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### Appendix: Search strategy

#### PubMed

("COVID-19"[Supplementary Concept] OR "severe acute respiratory syndrome coronavirus 2"[Supplementary Concept] OR ("Coronavirus"[MeSH Terms] OR "Coronavirus Infections"[Mesh:NoExp] OR pneumonia virus\*[tiab] OR cov[tiab]) AND (outbreak[tiab] OR wuhan[tiab] OR novel[all] OR 19[tiab] OR 2019[tiab] OR epidem\*[tiab] OR epidemy[all] OR epidemic\*[all] OR pandem\*[all] OR new[tiab])) OR coronavirus\*[tiab] OR corona virus\*[tiab] OR ncov[tiab] OR 2019ncov[tiab] OR covid19[tiab] OR "covid 19"[tiab] OR "sars cov 2"[tiab] OR sars2[tiab] OR "ncov 2019"[tiab] OR "sars coronavirus 2"[tiab] OR "sars corona virus 2"[tiab] OR "severe acute respiratory syndrome cov 2"[tiab] OR "severe acute respiratory syndrome cov2"[tiab] OR severe acute respiratory syndrome cov\*[tiab] OR cov2[tiab]) AND ("2019/12"[Date - Entrez] : "3000"[Date - Entrez])

#### Embase Ovid

- 1 exp Coronavirus/
- 2 exp Coronavirus Infections/
- 3 (coronavirus\* or corona virus\* or OC43 or NL63 or 229E or HKU1 or HCoV\* or ncov\* or covid\* or sars-cov\* or sarscov\* or Sars-coronavirus\* or Severe Acute Respiratory Syndrome Coronavirus\*).mp.
- 4 (or/1-3) and 20190101:20301231.(dc). [this set is the sensitive/broad part of the search]
- 5 4 not (SARS or SARS-CoV or MERS or MERS-CoV or Middle East respiratory syndrome or camel\* or dromedar\* or equine or coronary or coronal or covidence\* or covidien or influenza virus or HIV or bovine or calves or TGEV or feline or porcine or BCoV or PED or PEDV or PDCoV or FIPV or FCoV or SADS-CoV or canine or CCov or zoonotic or avian influenza or H1N1 or H5N1 or H5N6 or IBV or murine corona\*).mp. [line 5 removes noise in the search results]
- 6 ((pneumonia or covid\* or coronavirus\* or corona virus\* or ncov\* or 2019-ncov or sars\*).mp. or exp pneumonia/) and Wuhan.mp.
- 7 (coronavirus disease 2019 or 2019-ncov or ncov19 or ncov-19 or 2019-novel CoV or severe acute respiratory syndrome coronavirus 2 or sars-cov2 or sars-cov-2 or sarscov2 or sarscov-2 or Sars-coronavirus2 or Sars-coronavirus-2 or SARS-like coronavirus\* or coronavirus-19 or covid19 or covid-19 or covid 2019 or ((novel or new or nouveau) adj2 (CoV or nCoV or covid or coronavirus\* or corona virus or Pandemi\*2)) or ((covid or covid19 or covid-19) and pandemic\*2) or (coronavirus\* and pneumonia)).mp.
- 8 (coronavirus disease 2019 or severe acute respiratory syndrome coronavirus 2).sh,dj.
- 9 (630575119 OR 630830186 OR 630941329 OR 631043694 OR 631260659 OR 631272428 OR 631272880 OR 631286076 OR 631290163 OR 631308782 OR 631324397 OR 631352500 OR 631416440 OR 631431802 OR 631452886 OR 631456079 OR 631457551 OR 631462438 OR 631462876 OR 631465538 OR 631465685 OR 631469310 OR 2004499662 OR 2004505338 OR 2005280837 OR 2005387675 OR 2005408544 OR 2005484987 OR 2005549151).an. [Articles not captured by this search when created in April 2020, pending further indexing by NLM/Elsevier]
- 10 (or/6-9) and 20191201:20301231.(dc). [Lines 5 to 8 are specific to Covid-19]
- 11 5 or 10

*Appendix Table 1: Study outcomes and definitions*

<b>Severity stage</b>	<b>Case</b>	<b>control</b>	<b>Population</b>
1. Infection	Test positive	Test negative	General population
2. Hospitalization	Hospitalized	Not hospitalized	Confirmed COVID-19 cases
3. Severe symptoms	Severe symptoms	Non-severe symptoms	Hospitalised COVID-19 cases
4. ICU admission	Admitted to ICU	Not admitted to ICU	Hospitalised COVID-19 cases
5. Death	Death	Alive	Hospitalised COVID-19 cases

*Appendix: List of references of included papers*

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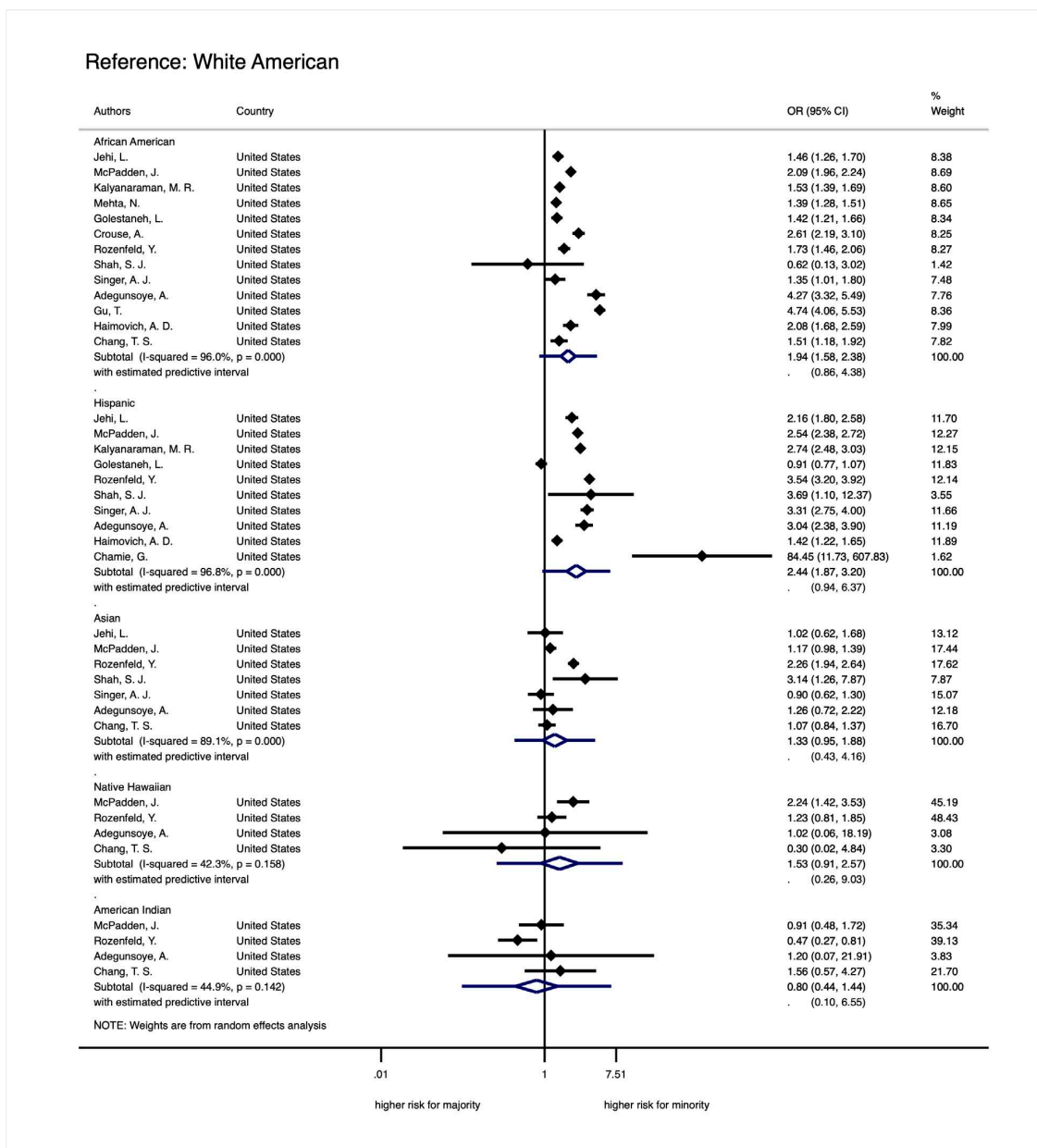
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Appendix Table 2: Overview of odds ratios adjusted for multiple factors per outcome

