Association between socioeconomic status and outcomes in critical care: a systematic review and meta-analysis

Supplementary Digital Material

Table of Contents

Page(s)	
2	Search Strategy for MEDLINE, Embase & CINAHL
3	Supplementary Figure 1. PRISMA flow chart of article selection and retrieval.
4-5	Supplementary Table 1. Table of study characteristics ordered by year(s) of recruitment. Showing study type, country, year(s) of recruitment, participant numbers for socioeconomic analysis (n), Newcastle-Ottawa Score converted to Agency for Healthcare Research and Quality Standard, and Deprivation Exposure.
6	Supplementary Table 2. Study characteristics of number of critical care units involved in cohort and the critical care population assessed.
7-9	Supplementary Table 3. Table of study mortality outcomes ordered by year(s) of recruitment. Showing mortality outcomes, socioeconomic groups assessed, and mortality associations (95% confidence intervals) by specified time points.
10-12	Supplementary Table 4. PRISMA 2020 Checklist
13-14	Supplementary Table 5. Table of studies included in meta-analysis, demonstrating adjustments for potentially confounding variables present in each study
15	Supplementary Figure 2. Subgroup meta-analysis and pooled effect sizes of the association between socioeconomic status and mortality up to 30 days following admission to critical care, including only studies reporting adjusted effect size
16	Supplementary Table 6. Multiple meta-regression of studies included in meta-analysis with year of publication, and population size as continuous variables, and continent of study, type of socioeconomic indicator (area- or individual-level), adjustment for confounders, and measure of effect (HR or OR) as categorical variables.
17	Supplementary Figure 3. Leave-one-out sensitivity analysis, sorted by I^2, of studies included in meta-analysis of the association between socioeconomic status and mortality up to 30 days following admission to critical care.
18	Supplementary Figure 4. Contour-enhanced funnel plot of the association between socioeconomic status and mortality up to 30 days following admission to critical care units.
19	Supplementary Figure 5. Contour-enhanced funnel plot & Egger's test of the association between socioeconomic status and ICU length of stay.

