6.8%	COVID-19 severity was not examined	
San-Juan, 2020[92]	Retrospective study of 32 pregnant women with COVID-19 in Madrid, Spain, 3/5 – 4/5/20	12.4%	COVID-19 severity was not examined	Only 4 participants with asthma
Burn, 2020[70]	International study with 18,425 patients hospitalized with COVID-19 in Spain, 3/1 – 4/20/20	6.6%	COVID-19 severity was not examined	

France				
Beurneir, 2020[93]	768 adults hospitalized with COVID-19 pneumonia in Paris, France, 3/15 – 4/15/20	4.8%	COVID-19 severity was not examined	Patients with asthma were slightly younger and had fewer comorbidities than patients without asthma
Grandbastien, 2020[94]	114 patients hospitalized with pneumonia related to COVID-19 in eastern France, 3/4 – 4/6/20	21.7%	COVID-19 severity was not examined	Co-morbidities (obesity, diabetes, heart disease, sleep apnea, not associated with asthma); SARS-CoV-2 pneumonia did not appear to induce severe asthma exacerbation
Italy				
Barroso, 2020[95]	A retrospective study of 189 adults hospitalized with laboratory-confirmed COVID-19 in Northern Italy, 3/1 – 3/21/20	5.8%	COVID-19 severity was not examined	
Caminati, 2020[96]	Data from 1,348 people hospitalized with COVID-19 in Verona and Brescia in northeast Italy, 3/1 – 4/30/20	1.9%	COVID-19 severity was not examined	The prevalence of asthma in the region's general population is 6%
Lombardi, 2020[97]	Retrospective study of 1,043 patients hospitalized with COVID-19 in Brescia, Italy, 2/20 – 4/20/20	1.9%	Survived: 2.2% (n=810) Died: 0.9% (n=233)	Only 20 participants with asthma; patients with asthma had a lower risk of mortality from COVID-19 than those without asthma (10.0% vs. 22.6%)

Other Europe				
Calmes, 2020[98]	Data from the medical records of 595 adult patients hospitalized in Liege, Belgium, with COVID-19, 3/18 – 4/17/20	9.6%	No ICU: 9.3% (n=508) ICU: 11.4% (n=88) Survived: 10.4% (n=509) Died: 4.6% (n=87)	Relative risk of death for asthma patients was 0.74 (0.24 – 2.3)
Gregoriano, 2020[99]	A retrospective cohort study of 99 adults admitted to hospital with COVID-19 in Switzerland, 2/26 – 4/30/20	16.2%	Not severe: 17.2% (n=64) Severe: 14.3% (n=35)	
Regina, 2020[100]	Retrospective observational study of 200 adult patients hospitalized in western Switzerland with confirmed COVID-19 3/1 – 3/25/20	4.0%	No ventilation: 4.3% (n=163) Ventilation: 2.7% (n=37)	Only 8 people with asthma
Avdeev, 2020[101]	A retrospective study assessing the prevalence of asthma among 1,307 ICU patients with COVID-19 in Russia who required mechanical ventilation; exact dates of assessment were not specified	1.8%	All had severe disease requiring mechanical ventilation	The prevalence of asthma in this study population did not exceed that in the general population
Meyer, 2020[102]	Retrospective study of 101 patients with COVID-19 admitted to a Danish hospital (February and March, but exact dates of assessment were not specified)	14.9%	No ICU: 14.8% (n=81) ICU: 15.0% (n=20) Survived: 16.9% (n=71) Died: 10.0% (n=30)	Only 3 participants with asthma died
Myrstad, 2020[103]	A prospective cohort study of 66 patients with laboratory-confirmed	10.6%	Not severe: 13.7% (n=51) Severe: 0% (n=15)	Only 7 participants with asthma

	COVID-19 in eastern Norway, 3/9 – 4/27/20			
Ottenhoff, 2020[104]	A retrospective cohort study of 2,218 adults with laboratory-confirmed COVID-19 admitted to a hospital in Holland, 2/27 – 6/8/20	10.4%	Favorable (not severe): 11.0% (n=1,703) Unfavorable (severe): 8.3% (n=516)	
Peixoto, 2020[105]	A retrospective cohort study of 20,293 (mostly adult) people with laboratory-confirmed COVID-19 in Portugal, up to 4/28/20	1.4%	Survived: 1.4% (n=19,768) Died: 0.6% (n=502)	Multivariable RR of mortality for asthma was 0.73 [0.24 - 2.23]
Giannoglou, 2020[106]	A retrospective analysis of data from 512 people admitted to hospitals in the Attica region of Greece, 2/21 – 6/30/20	13.9%	Survived: 14.2% (n=431) Died: 12.3% (n=81)	
Asia				
China				
Guan, 2020[107]	Data from 1,099 hospitalized patients with laboratory-confirmed COVID-19 in China, 12/11/19 – 1/29/20	0%	COVID-19 severity was not examined	No participants with asthma
Huang C, 2020[108]	41 patients hospitalized with laboratory-confirmed COVID-19 in Wuhan, China, 12/16/19 – 1/2/20	0%	COVID-19 severity was not examined	No participants with asthma

Huang Y, 2020[109]	Retrospective analysis of data from 34 patients hospitalized with laboratory-confirmed COVID-19 in Wuhan, China, 12/21/19 – 1/28/20	0%	COVID-19 severity was not examined	No participants with asthma
Li, 2020[110]	548 patients diagnosed with COVID-19 admitted to a hospital in Wuhan, China, 1/26 – 2/5/20	0.9%	Not severe: 0.7% (n=279) Severe: 1.1% (n=269)	Only 5 participants with asthma
Song, 2020[111]	Retrospective study of 961 adults hospitalized with laboratory-confirmed COVID-19 in Wuhan, China, 2/1 – 3/6/20	2.3%	Not severe: 2.9% (n=719) Severe: 0.4% (n=242)	
Shi, 2020[112]	Medical records from 65 patients with laboratory-confirmed COVID-19 at a hospital in Wuhan, China, 2/1 – 3/8/20	3.1%	COVID-19 severity was not examined	
Wang W, 2020[113]	Retrospective study of 123 patients hospitalized in the ICU with laboratory-confirmed COVID-19 in Wuhan, China, 2/10 – 3/27/20	0.8%	Not critical: 1.4% (n=73) Critical: 9% (n=50)	Only one participant with asthma
Wang J, 2020[114]	A retrospective case study of 562 patients with COVID -19 in several provinces in China, 1/28 – 2/25/20	12.1%	Non severe: 9.0% (n=509) Severe: 41.5% (n=53)	Covid-19 diagnosis used various methods, with potential for false positives and negatives
Yang S, 2020[115]	A retrospective cohort study of 463 adults hospitalized with laboratory-confirmed COVID-19 in Wuhan, China, 2/13 – 3/14/20	1.5%	Not severe: 1.5% (n=397) Severe: 1.5% (n=66)	Only 7 participants had asthma; the prevalence of asthma was relatively low

Wei, 2020[116]	A cluster of 14 infected health care workers from a hospital in Wuhan, China, 12/25/19 – 1/31/20	7.1%	COVID-19 severity was not examined	Only one participant with asthma
Zhang, 2020[117]	140 patients in hospital with laboratory confirmed COVID-19 In China, 1/16 – 2/3/20	0%	COVID-19 severity was not examined	No participant with asthma
South Korea				
Choi, YJ, 2020[118]	7,590 patients with laboratory-confirmed COVID-19 in the Ministry of Health and Welfare of Korea nationwide patient medical claims database in South Korea (prior to 5/15/20 - exact dates of assessment were not specified)	2.9%	Survived: 2.7% (n = 7363) Died: 7.5% (n=277)	Asthma was not a statistically significant risk factor for increased mortality in COVID-19 patients in multivariable models
Choi HG, 2020[119]	Data from 4,057 hospitalized patients across South Korea with COVID-19 collected by the Korea Centers for Disease Control and Prevention (dates of data collection were not specified)	2.4%	Survived: 3.0% (n=3,931) Died: 6.3% (n=126)	Relative risk of death for asthma patients was 2.20 (95% CI = 1.02-4.76)
Lee S, 2020[120]	A retrospective evaluation of 303 symptomatic and asymptomatic patients with SARS-CoV-2 infection in South Korea, 3/6-3/26-2020	0.3%	Not enough cases with asthma to analyze severity	Only 1 participant with asthma
Lee SC, 2020[121]	A retrospective cohort study using	9.4%	Not admitted: 9.5% (n=461)	

	data from 7,272 adults with confirmed COVID-19 in a nationwide administrative claims database, 1/20 – 5/27/20		Admitted: 9.4% (n=6,811) Not severe: 9.0% (n=6,901) Severe: 17.0% (n=371) Survived: 9.1% (n=7,045) Died: 19.4% (n=227)	
Kim D, 2020[122]	9,149 people in the South Korean Centers for Disease Control and Prevention database with confirmed COVID-19 in Korea (prior to 3/26/20 - exact dates of assessment were not specified)	16.9%	COVID-19 severity was not examined	
Kim ES, 2020[123]	The first 28 patients enrolled in a nationwide retrospective cohort study of hospitalized individuals in South Korea, 1/19 – 2/17/20	3.6%	COVID-19 severity was not examined	Only 1 participant with asthma
Kim S, 2020[124]	2,200 adults hospitalized in Daegu, Korea, with COVID-19, 2/20 – 3/20	3.2%	Asthma was not a risk factor for mortality from COVID-19 in multivariable analyses	The OR of death for asthma was 1.66 (0.62 – 4.40)
Yang, 2020[125]	Data from 7,340 people with a diagnosis of COVID-19 in the South Korean national health insurance claims-based database, 1/1 – 5/15/20	9.9%	Non-allergic asthma increased COVID-19 severity in multivariable models, but not allergic asthma	The prevalence of asthma in people in the cohort who tested negative was 15.1% (n=32,120)
Burn, 2020[70]	International study with 7,341 patients hospitalized with COVID-19 in South Korea, 3/1 – 4/20/20	12.0%	COVID-19 severity was not examined	

Other Asia				
Aggarwal, 2020[130]	32 adults with COVID-19 admitted to a hospital in New Delhi, India, 4/10 – 4/30/20	6.3%	Non-severe pneumonia: 0% (n=8) Severe pneumonia: 8.3% (n=24)	Only 2 participants with asthma
Goel, 2020[131]	A retrospective study of 35 patients with COVID-19 admitted to a hospital in New Delhi, 5/8 – 7/3/20	11.4%	COVID-19 severity was not examined	Only 4 participants with asthma
Morshed, 2020[132]	A cross-sectional study of 103 patients with laboratory-confirmed COVID-19 in Bangladesh, 7/5 – 7/18/20	5.8%	Mild and Moderate: 5.7% (n=87) Severe: 6.3% (n=16)	Only 6 participants with asthma
Saha, 2020[133]	A retrospective cohort study of 168 (mostly adult) patients with laboratory-confirmed COVID-19 admitted to a hospital in Bangladesh, 4/1 – 8/7/20	8.9%	Survived: 16.4% (n=73) Died: 3.2% (n=95)	Only 18 participants with asthma
Haw, 2020[134]	A retrospective study of data from 8,212 (mostly adult) patient with laboratory-confirmed COVID-19 in the Philippines, up to 4/29/20	3.2%	Survived: 4.9% (n=2,988) Died: 2.9% (n=768)	
Higuchi, 2020[135]	A retrospective cohort study of 57 adults hospitalized with laboratory-confirmed COVID-19 in Japan, 2/20 – 6/10/20	14.0%	Not severe: 16.0% (n=50) Severe: 0% (n=7)	Only 8 participants had asthma
Uchida, 2020[136]	A retrospective cohort study of 35 adults hospitalized with laboratory-	2.9%	Not severe: 0% (n=27) Severe: 12.5% (n=8)	Only 1 participant with asthma

	confirmed COVID-19 in Moroyama, Japan, March – June, 2020			
Africa				
Ashinyo, 2020[137]	A retrospective review of data from 307 discharged COVID-19 patients in Ghana, 3/23 – 6/29/20	2.0%	COVID-19 severity was not examined	Only 6 participants with asthma
Ombajo, 2020[138]	A multicenter cohort study of 787 patients hospitalized with laboratory-confirmed COVID-19 in Kenya, 3/14 – 9/17/20	N/A	Univariate OR of time to death for asthma was 1.06 (0.26-4.26)	
Otuonye, 2020[139]	A case series of 154 patients with laboratory-confirmed COVID-19 in Nigeria, 6/1 – 8/30/20	2.6%	COVID-19 severity was not examined	Only 4 participants had asthma
Leulseged, 2020[140]	A prospective cohort study of 1,345 patients hospitalized with laboratory-confirmed COVID-19 in Ethiopia, 7/1 – 9/30/20	4.1%	COVID-19 severity was not examined	
Middle East				
Alizadehsani,	A prospective study of 319 patients	C-19+ 1.6%	Survived: 1.9% (n=108)	No laboratory confirmation

2020[141]	in Iran with flu-like symptoms referred to a tertiary hospital in Iran; COVID-19 was diagnosed through CT imaging only. 123 were considered to have COVID-19 and 196 were not. 3/3 – 4/8/20	C-19- 3.1%	Died: 0% (n=15)	of COVID-19 diagnosis
Shahriaridad, 2020[142]	A retrospective cohort study of 113 adults with laboratory-confirmed COVID-19 in Iran, 2/20 – 3/20/20	6.2%	Not severe: 5.9% (n=102) Severe: 9.1% (n+11) Survived: 5.8% (n=104) Died: 11.1% (n=9)	Only 9 participants died
Almazeedi, 2020[143]	1,096 patients with laboratory-confirmed COVID-19 admitted to a hospital in Kuwait, 2/24 – 4/20/20	3.9%	No ICU: 3.5% (n=1,054) ICU: 14.3% (n=42) Survived: 3.6% (n=1,077) Died: 21.1% (n=19)	Multivariable OR of mortality for asthma was 4.92 (1.03-23.44)
Caliskan, 2020[144]	A retrospective study of 565 patients hospitalized with COVID-19 in Istanbul, Turkey, 3/15 – 5/10/20	3.7%	No ICU: 3.6% (n=474) ICU: 4.4% (n=91) Survived: 3.5% (n=490) Died: 5.3% (n=75)	The prevalence of asthma in 248 patients hospitalized with other diseases was 3.2%
Satici, 2020[145]	A retrospective cohort study of 681 adults hospitalized with laboratory-confirmed COVID-19 in Istanbul, Turkey, 4/2 – 5/1/20	6.3%	Survived: 6.7% (n=626) Died: 1.8% (n=55)	
Trabulus, 2020[146]	A retrospective cohort study of 336 adults with laboratory-confirmed COVID-19 in Istanbul, Turkey, 3/15 – 5/1/20	6.0%	Survived: 6.5% (n=293) Died: 2.3 (n=43)	Only 20 participants with asthma
Green, 2020[147]	A retrospective cross-sectional	6.8%	Not hospitalized: 6.6% (n=2,076)	

	study of 2,266 people with COVID-19 and 35,203 people who tested negative: data from a nationwide HMO in Israel, 2/1 – 6/20/20		Hospitalized: 8.9% (n=190)	
Israel, 2020[148]	A study of 26,959 adults hospitalized with COVID-19 in Israel, up to 10/10/20	6.4%	Not hospitalized: 6.1% (n=30,010) Hospitalized: 6.2% (n=13,121)	Among 31,010 untested controls (presumed mostly without COVID-19), the prevalence of asthma was 6.1%
Israel, 2020[149]	A retrospective cohort study of 4,151 adult members of a large health provider in Israel with laboratory-confirmed COVID-19 from the beginning of the disease outbreak until 5/16/2020	4.7%		The prevalence of asthma in 20,755 cohort members who tested negative for COVID-19 was 6.2%
Shabrawishi, 2020[150]	Retrospective case series of 150 patients hospitalized with laboratory-confirmed COVID-19 in Saudi Arabia, 3/12 – 3/31/20	2.7%	Not severe: 2.2% (n=134) Severe/ICU: 7.7% (n=16)	Only 4 participants with asthma

* Prevalence was presented in whole numbers

SUPPLEMENTAL TABLE E2

Pooled Prevalence per country/city

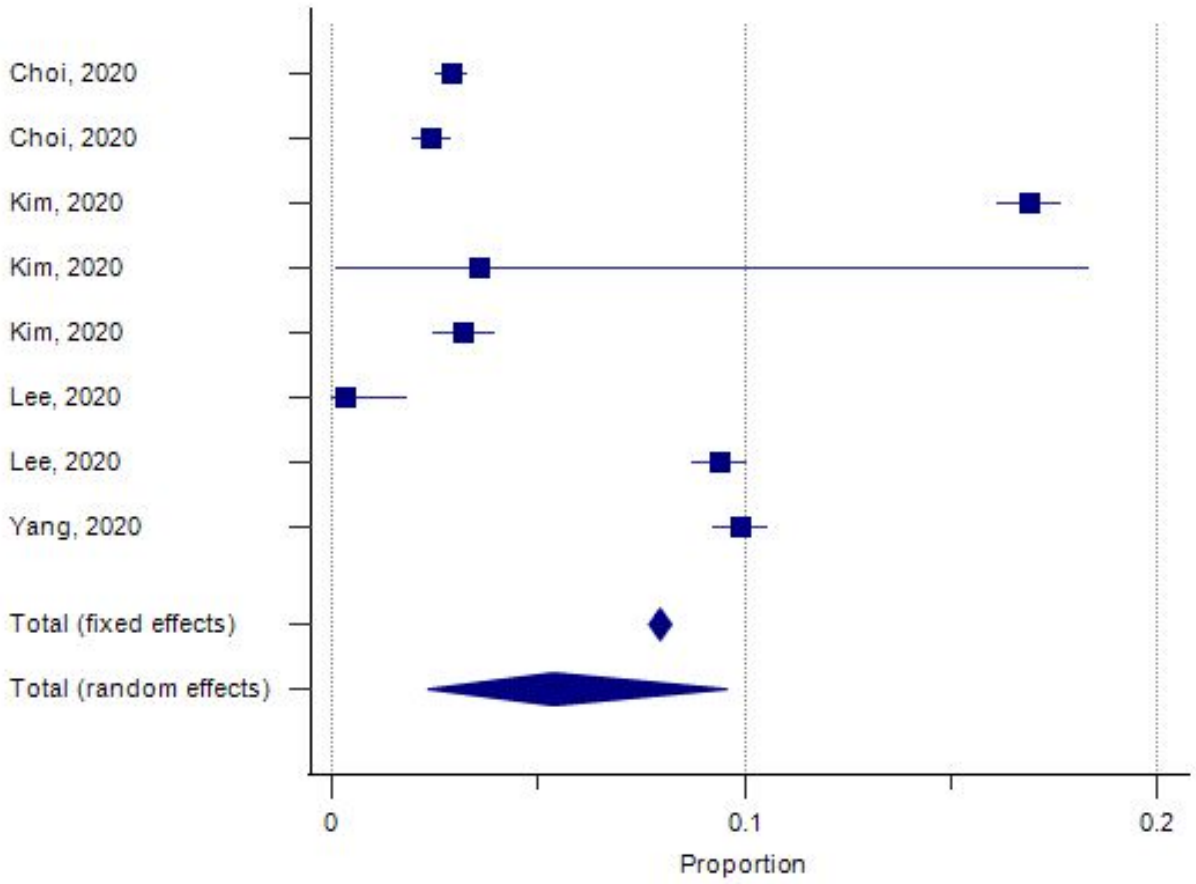
South Korea prevalence

Study	Sample size	Proportion (%)	95% CI	Weight (%)	
				Fixed	Random
Choi, 2020	7590	2.899	2.533 to 3.301	20.00	13.28
Choi, 2020	4057	2.391	1.943 to 2.909	10.69	13.25
Kim, 2020	9148	16.898	16.135 to 17.682	24.11	13.28
Kim, 2020	28	3.571	0.0904 to 18.348	0.076	7.94
Kim, 2020	2200	3.182	2.489 to 4.003	5.80	13.19
Lee, 2020	303	0.330	0.00836 to 1.825	0.80	12.50
Lee, 2020	7272	9.406	8.745 to 10.100	19.17	13.28
Yang, 2020	7340	9.905	9.230 to 10.611	19.35	13.28
Total (fixed effects)	37938	7.956	7.686 to 8.233	100.00	100.00
Total (random effects)	37938	5.373	2.328 to 9.579	100.00	100.00

Test for heterogeneity

Q	1579.6982
DF	7
Significance level	P < 0.0001
I^2 (inconsistency)	99.56%
95% CI for I^2	99.46 to 99.64

Prevalence – 5.37% (2.33% - 9.58%).