Author	Outcome	Country	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	OR group 1	OR group 2	OR group 3	OR group 4	OR group 5	OR group 6	OR group 7	OR group 8	Adjustment factors
Adegunsoye, A.	Infection	United States (NA)	Non-black	Black							Ref.	3.30 (2.75-3.97)							Age, sex, zip code
Dublin, S.	Infection	United States (NA)	Non Hispanic White	Non Hispanic Black	Non Hispanic Asian	Non Hispanic Mixed/Other	Hispanic				Ref.	4.03 (3.19-5.11)	2.23 (1.71-2.90)	0.90 (0.58-1.40)	2.67 (2.05-3.47)				Age, sex, comorbidities, BMI, smoking status, medications
Gu, T.	Infection	United States (NA)	White	Black	Other	Unknown					Ref.	3.56 (2.90-4.37)	1.57 (1.19-2.06)	0.78 (0.51-1.20)					Age, sex, comorbidities, neighborhood SES
Martin, C. A.	Infection	United Kingdom (EU)	White Caucasian	South Asian	Black						Ref.	2.44 (2.01-2.97)	2.56 (1.71-3.84)						Age, sex, EWS at presentation, decile of IMD, estimated household size and comorbidities
Niedzwiedz, C. L.	Infection	United Kingdom (EU)	White British	White Irish	White Other	Mixed	South Asian	Black	Chinese	Other	Ref.	1.132 (0.851-1.507)	1.020 (0.718-1.449)	0.896 (0.479-1.675)	1.279 (0.908-1.802)	1.289 (0.978-1.699)	2.373 (1.326-4.246)	1.119 (0.735-1.702)	Age, sex, assessment centre, country of birth, education level, household size, socioeconomic deprivation, housing tenure, urbanicity, employment status, manual occupation, healthcare worker, longstanding illness/disability, number of chronic conditions, self-rated health, body mass index, smoking status, alcohol consumption
De Lusignan, S.	Infection	United Kingdom (EU)	White	Asian	Black	Mixed, other					Ref.	1.46 (0.94-2.29)	4.75 (2.65-8.51)	1.71 (0.97-3.01)					Age, sex, socioeconomic deprivation level, household size, rural/urban, smoking status, BMI, comorbidities
Rozenfeld, Y.	Infection	United States (NA)	White	American Indian/Alaska Native	Asian	Black/African American	Native Hawaiian/Pacific Islander	Unknown			Ref.	0.63 (0.36-1.12)	1.43 (1.18-1.72)	1.51 (1.25-1.83)	1.02 (0.66-1.57)	1.34 (1.18-1.52)			Age, sex, region, education, religion, marital status, language, BMI, comorbidities, primary care type, symptoms
Adegunsoye, A.	Hospitalization	United States (NA)	Non-black	Black							Ref.	3.77 (2.38-5.99)							Age, sex, zip code
Dublin, S.	Hospitalization	United States (NA)	Non Hispanic White	Non Hispanic Black	Non Hispanic Asian	Non Hispanic Mixed/Other	Hispanic				Ref.	1.20 (0.68-2.12)	0.94 (0.54-1.63)	0.42 (0.11-1.62)	1.07 (0.49-2.36)				Age, sex, comorbidities, BMI, smoking status, medications
Gu, T.	Hospitalization	United States (NA)	White	Black	Other	Unknown					Ref.	1.72 (1.15-2.58)	1.42 (0.79-2.54)	0.72 (0.28-1.84)					Age, sex, comorbidities, neighborhood SES
Ingraham, N. E.	Hospitalization	United States (NA)	White	Black	Asian	Hispanic	Declined	Other			Ref.	1.50 (1.15-1.94)	2.39 (1.74-3.29)	3.80 (2.72-5.30)	1.82 (1.16-2.87)	2.04 (1.04-4.00)			Age, sex, comorbidities, area deprivation, rural/urban, marital status, English speaking
Killerby, M. E.	Hospitalization	United States (NA)	White	Black	Other	Missing					Ref.	3.2 (1.8-5.8)	Not reported	Not reported					Age, sex, obesity, smoking status, insurance status, comorbidities
McPadden, J.	Hospitalization	United States (NA)	Unknown	Asian	Black	Hawaiian/Pacific Islander	Hispanic	White	American Indian		Ref.	1.58 (1.02-2.41)	1.43 (1.14-1.78)	1.45 (0.53-3.52)	1.81 (1.50-2.18)	0.85 (0.70-1.03)	0.44 (0.02-2.68)		Age, sex, comorbidities
Petrilli, C. M.	Hospitalization	United States (NA)	Non-Hispanic white	Non-Hispanic African-American	Asian	Hispanic	Other/multiracial	Unknown			Ref.	0.81 (0.65-1.01)	1.29 (0.97-1.72)	1.63 (1.35-1.97)	1.6 (1.21-2.11)	0.89 (0.65-1.23)			Age, sex, smoking status, BMI, comorbidities, week of admission
Price-Haywood, E. G.	Hospitalization	United States (NA)	White Non-Hispanic	Black Non-Hispanic							Ref.	1.96 (1.62-2.37)							Fully adjusted models are adjusted for: age, sex, charlson comorb index, residence in low income area, obesity (and insurance in case of the hospitalization model)
Van Gerwen, M.	Hospitalization	United States (NA)	Non-Hispanic White	Non-Hispanic Black	Other	Unknown					Ref.	1.08 (0.86-1.35)	1.51 (1.24-1.85)	0.89 (0.61-1.29)					Age, sex, BMI, smoking status, and comorbidities
Mendy, A.	Hospitalization	United States (NA)	Non-Hispanic White	Non-Hispanic Black	Hispanics	Other					Ref.	2.23 (1.41-3.53)	1.91 (1.11-3.29)	0.59 (0.29-1.18)					Age, sex, smoking status
McCarty, T. R.	Severe disease	United States (NA)	White	Black	Latinx						Ref.	0.89 (0.45-1.79)	1.34 (0.79-2.28)						Age, sex, obesity, comorbidities