Search Terms for MEDLINE, Embase & CINAHL

Ovid MEDLINE(R) <1996 to August Week 1 2022>
Embase <1996 to 2022 Week 31>

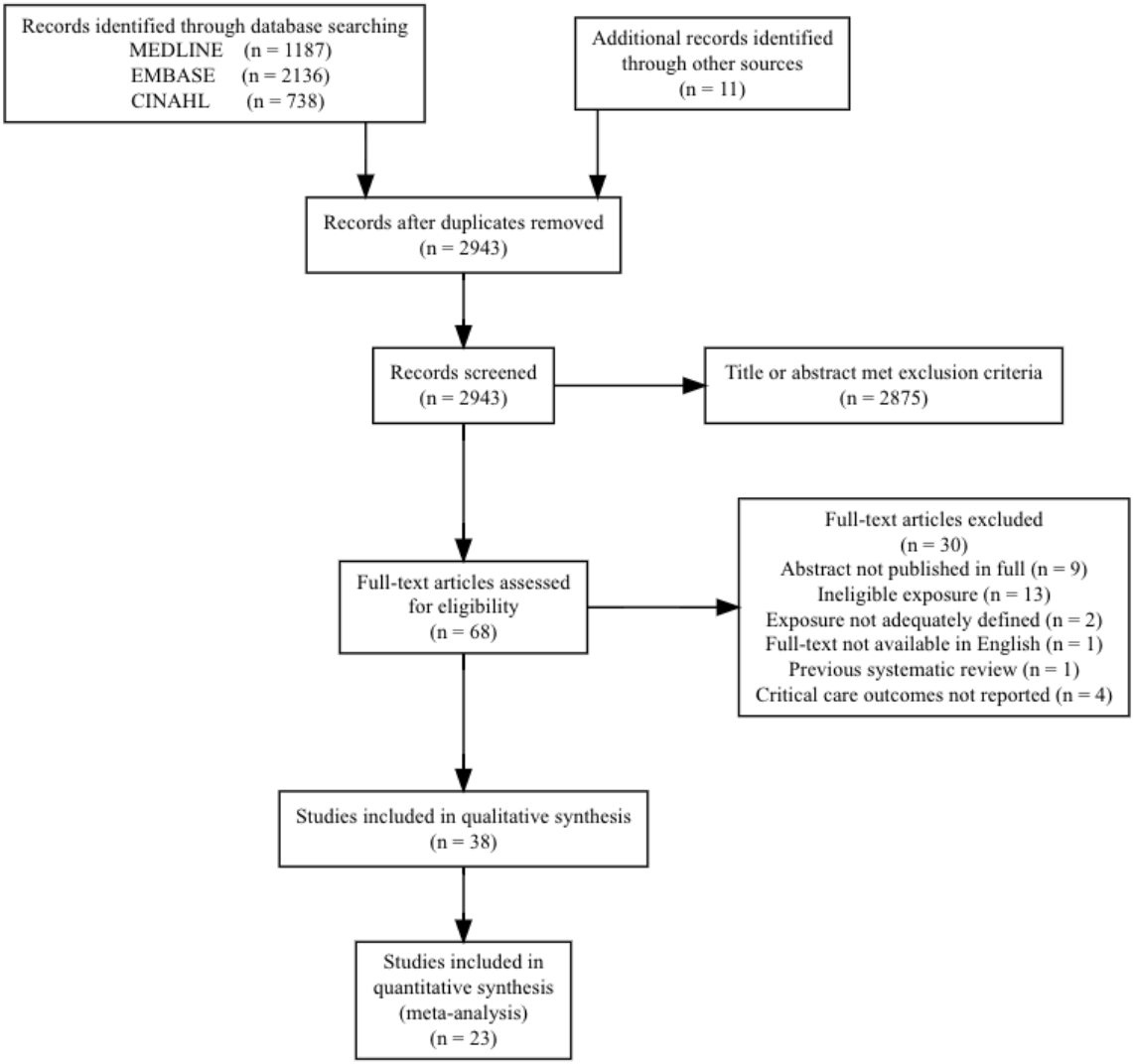
1 critical care/ or critical illness/ or critical care outcomes/ or intensive care units.mp. [mp=ti, bt, ab, ot, nm, hw, fx, kf, ox, px, rx, ui, sy, tn, dm, mf, dv, dq] 288553
2 ((intensive adj care) or (intensive adj care adj unit*) or (critical adj care) or (critical adj illness) or (critically adj ill) or (postintensive adj care adj syndrome) or (post-intensive adj care adj syndrome) or PICS or (critical adj care adj outcome*) or (intensive adj care adj outcome*)).mp. [mp=ti, bt, ab, ot, nm, hw, fx, kf, ox, px, rx, ui, sy, tn, dm, mf, dv, dq] 678631
3 socioeconomic factors/ or social class.mp. [mp=ti, bt, ab, ot, nm, hw, fx, kf, ox, px, rx, ui, sy, tn, dm, mf, dv, dq] 287634
4 ((social adj disadvantag*) or (socioeconomic adj disadvantage*) or (socio-economic adj disadvantage) or (socioeconomic adj status) or (socio-economic adj status) or (social adj deprivation) or deprivation or (socioeconomic adj deprivation) or (socio-economic adj deprivation) or (relative adj deprivation) or (socioeconomic adj position) or (socio-economic adj position) or (socioeconomic adj factor*) or (socio-economic adj factor*) or (area* adj deprivation) or (socioeconomic adj index) or (socioeconomic adj indexes) or (socioeconomic adj indices) or (socio-economic adj index) or (socio-economic adj indexes) or (socio-economic adj indices) or (deprivation adj index) or (deprivation adj indexes) or (deprivation adj indices) or (social adj class)).mp. [mp=ti, bt, ab, ot, nm, hw, fx, kf, ox, px, rx, ui, sy, tn, dm, mf, dv, dq] 464407
5 neonat$.mp. 536211
6 paediat$/ or child$.mp. [mp=ti, bt, ab, ot, nm, hw, fx, kf, ox, px, rx, ui, sy, tn, dm, mf, dv, dq] 3940115
7 ((1 or 2) and (3 or 4)) not 5 not 6 3001
8 remove duplicates from 7 2313