Choi, 2020
Choi, 2020
Kim, 2020
Kim, 2020
Kim, 2020
Lee, 2020
Lee, 2020
Yang, 2020
Total (fixed effects)
Total (random effects)
0
0.1
0.2
Proportion

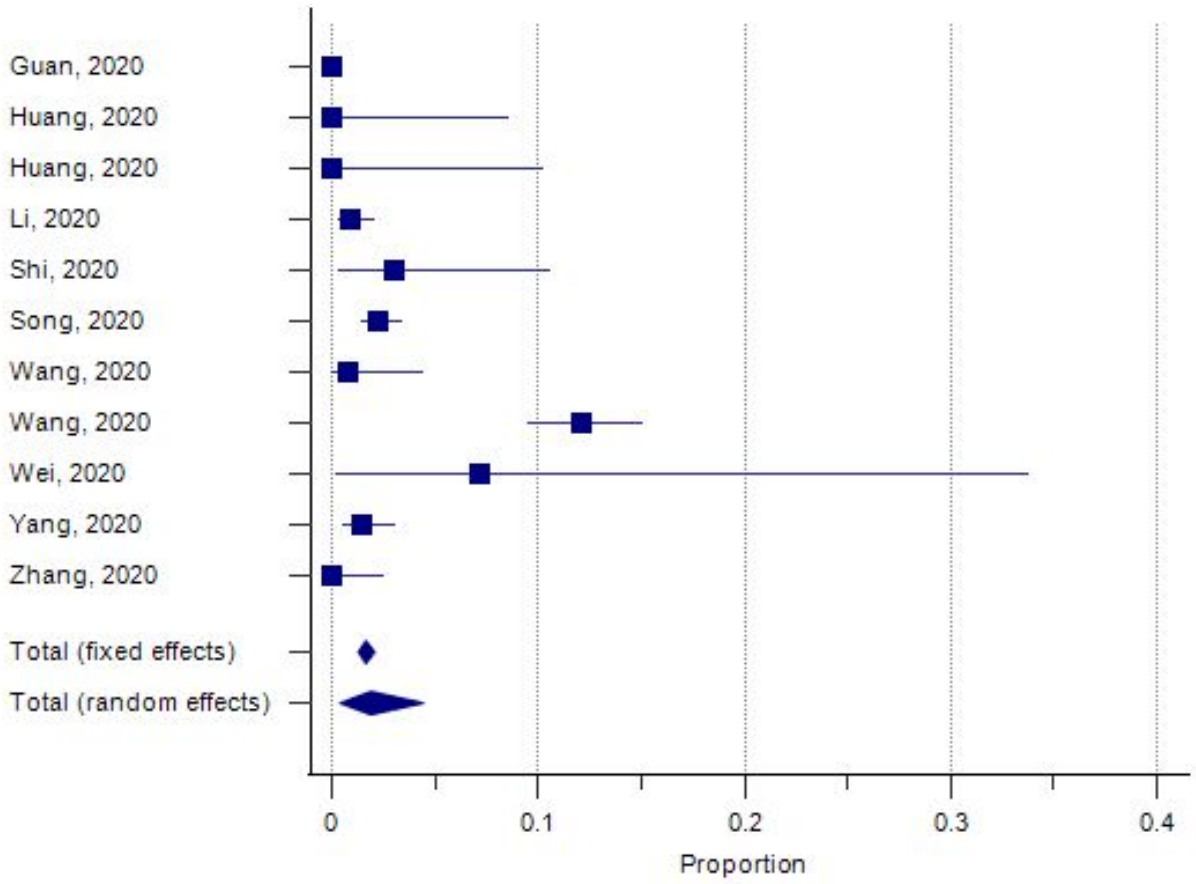
China Prevalence

Study	Sample size	Proportion (%)	95% CI	Weight (%)	
				Fixed	Random
Guan, 2020	1099	0.000	0.000 to 0.335	27.09	10.72
Huang, 2020	41	0.000	0.000 to 8.604	1.03	7.53
Huang, 2020	34	0.000	0.000 to 10.282	0.86	7.09
Li, 2020	548	0.912	0.297 to 2.116	13.52	10.54
Shi, 2020	65	3.077	0.375 to 10.677	1.63	8.48
Song, 2020	961	2.289	1.440 to 3.446	23.69	10.70
Wang, 2020	123	0.813	0.0206 to 4.446	3.05	9.47
Wang, 2020	562	12.100	9.520 to 15.086	13.86	10.55
Wei, 2020	14	7.143	0.181 to 33.868	0.37	4.83
Yang, 2020	463	1.512	0.610 to 3.090	11.43	10.48
Zhang, 2020	140	0.000	0.000 to 2.601	3.47	9.62
Total (fixed effects)	4050	1.645	1.276 to 2.085	100.00	100.00
Total (random effects)	4050	1.881	0.397 to 4.433	100.00	100.00

Test for heterogeneity

Q	186.0550
DF	10
Significance level	P < 0.0001
I^2 (inconsistency)	94.63%
95% CI for I^2	92.11 to 96.34

Prevalence – 1.88 (95% CI 0.40 – 4.43). Significant heterogeneity, p < 0.0001.


Guan, 2020
Huang, 2020
Huang, 2020
Li, 2020
Shi, 2020
Song, 2020
Wang, 2020
Wang, 2020
Wei, 2020
Yang, 2020
Zhang, 2020
Total (fixed effects)
Total (random effects)
0
0.1
0.2
0.3
0.4
Proportion

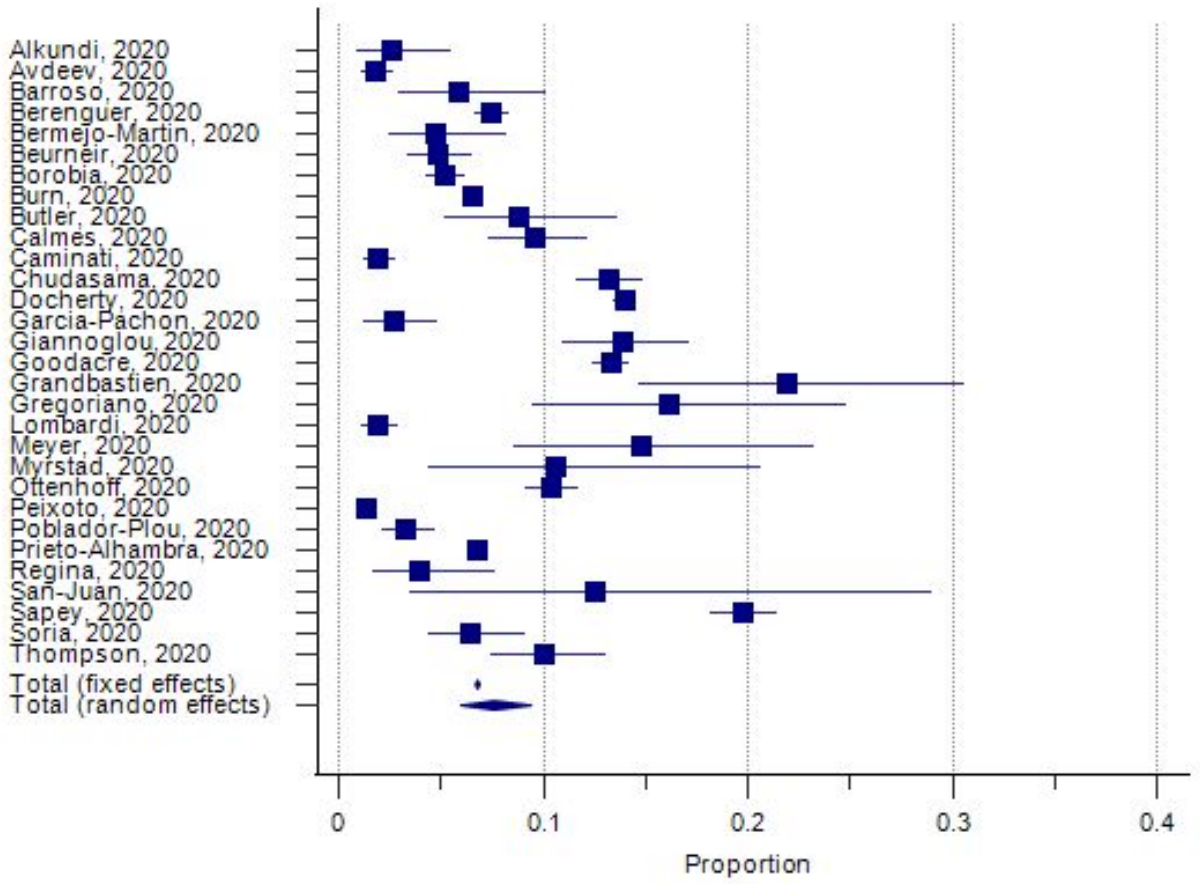
Europe Prevalence

Study	Sample size	Proportion (%)	95% CI	Weight (%)	
				Fixed	Random
Alkundi, 2020	232	2.586	0.955 to 5.544	0.11	3.22
Avdeev, 2020	1307	1.836	1.180 to 2.720	0.64	3.59
Barroso, 2020	189	5.820	2.941 to 10.175	0.093	3.13
Berenguer, 2020	4000	7.500	6.703 to 8.360	1.96	3.65
Bermejo-Martin, 2020	250	4.800	2.504 to 8.234	0.12	3.25
Beurneir, 2020	768	4.818	3.414 to 6.580	0.38	3.53
Borobia, 2020	2226	5.211	4.325 to 6.217	1.09	3.63
Burn, 2020	18425	6.600	6.245 to 6.968	9.03	3.67
Butler, 2020	193	8.808	5.215 to 13.728	0.095	3.14
Calmes, 2020	595	9.580	7.337 to 12.234	0.29	3.48
Caminati, 2020	1348	1.929	1.264 to 2.813	0.66	3.59
Chudasama, 2020	1706	13.189	11.618 to 14.887	0.84	3.61
Docherty, 2020	16749	14.001	13.479 to 14.536	8.21	3.67
Garcia-Pachon, 2020	376	2.660	1.283 to 4.837	0.18	3.38
Giannoglou, 2020	512	13.867	10.992 to 17.167	0.25	3.45
Goodacre, 2020	5768	13.298	12.431 to 14.201	2.83	3.66
Grandbastien, 2020	114	21.930	14.723 to 30.648	0.056	2.85
Gregoriano, 2020	99	16.162	9.529 to 24.915	0.049	2.75
Lombardi, 2020	1043	1.918	1.175 to 2.946	0.51	3.57
Meyer, 2020	101	14.851	8.557 to 23.310	0.050	2.77
Myrstad, 2020	66	10.606	4.372 to 20.639	0.033	2.45
Ottenhoff, 2020	2218	10.415	9.174 to 11.761	1.09	3.63
Peixoto, 2020	20293	1.399	1.242 to 1.571	9.95	3.67
Poblador-Plou, 2020	771	3.243	2.109 to 4.750	0.38	3.53
Prieto-Alhambra, 2020	121262	6.810	6.669 to 6.953	59.44	3.68
Regina, 2020	200	4.000	1.742 to 7.729	0.099	3.15
San-Juan, 2020	32	12.500	3.513 to 28.995	0.016	1.82
Sapey, 2020	2217	19.802	18.161 to 21.522	1.09	3.63
Soria, 2020	448	6.473	4.378 to 9.165	0.22	3.42
Thompson, 2020	470	10.000	7.440 to 13.076	0.23	3.44
Total (fixed effects)	203978	6.787	6.678 to 6.897	100.00	100.00
Total (random effects)	203978	7.610	5.980 to 9.418	100.00	100.00

Test for heterogeneity

Q	3793.5701
DF	29
Significance level	P < 0.0001
I^2 (inconsistency)	99.24%
95% CI for I^2	99.14 to 99.32

Prevalence 7.61 (5.98 – 9.42). Significant heterogeneity, $p < 0.0001$.


Alkundi, 2020
Avdeev, 2020
Barroso, 2020
Berenguer, 2020
Bermejo-Martin, 2020
Beurnéir, 2020
Borobia, 2020
Burn, 2020
Butler, 2020
Calmes, 2020
Caminati, 2020
Chudasama, 2020
Docherty, 2020
Garcia-Pachon, 2020
Giannoglou, 2020
Goodacre, 2020
Grandbastien, 2020
Gregoriano, 2020
Lombardi, 2020
Meyer, 2020
Myrstad, 2020
Ottenhoff, 2020
Peixoto, 2020
Poblador-Plou, 2020
Prieto-Alhambra, 2020
Regina, 2020
San-Juan, 2020
Sapey, 2020
Soria, 2020
Thompson, 2020
Total (fixed effects)
Total (random effects)
0
0.1
0.2
0.3
0.4
Proportion

USA Prevalence

Study	Sample size	Proportion (%)	95% CI	Weight (%)	
				Fixed	Random
Abrams, 2020	133	4.511	1.673 to 9.560	0.038	1.36
Andrikopoulou, 2020	158	11.392	6.893 to 17.406	0.045	1.42
Arentz, 2020	21	9.524	1.175 to 30.377	0.0063	0.61
Argenziano, 2020	1000	11.300	9.404 to 13.427	0.28	1.73
Arshad, 2020	2541	9.917	8.782 to 11.146	0.72	1.77
Azar, 2020	1052	11.312	9.461 to 13.382	0.30	1.73
Bajaj, 2020	108	8.333	3.881 to 15.230	0.031	1.29
Barasa	117	11.966	6.699 to 19.261	0.034	1.32
Bhatraju, 2020	24	12.500	2.656 to 32.361	0.0071	0.66
Bramante, 2020	6256	4.204	3.720 to 4.731	1.78	1.79
Broadhurst, 2020	436	12.156	9.240 to 15.597	0.12	1.64
Bruckner, 2020	105	9.524	4.662 to 16.818	0.030	1.28
Burn, 2020	240392	13.500	13.364 to 13.637	68.33	1.80
Burn, 2020	3105	12.593	11.445 to 13.811	0.88	1.78
Campioli, 2020	251	18.327	13.741 to 23.678	0.072	1.54
Cates, 2020	3948	6.890	6.119 to 7.725	1.12	1.78
Chhiba, 2020	1526	14.417	12.691 to 16.280	0.43	1.75
Clouston, 2020	1387	6.273	5.054 to 7.680	0.39	1.75
Cummings, 2020	257	8.171	5.129 to 12.219	0.073	1.54
Dai, 2020	863	4.751	3.431 to 6.390	0.25	1.72
Dashti, 2020	4140	12.899	11.892 to 13.958	1.18	1.78
Duanmu, 2020	100	10.000	4.900 to 17.622	0.029	1.26
Ferguson, 2020	72	9.722	3.999 to 19.011	0.021	1.13
Fox, 2020	355	7.606	5.072 to 10.873	0.10	1.61
Garg, 2020	159	16.981	11.499 to 23.737	0.045	1.42
Garibaldi, 2020	832	9.495	7.590 to 11.693	0.24	1.71
Gayam, 2020	408	13.235	10.101 to 16.914	0.12	1.63
Gold, 2020	305	10.492	7.288 to 14.488	0.087	1.58
Goyal, 2020	391	12.532	9.417 to 16.228	0.11	1.62
Gupta, 2020	2215	11.603	10.298 to 13.010	0.63	1.77
Hsu, 2020	2729	13.192	11.944 to 14.519	0.78	1.77
Hussein, 2020	495	14.545	11.558 to 17.964	0.14	1.66
Jehi, 2020	4536	14.396	13.386 to 15.451	1.29	1.78
Keswani, 2020	1043	25.407	22.790 to 28.165	0.30	1.73
Kim, 2020	2484	12.601	11.320 to 13.970	0.71	1.77
Ko, 2020	5416	12.999	12.114 to 13.923	1.54	1.79
Lieberman-Cribbin, 2020	6245	4.404	3.908 to 4.942	1.78	1.79
Lokken, 2020	46	8.696	2.420 to 20.792	0.013	0.94
Lovinsky-Desir, 2020	1298	12.635	10.875 to 14.566	0.37	1.74
Maeda, 2020	224	10.268	6.621 to 15.008	0.064	1.51
Mahadavinia, 2020	935	25.775	22.998 to 28.706	0.27	1.72
Marcello, 2020	10142	7.000	6.511 to 7.514	2.88	1.79
Mendy, 2020	689	10.160	8.006 to 12.661	0.20	1.69

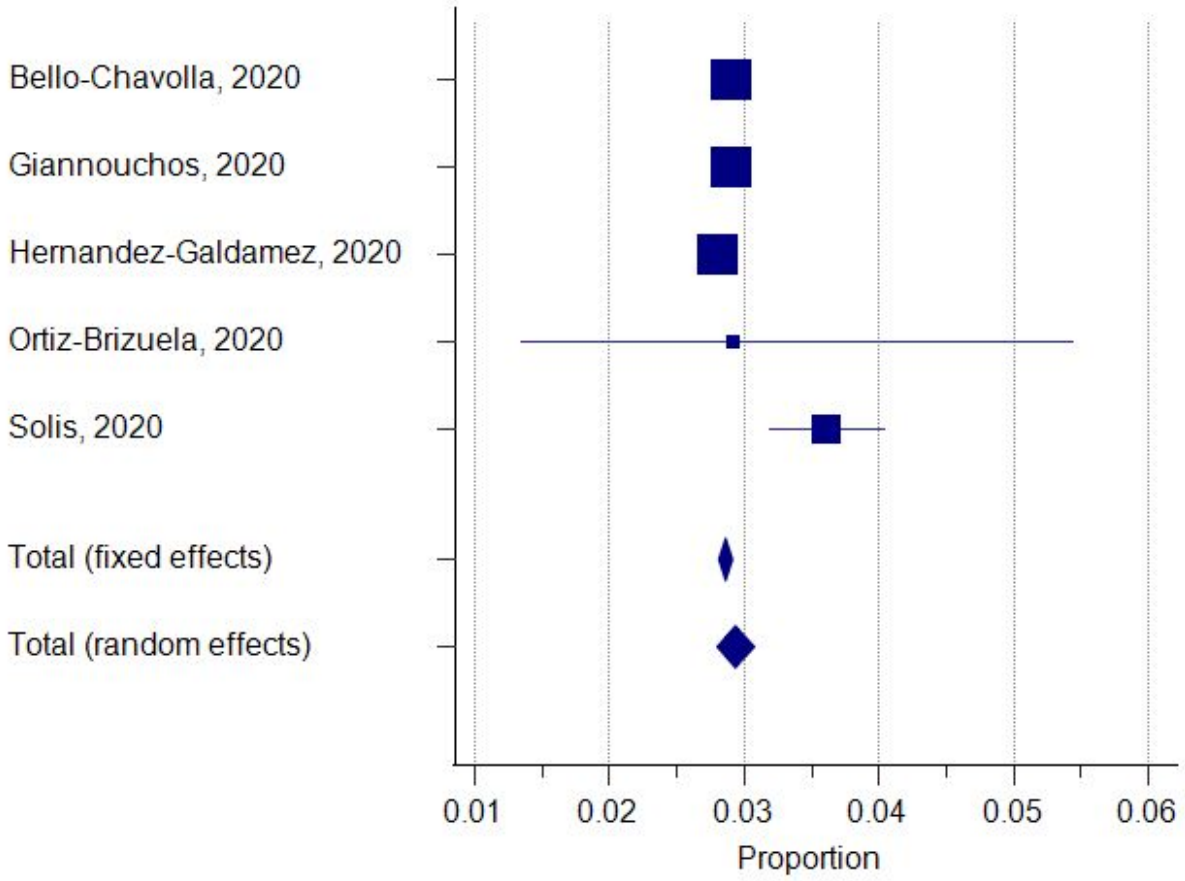
Meyers, 2020	91	5.495	1.808 to 12.358	0.026	1.22
Mikami, 2020	6493	4.205	3.729 to 4.721	1.85	1.79
Monteiro, 2020	112	11.607	6.327 to 19.030	0.032	1.30
Newton, 2020	993	13.494	11.430 to 15.778	0.28	1.73
Nguyen, 2020	689	17.271	14.521 to 20.305	0.20	1.69
O'Keefe, 2020	496	14.718	11.717 to 18.146	0.14	1.66
Palaiodimos, 2020	200	13.500	9.089 to 19.031	0.057	1.48
Paranjpe, 2020	2199	8.186	7.073 to 9.411	0.63	1.77
Price-Haywood, 2020	3481	4.108	3.473 to 4.821	0.99	1.78
Richardson, 2020	5700	9.000	8.269 to 9.773	1.62	1.79
Salacup, 2020	242	7.025	4.145 to 11.009	0.069	1.53
Shah, 2020	316	12.025	8.652 to 16.130	0.090	1.58
Silver, 2020	249	19.679	14.927 to 25.168	0.071	1.53
Singer, 2020	2388	6.281	5.341 to 7.330	0.68	1.77
Suleyman, 2020	463	15.767	12.567 to 19.411	0.13	1.65
Tartof, 2020	6916	18.407	17.499 to 19.340	1.97	1.79
Toussie, 2020	338	13.609	10.139 to 17.733	0.096	1.60
Van Gerwen, 2020	3703	11.612	10.597 to 12.688	1.05	1.78
Wang, 2020	7592	4.505	4.049 to 4.996	2.16	1.79
Yan, 2020	128	10.156	5.520 to 16.741	0.037	1.35
Total (fixed effects)	351728	12.054	11.947 to 12.162	100.00	100.00
Total (random effects)	351728	11.002	9.784 to 12.283	100.00	100.00