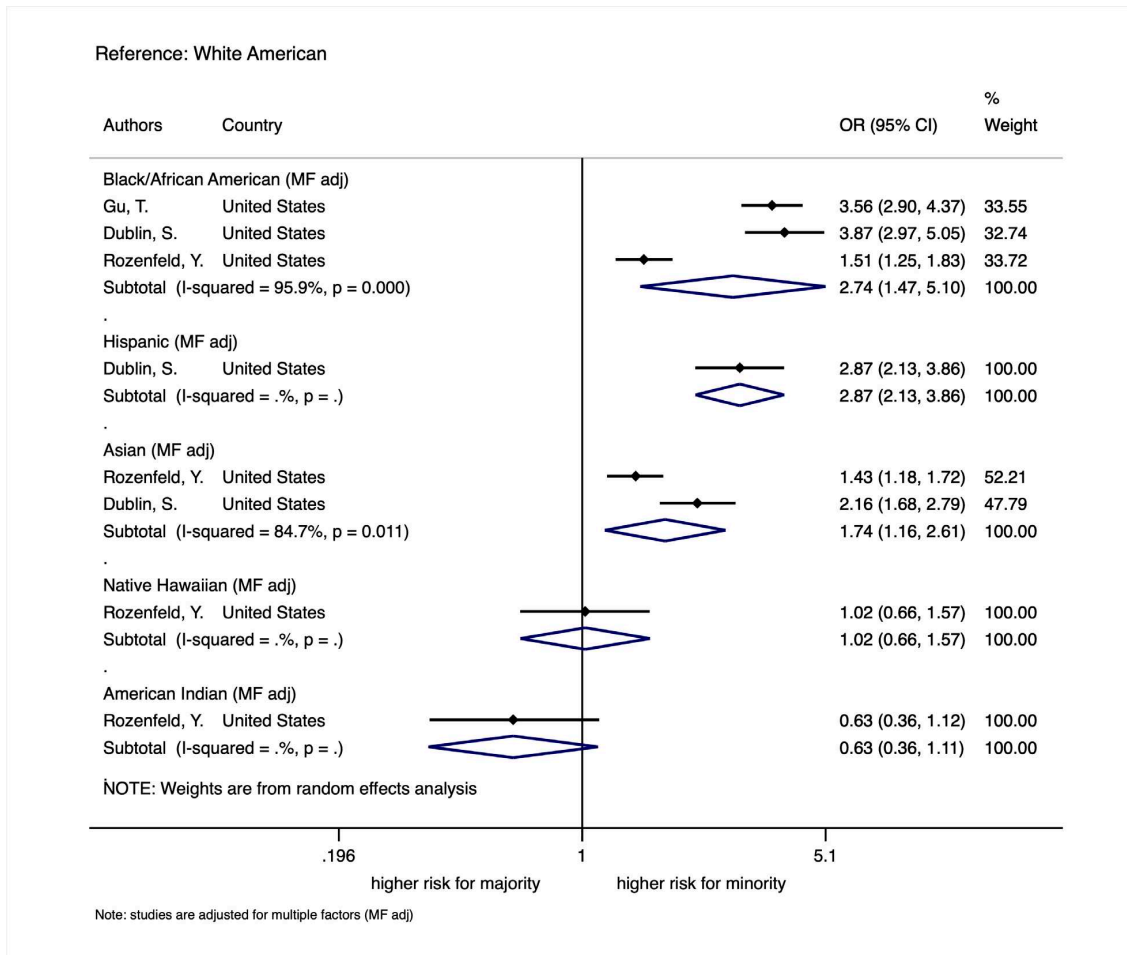
Van Gerwen, M.	Severe disease	United States (NA)	Non-Hispanic White	Non-Hispanic Black	Other	Unknown					Ref.	1.31 (0.97-1.77)	1.52 (1.16-1.98)	1.53 (0.92-2.55)						Age, sex, BMI, smoking status, and comorbidities
Mendy, A.	Severe disease	United States (NA)	Non-Hispanic White	Non-Hispanic Black	Hispanics	Other					Ref.	3.15 (1.71-5.79)	2.78 (1.29-5.96)	Not estimated						Age, sex, smoking status
Costa Monteiro, A. C.	ICU admission	United States (NA)	White	Latinx	Asian	Black	Other				Ref.	2.63 (0.63-11.03)	5.44 (0.62-47.71)	5.19 (0.81-33.44)	2.98 (0.46-19.26)					Age, sex, smoking status, comorbidities
Gu, T.	ICU admission	United States (NA)	White	Black	Other	Unknown					Ref.	1.15 (0.73-1.82)	0.86 (0.42-1.78)	0.60 (0.18-2.04)						Age, sex, comorbidities, neighborhood SES
Kim, L.	ICU admission	United States (NA)	Non-Hispanic White	Non-Hispanic Black	Hispanic	Non-Hispanic Other	Unknown				Ref.	1.01 (0.89-1.15)	0.96 (0.76-1.21)	1.06 (0.83-1.37)	0.93 (0.74-1.15)					Age, sex, smoking status, obesity, comorbidities
McCarty, T. R.	ICU admission	United States (NA)	White	Black	Latinx						Ref.	0.77 (0.39-1.53)	1.50 (0.89-2.52)							Age, sex, obesity, comorbidities
Adegunsoye, A.	Death	United States (NA)	Non-Black	Black							Ref.	0.68 (0.14-3.18)								Age, sex, zip code
Golestaneh, L.	Death	United States (NA)	Non-Hispanic White	Non-Hispanic Black	Hispanic	Other					Ref.	1.2 (0.7-2.0)	1.0 (0.6-1.7)	1.3 (0.7-2.2)						Age, sex, comorbidities, smoking, obesity, SES, household size, % black residents, >60% residents using public transportation regularly
Kim, L.	Death	United States (NA)	Non-Hispanic White	Non-Hispanic Black	Hispanic	Non-Hispanic Other	Unknown				Ref.	1.07 (0.85-1.35)	1.17 (0.91-1.51)	1.26 (0.86-1.82)	1.30 (0.74-2.31)					Age, sex, smoking status, obesity, comorbidities
McCarty, T. R.	Death	United States (NA)	White	Black	Latinx						Ref.	0.39 (0.13-1.12)	0.55 (0.23-1.29)							Age, sex, obesity, comorbidities
McPadden, J.	Death	United States (NA)	Unknown	Black/African-American	Hispanic	White	Asian				Ref.	1.22 (0.64-2.36)	1.34 (0.75-2.37)	1.18 (0.65-2.14)	1.76 (0.54-5.18)					Age, sex, comorbidities
Mikami, T.	Death	United States (NA)	White	African American	Asian	Others					Ref.	0.78 (0.65-0.95)	0.94 (0.83-1.08)	1.00 (0.83-1.19)						Age, sex, smoking status, comorbidities, clinical parameters (e.g. resp. rate, eGFR, labs)
Musoke, N.	Death	United States (NA)	African American	Caucasian	Hispanic	Other					Ref.	1.20 (0.38-3.77)	0.75 (0.22-2.52)	1.31 (0.52-3.32)						Age, sex, BMI, comorbidities, therapeutic anticoagulation
Peterson, E.	Death	United States (NA)	African American	Caucasian	Others						Ref.	1.157 (0.385-3.482)	0.992 (0.492-1.997)							Age, sex, BMI, comorbidities
Price-Haywood, E. G.	Death	United States (NA)	White Non-Hispanic	Black Non-Hispanic							Ref.	1.14 (0.88-1.49)								Age, sex, charlson comorb index, residence in low income area, obesity
Van Gerwen, M.	Death	United States (NA)	Non-Hispanic White	Non-Hispanic Black	Other	Unknown					Ref.	0.96 (0.72-1.28)	0.98 (0.76-1.27)	1.00 (0.56-1.66)						Age, sex, BMI, smoking status, and comorbidities

Appendix Figure 1: Individual studies with unadjusted risk estimates for SARS-CoV-2 infection among the general population in the U.S. by ethnic minority group