CINAHL

("Critical Care" OR "Intensive Care") AND ("Social Class" OR "Socioeconomic Status" OR "Socioeconomic Factors" OR "Deprivation")

Limits - Age Groups: All Adult

Supplementary Figure 1 - PRISMA flow chart of article selection and retrieval.



Supplementary Table 1. Table of study characteristics ordered by year(s) of recruitment. Showing study type, country, year(s) of recruitment, participant numbers for socioeconomic analysis (n), Newcastle-Ottawa Score converted to Agency for Healthcare Research and Quality Standard, and Deprivation Exposure.

Study	Study Type	Country/Region	Recruitment Year(s)	n =	Agency for Healthcare Research and Quality Standard	Socioeconomic Status Level	Socioeconomic Status Measure
Latour et al. 1991 (38)	Retrospective Cohort	Spain	Unspecified	824	Good	Individual	Occupation
Shippee et al. 2011 (42)	Retrospective Cohort	USA	1971-1992	4229	Good	Individual	Income, Education assessed independently
Ho et al. 2008 (46)	Retrospective Cohort	Australia	1987-2002	15619	Good	Area	Index of Relative Socioeconomic Disadvantage 1986, 1991, 1996, 2001
Findlay et al. 2000 (44)	Retrospective Cohort	Scotland	1993-1994	716	Good	Area	Carstairs Score
Hutchings et al. 2004 (4)	Retrospective Cohort	England & Wales	1995-2000	51572	Good	Area	Carstairs Score
Zager et al. 2011 (22)	Retrospective Cohort	USA	1997-2007	38917	Good	Area	Federal Poverty Rate 1990
Mendu et al. 2012 (21)	Retrospective Cohort	USA	1997-2007	14597	Good	Area	Federal Poverty Rate 1990
Falvey et al. 2022 (28)	Prospective Cohort	USA	1998-1999	239	Good	Area	Area Deprivation Index
Norena et al. 2006 (48)	Retrospective Cohort	Canada	1998-2003	1603	Good	Area	Area average Income, Education, Employment assessed independently
Garland et al. 2015 (45)	Retrospective Cohort	Manitoba, Canada	1999-2008	38862	Good	Area	Average area household income
Welch et al. 2010 (6)	Retrospective Cohort	England & Wales	2000-2002	71710	Good	Area	Index of Multiple Deprivation 2004
Puxty et al. 2015 (33)	Retrospective Cohort	Scotland	2000-2009	6040	Good	Area	Scottish Index of Multiple Deprivation 2012
Bigé et al. 2015 (30)	Case-Control	France	2000-2012	421	Good	Individual	Living place, finances, insurance, isolation
Fletcher et al. 2014 (47)	Retrospective Cohort	England	2003-2010	6937	Good	Area	Index of Multiple Deprivation 2007
Haddad et al. 2020 (26)	Prospective Cohort	USA	2006-2010	489	Good	Area	Agency for Healthcare Research and Quality Socioeconomic Status Index 2008
Mullany et al. 2021 (7)	Retrospective Cohort	Queensland, Australia	2006-2015	218462	Good	Area	Index of Relative Socioeconomic Disadvantage 2006, 2011
Gabriel et al. 2016 (23)	Retrospective Cohort	Victoria, Australia	2007-2012	33306	Good	Area	Index of Relative Socioeconomic Disadvantage 2011
Docherty et al. 2022 (24)	Retrospective Cohort	Victoria, Australia	2007-2018	130775	Good	Area	Index of Relative Socioeconomic Disadvantage 2016
Ventre et al. 2018 (35)	Retrospective Cohort	Scotland	2008-2010	1464	Good	Area	Scottish Index of Multiple Deprivation 2012
Docking et al. 2014 (43)	Retrospective Cohort	Scotland	2008-2010	1017	Poor[a]	Area	Scottish Index of Multiple Deprivation 2009