11.00 (9.78 – 12.28)

Mexico prevalence

Study	Sample size	Proportion (%)	95% CI	Weight (%)	
				Fixed	Random
Bello-Chavolla, 2020	101237	2.899	2.797 to 3.004	24.70	29.21
Giannouchos, 2020	89756	2.900	2.791 to 3.012	21.90	28.63
Hernandez-Galdamez, 2020	211002	2.800	2.730 to 2.871	51.49	31.86
Ortiz-Brizuela, 2020	309	2.913	1.340 to 5.457	0.076	0.55
Solis, 2020	7496	3.601	3.191 to 4.048	1.83	9.75
Total (fixed effects)	409800	2.861	2.810 to 2.912	100.00	100.00
Total (random effects)	409800	2.934	2.795 to 3.077	100.00	100.00

2.93 (2.80 – 3.08)



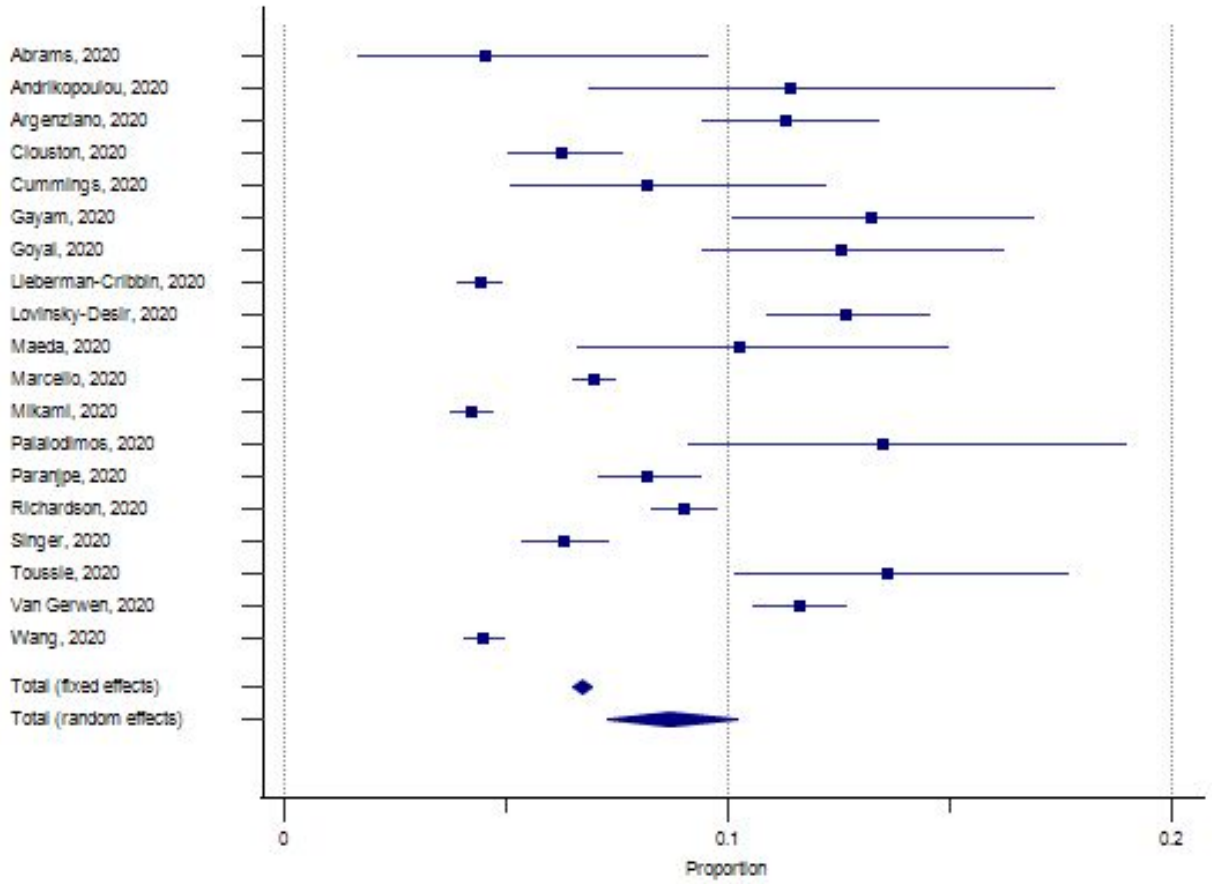
New York City prevalence

Study	Sample size	Proportion (%)	95% CI	Weight (%)	
				Fixed	Random
Abrams, 2020	133	4.511	1.673 to 9.560	0.27	3.68
Andrikopoulou, 2020	158	11.392	6.893 to 17.406	0.32	3.93
Argenziano, 2020	1000	11.300	9.404 to 13.427	1.99	5.57
Clouston, 2020	1387	6.273	5.054 to 7.680	2.76	5.70
Cummings, 2020	257	8.171	5.129 to 12.219	0.51	4.54
Gayam, 2020	408	13.235	10.101 to 16.914	0.81	5.00
Goyal, 2020	391	12.532	9.417 to 16.228	0.78	4.96
Lieberman-Cribbin, 2020	6245	4.404	3.908 to 4.942	12.42	5.97
Lovinsky-Desir, 2020	1298	12.635	10.875 to 14.566	2.58	5.68
Maeda, 2020	224	10.268	6.621 to 15.008	0.45	4.38
Marcello, 2020	10142	7.000	6.511 to 7.514	20.18	6.00
Mikami, 2020	6493	4.205	3.729 to 4.721	12.92	5.98
Palaiodimos, 2020	200	13.500	9.089 to 19.031	0.40	4.24
Paranjpe, 2020	2199	8.186	7.073 to 9.411	4.38	5.83
Richardson, 2020	5700	9.000	8.269 to 9.773	11.34	5.97
Singer, 2020	2388	6.281	5.341 to 7.330	4.75	5.84
Toussie, 2020	338	13.609	10.139 to 17.733	0.67	4.83
Van Gerwen, 2020	3703	11.612	10.597 to 12.688	7.37	5.92
Wang, 2020	7592	4.505	4.049 to 4.996	15.10	5.99
Total (fixed effects)	50256	6.717	6.500 to 6.940	100.00	100.00
Total (random effects)	50256	8.693	7.287 to 10.211	100.00	100.00

Test for heterogeneity

Q	530.7536
DF	18
Significance level	P < 0.0001
I^2 (inconsistency)	96.61%
95% CI for I^2	95.65 to 97.36

Prevalence 8.69 (7.29 – 10.21). Significant heterogeneity, p < 0.0001.


Abrams, 2020
Andrikopoulou, 2020
Argenziano, 2020
Clouston, 2020
Cummings, 2020
Gayam, 2020
Goyal, 2020
Lieberman-Cribbin, 2020
Lovinsky-Desir, 2020
Maeda, 2020
Marcello, 2020
Mikami, 2020
Palaiodimos, 2020
Paranjpe, 2020
Richardson, 2020
Singer, 2020
Toussie, 2020
Van Gerwen, 2020
Wang, 2020
Total (fixed effects)
Total (random effects)
0
0.1
0.2
Proportion

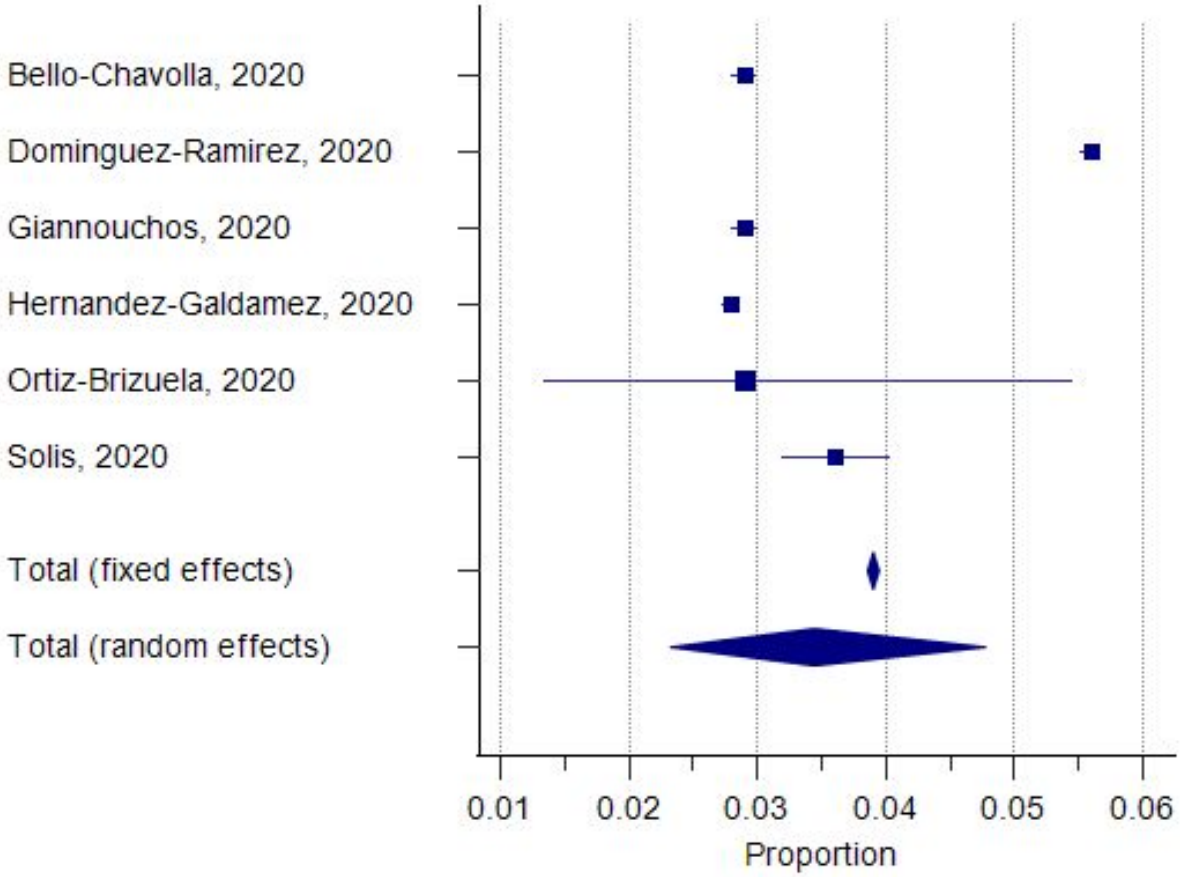
Mexico prevalence

Study	Sample size	Proportion (%)	95% CI	Weight (%)	
				Fixed	Random
Bello-Chavolla, 2020	101237	2.899	2.797 to 3.004	14.37	17.67
Dominguez-Ramirez, 2020	294744	5.600	5.517 to 5.684	41.83	17.69
Giannouchos, 2020	89756	2.900	2.791 to 3.012	12.74	17.67
Hernandez-Galdamez, 2020	211002	2.800	2.730 to 2.871	29.95	17.69
Ortiz-Brizuela, 2020	309	2.913	1.340 to 5.457	0.044	11.92
Solis, 2020	7496	3.601	3.191 to 4.048	1.06	17.35
Total (fixed effects)	704544	3.900	3.855 to 3.946	100.00	100.00
Total (random effects)	704544	3.443	2.323 to 4.773	100.00	100.00

Test for heterogeneity

Q	3278.5893
DF	5
Significance level	P < 0.0001
I^2 (inconsistency)	99.85%
95% CI for I^2	99.82 to 99.87

Prevalence 3.44 (2.32 – 4.77). Significant heterogeneity, p < 0.0001


Bello-Chavolla, 2020
Dominguez-Ramirez, 2020
Giannouchos, 2020
Hernandez-Galdamez, 2020
Ortiz-Brizuela, 2020
Solis, 2020
Total (fixed effects)
Total (random effects)
0.01
0.02
0.03
0.04
0.05
0.06
Proportion

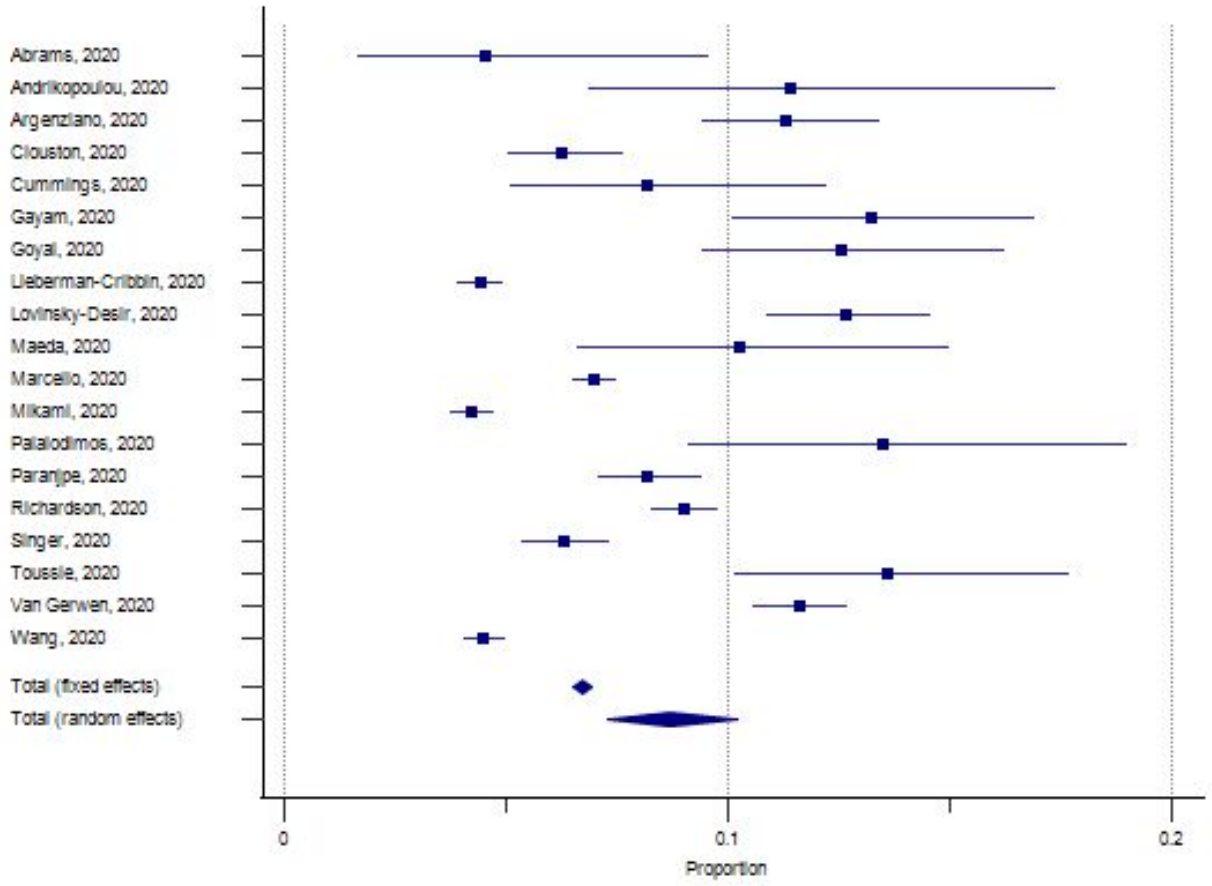
New York City prevalence

Study	Sample size	Proportion (%)	95% CI	Weight (%)	
				Fixed	Random
Abrams, 2020	133	4.511	1.673 to 9.560	0.27	3.68
Andrikopoulou, 2020	158	11.392	6.893 to 17.406	0.32	3.93
Argenziano, 2020	1000	11.300	9.404 to 13.427	1.99	5.57
Clouston, 2020	1387	6.273	5.054 to 7.680	2.76	5.70
Cummings, 2020	257	8.171	5.129 to 12.219	0.51	4.54
Gayam, 2020	408	13.235	10.101 to 16.914	0.81	5.00
Goyal, 2020	391	12.532	9.417 to 16.228	0.78	4.96
Lieberman-Cribbin, 2020	6245	4.404	3.908 to 4.942	12.42	5.97
Lovinsky-Desir, 2020	1298	12.635	10.875 to 14.566	2.58	5.68
Maeda, 2020	224	10.268	6.621 to 15.008	0.45	4.38
Marcello, 2020	10142	7.000	6.511 to 7.514	20.18	6.00
Mikami, 2020	6493	4.205	3.729 to 4.721	12.92	5.98
Palaiodimos, 2020	200	13.500	9.089 to 19.031	0.40	4.24
Paranjpe, 2020	2199	8.186	7.073 to 9.411	4.38	5.83
Richardson, 2020	5700	9.000	8.269 to 9.773	11.34	5.97
Singer, 2020	2388	6.281	5.341 to 7.330	4.75	5.84
Toussie, 2020	338	13.609	10.139 to 17.733	0.67	4.83
Van Gerwen, 2020	3703	11.612	10.597 to 12.688	7.37	5.92
Wang, 2020	7592	4.505	4.049 to 4.996	15.10	5.99
Total (fixed effects)	50256	6.717	6.500 to 6.940	100.00	100.00
Total (random effects)	50256	8.693	7.287 to 10.211	100.00	100.00

Test for heterogeneity

Q	530.7536
DF	18
Significance level	P < 0.0001
I^2 (inconsistency)	96.61%
95% CI for I^2	95.65 to 97.36