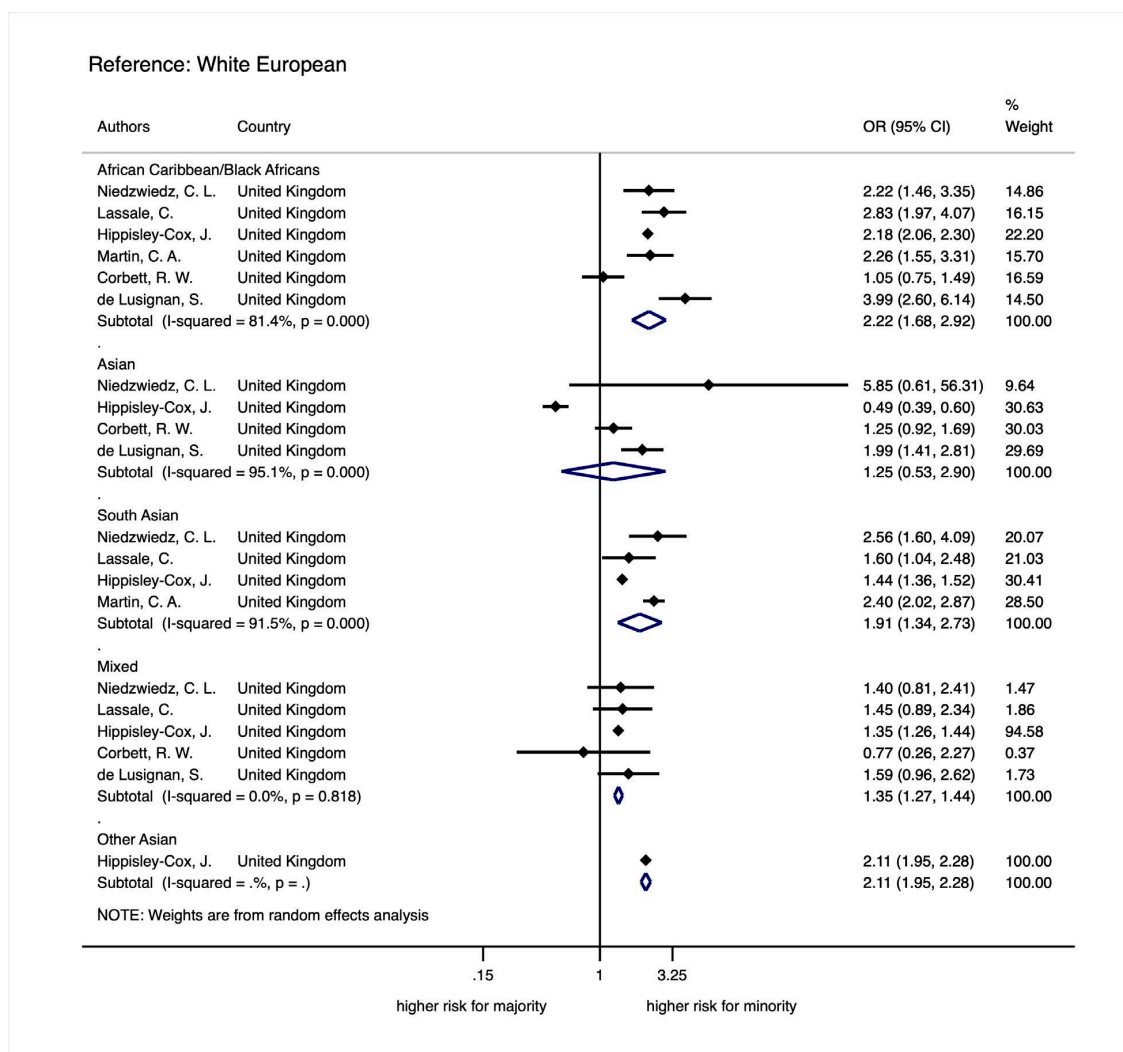




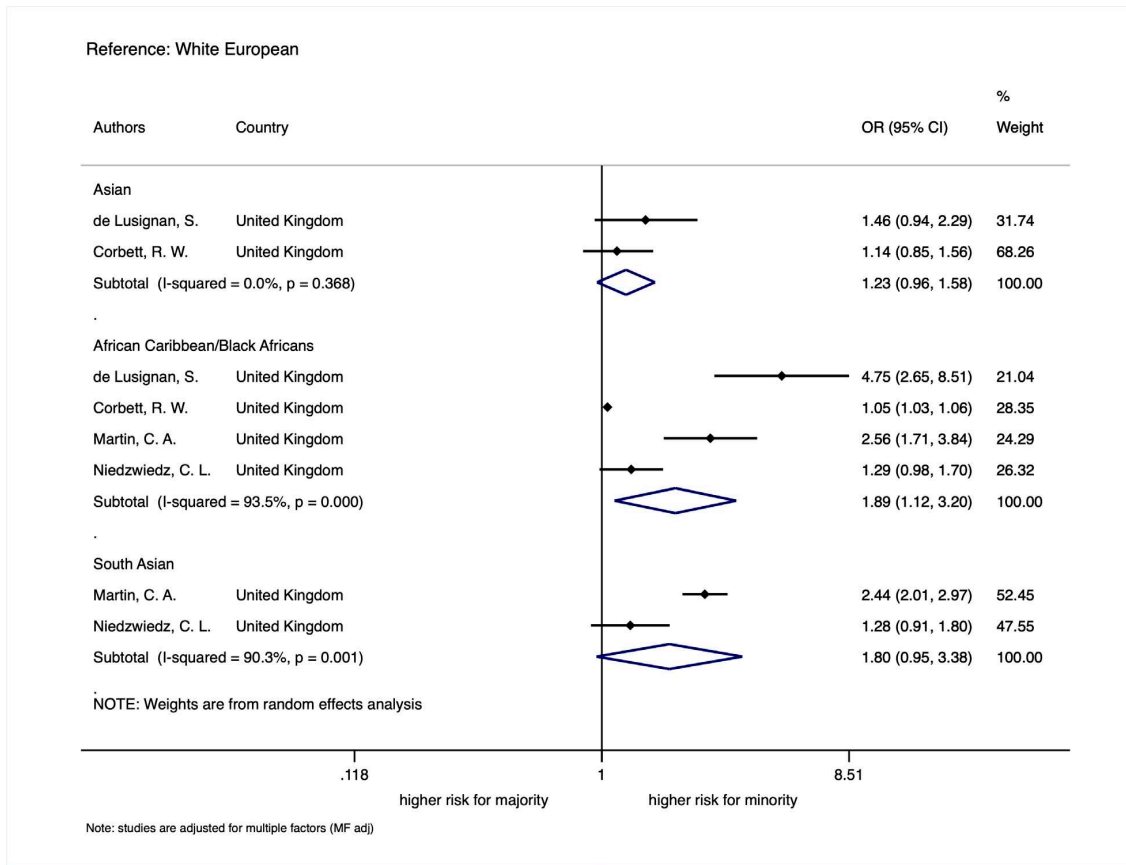
Appendix Figure 2: Individual studies with adjusted risk estimates for SARS-CoV-2 infection among the general population in the U.S. by ethnic minority group



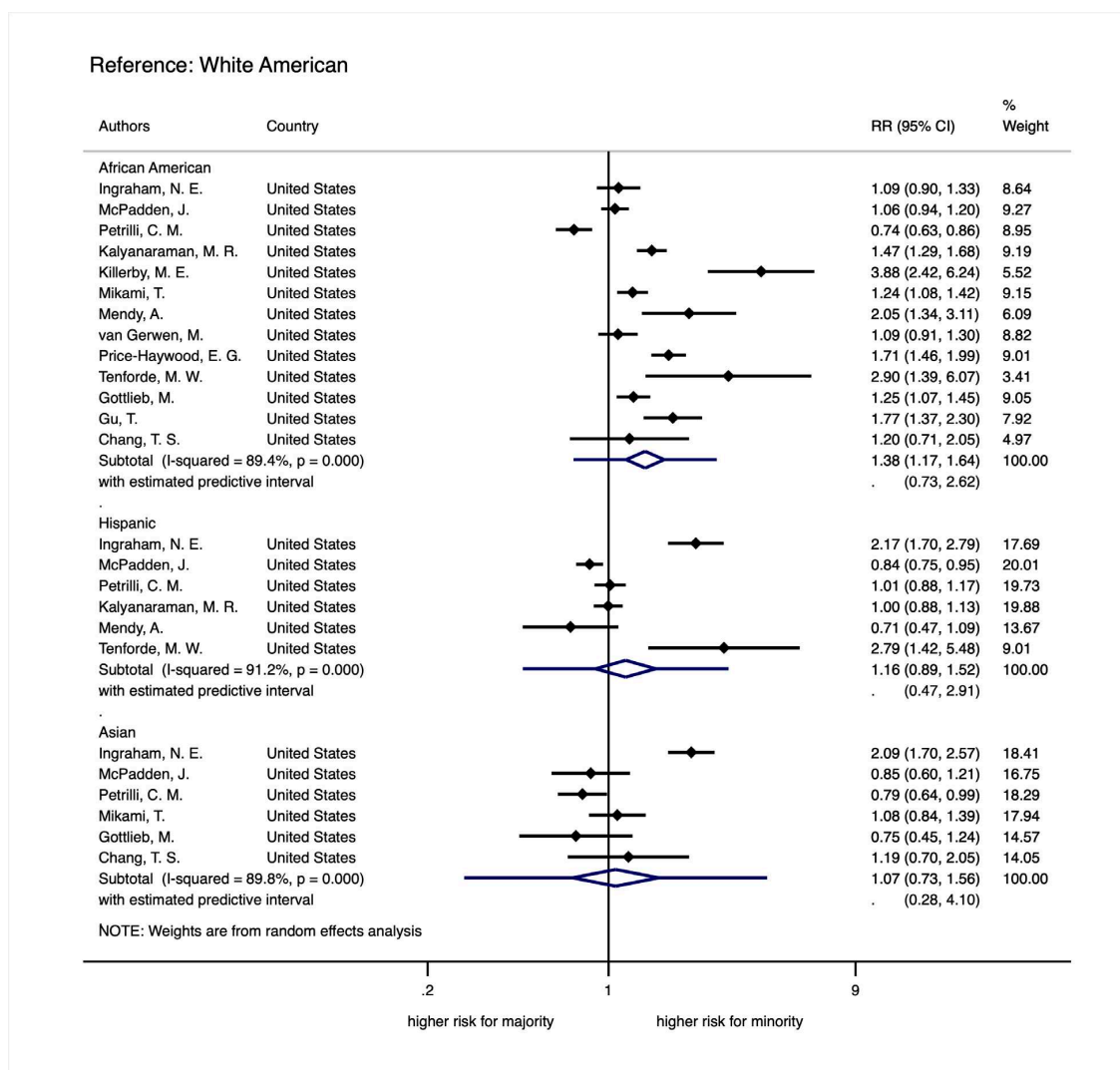
Appendix Figure 3: Individual studies with unadjusted risk estimates for SARS-CoV-2 infection among the general population in Europe by ethnic minority group