Schnegelsberg et al. 2016 (32)	Retrospective Cohort	Denmark	2008-2010	387	Good	Individual	Income, Education, Cohabitation assessed independently
Hua et al. 2015 (49)	Retrospective Cohort	USA	2008-2010	492653	Good	Area	Median area income
Bein et al. 2012 (36)	Retrospective Cohort	Germany	2009-2010	1006	Good	Individual	Composite index of Education, Occupation, Income
Griffith et al. 2018 (25)	Prospective Cohort	United Kingdom	2010-2013	240	Good	Area	Scottish Index of Multiple Deprivation 2012
Gayat et al. 2018 (19)	Retrospective Cohort	France & Belgium	2011-2013	1570	Poor[a]	Area	French Deprivation Index (FDep)
Bastian et al. 2018 (20)	Retrospective Cohort	France	2011-2013	1834	Good	Area	French Deprivation Index (FDep)
Barwise et al. 2021 (3)	Retrospective Cohort	USA	2011-2014	3378	Good	Individual	HOUsing-based index of socioeconomic status (HOUSES)
Vasquez et al. 2015 (41)	Retrospective Cohort	Argentina	2012	362	Good	Individual	Education
McPeake et al. 2015 (27)	Prospective Cohort	Scotland	2012-2013	580	Good	Area	Scottish Index of Multiple Deprivation 2012
Oh et al. 2018 (39)	Retrospective Cohort	S Korea	2012-2016	6008	Good	Individual	Education, Occupation, Marital, Religion, Insurance assessed independently
Quenot et al. 2020 (40)	Retrospective Cohort	France	2013-2016	1294	Good	Individual	Evaluation de la Précarité et des Inégalités de santé dans les Centres d'Examens de Santé (EPICES) score of social conditions, leisure activities & family/social support
Oh et al. 2020 (34)	Retrospective Cohort	S Korea, Nationwide	2013-2017	14600	Good	Individual	Income at month of admission
Liisanantti et al. 2017 (50)	Retrospective Cohort	Finland	2013-2015	735	Poor[a]	Area	Area-level median income
Benaïs et al. 2018 (37) *Letter	Retrospective Cohort	France	2017	234	Good	Individual	Social environment, language, education, housing, finance, insurance assessed independently
Lone et al. 2021 (18)	Retrospective Cohort	Scotland	2020	688	Good	Area	Scottish Index of Multiple Deprivation 2020
Ferrando-Vivas et al. 2021 (31)	Retrospective Cohort	England, Wales & Northern Ireland	2020	9267	Good	Area	Index of Multiple Deprivation 2020
Soulsby et al. 2020 (17) *Letter	Retrospective Cohort	Scotland	2020	62	Good	Area	Scottish Index of Multiple Deprivation 2020
Nordberg et al. 2022 (29)	Mixed Case-Control and Retrospective Cohort	Sweden	2020-2021	4921	Good	Individual	Education, Income