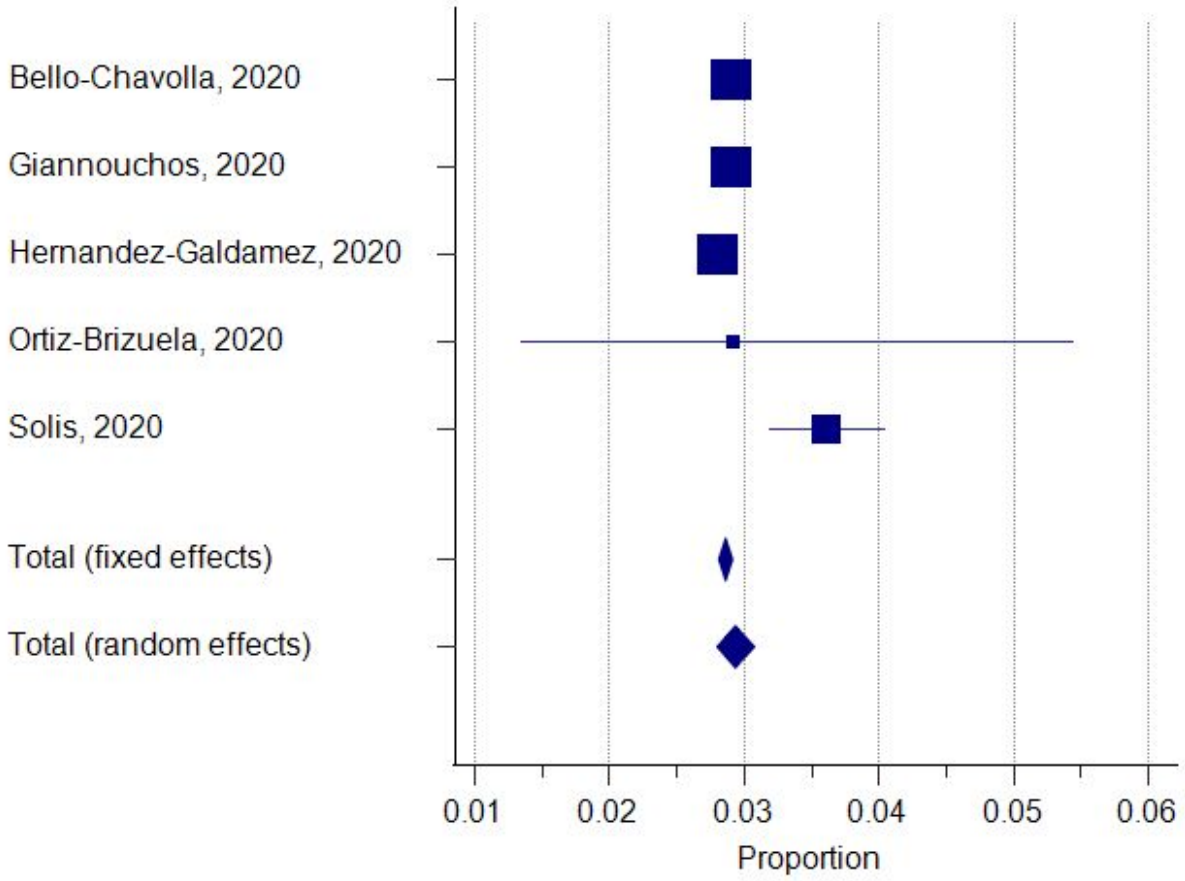
Prevalence 8.69 (7.29 – 10.21). Significant heterogeneity, p < 0.0001.


Abrams, 2020
Andrikopoulou, 2020
Argenziano, 2020
Clouston, 2020
Cummings, 2020
Gayam, 2020
Goyal, 2020
Lieberman-Cribbin, 2020
Lovinsky-Desir, 2020
Maeda, 2020
Marcello, 2020
Mikami, 2020
Palaiodimos, 2020
Paranjpe, 2020
Richardson, 2020
Singer, 2020
Toussie, 2020
Van Gerwen, 2020
Wang, 2020
Total (fixed effects)
Total (random effects)
0
0.1
0.2
Proportion

Mexico prevalence

Study	Sample size	Proportion (%)	95% CI	Weight (%)	
				Fixed	Random
Bello-Chavolla, 2020	101237	2.899	2.797 to 3.004	24.70	29.21
Giannouchos, 2020	89756	2.900	2.791 to 3.012	21.90	28.63
Hernandez-Galdamez, 2020	211002	2.800	2.730 to 2.871	51.49	31.86
Ortiz-Brizuela, 2020	309	2.913	1.340 to 5.457	0.076	0.55
Solis, 2020	7496	3.601	3.191 to 4.048	1.83	9.75
Total (fixed effects)	409800	2.861	2.810 to 2.912	100.00	100.00
Total (random effects)	409800	2.934	2.795 to 3.077	100.00	100.00

2.93 (2.80 – 3.08)



USA Prevalence

Study	Sample size	Proportion (%)	95% CI	Weight (%)	
				Fixed	Random
Abrams, 2020	133	4.511	1.673 to 9.560	0.038	1.36
Andrikopoulou, 2020	158	11.392	6.893 to 17.406	0.045	1.42
Arentz, 2020	21	9.524	1.175 to 30.377	0.0063	0.61
Argenziano, 2020	1000	11.300	9.404 to 13.427	0.28	1.73
Arshad, 2020	2541	9.917	8.782 to 11.146	0.72	1.77
Azar, 2020	1052	11.312	9.461 to 13.382	0.30	1.73
Bajaj, 2020	108	8.333	3.881 to 15.230	0.031	1.29
Barasa	117	11.966	6.699 to 19.261	0.034	1.32
Bhatraju, 2020	24	12.500	2.656 to 32.361	0.0071	0.66
Bramante, 2020	6256	4.204	3.720 to 4.731	1.78	1.79
Broadhurst, 2020	436	12.156	9.240 to 15.597	0.12	1.64
Bruckner, 2020	105	9.524	4.662 to 16.818	0.030	1.28
Burn, 2020	240392	13.500	13.364 to 13.637	68.33	1.80
Burn, 2020	3105	12.593	11.445 to 13.811	0.88	1.78
Campioli, 2020	251	18.327	13.741 to 23.678	0.072	1.54
Cates, 2020	3948	6.890	6.119 to 7.725	1.12	1.78
Chhiba, 2020	1526	14.417	12.691 to 16.280	0.43	1.75
Clouston, 2020	1387	6.273	5.054 to 7.680	0.39	1.75
Cummings, 2020	257	8.171	5.129 to 12.219	0.073	1.54
Dai, 2020	863	4.751	3.431 to 6.390	0.25	1.72
Dashti, 2020	4140	12.899	11.892 to 13.958	1.18	1.78
Duanmu, 2020	100	10.000	4.900 to 17.622	0.029	1.26
Ferguson, 2020	72	9.722	3.999 to 19.011	0.021	1.13
Fox, 2020	355	7.606	5.072 to 10.873	0.10	1.61
Garg, 2020	159	16.981	11.499 to 23.737	0.045	1.42
Garibaldi, 2020	832	9.495	7.590 to 11.693	0.24	1.71
Gayam, 2020	408	13.235	10.101 to 16.914	0.12	1.63
Gold, 2020	305	10.492	7.288 to 14.488	0.087	1.58
Goyal, 2020	391	12.532	9.417 to 16.228	0.11	1.62
Gupta, 2020	2215	11.603	10.298 to 13.010	0.63	1.77
Hsu, 2020	2729	13.192	11.944 to 14.519	0.78	1.77
Hussein, 2020	495	14.545	11.558 to 17.964	0.14	1.66
Jehi, 2020	4536	14.396	13.386 to 15.451	1.29	1.78
Keswani, 2020	1043	25.407	22.790 to 28.165	0.30	1.73
Kim, 2020	2484	12.601	11.320 to 13.970	0.71	1.77
Ko, 2020	5416	12.999	12.114 to 13.923	1.54	1.79
Lieberman-Cribbin, 2020	6245	4.404	3.908 to 4.942	1.78	1.79
Lokken, 2020	46	8.696	2.420 to 20.792	0.013	0.94
Lovinsky-Desir, 2020	1298	12.635	10.875 to 14.566	0.37	1.74
Maeda, 2020	224	10.268	6.621 to 15.008	0.064	1.51
Mahadavinia, 2020	935	25.775	22.998 to 28.706	0.27	1.72
Marcello, 2020	10142	7.000	6.511 to 7.514	2.88	1.79
Mendy, 2020	689	10.160	8.006 to 12.661	0.20	1.69

Meyers, 2020	91	5.495	1.808 to 12.358	0.026	1.22
Mikami, 2020	6493	4.205	3.729 to 4.721	1.85	1.79
Monteiro, 2020	112	11.607	6.327 to 19.030	0.032	1.30
Newton, 2020	993	13.494	11.430 to 15.778	0.28	1.73
Nguyen, 2020	689	17.271	14.521 to 20.305	0.20	1.69
O'Keefe, 2020	496	14.718	11.717 to 18.146	0.14	1.66
Palaiodimos, 2020	200	13.500	9.089 to 19.031	0.057	1.48
Paranjpe, 2020	2199	8.186	7.073 to 9.411	0.63	1.77
Price-Haywood, 2020	3481	4.108	3.473 to 4.821	0.99	1.78
Richardson, 2020	5700	9.000	8.269 to 9.773	1.62	1.79
Salacup, 2020	242	7.025	4.145 to 11.009	0.069	1.53
Shah, 2020	316	12.025	8.652 to 16.130	0.090	1.58
Silver, 2020	249	19.679	14.927 to 25.168	0.071	1.53
Singer, 2020	2388	6.281	5.341 to 7.330	0.68	1.77
Suleyman, 2020	463	15.767	12.567 to 19.411	0.13	1.65
Tartof, 2020	6916	18.407	17.499 to 19.340	1.97	1.79
Toussie, 2020	338	13.609	10.139 to 17.733	0.096	1.60
Van Gerwen, 2020	3703	11.612	10.597 to 12.688	1.05	1.78
Wang, 2020	7592	4.505	4.049 to 4.996	2.16	1.79
Yan, 2020	128	10.156	5.520 to 16.741	0.037	1.35
Total (fixed effects)	351728	12.054	11.947 to 12.162	100.00	100.00
Total (random effects)	351728	11.002	9.784 to 12.283	100.00	100.00

11.00 (9.78 – 12.28)

Severity

Study	Intervention	Controls	Relative risk	95% CI	z	P	Weight (%)	
							Fixed	Random
Aggarwal, 2020	2/24	0/8	1.800	0.0952 to 34.024			0.054	0.36
Almazeedi, 2020	6/42	37/1054	4.069	1.818 to 9.108			0.72	2.53
Andrikopoulou, 2020	8/34	10/124	2.918	1.249 to 6.818			0.65	2.40
Argenziano, 2020	29/236	59/614	1.279	0.842 to 1.943			2.68	3.93
Azar, 2020	20/110	23/146	1.154	0.669 to 1.992			1.58	3.44
Bermejo-Martin, 2020	2/100	6/100	0.333	0.0689 to 1.612			0.19	1.06
Broadhurst, 2020	15/139	29/212	0.789	0.439 to 1.417			1.37	3.29
Bruckner, 2020	3/51	7/54	0.454	0.124 to 1.660			0.28	1.42
Caliskan, 2020	4/91	17/474	1.226	0.422 to 3.558			0.41	1.85
Calmes, 2020	10/88	47/508	1.228	0.645 to 2.339			1.13	3.07
Dashti, 2020	90/619	81/575	1.032	0.782 to 1.363			6.08	4.44
Garibaldi, 2020	16/171	54/523	0.906	0.533 to 1.540			1.67	3.50
Giannouchos, 2020	269/11705	2341/78049	0.766	0.676 to 0.868			30.21	4.83
Goyal, 2020	17/130	32/263	1.075	0.620 to 1.862			1.56	3.42
Gregoriano, 2020	5/35	11/64	0.831	0.314 to 2.200			0.50	2.07
Hernandez-Galdamez, 2020	143/5508	1379/59987	1.129	0.953 to 1.339			16.26	4.74

Higuchi ,2020	0/7	8/50	0.375	0.0239 to 5.884			0.062	0.41
Hsu, 2020	29/188	140/900	0.992	0.687 to 1.432			3.47	4.12
Lee, 2020	63/371	621/6901	1.887	1.489 to 2.392			8.35	4.56
Li, 2020	3/269	2/279	1.556	0.262 to 9.238			0.15	0.87
Lovinsky-Desir, 2020	35/268	128/1030	1.051	0.741 to 1.490			3.86	4.19
Maeda, 2020	4/57	19/167	0.617	0.219 to 1.737			0.44	1.92
Mendy, 2020	23/91	47/598	3.216	2.056 to 5.030			2.35	3.82
Meyer, 2020	3/20	12/81	1.012	0.315 to 3.251			0.35	1.65
Monteiro, 2020	4/28	9/84	1.333	0.445 to 3.995			0.39	1.79
Morshed, 2020	1/16	5/87	1.087	0.136 to 8.703			0.11	0.67
Myrstad, 2020	0/15	7/51	0.217	0.0131 to 3.589			0.060	0.39
Newton, 2020	13/70	54/370	1.272	0.735 to 2.203			1.56	3.43
Ortiz-Birzuela, 2020	0/29	2/111	0.747	0.0368 to 15.141			0.052	0.35
Ottenhoff, 2020	43/516	187/1703	0.759	0.553 to 1.041			4.69	4.31
Regina, 2020	1/37	11/263	0.646	0.0859 to 4.862			0.12	0.71
Rosenthal, 2020	11/68	94/659	1.134	0.640 to 2.010			1.43	3.34
Shabwarishi, 2000	1/16	3/134	2.792	0.308 to 25.271			0.097	0.61

Shahriaridad, 2020	1/11	6/102	1.545	0.204 to 11.692			0.11	0.71
Song, 2020	1/242	21/719	0.141	0.0191 to 1.046			0.12	0.72
Soria, 2020	21/346	8/102	0.774	0.353 to 1.695			0.76	2.60
Suleyman, 2020	19/141	34/214	0.848	0.504 to 1.426			1.74	3.54
Toussie, 2020	17/136	29/202	0.871	0.498 to 1.521			1.51	3.39
Uchida, 2020	1/8	0/27	9.333	0.416 to 209.536			0.049	0.33
Wang, 2020	5/50	1/73	7.300	0.879 to 60.618			0.10	0.65
Wang, 2020	22/53	46/509	4.593	3.012 to 7.005			2.64	3.92
Yang, 2020	1/66	6/397	1.003	0.123 to 8.195			0.11	0.66
Total (fixed effects)	961/22202	5633/158568	0.997	0.931 to 1.068	-0.0740	0.941	100.00	100.00
Total (random effects)	961/22202	5633/158568	1.182	0.984 to 1.420	1.785	0.074	100.00	100.00

1.18 (0.98 – 1.42), p = 0.07

Severity prevalence

Study	Sample size	Proportion (%)	95% CI	Weight (%)	
				Fixed	Random
Aggarwal, 2020	24	8.333	1.026 to 26.997	0.11	1.73
Almazeedi, 2020	42	14.286	5.428 to 28.539	0.19	2.15
Andrikopoulou, 2020	34	23.529	10.746 to 41.171	0.16	2.00
Argenziano, 2020	236	12.288	8.386 to 17.169	1.07	2.97
Azar, 2020	110	18.182	11.474 to 26.674	0.50	2.71
Bermejo-Martin, 2020	100	2.000	0.243 to 7.038	0.45	2.67
Broadhurst, 2020	139	10.791	6.167 to 17.174	0.63	2.80
Bruckner, 2020	51	5.882	1.230 to 16.242	0.23	2.28
Caliskan, 2020	91	4.396	1.210 to 10.873	0.41	2.62
Calmes, 2020	88	11.364	5.586 to 19.907	0.40	2.60
Dashti, 2020	619	14.540	11.856 to 17.566	2.79	3.13
Garibaldi, 2020	171	9.357	5.443 to 14.750	0.77	2.88
Giannouchos, 2020	11705	2.298	2.034 to 2.586	52.63	3.23
Goyal, 2020	130	13.077	7.806 to 20.110	0.59	2.78
Gregoriano, 2020	35	14.286	4.806 to 30.257	0.16	2.02
Hernandez-Galdamez, 2020	5508	2.596	2.192 to 3.051	24.77	3.23
Higuchi ,2020	7	0.000	0.000 to 40.962	0.036	0.87
Hsu, 2020	188	15.426	10.581 to 21.397	0.85	2.90
Lee, 2020	371	16.981	13.302 to 21.196	1.67	3.06
Li, 2020	269	1.115	0.231 to 3.224	1.21	3.00
Lovinsky-Desir, 2020	268	13.060	9.268 to 17.692	1.21	3.00
Maeda, 2020	57	7.018	1.945 to 17.004	0.26	2.36
Mendy, 2020	91	25.275	16.746 to 35.473	0.41	2.62
Meyer, 2020	20	15.000	3.207 to 37.893	0.094	1.59
Monteiro, 2020	28	14.286	4.034 to 32.665	0.13	1.85
Morshed, 2020	16	6.250	0.158 to 30.232	0.076	1.42
Myrstad, 2020	15	0.000	0.000 to 21.802	0.072	1.37
Newton, 2020	70	18.571	10.276 to 29.661	0.32	2.48
Ortiz-Birzuela, 2020	29	0.000	0.000 to 11.944	0.13	1.88
Ottenhoff, 2020	516	8.333	6.096 to 11.061	2.32	3.11
Regina, 2020	37	2.703	0.0684 to 14.160	0.17	2.06
Rosenthal, 2020	68	16.176	8.362 to 27.103	0.31	2.46
Shabwarishi, 2000	16	6.250	0.158 to 30.232	0.076	1.42
Shahriaridad, 2020	11	9.091	0.230 to 41.278	0.054	1.15
Song, 2020	242	0.413	0.0105 to 2.281	1.09	2.97
Soria, 2020	346	6.069	3.796 to 9.128	1.56	3.05
Suleyman, 2020	141	13.475	8.312 to 20.241	0.64	2.81
Toussie, 2020	136	12.500	7.453 to 19.258	0.62	2.80
Uchida, 2020	8	12.500	0.316 to 52.651	0.040	0.95
Wang, 2020	50	10.000	3.328 to 21.814	0.23	2.27
Wang, 2020	53	41.509	28.136 to 55.866	0.24	2.31
Yang, 2020	66	1.515	0.0384 to 8.155	0.30	2.45
Total (fixed effects)	22202	3.716	3.471 to 3.973	100.00	100.00

Total (random effects)	22202	9.918	7.774 to 12.292	100.00	100.00

9.92 (7.77 – 12.29)