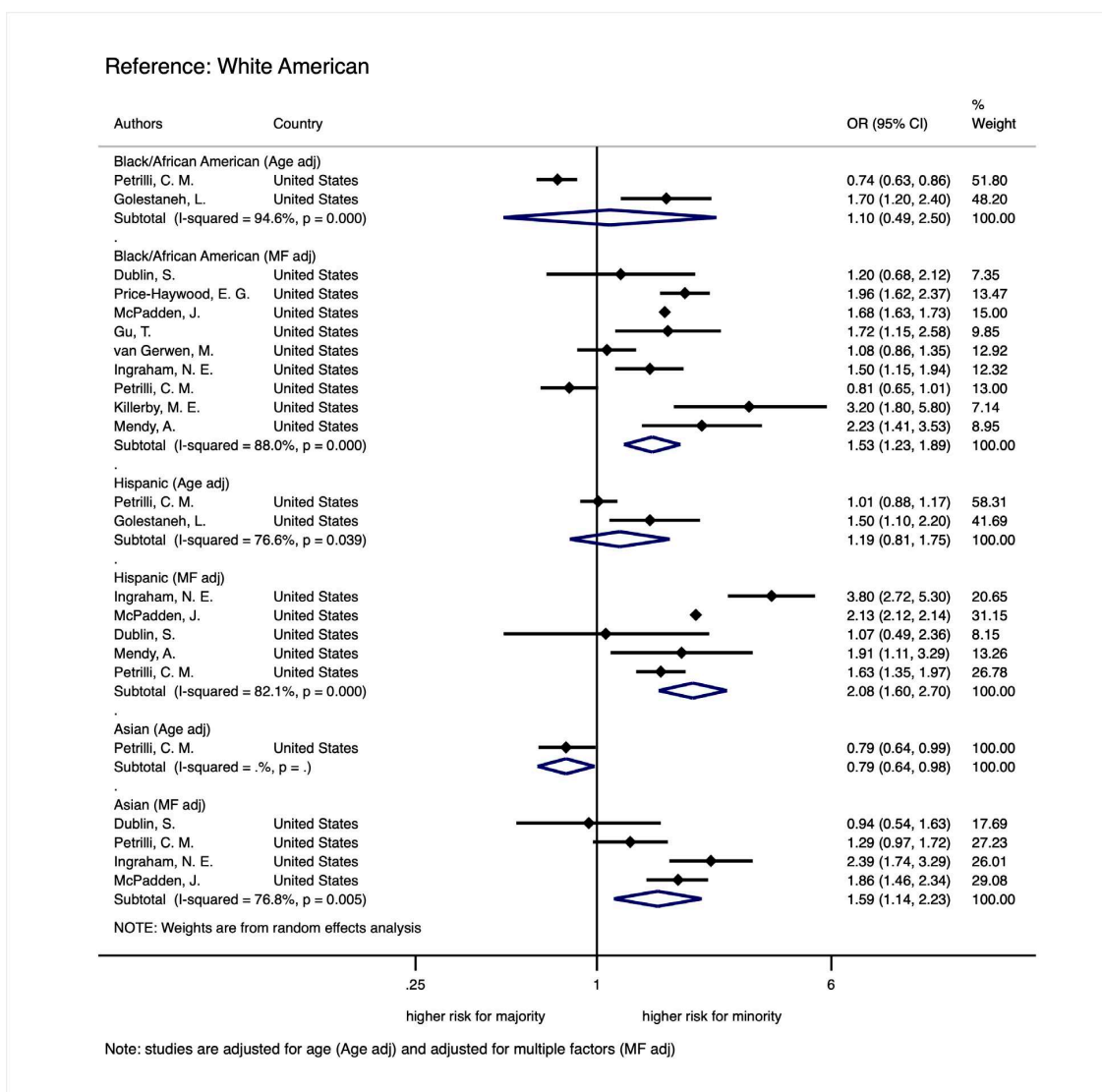
Appendix Figure 4: Individual studies with adjusted risk estimates for SARS-CoV-2 infection among the general population in Europe by ethnic minority group



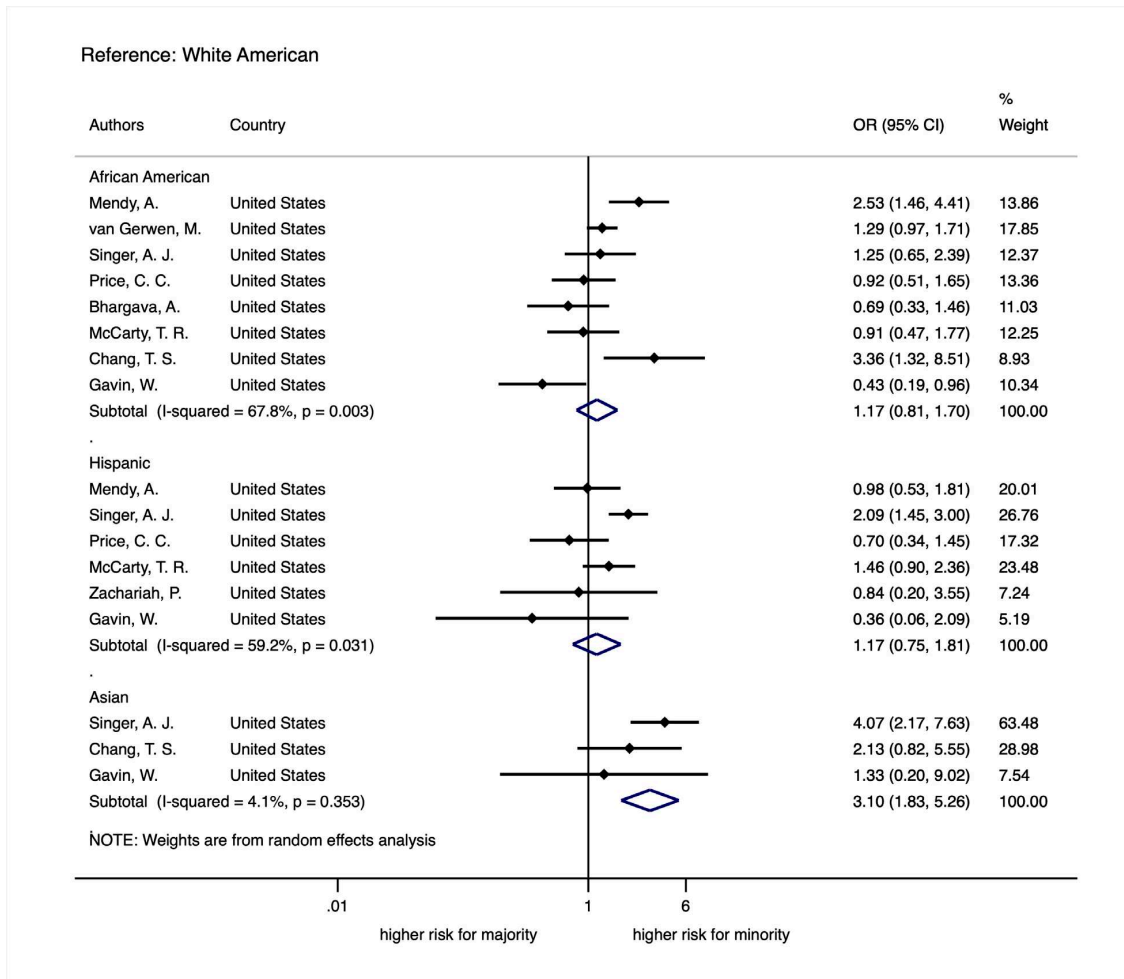
Appendix Figure 5: Individual studies with unadjusted risk estimates for hospitalization among infected individuals in the U.S. by ethnic minority group