[a] In relation to adjustment for outcomes based on SES exposure

Supplementary Table 2. Study characteristics of number of critical care units involved in cohort and the critical care population assessed.		
Study	**Number of Units**	**Critical Care Population**
Latour et al. 1991 (38)	3	All
Shippee et al. 2011 (42)	Unspecified	Cardiac ICU
Ho et al. 2008 (46)	1	All
Findlay et al. 2000 (44)	1	All
Hutchings et al. 2004 (4)	99	All
Zager et al. 2011 (22)	2	All
Mendu et al. 2012 (21)	2	Septicaemia
Falvey et al. 2022 (28)	State	Age ≥70, independent with activities of daily living, and non-frail
Norena et al. 2006 (48)	1	All
Garland et al. 2015 (45)	12	All
Welch et al. 2010 (6)	138	All
Puxty et al. 2015 (33)	National	Cancer
Bigé et al. 2015 (30)	1	All
Fletcher et al. 2014 (47)	1	All
Haddad et al. 2020 (26)	5	All
Mullany et al. 2021 (7)	35	All
Gabriel et al. 2016 (23)	5	All
Docherty et al. 2022 (24)	23	All
Ventre et al. 2018 (35)	National	Acute Pancreatitis
Docking et al. 2014 (43)	1	All
Schnegelsberg et al. 2016 (32)	1	Sepsis
Hua et al. 2015 (49)	State	All
Bein et al. 2012 (36)	1	Surgical
Griffith et al. 2018 (25)	2	All
Gayat et al. 2018 (19)	21	All
Bastian et al. 2018 (20)	20	All
Barwise et al. 2021 (3)	7	All
Vasquez et al. 2015 (41)	National	Maternal
McPeake et al. 2015 (27)	1	All
Oh et al. 2018 (39)	4	All
Quenot et al. 2020 (40)	8	All
Oh et al. 2020 (34)	National	ARDS
Liisanantti et al. 2017 (50)	1	Non-trauma, emergency admissions
Benaïs et al. 2018 (37) *Letter	1	All
Lone et al. 2021 (18)	National	COVID-19
Ferrando-Vivas et al. 2021 (31)	258	COVID-19
Soulsby et al. 2020 (17) *Letter	1	COVID-19
Nordberg et al. 2022 (29)	National	Severe COVID-19 requiring mechanical ventilation

Supplementary Table 3. Table of study mortality outcomes ordered by year(s) of recruitment. Showing mortality outcomes, socioeconomic groups assessed, and mortality associations (95% confidence intervals) by specified time points.						
Study	**Mortality Outcome(s)**	**Socioeconomic Groups Assessed**	**ICU Mortality**	**Hospital Mortality**	**30d Mortality**	**Longer Term**
Latour et al. 1991 (38)	ICU	Dichotomised low and high socioeconomic status	Unadjusted OR 1.61 (1.07-2.42)[a] Adjusted Mantel-Haenszel chi-square p=0.1776			
Shippee et al. 2011 (42)	Long Term up to 20 year follow-up	Individually grouped for each socioeconomic factor Education – 7 categories Income – 12 categories				Education Measure HR 1.019 (0.962-1.079)[c] Income Measure HR 1.038 (0.99-1.089)[c]
Ho et al. 2008 (46)	In-Hospital & Long Term	Most to least deprived sextile		Adjusted OR 1.16 (0.85-1.59)		Adjusted HR 1.21 (1.04-1.41)
Findlay et al. 2000 (44)	In-Hospital	2 most deprived septiles to 5 least deprived septiles		Adjusted OR 1.3 (0.9-1.8)		
Hutchings et al. 2004 (4)	In-Hospital	Most to least deprived quintile		Adjusted OR 1.04 (1.01-1.19)		
Zager et al. 2011 (22)	In-Hospital, & 30, 90 & 365 Day	Federal poverty rate >40% to <5%		No significant difference in adjusted model[b]	Adjusted OR 1.2 (0.9-1.6)	90 Day No significant difference in adjusted model[b] 365 Day No significant difference in adjusted model[b]
Mendu et al. 2012 (21)	In-Hospital, & 30, 90 & 365 Day	Federal poverty rate >40% to <5%		Adjusted OR 0.85 (0.58-1.24)	Adjusted OR 0.80 (0.55-1.15)	90 Day Adjusted OR 0.77 (0.54-1.09) 365 Day Adjusted OR 0.83 (0.60-1.15)
Norena et al. 2006 (48)	In-Hospital	Groups at the limits of interquartile range for each measure		Education Measure (% Postsecondary Education) Adjusted with Charleston Comorbidity Index OR 0.854 (0.759-0.976)[c] Employment Measure (% Unemployed) Adjusted with Charleston Comorbidity Index OR 1.0378 (0.874-1.2079) Income Measure (per $1000 Median Income) Adjusted with Charleston Comorbidity Index OR 0.8928 (0.6583-1.1273)		
Garland et al. 2015 (45)	In-Hospital	Test-of-trend across quintiles		Adjusted Fisher exact p<0.0001 Declining mortality with rising socioeconomic status for urban residents[b]		
Welch et al. 2010 (6)	In-Hospital	Most to least deprived quintile		Adjusted OR 1.19 (1.1-1.28)		
Puxty et al. 2015 (33)	In-Hospital	Most to least deprived quintile		Adjusted OR 2.7 (1.52-4.76)[c]		
Bigé et al. 2015 (30)	In-Hospital & ICU	Homeless to non-homeless	Adjusted OR 1.20 (0.84-1.69)	Adjusted OR 1.07 (0.77-1.49)		