Non-severity

Study	Sample size	Proportion (%)	95% CI	Weight (%)	
				Fixed	Random
Aggarwal, 2020	8	0.000	0.000 to 36.942	0.0057	0.45
Almazeedi, 2020	1054	3.510	2.483 to 4.806	0.67	2.95
Andrikopoulou, 2020	124	8.065	3.935 to 14.331	0.079	2.18
Argenziano, 2020	614	9.609	7.395 to 12.220	0.39	2.85
Azar, 2020	146	15.753	10.256 to 22.694	0.093	2.28
Bermejo-Martin, 2020	100	6.000	2.233 to 12.603	0.064	2.04
Broadhurst, 2020	212	13.679	9.356 to 19.051	0.13	2.48
Bruckner, 2020	54	12.963	5.374 to 24.901	0.035	1.58
Caliskan, 2020	474	3.586	2.103 to 5.680	0.30	2.79
Calmes, 2020	508	9.252	6.877 to 12.113	0.32	2.81
Dashti, 2020	575	14.087	11.347 to 17.202	0.36	2.84
Garibaldi, 2020	523	10.325	7.852 to 13.257	0.33	2.82
Giannouchos, 2020	78049	2.999	2.881 to 3.121	49.21	3.10
Goyal, 2020	263	12.167	8.473 to 16.741	0.17	2.58
Gregoriano, 2020	64	17.187	8.905 to 28.675	0.041	1.71
Hernandez-Galdamez, 2020	59987	2.299	2.180 to 2.422	37.82	3.10
Higuchi ,2020	50	16.000	7.170 to 29.113	0.032	1.52
Hsu, 2020	900	15.556	13.248 to 18.091	0.57	2.93
Lee, 2020	6901	8.999	8.334 to 9.699	4.35	3.08
Li, 2020	279	0.717	0.0869 to 2.565	0.18	2.61
Lovinsky-Desir, 2020	1030	12.427	10.474 to 14.598	0.65	2.95
Maeda, 2020	167	11.377	6.991 to 17.196	0.11	2.36
Mendy, 2020	598	7.860	5.832 to 10.315	0.38	2.85
Meyer, 2020	81	14.815	7.896 to 24.449	0.052	1.89
Monteiro, 2020	84	10.714	5.018 to 19.367	0.054	1.91
Morshed, 2020	87	5.747	1.892 to 12.904	0.055	1.94
Myrstad, 2020	51	13.725	5.701 to 26.255	0.033	1.54
Newton, 2020	370	14.595	11.158 to 18.610	0.23	2.71
Ortiz-Birzuela, 2020	111	1.802	0.219 to 6.357	0.071	2.11
Ottenhoff, 2020	1703	10.981	9.535 to 12.563	1.07	3.01
Regina, 2020	263	4.183	2.106 to 7.360	0.17	2.58
Rosenthal, 2020	659	14.264	11.683 to 17.170	0.42	2.87
Shabwarishi, 2000	134	2.239	0.464 to 6.403	0.085	2.23
Shahriaridad, 2020	102	5.882	2.189 to 12.365	0.065	2.05
Song, 2020	719	2.921	1.817 to 4.430	0.45	2.89
Soria, 2020	102	7.843	3.447 to 14.870	0.065	2.05
Suleyman, 2020	214	15.888	11.261 to 21.488	0.14	2.49
Toussie, 2020	202	14.356	9.830 to 19.963	0.13	2.46
Uchida, 2020	27	0.000	0.000 to 12.770	0.018	1.07
Wang, 2020	73	1.370	0.0347 to 7.398	0.047	1.81
Wang, 2020	509	9.037	6.692 to 11.870	0.32	2.81
Yang, 2020	397	1.511	0.557 to 3.260	0.25	2.74
Total (fixed effects)	158568	3.300	3.212 to 3.389	100.00	100.00

Total (random effects)	158568	8.226	6.968 to 9.578	100.00	100.00

8.23 (6.97 – 9.58)

Survival

Study	Intervention	Controls	Relative risk	95% CI	z	P	Weight (%)	
							Fixed	Random
Alizadehsani, 2020	0/15	2/108	1.362	0.0685 to 27.114			0.032	0.20
Alkundi, 2020	0/24	2/63	0.512	0.0255 to 10.294			0.032	0.20
Almazeedi, 2020	4/19	39/1077	5.814	2.308 to 14.642			0.34	1.52
Azar, 2020	10/51	10/59	1.157	0.524 to 2.555			0.46	1.86
Baqui, 2020	100/3328	182/4043	0.667	0.525 to 0.848			4.98	4.23
Berenguer, 2020	69/1116	231/2884	0.772	0.595 to 1.001			4.24	4.14
Bisso, 2020	1/46	8/122	0.332	0.0426 to 2.578			0.068	0.41
Borobia, 2020	17/460	97/1766	0.673	0.406 to 1.115			1.12	2.93
Caliskan, 2020	4/75	17/490	1.537	0.532 to 4.445			0.25	1.25
Calmes, 2020	4/87	53/509	0.442	0.164 to 1.189			0.29	1.38
Choi, 2020	21/277	199/7363	2.805	1.818 to 4.327			1.52	3.27
Choi, 2020	8/126	118/3931	2.115	1.057 to 4.233			0.59	2.17
Clouston, 2020	13/211	73/1176	0.993	0.560 to 1.758			0.88	2.64
Dashti, 2020	25/187	510/3953	1.036	0.713 to 1.506			2.05	3.57
Garibaldi, 2020	8/131	70/694	0.605	0.298 to 1.228			0.57	2.12

Gayam, 2020	16/132	38/276	0.880	0.510 to 1.520			0.96	2.75
Giannoglou, 2020	10/81	61/431	0.872	0.467 to 1.630			0.73	2.42
Gupta, 2020	70/784	187/1431	0.683	0.527 to 0.887			4.22	4.13
Haw, 2020	22/768	146/2988	0.586	0.377 to 0.911			1.47	3.23
Hernandez-Galdamez, 2020	544/25928	5366/185075	0.724	0.663 to 0.789			37.59	4.76
Hsu, 2020	15/98	169/1088	0.985	0.606 to 1.602			1.21	3.02
Hussein, 2020	7/64	65/431	0.725	0.348 to 1.511			0.53	2.03
Lee, 2020	44/227	641/7045	2.130	1.618 to 2.806			3.77	4.06
Lombardi, 2020	2/233	18/810	0.386	0.0903 to 1.653			0.14	0.75
Lovinsky-Desir, 2020	9/110	154/1188	0.631	0.332 to 1.201			0.69	2.35
Marcello, 2020	103/1717	323/4363	0.810	0.654 to 1.004			6.21	4.34
Meyer, 2020	3/30	12/71	0.592	0.180 to 1.947			0.20	1.04
Mikami, 2020	76/1694	97/2014	0.932	0.695 to 1.249			3.33	3.97
Nguyen, 2020	2/34	44/266	0.356	0.0902 to 1.401			0.15	0.83
Paranjpe, 2020	23/310	157/1889	0.893	0.586 to 1.360			1.62	3.34
Peixoto, 2020	3/502	277/19768	0.426	0.137 to 1.326			0.22	1.13
Robinson, 2020	7/45	73/358	0.763	0.375 to 1.553			0.57	2.11

Rosenthal, 2020	10/61	95/666	1.149	0.633 to 2.087			0.80	2.53
Saha, 2020	3/95	12/73	0.192	0.0563 to 0.656			0.19	1.00
Salacup, 2020	0/52	19/190	0.0924	0.00567 to 1.505			0.037	0.23
Sapey, 2020	143/769	295/1448	0.913	0.763 to 1.092			8.87	4.48
Sardinha, 2020	10/470	13/737	1.206	0.533 to 2.728			0.43	1.79
Satici, 2020	1/55	42/626	0.271	0.0380 to 1.931			0.074	0.44
Shahriaridad, 2020	1/9	6/104	1.926	0.259 to 14.295			0.071	0.43
Tartof, 2020	44/206	1228/6710	1.167	0.894 to 1.524			4.02	4.10
Thompson, 2020	11/169	36/301	0.544	0.285 to 1.041			0.68	2.33
Trabulus, 2020	1/43	19/293	0.359	0.0493 to 2.611			0.073	0.44
Van Gerwen, 2020	61/616	171/1399	0.810	0.614 to 1.068			3.74	4.06
Total (fixed effects)	1525/41455	11375/270277	0.796	0.755 to 0.840	-8.315	<0.001	100.00	100.00
Total (random effects)	1525/41455	11375/270277	0.888	0.774 to 1.019	-1.688	0.091	100.00	100.00

0.89 (0.77 – 1.02), p = 0.09
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Died

Study	Sample size	Proportion (%)	95% CI	Weight (%)	
				Fixed	Random
Alizadehsani, 2020	15	0.000	0.000 to 21.802	0.039	1.05
Alkundi, 2020	24	0.000	0.000 to 14.247	0.060	1.37
Almazeedi, 2020	19	21.053	6.052 to 45.565	0.048	1.21
Azar, 2020	51	19.608	9.824 to 33.116	0.13	1.91
Baqui, 2020	3328	3.005	2.451 to 3.643	8.02	2.99
Berenguer, 2020	1116	6.183	4.842 to 7.760	2.69	2.93
Bisso, 2020	46	2.174	0.0550 to 11.527	0.11	1.84
Borobia, 2020	460	3.696	2.167 to 5.851	1.11	2.83
Caliskan, 2020	75	5.333	1.472 to 13.096	0.18	2.16
Calmes, 2020	87	4.598	1.267 to 11.355	0.21	2.25
Choi, 2020	277	7.581	4.754 to 11.355	0.67	2.72
Choi, 2020	126	6.349	2.781 to 12.127	0.31	2.44
Clouston, 2020	211	6.161	3.321 to 10.305	0.51	2.64
Dashti, 2020	187	13.369	8.842 to 19.100	0.45	2.60
Garibaldi, 2020	131	6.107	2.673 to 11.678	0.32	2.46
Gayam, 2020	132	12.121	7.090 to 18.937	0.32	2.46
Giannoglou, 2020	81	12.346	6.082 to 21.534	0.20	2.21
Gupta, 2020	784	8.929	7.026 to 11.146	1.89	2.90
Haw, 2020	768	2.865	1.804 to 4.305	1.85	2.90
Hernandez-Galdamez, 2020	25928	2.098	1.927 to 2.280	62.48	3.01
Hsu, 2020	98	15.306	8.827 to 23.986	0.24	2.31
Hussein, 2020	64	10.938	4.512 to 21.246	0.16	2.06
Lee, 2020	227	19.383	14.451 to 25.134	0.55	2.66
Lombardi, 2020	233	0.858	0.104 to 3.066	0.56	2.67
Lovinsky-Desir, 2020	110	8.182	3.810 to 14.964	0.27	2.37
Marcello, 2020	1717	5.999	4.923 to 7.228	4.14	2.96
Meyer, 2020	30	10.000	2.112 to 26.529	0.075	1.53
Mikami, 2020	1694	4.486	3.551 to 5.583	4.08	2.96
Nguyen, 2020	34	5.882	0.720 to 19.677	0.084	1.62
Paranjpe, 2020	310	7.419	4.761 to 10.925	0.75	2.75
Peixoto, 2020	502	0.598	0.123 to 1.736	1.21	2.84
Robinson, 2020	45	15.556	6.491 to 29.455	0.11	1.82
Rosenthal, 2020	61	16.393	8.152 to 28.089	0.15	2.03
Saha, 2020	95	3.158	0.656 to 8.952	0.23	2.30
Salacup, 2020	52	0.000	0.000 to 6.848	0.13	1.92
Sapey, 2020	769	18.596	15.905 to 21.529	1.86	2.90
Sardinha, 2020	470	2.128	1.025 to 3.878	1.13	2.83
Satici, 2020	55	1.818	0.0460 to 9.719	0.13	1.96
Shahriaridad, 2020	9	11.111	0.281 to 48.250	0.024	0.75
Tartof, 2020	206	21.359	15.969 to 27.593	0.50	2.63
Thompson, 2020	169	6.509	3.294 to 11.348	0.41	2.56
Trabulus, 2020	43	2.326	0.0589 to 12.289	0.11	1.79
Van Gerwen, 2020	616	9.903	7.660 to 12.538	1.49	2.87

Total (fixed effects)	41455	3.262	3.093 to 3.437	100.00	100.00
Total (random effects)	41455	7.136	5.621 to 8.818	100.00	100.00

7.14 (5.62 – 8.82)
TIF attached

Survived

Study	Sample size	Proportion (%)	95% CI	Weight (%)	
				Fixed	Random
Alizadehsani, 2020	108	1.852	0.225 to 6.530	0.040	2.01
Alkundi, 2020	63	3.175	0.387 to 11.002	0.024	1.77
Almazeedi, 2020	1077	3.621	2.587 to 4.917	0.40	2.43
Azar, 2020	59	16.949	8.439 to 28.969	0.022	1.74
Baqui, 2020	4043	4.502	3.883 to 5.187	1.50	2.47
Berenguer, 2020	2884	8.010	7.045 to 9.061	1.07	2.47
Bisso, 2020	122	6.557	2.873 to 12.512	0.046	2.05
Borobia, 2020	1766	5.493	4.476 to 6.660	0.65	2.45
Caliskan, 2020	490	3.469	2.034 to 5.497	0.18	2.36
Calmes, 2020	509	10.413	7.897 to 13.398	0.19	2.37
Choi, 2020	7363	2.703	2.344 to 3.099	2.72	2.48
Choi, 2020	3931	3.002	2.491 to 3.584	1.45	2.47
Clouston, 2020	1176	6.207	4.897 to 7.742	0.44	2.44
Dashti, 2020	3953	12.902	11.872 to 13.987	1.46	2.47
Garibaldi, 2020	694	10.086	7.947 to 12.572	0.26	2.40
Gayam, 2020	276	13.768	9.931 to 18.405	0.10	2.28
Giannoglou, 2020	431	14.153	11.002 to 17.806	0.16	2.35
Gupta, 2020	1431	13.068	11.364 to 14.925	0.53	2.45
Haw, 2020	2988	4.886	4.141 to 5.721	1.11	2.47
Hernandez-Galdamez, 2020	185075	2.900	2.824 to 2.977	68.47	2.49
Hsu, 2020	1088	15.533	13.430 to 17.824	0.40	2.43
Hussein, 2020	431	15.081	11.836 to 18.814	0.16	2.35
Lee, 2020	7045	9.099	8.437 to 9.794	2.61	2.48
Lombardi, 2020	810	2.222	1.322 to 3.489	0.30	2.41
Lovinsky-Desir, 2020	1188	12.963	11.104 to 15.007	0.44	2.44
Marcello, 2020	4363	7.403	6.644 to 8.220	1.61	2.48
Meyer, 2020	71	16.901	9.050 to 27.663	0.027	1.83
Mikami, 2020	2014	4.816	3.923 to 5.844	0.75	2.46
Nguyen, 2020	266	16.541	12.284 to 21.563	0.099	2.27
Paranjpe, 2020	1889	8.311	7.105 to 9.648	0.70	2.46
Peixoto, 2020	19768	1.401	1.242 to 1.575	7.31	2.49
Robinson, 2020	358	20.391	16.338 to 24.942	0.13	2.32
Rosenthal, 2020	666	14.264	11.696 to 17.153	0.25	2.40
Saha, 2020	73	16.438	8.793 to 26.954	0.027	1.84
Salacup, 2020	190	10.000	6.129 to 15.175	0.071	2.19
Sapey, 2020	1448	20.373	18.326 to 22.541	0.54	2.45
Sardinha, 2020	737	1.764	0.942 to 2.997	0.27	2.41
Satici, 2020	626	6.709	4.878 to 8.961	0.23	2.39
Shahriaridad, 2020	104	5.769	2.146 to 12.135	0.039	1.99
Tartof, 2020	6710	18.301	17.382 to 19.247	2.48	2.48
Thompson, 2020	301	11.960	8.519 to 16.172	0.11	2.29
Trabulus, 2020	293	6.485	3.949 to 9.942	0.11	2.29
Van Gerwen, 2020	1399	12.223	10.552 to 14.055	0.52	2.44

Total (fixed effects)	270277	3.776	3.705 to 3.849	100.00	100.00
Total (random effects)	270277	8.566	6.949 to 10.334	100.00	100.00

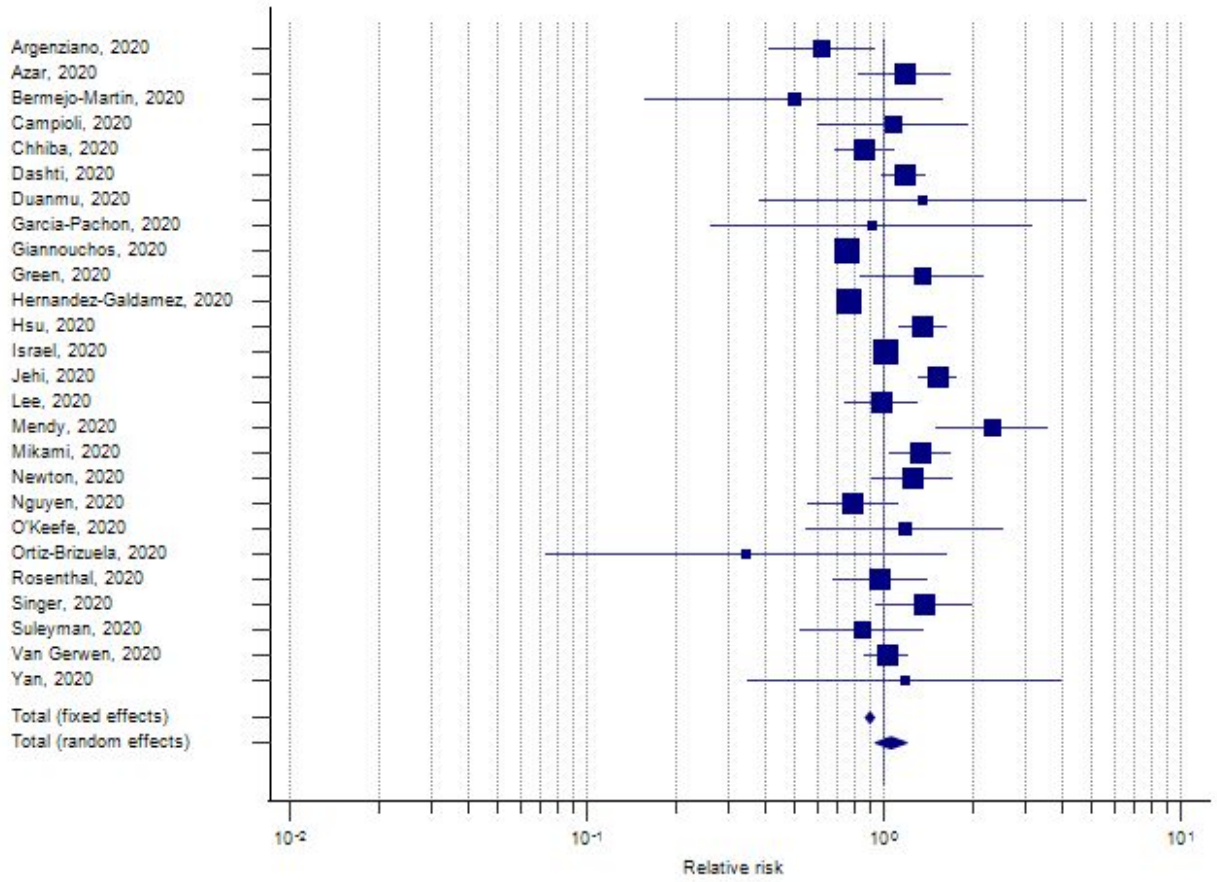
8.57 (6.95 – 10.33)

Hospitalization

Study	Intervention	Controls	Relative risk	95% CI	z	P	Weight (%)	
							Fixed	Random
Argenziano, 2020	88/850	25/150	0.621	0.413 to 0.935			0.70	3.74
Azar, 2020	40/356	76/796	1.177	0.819 to 1.690			0.90	4.12
Bermejo-Martin, 2020	8/200	4/50	0.500	0.157 to 1.594			0.088	0.94
Campioli, 2020	12/62	34/189	1.076	0.595 to 1.945			0.34	2.56
Chhiba, 2020	115/853	133/853	0.865	0.686 to 1.089			2.21	5.25
Dashti, 2020	171/1194	337/2759	1.173	0.988 to 1.391			4.02	5.74
Duanmu, 2020	3/24	7/76	1.357	0.380 to 4.844			0.073	0.80
Garcia-Pachon, 2020	4/158	6/218	0.920	0.264 to 3.206			0.076	0.83
Giannouchos, 2020	750/31270	1872/58484	0.749	0.689 to 0.815			16.85	6.28
Green, 2020	17/190	137/2076	1.356	0.838 to 2.195			0.51	3.22
Hernandez-Galdamez, 2020	1506/65495	4365/145507	0.767	0.723 to 0.812			35.19	6.38
Hsu, 2020	184/1186	176/1543	1.360	1.122 to 1.649			3.18	5.58
Israel, 2020	814/13120	1831/30010	1.017	0.939 to 1.101			18.40	6.30
Jehi, 2020	189/958	462/3578	1.528	1.311 to 1.781			5.00	5.87
Lee, 2020	640/6811	44/461	0.985	0.736 to 1.316			1.39	4.73
Mendy, 2020	36/216	34/473	2.319	1.493 to 3.601			0.61	3.51