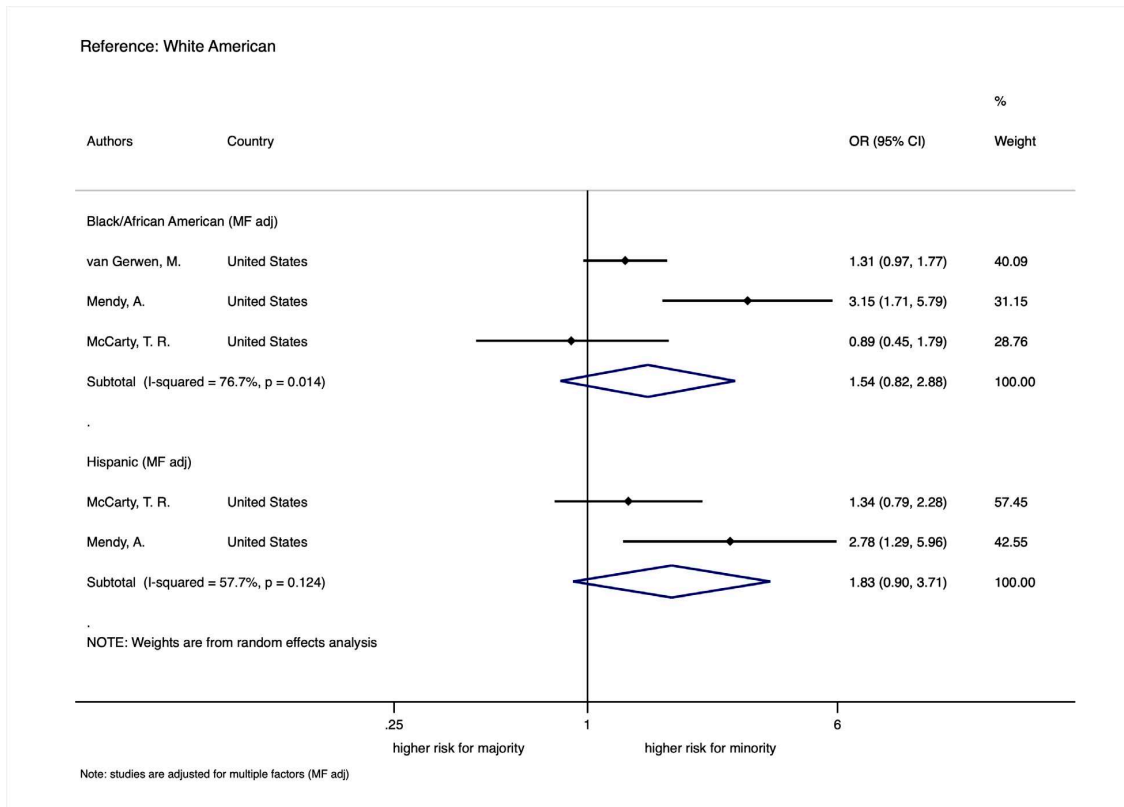
Appendix Figure 6: Individual studies with adjusted risk estimates for hospitalization among infected individuals in the U.S. by ethnic minority group



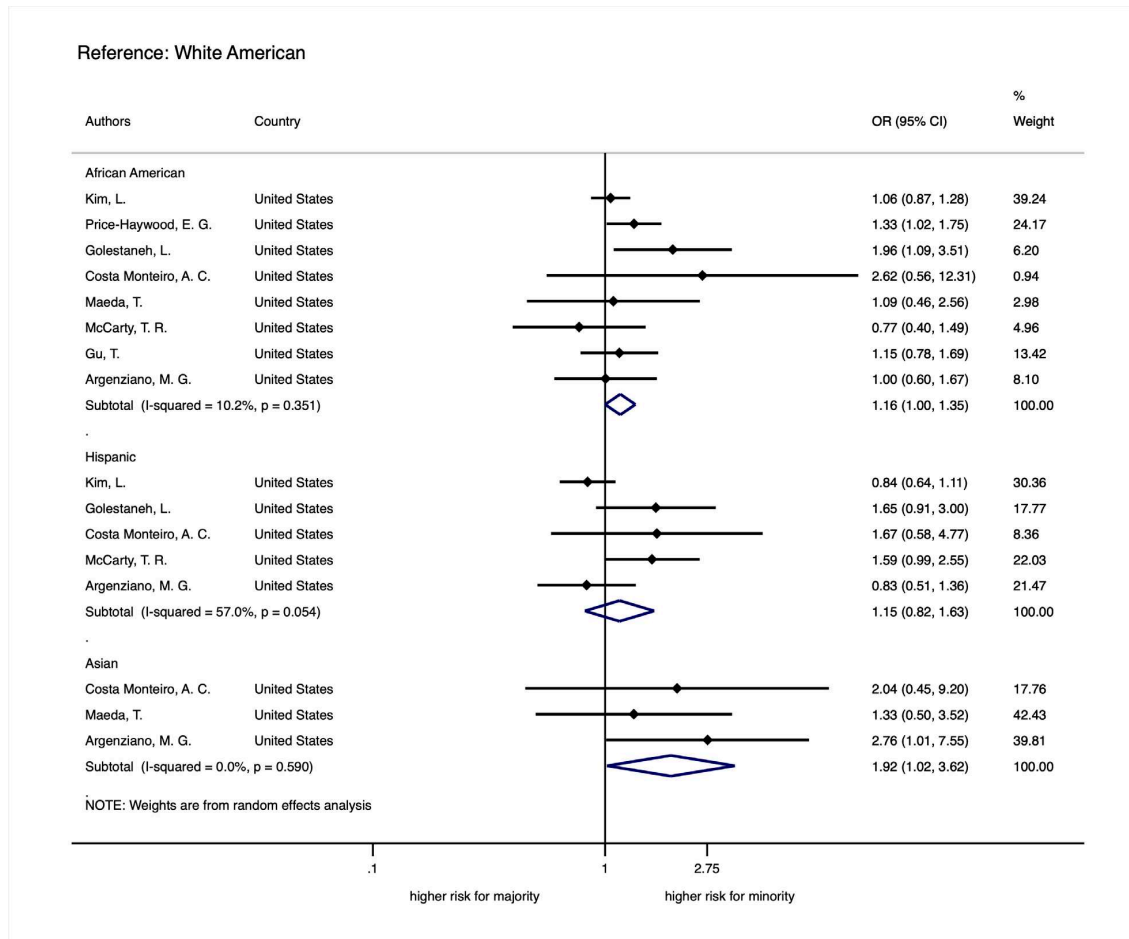
Appendix Figure 7: Individual studies with unadjusted risk estimates for severe disease among hospitalized COVID-19 patients in the U.S. by ethnic minority group