Fletcher et al. 2014 (47)	In-Hospital	Average of most deprived to average of least deprived quintile		Calculated adjusted HR 1.18 (1.06-1.30)		
Mullany et al. 2021 (7)	In-Hospital	Most to least disadvantaged decile		Adjusted OR 0.94 (0.82-1.08)[c]		
Gabriel et al. 2016 (23)	In-Hospital	Most to least disadvantaged decile		Adjusted OR 1.19 (0.98- 1.42)[c]		
Docherty et al. 2022 (24)	Long Term (median follow-up to 3.6 years)	Most to least deprived quartile				Adjusted HR 1.09 (1.05-1.12)
Ventre et al. 2018 (35)	Long Term (median follow-up to 4.4 years)	Most to least deprived quintile				Mantel-Cox chi-square p = 0.50
Docking et al. 2014 (43)	In-Hospital & ICU (within 30 days)	Most to least deprived decile	Unadjusted OR 1.22 (0.48-3.13)[c]	Unadjusted OR 1.32 (0.55-3.23)[c]		
Schnegelsberg et al. 2016 (32)	30 & 180 Day	Each group reported			Income Measure Adjusted HR 1.99 (1.24-3.21) Education Measure Adjusted HR 1.49 (0.84-2.65) Cohabitation Measure Adjusted HR 0.57 (0.38-0.83)	180 Day Income Measure Adjusted HR 1.72 (0.86-3.45) Education Measure Adjusted HR 1.39 (0.62-3.1) Cohabitation Measure Adjusted HR 1.29 (0.73-2.29)
Gayat et al. 2018 (19)	1 Year	Continuous				1 Year Unadjusted Wilcoxon rank-sum test p = 0.44
Bastian et al. 2018 (20)	In-Hospital & ICU, 28 Day & 1 Year	Dichotomised deprived to not deprived	Chi-square p=0.704 Calculated unadjusted OR 1.1 (0.87-1.4)	Chi-square p = 0.364 Calculated unadjusted OR 1.07 (0.86-1.33)	28 Day *of ICU survivors* Chi-square p = 0.172 Calculated unadjusted OR 1.09 (0.73-1.62)	1 year *of ICU survivors* Chi-square p=0.304. Calculated unadjusted OR 1.08 (0.82-1.43)
Barwise et al. 2021 (3)	In-Hospital	Q2-4 compared to most deprived quartile		Adjusted HR 1.23 (0.96-1.59) Subgroup >50 years adjusted HR 1.39 (1.07-1.79)[c]		
Vasquez et al. 2015 (41)	Maternal-foetal-neonatal mortality			Adjusted OR 1.12 (1.02-1.25)[c]		
McPeake et al. 2015 (27)	6 Month	Most deprived quintile to quintiles 2-5				6 Month *of ICU survivor* Adjusted HR 1.11 (0.84-1.45)
Oh et al. 2018 (39)	30 Day & 1 Year	Individually grouped for each socioeconomic factor			Education Measure (<High School to ≥College) Adjusted HR 1.14 (0.88-1.47)[c] Employment Measure (Unemployed to Office Worker) Adjusted HR 1.4 (0.89-2.18)	1 year Education Measure (<High School to ≥College) Adjusted HR 1.04 (0.89-1.22)[c] Employment Measure (Unemployed to Office Worker) Adjusted HR 1.83 (1.37-2.43)