Mikami, 2020	174/3708	98/2785	1.334	1.046 to 1.700			2.00	5.15
Newton, 2020	67/440	67/553	1.257	0.918 to 1.722			1.19	4.52
Nguyen, 2020	46/302	59/306	0.790	0.556 to 1.122			0.95	4.21
O'Keefe, 2020	6/35	67/461	1.180	0.551 to 2.525			0.20	1.84
Ortiz-Brizuela, 2020	2/140	7/169	0.345	0.072 8 to 1.634			0.049	0.56
Rosenthal, 2020	39/274	66/453	0.977	0.677 to 1.409			0.88	4.08
Singer, 2020	52/737	47/914	1.372	0.936 to 2.011			0.81	3.95
Suleyman, 2020	53/355	19/108	0.849	0.526 to 1.368			0.52	3.24
Van Gerwen, 2020	242/2015	198/1688	1.024	0.858 to 1.221			3.79	5.70
Yan, 2020	3/26	10/102	1.177	0.349 to 3.972			0.080	0.87
Total (fixed effects)	5261/130975	10181/254762	0.897	0.867 to 0.928	-6.235	<0.001	100.00	100.00
Total (random effects)	5261/130975	10181/254762	1.057	0.936 to 1.194	0.890	0.374	100.00	100.00

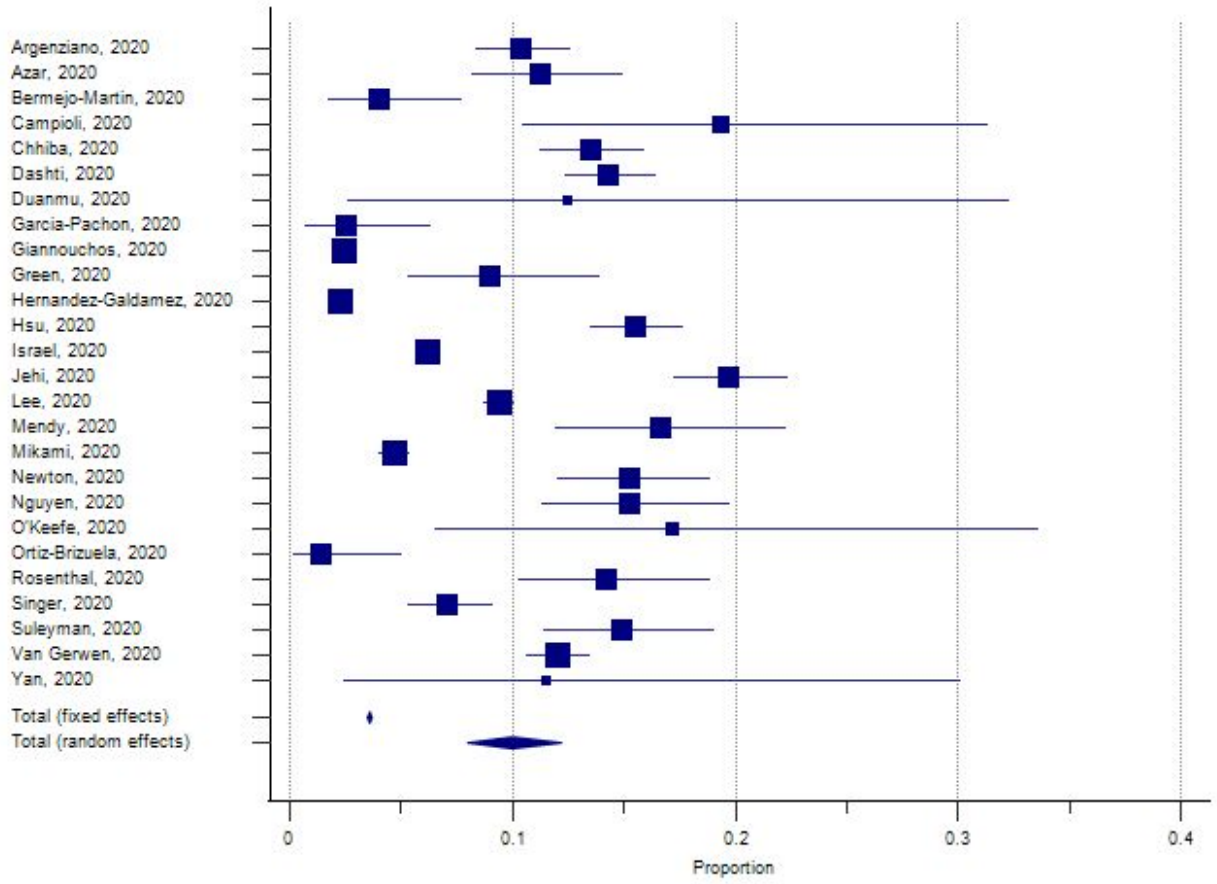
1.06 (0.94 – 1.19), p = 0.37


Argenziano, 2020
Azar, 2020
Bermejo-Martin, 2020
Campioli, 2020
Chhiba, 2020
Dashti, 2020
Duanmu, 2020
Garcia-Pachon, 2020
Giannouchos, 2020
Green, 2020
Hernandez-Galdamez, 2020
Hsu, 2020
Israel, 2020
Jehi, 2020
Lee, 2020
Mendy, 2020
Mikami, 2020
Newton, 2020
Nguyen, 2020
O'Keefe, 2020
Ortiz-Brizuela, 2020
Rosenthal, 2020
Singer, 2020
Suleyman, 2020
Van Gerwen, 2020
Yan, 2020
Total (fixed effects)
Total (random effects)
10-2
10-1
100
101
Relative risk

Hospitalized prevalence

Study	Sample size	Proportion (%)	95% CI	Weight (%)	
				Fixed	Random
Argenziano, 2020	850	10.353	8.386 to 12.599	0.65	4.27
Azar, 2020	356	11.236	8.150 to 14.985	0.27	4.05
Bermejo-Martin, 2020	200	4.000	1.742 to 7.729	0.15	3.80
Campioli, 2020	62	19.355	10.421 to 31.369	0.048	2.88
Chhiba, 2020	853	13.482	11.261 to 15.959	0.65	4.27
Dashti, 2020	1194	14.322	12.383 to 16.438	0.91	4.32
Duanmu, 2020	24	12.500	2.656 to 32.361	0.019	1.87
Garcia-Pachon, 2020	158	2.532	0.694 to 6.355	0.12	3.65
Giannouchos, 2020	31270	2.398	2.232 to 2.574	23.87	4.44
Green, 2020	190	8.947	5.299 to 13.939	0.15	3.77
Hernandez-Galdamez, 2020	65495	2.299	2.186 to 2.417	50.00	4.44
Hsu, 2020	1186	15.514	13.499 to 17.702	0.91	4.32
Israel, 2020	13120	6.204	5.797 to 6.630	10.02	4.43
Jehi, 2020	958	19.729	17.253 to 22.392	0.73	4.29
Lee, 2020	6811	9.397	8.714 to 10.114	5.20	4.42
Mendy, 2020	216	16.667	11.954 to 22.319	0.17	3.84
Mikami, 2020	3708	4.693	4.034 to 5.423	2.83	4.40
Newton, 2020	440	15.227	12.000 to 18.931	0.34	4.12
Nguyen, 2020	302	15.232	11.372 to 19.789	0.23	3.99
O'Keefe, 2020	35	17.143	6.562 to 33.650	0.027	2.27
Ortiz-Brizuela, 2020	140	1.429	0.173 to 5.065	0.11	3.57
Rosenthal, 2020	274	14.234	10.321 to 18.940	0.21	3.95
Singer, 2020	737	7.056	5.314 to 9.150	0.56	4.25
Suleyman, 2020	355	14.930	11.388 to 19.069	0.27	4.05
Van Gerwen, 2020	2015	12.010	10.622 to 13.510	1.54	4.37
Yan, 2020	26	11.538	2.446 to 30.154	0.021	1.96
Total (fixed effects)	130975	3.583	3.483 to 3.685	100.00	100.00
Total (random effects)	130975	9.988	7.975 to 12.200	100.00	100.00

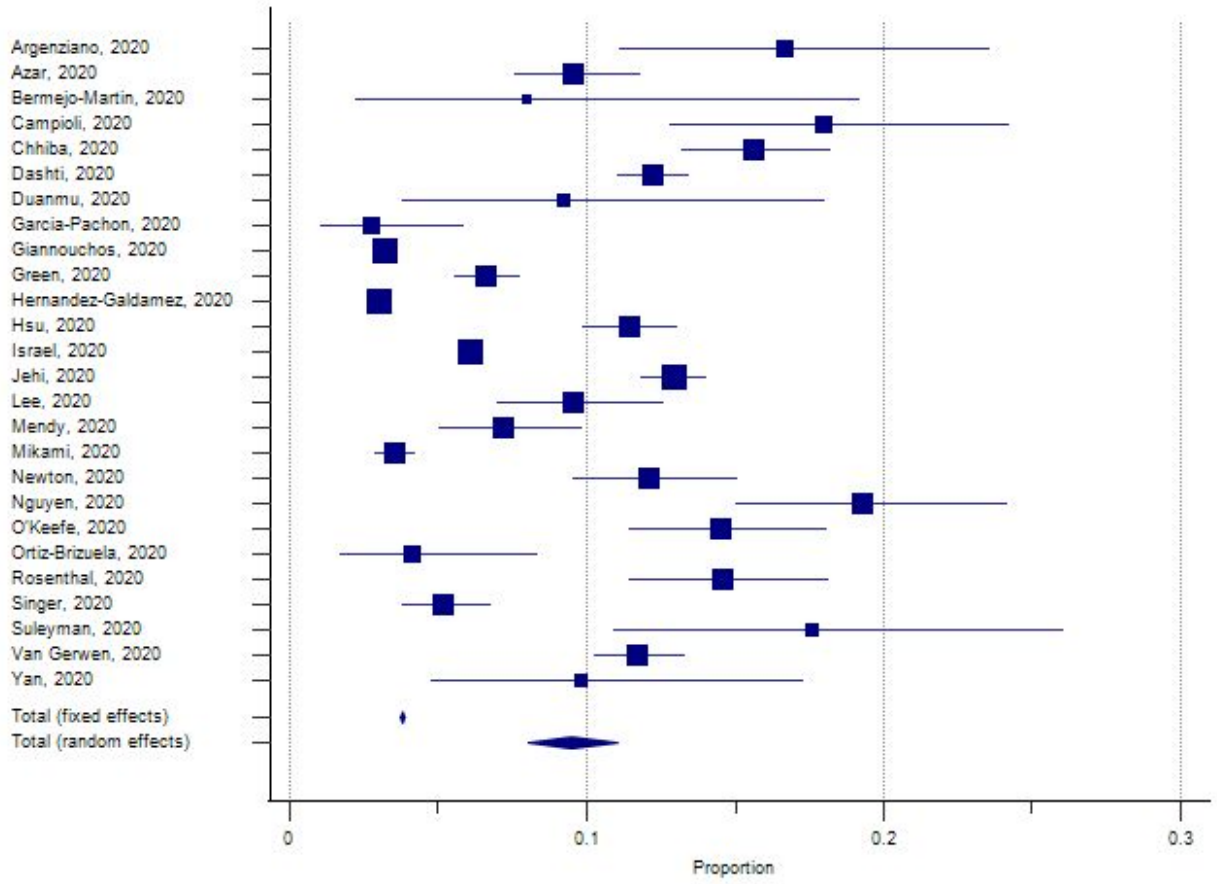
9.99 (7.98 – 12.2)


Argenziano, 2020
Azar, 2020
Bermejo-Martin, 2020
Campioli, 2020
Chhiba, 2020
Dashti, 2020
Duanmu, 2020
Garcia-Pachon, 2020
Giannouchos, 2020
Green, 2020
Hernandez-Galdamez, 2020
Hsu, 2020
Israel, 2020
Jehi, 2020
Lee, 2020
Mendy, 2020
Mikami, 2020
Newton, 2020
Nguyen, 2020
O'Keefe, 2020
Ortiz-Brizuela, 2020
Rosenthal, 2020
Singer, 2020
Suleyman, 2020
Van Gerwen, 2020
Yan, 2020
Total (fixed effects)
Total (random effects)
0
0.1
0.2
0.3
0.4
Proportion

Non-hospitalized prevalence

Study	Sample size	Proportion (%)	95% CI	Weight (%)	
				Fixed	Random
Argenziano, 2020	150	16.667	11.086 to 23.612	0.059	3.17
Azar, 2020	796	9.548	7.596 to 11.805	0.31	4.21
Bermejo-Martin, 2020	50	8.000	2.223 to 19.234	0.020	1.98
Campioli, 2020	189	17.989	12.792 to 24.221	0.075	3.38
Chhiba, 2020	853	15.592	13.221 to 18.203	0.34	4.23
Dashti, 2020	2759	12.215	11.015 to 13.495	1.08	4.45
Duanmu, 2020	76	9.211	3.784 to 18.061	0.030	2.45
Garcia-Pachon, 2020	218	2.752	1.017 to 5.894	0.086	3.50
Giannouchos, 2020	58484	3.201	3.060 to 3.347	22.95	4.55
Green, 2020	2076	6.599	5.569 to 7.754	0.82	4.41
Hernandez-Galdamez, 2020	145507	3.000	2.913 to 3.089	57.11	4.55
Hsu, 2020	1543	11.406	9.862 to 13.099	0.61	4.37
Israel, 2020	30010	6.101	5.833 to 6.378	11.78	4.55
Jehi, 2020	3578	12.912	11.830 to 14.055	1.40	4.47
Lee, 2020	461	9.544	7.021 to 12.601	0.18	3.98
Mendy, 2020	473	7.188	5.029 to 9.900	0.19	4.00
Mikami, 2020	2785	3.519	2.866 to 4.272	1.09	4.45
Newton, 2020	553	12.116	9.514 to 15.130	0.22	4.07
Nguyen, 2020	306	19.281	15.014 to 24.154	0.12	3.75
O'Keefe, 2020	461	14.534	11.444 to 18.086	0.18	3.98
Ortiz-Brizuela, 2020	169	4.142	1.681 to 8.348	0.067	3.28
Rosenthal, 2020	453	14.570	11.451 to 18.160	0.18	3.98
Singer, 2020	914	5.142	3.802 to 6.780	0.36	4.25
Suleyman, 2020	108	17.593	10.937 to 26.102	0.043	2.84
Van Gerwen, 2020	1688	11.730	10.233 to 13.361	0.66	4.38
Yan, 2020	102	9.804	4.802 to 17.291	0.040	2.77
Total (fixed effects)	254762	3.796	3.722 to 3.871	100.00	100.00
Total (random effects)	254762	9.485	8.032 to 11.045	100.00	100.00

9.49 (8.03 – 11.05)


Argenziano, 2020
Azar, 2020
Bermejo-Martin, 2020
Campioli, 2020
Chhiba, 2020
Dashti, 2020
Duanmu, 2020
Garcia-Pachon, 2020
Giannouchos, 2020
Green, 2020
Hernandez-Galdamez, 2020
Hsu, 2020
Israel, 2020
Jehi, 2020
Lee, 2020
Mendy, 2020
Mikami, 2020
Newton, 2020
Nguyen, 2020
O'Keefe, 2020
Ortiz-Brizuela, 2020
Rosenthal, 2020
Singer, 2020
Suleyman, 2020
Van Gerwen, 2020
Yan, 2020
Total (fixed effects)
Total (random effects)
0
0.1
0.2
0.3
Proportion

Survival

Study	Intervention	Controls	Relative risk	95% CI	z	P	Weight (%)	
							Fixed	Random
Alizadehsani, 2020	0/15	2/108	1.362	0.0685 to 27.114			0.016	0.31
Alkundi, 2020	0/24	2/63	0.512	0.0255 to 10.294			0.016	0.31
Almazeedi, 2020	4/19	39/1077	5.814	2.308 to 14.642			0.17	1.82
Azar, 2020	10/51	10/59	1.157	0.524 to 2.555			0.23	2.10
Baqui, 2020	100/3328	182/4043	0.667	0.525 to 0.848			2.52	3.47
Berenguer, 2020	69/1116	231/2884	0.772	0.595 to 1.001			2.14	3.43
Bisso, 2020	1/46	8/122	0.332	0.0426 to 2.578			0.034	0.61
Borobia, 2020	17/460	97/1766	0.673	0.406 to 1.115			0.57	2.83
Caliskan, 2020	4/75	17/490	1.537	0.532 to 4.445			0.13	1.56
Calmes, 2020	4/87	53/509	0.442	0.164 to 1.189			0.15	1.69
Choi, 2020	21/277	199/7363	2.805	1.818 to 4.327			0.77	3.02
Choi, 2020	8/126	118/3931	2.115	1.057 to 4.233			0.30	2.34
Clouston, 2020	13/211	73/1176	0.993	0.560 to 1.758			0.44	2.66
Dashti, 2020	25/187	510/3953	1.036	0.713 to 1.506			1.04	3.18
Dominguez-Ramirez, 2020	1388/51408	15086/243335	0.435	0.413 to 0.460			49.38	3.70

Garibaldi, 2020	8/131	70/694	0.605	0.298 to 1.228			0.29	2.31
Gayam, 2020	16/132	38/276	0.880	0.510 to 1.520			0.49	2.72
Giannoglou, 2020	10/81	61/431	0.872	0.467 to 1.630			0.37	2.52
Gupta, 2020	70/784	187/1431	0.683	0.527 to 0.887			2.13	3.43
Haw, 2020	22/768	146/2988	0.586	0.377 to 0.911			0.74	3.00
Hernandez-Galdamez, 2020	544/25928	5366/185075	0.724	0.663 to 0.789			19.03	3.68
Hsu, 2020	15/98	169/1088	0.985	0.606 to 1.602			0.61	2.89
Hussein, 2020	7/64	65/431	0.725	0.348 to 1.511			0.27	2.24
Lee, 2020	44/227	641/7045	2.130	1.618 to 2.806			1.91	3.40
Lombardi, 2020	2/233	18/810	0.386	0.0903 to 1.653			0.069	1.04
Lovinsky-Desir, 2020	9/110	154/1188	0.631	0.332 to 1.201			0.35	2.47
Marcello, 2020	103/1717	323/4363	0.810	0.654 to 1.004			3.14	3.52
Meyer, 2020	3/30	12/71	0.592	0.180 to 1.947			0.10	1.36
Mikami, 2020	76/1694	97/2014	0.932	0.695 to 1.249			1.68	3.36
Nguyen, 2020	2/34	44/266	0.356	0.0902 to 1.401			0.077	1.13
Paranjpe, 2020	23/310	157/1889	0.893	0.586 to 1.360			0.82	3.06

Peixoto, 2020	3/502	277/19768	0.426	0.137 to 1.326			0.11	1.45
Robinson, 2020	7/45	73/358	0.763	0.375 to 1.553			0.29	2.30
Rosenthal, 2020	10/61	95/666	1.149	0.633 to 2.087			0.41	2.59
Saha, 2020	3/95	12/73	0.192	0.0563 to 0.656			0.096	1.31
Salacup, 2020	0/52	19/190	0.0924	0.00567 to 1.505			0.019	0.35
Sapey, 2020	143/769	295/1448	0.913	0.763 to 1.092			4.49	3.58
Sardinha, 2020	10/470	13/737	1.206	0.533 to 2.728			0.22	2.05
Satici, 2020	1/55	42/626	0.271	0.0380 to 1.931			0.038	0.65
Shahriaridad, 2020	1/9	6/104	1.926	0.259 to 14.295			0.036	0.63
Tartof, 2020	44/206	1228/6710	1.167	0.894 to 1.524			2.03	3.42
Thompson, 2020	11/169	36/301	0.544	0.285 to 1.041			0.34	2.46
Trabulus, 2020	1/43	19/293	0.359	0.0493 to 2.611			0.037	0.64
Van Gerwen, 2020	61/616	171/1399	0.810	0.614 to 1.068			1.89	3.40
Total (fixed effects)	2913/92863	26461/513612	0.566	0.545 to 0.588	-29.296	<0.001	100.00	100.00
Total (random effects)	2913/92863	26461/513612	0.851	0.714 to 1.013	-1.819	0.069	100.00	100.00