Appendix Figure 8: Individual studies with adjusted risk estimates for severe disease among hospitalized COVID-19 patients in the U.S. by ethnic minority group

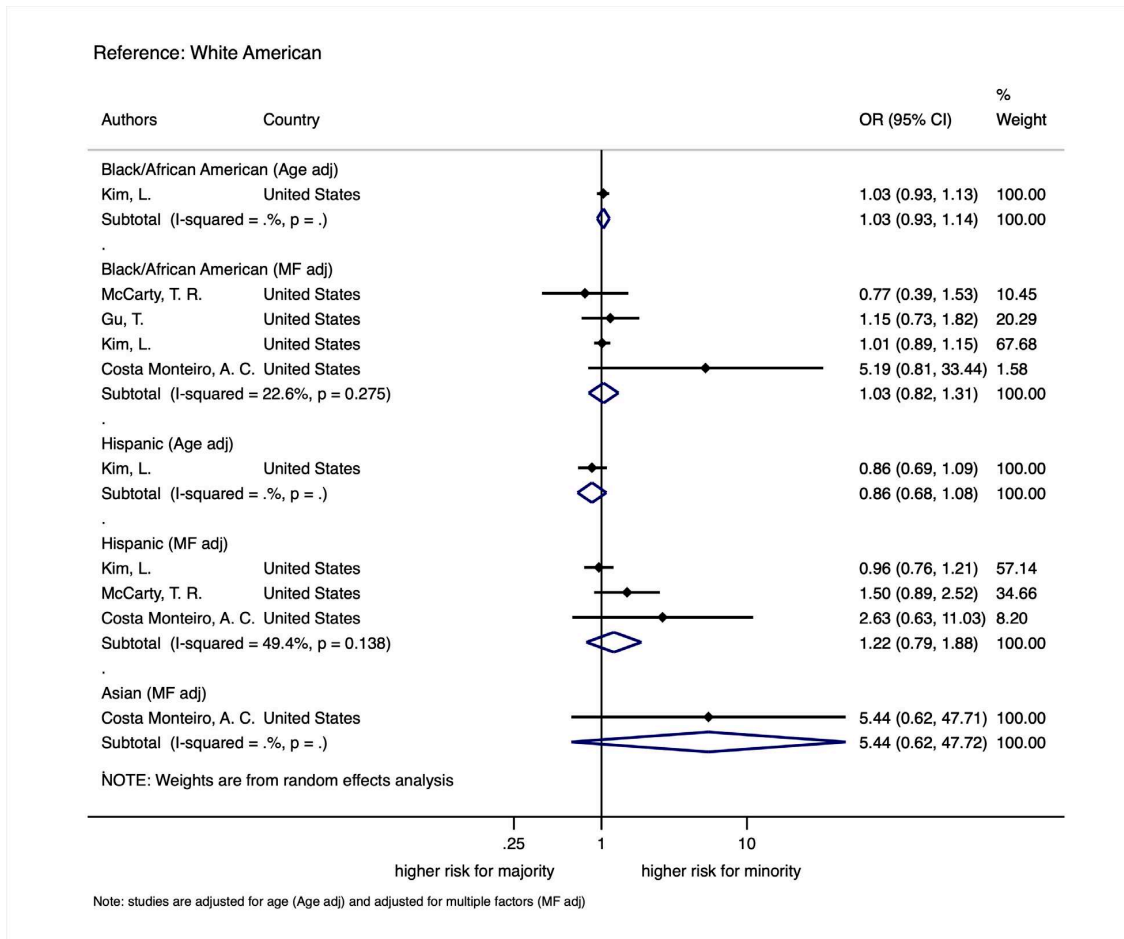


Appendix Figure 9: Individual studies with unadjusted risk estimates for ICU admission among hospitalized COVID-19 patients in the U.S. by ethnic minority group

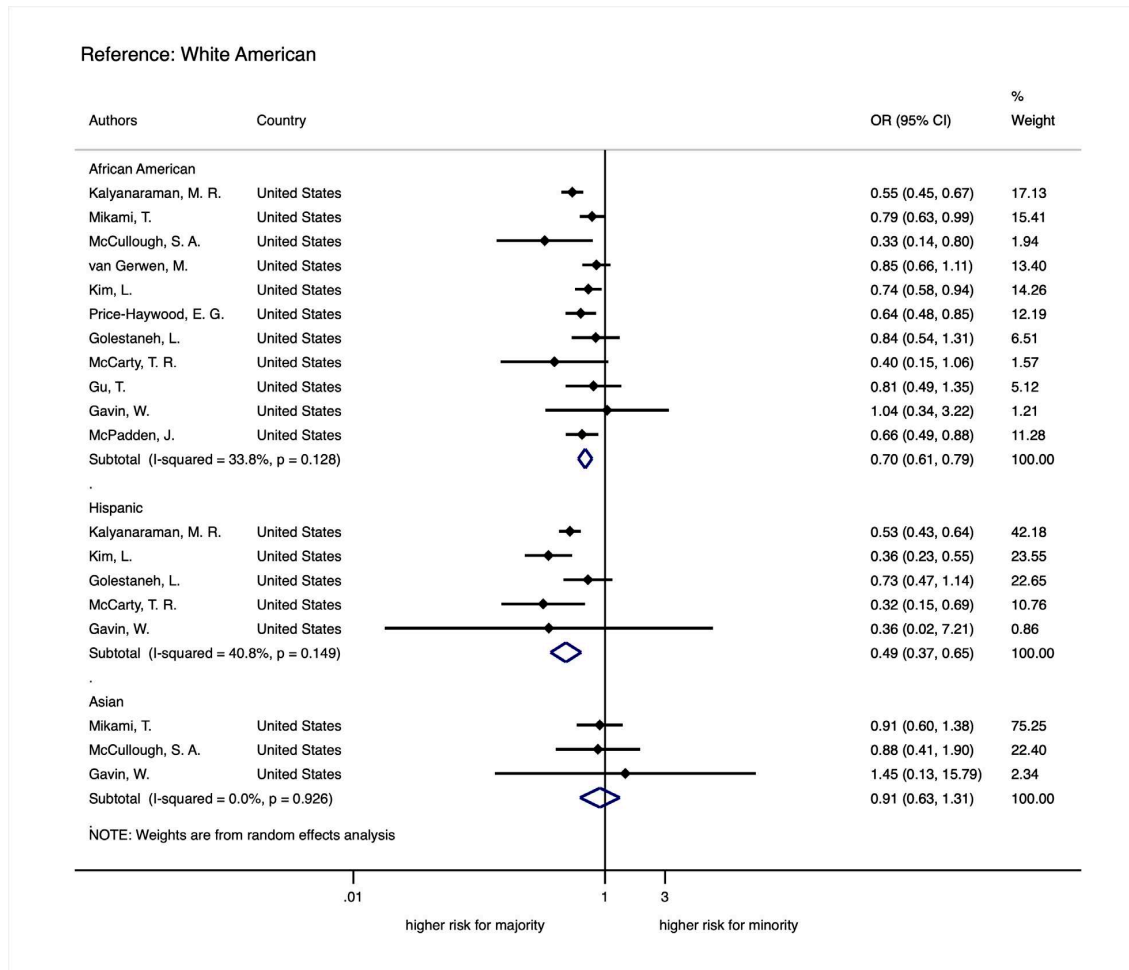




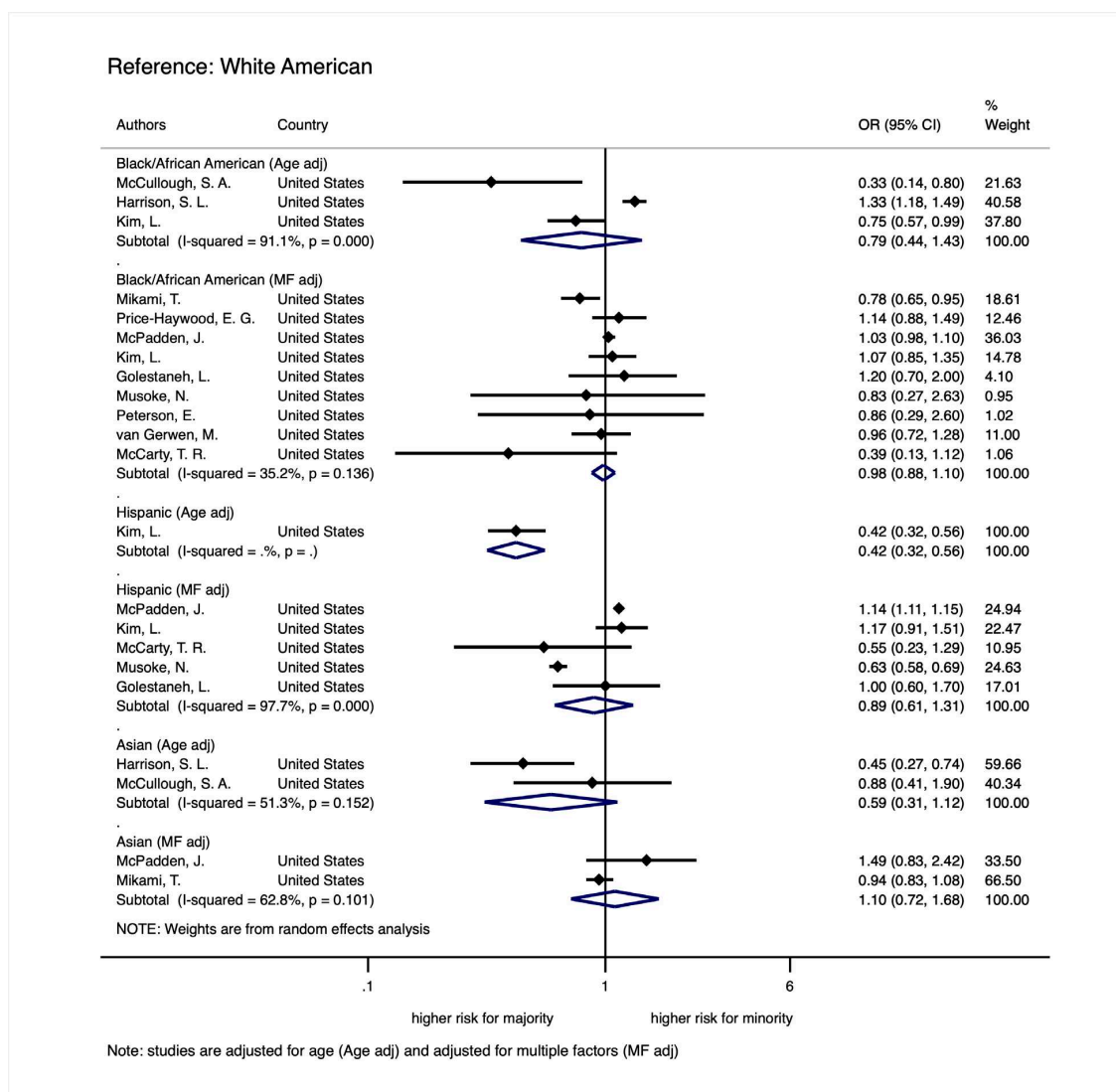
Appendix Figure 10: Individual studies with adjusted risk estimates for ICU admission among hospitalized COVID-19 patients in the U.S. by ethnic minority group



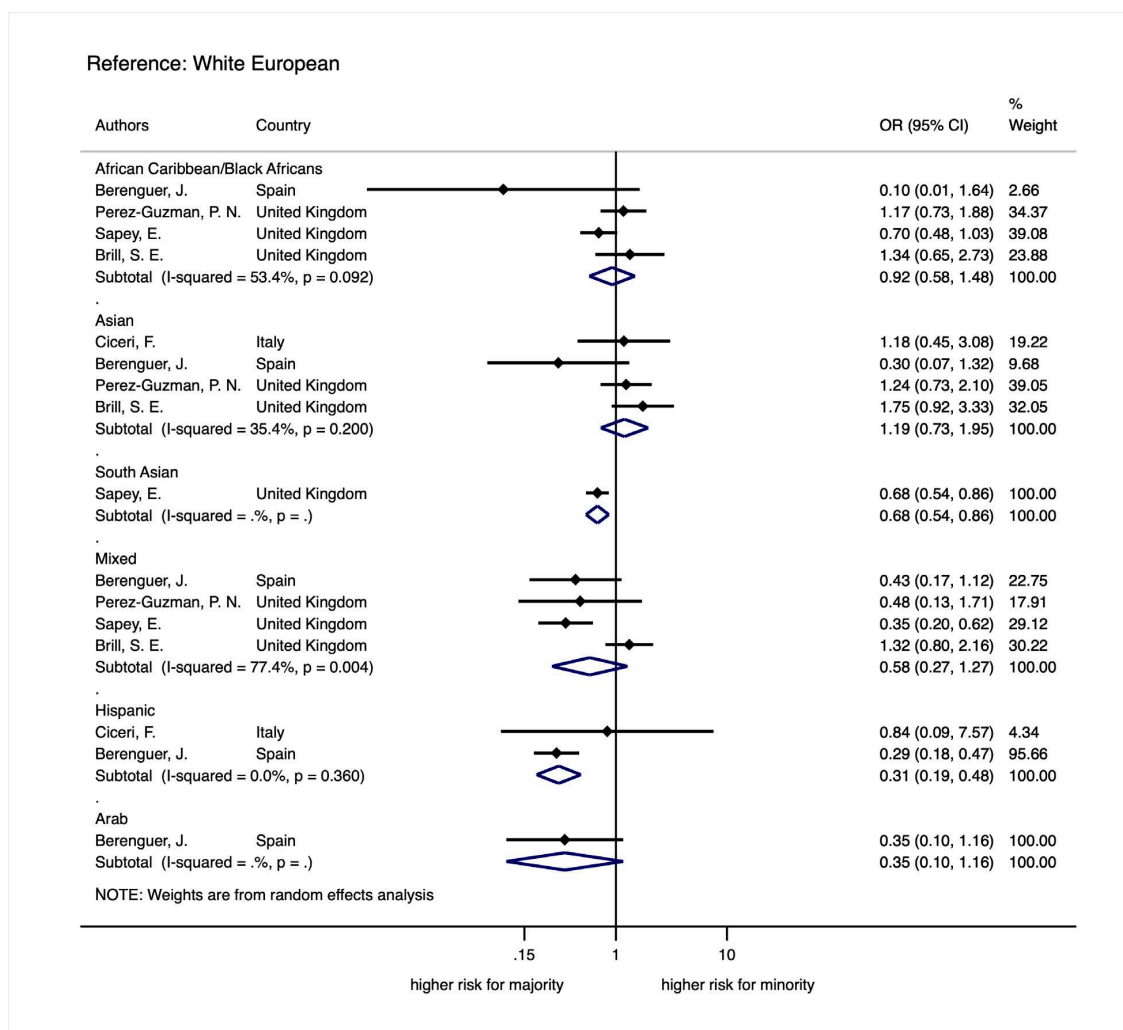
Appendix Figure 11: Individual studies with unadjusted risk estimates for death among hospitalized COVID-19 patients in the U.S. by ethnic minority group



Appendix Figure 12: Individual studies with adjusted risk estimates for death among hospitalized COVID-19 patients in the U.S. by ethnic minority group



Appendix Figure 13: Individual studies with unadjusted risk estimates for death among hospitalized COVID-19 patients in Europe by ethnic minority group



Appendix Figure 14: Individual studies with unadjusted risk estimates for death among hospitalized COVID-19 patients in Brazil by ethnic minority group