PR = 0.85, 95% CI 0.71 – 1.01, p = 0.07

Survival Pooled Prevalence

Study	Sample size	Proportion (%)	95% CI	Weight (%)	
				Fixed	Random
Alizadehsani, 2020	108	1.852	0.225 to 6.530	0.021	1.77
Alkundi, 2020	63	3.175	0.387 to 11.002	0.012	1.46
Almazeedi, 2020	1077	3.621	2.587 to 4.917	0.21	2.43
Azar, 2020	59	16.949	8.439 to 28.969	0.012	1.42
Baqui, 2020	4043	4.502	3.883 to 5.187	0.79	2.50
Berenguer, 2020	2884	8.010	7.045 to 9.061	0.56	2.49
Bisso, 2020	122	6.557	2.873 to 12.512	0.024	1.83
Borobia, 2020	1766	5.493	4.476 to 6.660	0.34	2.47
Caliskan, 2020	490	3.469	2.034 to 5.497	0.096	2.31
Calmes, 2020	509	10.413	7.897 to 13.398	0.099	2.32
Choi, 2020	7363	2.703	2.344 to 3.099	1.43	2.52
Choi, 2020	3931	3.002	2.491 to 3.584	0.77	2.50
Clouston, 2020	1176	6.207	4.897 to 7.742	0.23	2.44
Dashti, 2020	3953	12.902	11.872 to 13.987	0.77	2.50
Dominguez-Ramirez, 2020	243335	6.200	6.105 to 6.297	47.37	2.53
Garibaldi, 2020	694	10.086	7.947 to 12.572	0.14	2.37
Gayam, 2020	276	13.768	9.931 to 18.405	0.054	2.17
Giannoglou, 2020	431	14.153	11.002 to 17.806	0.084	2.28
Gupta, 2020	1431	13.068	11.364 to 14.925	0.28	2.45
Haw, 2020	2988	4.886	4.141 to 5.721	0.58	2.49
Hernandez-Galdamez, 2020	185075	2.900	2.824 to 2.977	36.03	2.53
Hsu, 2020	1088	15.533	13.430 to 17.824	0.21	2.43
Hussein, 2020	431	15.081	11.836 to 18.814	0.084	2.28
Lee, 2020	7045	9.099	8.437 to 9.794	1.37	2.52
Lombardi, 2020	810	2.222	1.322 to 3.489	0.16	2.39
Lovinsky-Desir, 2020	1188	12.963	11.104 to 15.007	0.23	2.44
Marcello, 2020	4363	7.403	6.644 to 8.220	0.85	2.51
Meyer, 2020	71	16.901	9.050 to 27.663	0.014	1.53
Mikami, 2020	2014	4.816	3.923 to 5.844	0.39	2.48
Nguyen, 2020	266	16.541	12.284 to 21.563	0.052	2.15
Paranjpe, 2020	1889	8.311	7.105 to 9.648	0.37	2.47
Peixoto, 2020	19768	1.401	1.242 to 1.575	3.85	2.53
Robinson, 2020	358	20.391	16.338 to 24.942	0.070	2.24
Rosenthal, 2020	666	14.264	11.696 to 17.153	0.13	2.37
Saha, 2020	73	16.438	8.793 to 26.954	0.014	1.55
Salacup, 2020	190	10.000	6.129 to 15.175	0.037	2.03
Sapey, 2020	1448	20.373	18.326 to 22.541	0.28	2.45
Sardinha, 2020	737	1.764	0.942 to 2.997	0.14	2.38
Satici, 2020	626	6.709	4.878 to 8.961	0.12	2.36
Shahriaridad, 2020	104	5.769	2.146 to 12.135	0.020	1.75
Tartof, 2020	6710	18.301	17.382 to 19.247	1.31	2.52

Thompson, 2020	301	11.960	8.519 to 16.172	0.059	2.19
Trabulus, 2020	293	6.485	3.949 to 9.942	0.057	2.18
Van Gerwen, 2020	1399	12.223	10.552 to 14.055	0.27	2.45
Total (fixed effects)	513612	4.854	4.795 to 4.913	100.00	100.00
Total (random effects)	513612	8.445	7.224 to 9.751	100.00	100.00

8.45 (7.22 – 9.75)

Died Pooled Prevalence

Study	Sample size	Proportion (%)	95% CI	Weight (%)	
				Fixed	Random
Alizadehsani, 2020	15	0.000	0.000 to 21.802	0.017	0.67
Alkundi, 2020	24	0.000	0.000 to 14.247	0.027	0.95
Almazeedi, 2020	19	21.053	6.052 to 45.565	0.022	0.80
Azar, 2020	51	19.608	9.824 to 33.116	0.056	1.52
Baqui, 2020	3328	3.005	2.451 to 3.643	3.58	3.41
Berenguer, 2020	1116	6.183	4.842 to 7.760	1.20	3.28
Bisso, 2020	46	2.174	0.0550 to 11.527	0.051	1.43
Borobia, 2020	460	3.696	2.167 to 5.851	0.50	3.04
Caliskan, 2020	75	5.333	1.472 to 13.096	0.082	1.85
Calmes, 2020	87	4.598	1.267 to 11.355	0.095	1.98
Choi, 2020	277	7.581	4.754 to 11.355	0.30	2.80
Choi, 2020	126	6.349	2.781 to 12.127	0.14	2.28
Clouston, 2020	211	6.161	3.321 to 10.305	0.23	2.64
Dashti, 2020	187	13.369	8.842 to 19.100	0.20	2.57
Dominguez-Ramirez, 2020	51408	2.700	2.562 to 2.844	55.33	3.48
Garibaldi, 2020	131	6.107	2.673 to 11.678	0.14	2.31
Gayam, 2020	132	12.121	7.090 to 18.937	0.14	2.31
Giannoglou, 2020	81	12.346	6.082 to 21.534	0.088	1.92
Gupta, 2020	784	8.929	7.026 to 11.146	0.84	3.21
Haw, 2020	768	2.865	1.804 to 4.305	0.83	3.20
Hernandez-Galdamez, 2020	25928	2.098	1.927 to 2.280	27.91	3.47
Hsu, 2020	98	15.306	8.827 to 23.986	0.11	2.08
Hussein, 2020	64	10.938	4.512 to 21.246	0.070	1.71
Lee, 2020	227	19.383	14.451 to 25.134	0.25	2.69
Lombardi, 2020	233	0.858	0.104 to 3.066	0.25	2.71
Lovinsky-Desir, 2020	110	8.182	3.810 to 14.964	0.12	2.17
Marcello, 2020	1717	5.999	4.923 to 7.228	1.85	3.35
Meyer, 2020	30	10.000	2.112 to 26.529	0.033	1.10
Mikami, 2020	1694	4.486	3.551 to 5.583	1.82	3.35
Nguyen, 2020	34	5.882	0.720 to 19.677	0.038	1.19
Paranjpe, 2020	310	7.419	4.761 to 10.925	0.33	2.86
Peixoto, 2020	502	0.598	0.123 to 1.736	0.54	3.07
Robinson, 2020	45	15.556	6.491 to 29.455	0.050	1.42
Rosenthal, 2020	61	16.393	8.152 to 28.089	0.067	1.67
Saha, 2020	95	3.158	0.656 to 8.952	0.10	2.05
Salacup, 2020	52	0.000	0.000 to 6.848	0.057	1.54
Sapey, 2020	769	18.596	15.905 to 21.529	0.83	3.20
Sardinha, 2020	470	2.128	1.025 to 3.878	0.51	3.05
Satici, 2020	55	1.818	0.0460 to 9.719	0.060	1.58
Shahriaridad, 2020	9	11.111	0.281 to 48.250	0.011	0.45
Tartof, 2020	206	21.359	15.969 to 27.593	0.22	2.63

Thompson, 2020	169	6.509	3.294 to 11.348	0.18	2.50
Trabulus, 2020	43	2.326	0.0589 to 12.289	0.047	1.38
Van Gerwen, 2020	616	9.903	7.660 to 12.538	0.66	3.14
Total (fixed effects)	92863	2.945	2.837 to 3.056	100.00	100.00
Total (random effects)	92863	6.814	5.732 to 7.982	100.00	100.00

6.81 (5.73 – 7.98)

Severity

Study	Intervention	Controls	Relative risk	95% CI	z	P	Weight (%)	
							Fixed	Random
Aggarwal, 2020	2/24	0/8	1.800	0.0952 to 34.024			0.055	0.35
Almazeedi, 2020	37/1054	6/42	0.246	0.110 to 0.550			0.73	2.56
Andrikopoulou, 2020	8/34	10/124	2.918	1.249 to 6.818			0.66	2.42
Argenziano, 2020	29/236	59/614	1.279	0.842 to 1.943			2.70	4.08
Azar, 2020	23/146	20/110	0.866	0.502 to 1.495			1.59	3.53
Bermejo-Martin, 2020	6/100	2/100	3.000	0.620 to 14.509			0.19	1.05
Broadhurst, 2020	15/139	29/212	0.789	0.439 to 1.417			1.38	3.37
Bruckner, 2020	3/51	7/54	0.454	0.124 to 1.660			0.28	1.41
Caliskan, 2020	17/474	4/91	0.816	0.281 to 2.369			0.42	1.85
Calmes, 2020	47/508	10/88	0.814	0.428 to 1.550			1.14	3.14
Dashti, 2020	90/619	81/575	1.032	0.782 to 1.363			6.13	4.65
Garibaldi, 2020	54/523	16/171	1.103	0.649 to 1.876			1.68	3.60
Giannouchos, 2020	269/11705	2341/78049	0.766	0.676 to 0.868			30.44	5.10
Goyal, 2020	17/130	32/263	1.075	0.620 to 1.862			1.57	3.52
Gregoriano, 2020	5/35	11/64	0.831	0.314 to 2.200			0.50	2.07

Hernandez-Galdamez, 2020	143/5508	1379/59987	1.129	0.953 to 1.339			16.38	5.00
Higuchi ,2020	8/50	0/7	2.667	0.170 to 41.844			0.062	0.40
Hsu, 2020	29/188	140/900	0.992	0.687 to 1.432			3.50	4.29
Lee, 2020	621/6901	63/371	0.530	0.418 to 0.672			8.41	4.79
Li, 2020	3/269	2/279	1.556	0.262 to 9.238			0.15	0.86
Lovinsky-Desir, 2020	35/268	128/1030	1.051	0.741 to 1.490			3.89	4.37
Maeda, 2020	19/167	4/57	1.621	0.576 to 4.566			0.44	1.92
Mendy, 2020	23/91	47/598	3.216	2.056 to 5.030			2.36	3.96
Meyer, 2020	3/20	12/81	1.012	0.315 to 3.251			0.35	1.64
Monteiro, 2020	9/84	4/28	0.750	0.250 to 2.247			0.39	1.78
Morshed, 2020	5/87	1/16	0.920	0.115 to 7.359			0.11	0.66
Myrstad, 2020	0/15	7/51	0.217	0.0131 to 3.589			0.060	0.38
Newton, 2020	54/370	13/70	0.786	0.454 to 1.361			1.57	3.52
Ortiz-Birzuela, 2020	0/29	2/111	0.747	0.0368 to 15.141			0.052	0.34
Ottenhoff, 2020	187/1703	43/516	1.318	0.960 to 1.808			4.72	4.50
Regina, 2020	1/37	11/263	0.646	0.0859 to 4.862			0.12	0.69

Rosenthal, 2020	94/659	11/68	0.882	0.497 to 1.563			1.44	3.42
Shabwarishi, 2000	1/16	3/134	2.792	0.308 to 25.271			0.098	0.59
Shahriaridad, 2020	6/102	1/11	0.647	0.0855 to 4.895			0.12	0.69
Song, 2020	1/242	21/719	0.141	0.0191 to 1.046			0.12	0.70
Suleyman, 2020	19/141	34/214	0.848	0.504 to 1.426			1.75	3.65
Toussie, 2020	17/136	29/202	0.871	0.498 to 1.521			1.52	3.48
Uchida, 2020	0/27	1/8	0.107	0.00477 to 2.405			0.049	0.32
Wang, 2020	5/50	1/73	7.300	0.879 to 60.618			0.11	0.64
Wang, 2020	46/509	22/53	0.218	0.143 to 0.332			2.66	4.06
Yang, 2020	6/397	1/66	0.997	0.122 to 8.153			0.11	0.65
Total (fixed effects)	1957/33844	4608/146478	0.895	0.836 to 0.959	-3.147	0.002	100.00	100.00
Total (random effects)	1957/33844	4608/146478	0.920	0.768 to 1.102	-0.909	0.363	100.00	100.00

0.92 (0.77 – 1.10), p = 0.36

Severe Pooled Prevalence

Aggarwal, 2020	24	8.333	1.026 to 26.997	0.074	1.51
Almazeedi, 2020	1054	3.510	2.483 to 4.806	3.11	2.99
Andrikopoulou, 2020	34	23.529	10.746 to 41.171	0.10	1.77
Argenziano, 2020	236	12.288	8.386 to 17.169	0.70	2.77
Azar, 2020	146	15.753	10.256 to 22.694	0.43	2.61
Bermejo-Martin, 2020	100	6.000	2.233 to 12.603	0.30	2.44
Broadhurst, 2020	139	10.791	6.167 to 17.174	0.41	2.59
Bruckner, 2020	51	5.882	1.230 to 16.242	0.15	2.05
Caliskan, 2020	474	3.586	2.103 to 5.680	1.40	2.91
Calmes, 2020	508	9.252	6.877 to 12.113	1.50	2.92
Dashti, 2020	619	14.540	11.856 to 17.566	1.83	2.95
Garibaldi, 2020	523	10.325	7.852 to 13.257	1.55	2.92
Giannouchos, 2020	11705	2.298	2.034 to 2.586	34.55	3.06
Goyal, 2020	130	13.077	7.806 to 20.110	0.39	2.56
Gregoriano, 2020	35	14.286	4.806 to 30.257	0.11	1.79
Hernandez-Galdamez, 2020	5508	2.596	2.192 to 3.051	16.26	3.05
Higuchi ,2020	50	16.000	7.170 to 29.113	0.15	2.04
Hsu, 2020	188	15.426	10.581 to 21.397	0.56	2.70
Lee, 2020	6901	8.999	8.334 to 9.699	20.37	3.06
Li, 2020	269	1.115	0.231 to 3.224	0.80	2.80
Lovinsky-Desir, 2020	268	13.060	9.268 to 17.692	0.79	2.80
Maeda, 2020	167	11.377	6.991 to 17.196	0.50	2.66
Mendy, 2020	91	25.275	16.746 to 35.473	0.27	2.40
Meyer, 2020	20	15.000	3.207 to 37.893	0.062	1.38
Monteiro, 2020	84	10.714	5.018 to 19.367	0.25	2.35
Morshed, 2020	87	5.747	1.892 to 12.904	0.26	2.37
Myrstad, 2020	15	0.000	0.000 to 21.802	0.047	1.17
Newton, 2020	370	14.595	11.158 to 18.610	1.09	2.87
Ortiz-Birzuela, 2020	29	0.000	0.000 to 11.944	0.089	1.65
Ottenhoff, 2020	1703	10.981	9.535 to 12.563	5.03	3.02
Regina, 2020	37	2.703	0.0684 to 14.160	0.11	1.83
Rosenthal, 2020	659	14.264	11.683 to 17.170	1.95	2.95
Shabwarishi, 2000	16	6.250	0.158 to 30.232	0.050	1.22
Shahriaridad, 2020	102	5.882	2.189 to 12.365	0.30	2.45
Song, 2020	242	0.413	0.0105 to 2.281	0.72	2.77
Suleyman, 2020	141	13.475	8.312 to 20.241	0.42	2.60
Toussie, 2020	136	12.500	7.453 to 19.258	0.40	2.58
Uchida, 2020	27	0.000	0.000 to 12.770	0.083	1.60
Wang, 2020	50	10.000	3.328 to 21.814	0.15	2.04
Wang, 2020	509	9.037	6.692 to 11.870	1.51	2.92
Yang, 2020	397	1.511	0.557 to 3.260	1.17	2.88
Total (fixed effects)	33844	5.120	4.888 to 5.360	100.00	100.00

Total (random effects)	33844	8.673	6.867 to 10.668	100.00	100.00

8.67 (6.87 – 10.67)

Not Severe Pooled Prevalence

Aggarwal, 2020	8	0.000	0.000 to 36.942	0.0061	0.45
Almazeedi, 2020	42	14.286	5.428 to 28.539	0.029	1.52
Andrikopoulou, 2020	124	8.065	3.935 to 14.331	0.085	2.57
Argenziano, 2020	614	9.609	7.395 to 12.220	0.42	3.62
Azar, 2020	110	18.182	11.474 to 26.674	0.076	2.46
Bermejo-Martin, 2020	100	2.000	0.243 to 7.038	0.069	2.37
Broadhurst, 2020	212	13.679	9.356 to 19.051	0.15	3.03
Bruckner, 2020	54	12.963	5.374 to 24.901	0.038	1.76
Caliskan, 2020	91	4.396	1.210 to 10.873	0.063	2.28
Calmes, 2020	88	11.364	5.586 to 19.907	0.061	2.24
Dashti, 2020	575	14.087	11.347 to 17.202	0.39	3.59
Garibaldi, 2020	171	9.357	5.443 to 14.750	0.12	2.85
Giannouchos, 2020	78049	2.999	2.881 to 3.121	53.27	4.03
Goyal, 2020	263	12.167	8.473 to 16.741	0.18	3.18
Gregoriano, 2020	64	17.187	8.905 to 28.675	0.044	1.93
Hernandez-Galdamez, 2020	59987	2.299	2.180 to 2.422	40.94	4.03
Higuchi ,2020	7	0.000	0.000 to 40.962	0.0055	0.41
Hsu, 2020	900	15.556	13.248 to 18.091	0.61	3.74
Lee, 2020	371	16.981	13.302 to 21.196	0.25	3.39
Li, 2020	279	0.717	0.0869 to 2.565	0.19	3.22
Lovinsky-Desir, 2020	1030	12.427	10.474 to 14.598	0.70	3.78
Maeda, 2020	57	7.018	1.945 to 17.004	0.040	1.81
Mendy, 2020	598	7.860	5.832 to 10.315	0.41	3.61
Meyer, 2020	81	14.815	7.896 to 24.449	0.056	2.16
Monteiro, 2020	28	14.286	4.034 to 32.665	0.020	1.17
Morshed, 2020	16	6.250	0.158 to 30.232	0.012	0.78
Myrstad, 2020	51	13.725	5.701 to 26.255	0.035	1.70
Newton, 2020	70	18.571	10.276 to 29.661	0.048	2.02
Ortiz-Birzuela, 2020	111	1.802	0.219 to 6.357	0.076	2.47
Ottenhoff, 2020	516	8.333	6.096 to 11.061	0.35	3.55
Regina, 2020	263	4.183	2.106 to 7.360	0.18	3.18
Rosenthal, 2020	68	16.176	8.362 to 27.103	0.047	1.99
Shabwarishi, 2000	134	2.239	0.464 to 6.403	0.092	2.64
Shahriaridad, 2020	11	9.091	0.230 to 41.278	0.0082	0.58
Song, 2020	719	2.921	1.817 to 4.430	0.49	3.67
Suleyman, 2020	214	15.888	11.261 to 21.488	0.15	3.03
Toussie, 2020	202	14.356	9.830 to 19.963	0.14	2.99
Uchida, 2020	8	12.500	0.316 to 52.651	0.0061	0.45
Wang, 2020	73	1.370	0.0347 to 7.398	0.051	2.06
Wang, 2020	53	41.509	28.136 to 55.866	0.037	1.74
Yang, 2020	66	1.515	0.0384 to 8.155	0.046	1.96
Total (fixed effects)	146478	2.983	2.897 to 3.072	100.00	100.00

Total (random effects)	146478	9.142	7.842 to 10.530	100.00	100.00

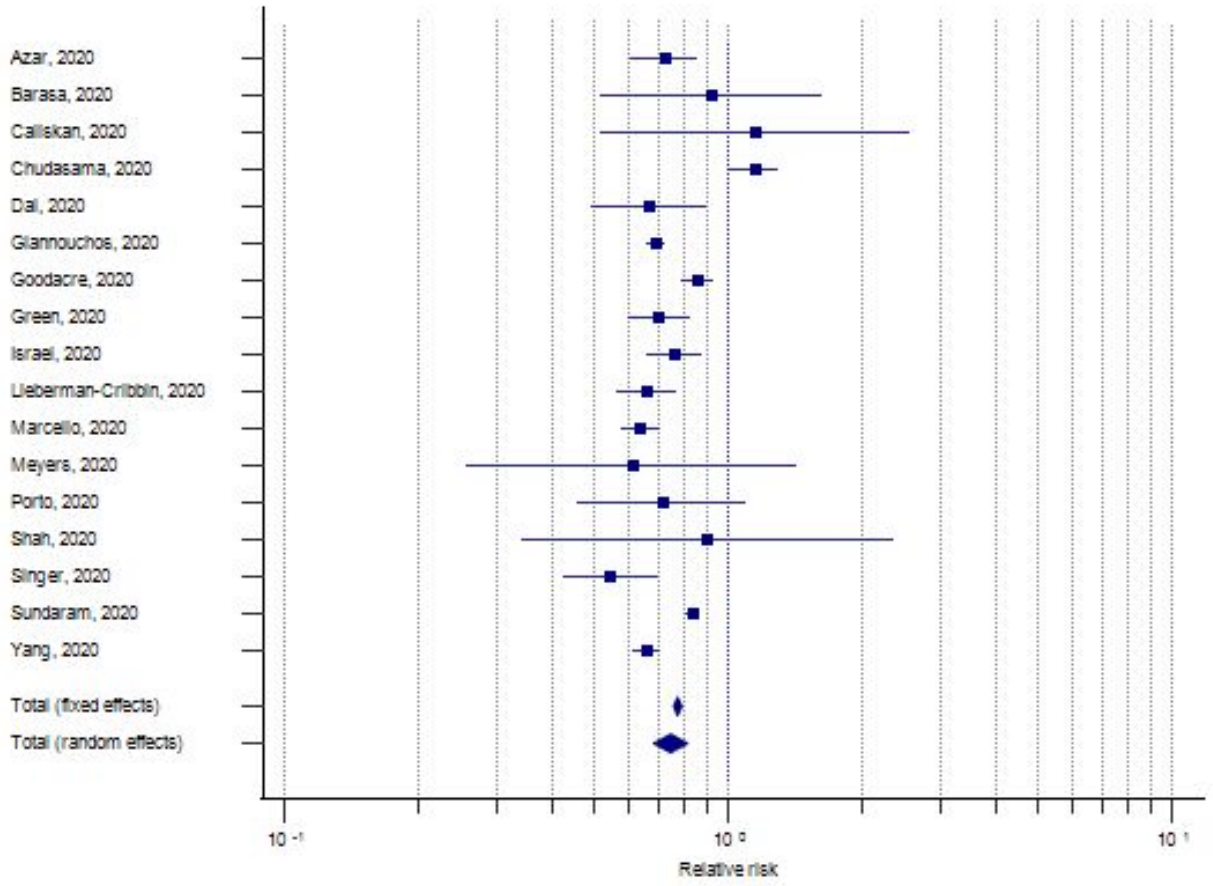
9.14 (7.84 – 10.53)

COVID testing

Study	Intervention	Controls	Relative risk	95% CI	z	P	Weight (%)	
							Fixed	Random
Azar, 2020	119/1052	2042/12983	0.719	0.604 to 0.856			1.40	6.96
Barasa, 2020	14/117	36/277	0.921	0.516 to 1.642			0.13	1.85
Caliskan, 2020	21/565	8/248	1.152	0.517 to 2.566			0.066	1.06
Chudasama, 2020	226/1706	41379/358576	1.148	1.016 to 1.297			2.86	8.10
Dai, 2020	41/863	21788/305588	0.666	0.494 to 0.899			0.47	4.52
Giannouchos, 2020	2603/89756	6161/146682	0.690	0.660 to 0.722			20.90	9.37
Goodacre, 2020	767/5768	1276/8228	0.858	0.789 to 0.932			6.16	8.84
Green, 2020	153/2266	3387/35203	0.702	0.600 to 0.821			1.74	7.35
Israel, 2020	195/4151	1287/20755	0.758	0.654 to 0.877			1.97	7.56
Lieberman-Cribbin, 2020	275/6245	346/5160	0.657	0.563 to 0.766			1.79	7.40
Marcello, 2020	710/10142	711/6464	0.636	0.576 to 0.703			4.31	8.55
Meyers, 2020	5/91	258/2862	0.610	0.258 to 1.440			0.057	0.93
Porto, 2020	26/410	68/763	0.712	0.460 to 1.100			0.22	2.84
Shah, 2020	4/33	38/283	0.903	0.344 to 2.370			0.046	0.76

Singer, 2020	99/1651	137/1246	0.545	0.426 to 0.699			0.69	5.42
Sundaram, 2020	3880/25030	136461/733661	0.833	0.809 to 0.858			49.37	9.50
Yang, 2020	727/7340	4850/32119	0.656	0.609 to 0.706			7.81	8.99
Total (fixed effects)	9865/157186	220233/1671098	0.769	0.753 to 0.785	-24.979	<0.001	100.00	100.00
Total (random effects)	9865/157186	220233/1671098	0.742	0.680 to 0.810	-6.688	<0.001	100.00	100.00

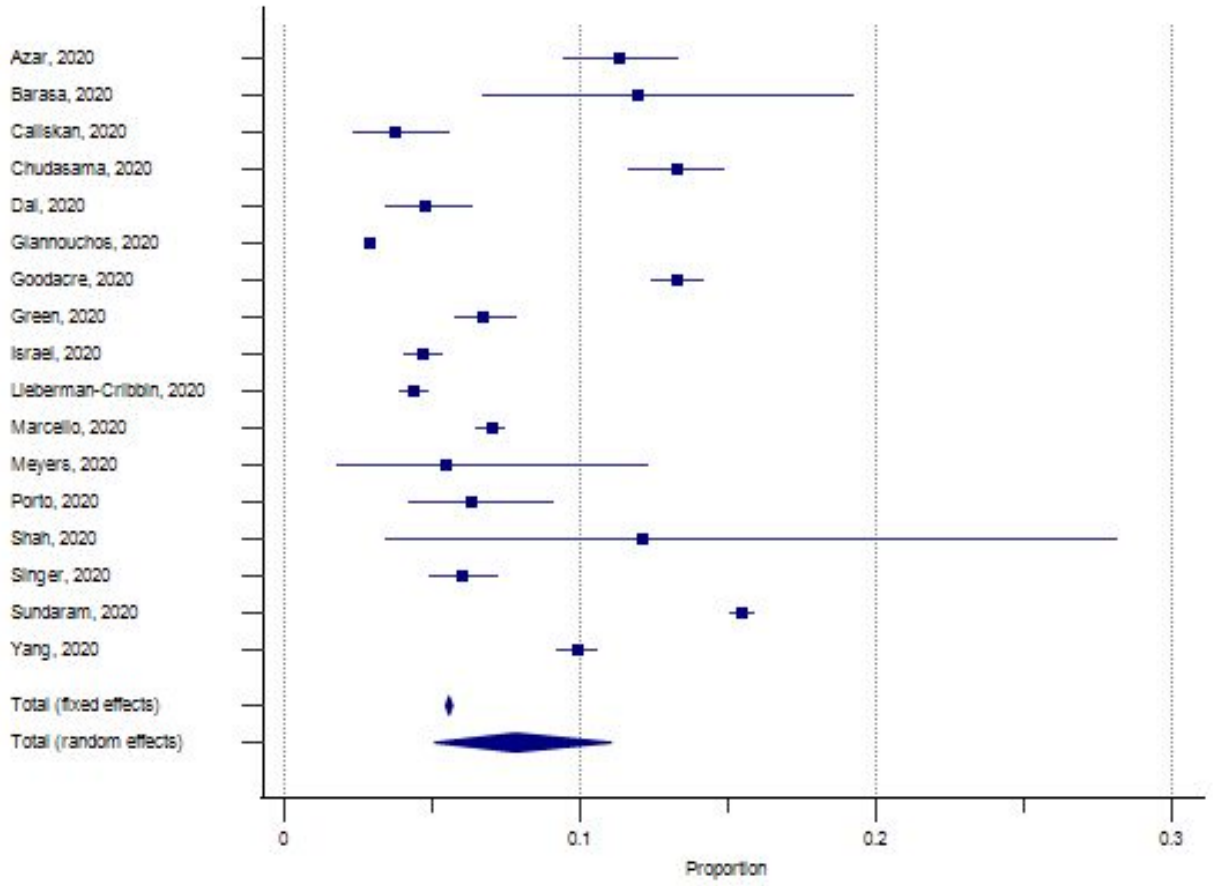
Significant 0.74 (0.68 – 0.81), p < 0.001



COVID+ pooled prevalence

Study	Sample size	Proportion (%)	95% CI	Weight (%)	
				Fixed	Random
Azar, 2020	1052	11.312	9.461 to 13.382	0.67	6.08
Barasa, 2020	117	11.966	6.699 to 19.261	0.075	5.32
Caliskan, 2020	565	3.717	2.315 to 5.626	0.36	5.98
Chudasama, 2020	1706	13.247	11.674 to 14.949	1.09	6.12
Dai, 2020	863	4.751	3.431 to 6.390	0.55	6.05
Giannouchos, 2020	89756	2.900	2.791 to 3.012	57.10	6.19
Goodacre, 2020	5768	13.298	12.431 to 14.201	3.67	6.17
Green, 2020	2266	6.752	5.753 to 7.864	1.44	6.13
Israel, 2020	4151	4.698	4.074 to 5.386	2.64	6.16
Lieberman-Cribbin, 2020	6245	4.404	3.908 to 4.942	3.97	6.17
Marcello, 2020	10142	7.000	6.511 to 7.514	6.45	6.17
Meyers, 2020	91	5.495	1.808 to 12.358	0.059	5.12
Porto, 2020	410	6.341	4.184 to 9.154	0.26	5.91
Shah, 2020	33	12.121	3.403 to 28.202	0.022	3.96
Singer, 2020	1651	5.996	4.900 to 7.252	1.05	6.12
Sundaram, 2020	25030	15.501	15.055 to 15.956	15.92	6.18
Yang, 2020	7340	9.905	9.230 to 10.611	4.67	6.17
Total (fixed effects)	157186	5.564	5.451 to 5.678	100.00	100.00
Total (random effects)	157186	7.806	5.084 to 11.051	100.00	100.00

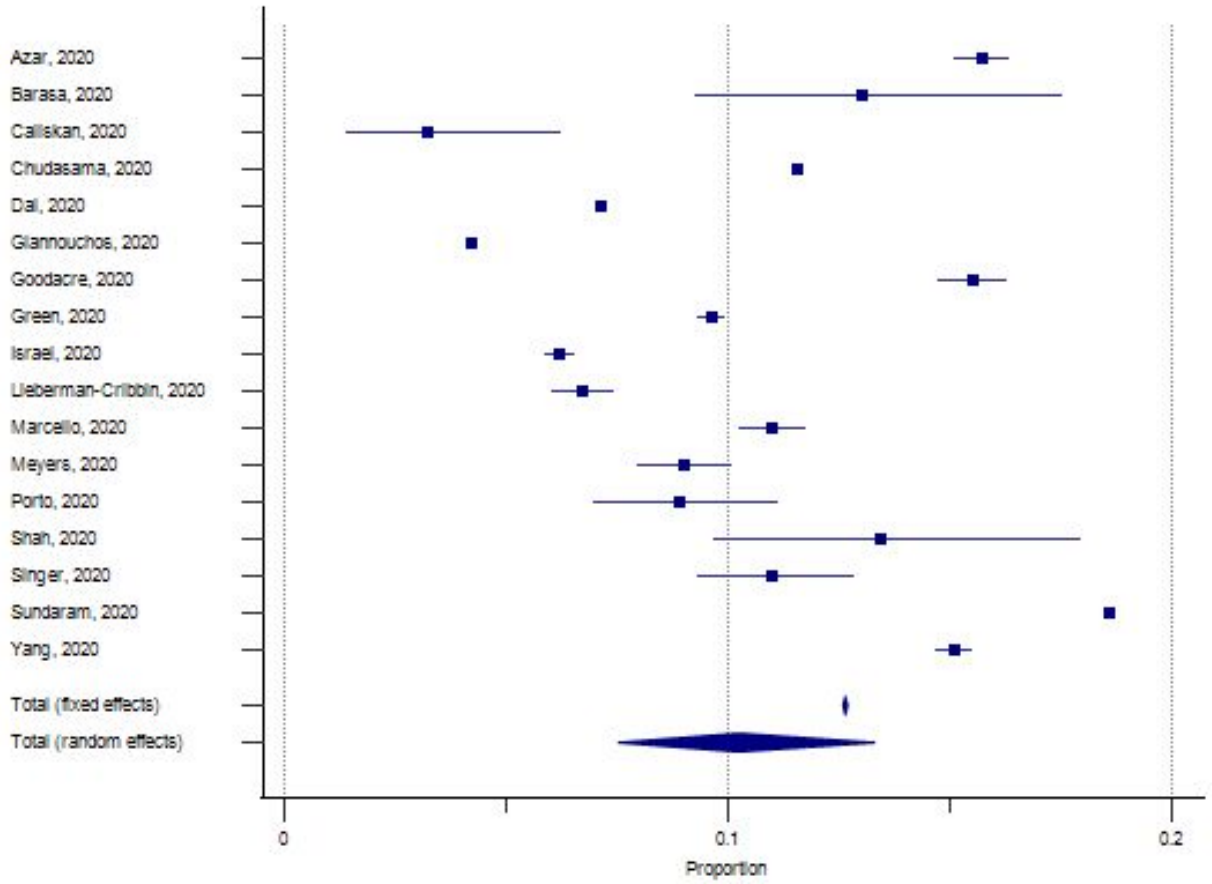
7.81 (5.08 – 11.05)


Azar, 2020
Barasa, 2020
Calliskan, 2020
Chudasama, 2020
Dal, 2020
Giannouchos, 2020
Goodacre, 2020
Green, 2020
Israel, 2020
Lieberman-Cribbin, 2020
Marcello, 2020
Meyers, 2020
Porto, 2020
Shah, 2020
Singer, 2020
Sundaram, 2020
Yang, 2020
Total (fixed effects)
Total (random effects)
0
0.1
0.2
0.3
Proportion

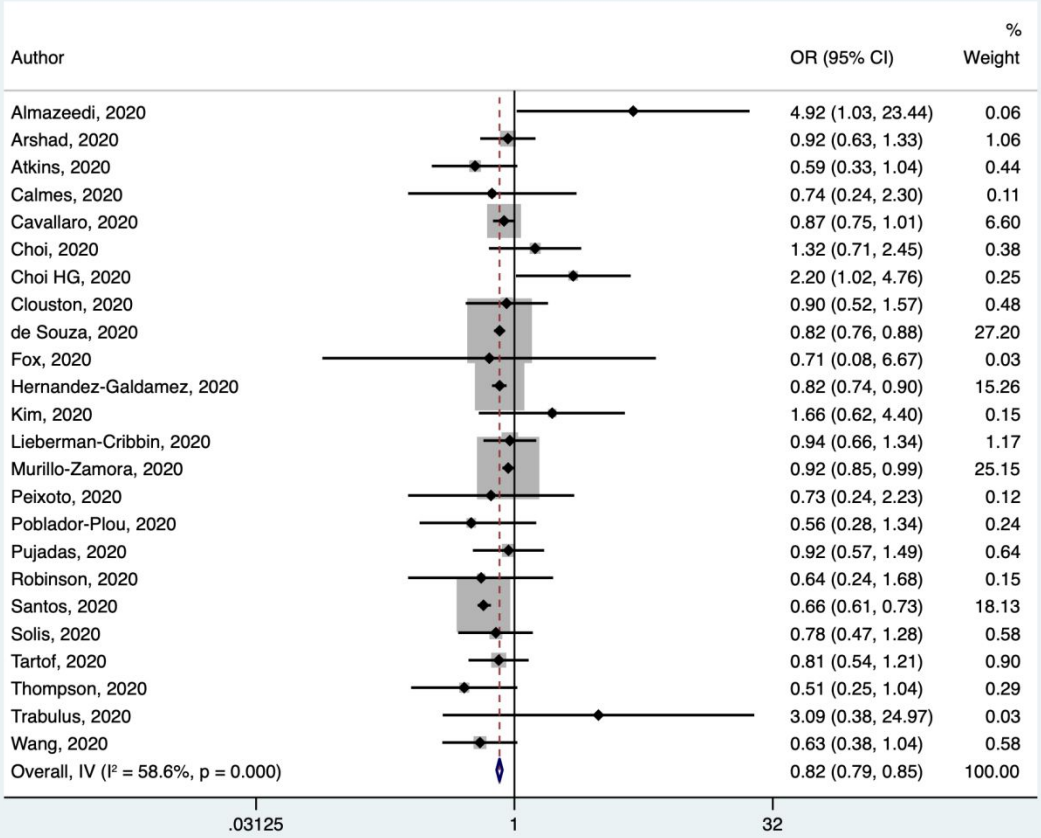
COVID- pooled prevalence

Study	Sample size	Proportion (%)	95% CI	Weight (%)	
				Fixed	Random
Azar, 2020	12983	15.727	15.105 to 16.365	0.78	5.99
Barasa, 2020	277	12.996	9.271 to 17.536	0.017	5.50
Caliskan, 2020	248	3.226	1.403 to 6.257	0.015	5.45
Chudasama, 2020	358576	11.540	11.436 to 11.645	21.46	6.00
Dai, 2020	305588	7.130	7.039 to 7.222	18.29	6.00
Giannouchos, 2020	146682	4.200	4.098 to 4.304	8.78	6.00
Goodacre, 2020	8228	15.506	14.730 to 16.306	0.49	5.98
Green, 2020	35203	9.621	9.315 to 9.934	2.11	6.00
Israel, 2020	20755	6.201	5.877 to 6.538	1.24	5.99
Lieberman-Cribbin, 2020	5160	6.705	6.038 to 7.422	0.31	5.97
Marcello, 2020	6464	10.999	10.247 to 11.788	0.39	5.98
Meyers, 2020	2862	9.015	7.990 to 10.124	0.17	5.95
Porto, 2020	763	8.912	6.987 to 11.162	0.046	5.81
Shah, 2020	283	13.428	9.680 to 17.962	0.017	5.51
Singer, 2020	1246	10.995	9.312 to 12.865	0.075	5.88
Sundaram, 2020	733661	18.600	18.511 to 18.689	43.90	6.00
Yang, 2020	32119	15.100	14.710 to 15.496	1.92	6.00
Total (fixed effects)	1671098	12.640	12.589 to 12.690	100.00	100.00
Total (random effects)	1671098	10.232	7.526 to 13.299	100.00	100.00

10.23 (7.53 – 13.30)


Azar, 2020
Barasa, 2020
Calliskan, 2020
Chudasama, 2020
Dal, 2020
Giannouchos, 2020
Goodacre, 2020
Green, 2020
Israel, 2020
Lieberman-Cribbin, 2020
Marcello, 2020
Meyers, 2020
Porto, 2020
Shah, 2020
Singer, 2020
Sundaram, 2020
Yang, 2020
Total (fixed effects)
Total (random effects)
0
0.1
0.2
Proportion

Meta-analysis of Relative Measures of Association Adjusted for Confounding Factors



Significant heterogeneity, I2 = 59.1%, (29.7% - 72.9%), p < 0.001