Quenot et al. 2020 (40)	In-Hospital & ICU, 3, 6 & 12 Month	Dichotomised deprived to not deprived	Chi-square p = 0.557 Calculated unadjusted OR 1.11 (0.84-1.47)	*For ICU survivors* Chi-square p = 0.987 Calculated unadjusted OR 1.26 (0.80-2.00)		3 Month *of ICU survivors* Adjusted OR 1.04(0.79-1.37) 6 Month *of ICU survivors* Adjusted OR 0.97 (0.75-1.27) 12 Month *of ICU survivors* Adjusted OR 1.06 (0.82-1.37)
Oh et al. 2020 (34)	30 Day & 1 Year	Least income quartile to most income quartile			Adjusted HR 1.02 (0.95-1.10)[c]	1 year Adjusted HR 1.04 (0.98-1.10)[c]
Liisanantti et al. 2017 (50)	In-Hospital and ICU	Low, middle and high area-level median income	Calculated unadjusted OR 0.56 (0.29-1.17)	Calculated unadjusted OR 0.72 (0.44-1.19)		
Benaïs et al. 2018 (37)	ICU	Dichotomised low and high socioeconomic status for each variable assessed	Social Measure Adjusted HR 1.73 (0.62-4.83) Language Measure Adjusted HR 1.3 (0.29-5.79) Education Measure Adjusted HR 1.15 (0.46-2.98) Housing Measure Adjusted HR 1.77 (0.53-5.86) Finance Measure Adjusted HR 0.26 (0.06-1.17) Health Insurance Measure Adjusted HR 1.29 (0.29-5.79)			
Lone et al. 2021 (18)	30 Day	Most to least deprived quintile			Adjusted OR 1.78 (1.01-3.15)	
Ferrando-Vivas et al. 2021 (31)	30 Day	Most to least deprived quintile			Adjusted HR 1.14 (1.01-1.28)	
Soulsby et al. 2020 (17)	30 Day	Most to least deprived quintile			Adjusted HR 2.9 (1.3-6.5)	
Nordberg et al. 2022 (29)	90 Day	Individually groups for each socioeconomic factor				90 day Education Measure (Primary to >Secondary) Adjusted HR 1.00 (0.87-1.16)[c] Income Measure (Quartile 1 to Quartile 5) Adjusted HR 1.16 (0.97-1.39)

[a]Unadjusted effect utilised for meta-analysis as adjusted effect size not presented

[b]Further data or analysis not presented.

[c] Transformed to maintain relationship of most deprived group to reference of least deprived group.

PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	Introduction
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	Abstract
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Introduction
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Introduction
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Methods
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	Methods
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Supplementary Material
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	Methods
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	Methods
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	Methods
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	Methods
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	Methods
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	Methods
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	Methods
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	Methods
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	Methods
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	Methods
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	Methods
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	Methods

Section and Topic	Item #	Checklist item	Location where item is reported
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	Methods
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	Methods
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	Results & Supplementary Material
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	Supplementary Material
Study characteristics	17	Cite each included study and present its characteristics.	Results & Supplementary Material
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	Supplementary Material
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	Table 2 & Supplementary Material
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	Results
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	Results & Supplementary Material
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	Results & Supplementary Material
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	Results & Supplementary Material
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	N/A
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	Results
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	Discussion
	23b	Discuss any limitations of the evidence included in the review.	Discussion
	23c	Discuss any limitations of the review processes used.	Discussion
	23d	Discuss implications of the results for practice, policy, and future research.	Discussion
OTHER INFORMATION			

Section and Topic	Item #	Checklist item	Location where item is reported
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	N/A
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	N/A
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	N/A
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	Other Information
Competing interests	26	Declare any competing interests of review authors.	Other Information
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	Other Information

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71
For more information, visit: http://www.prisma-statement.org/

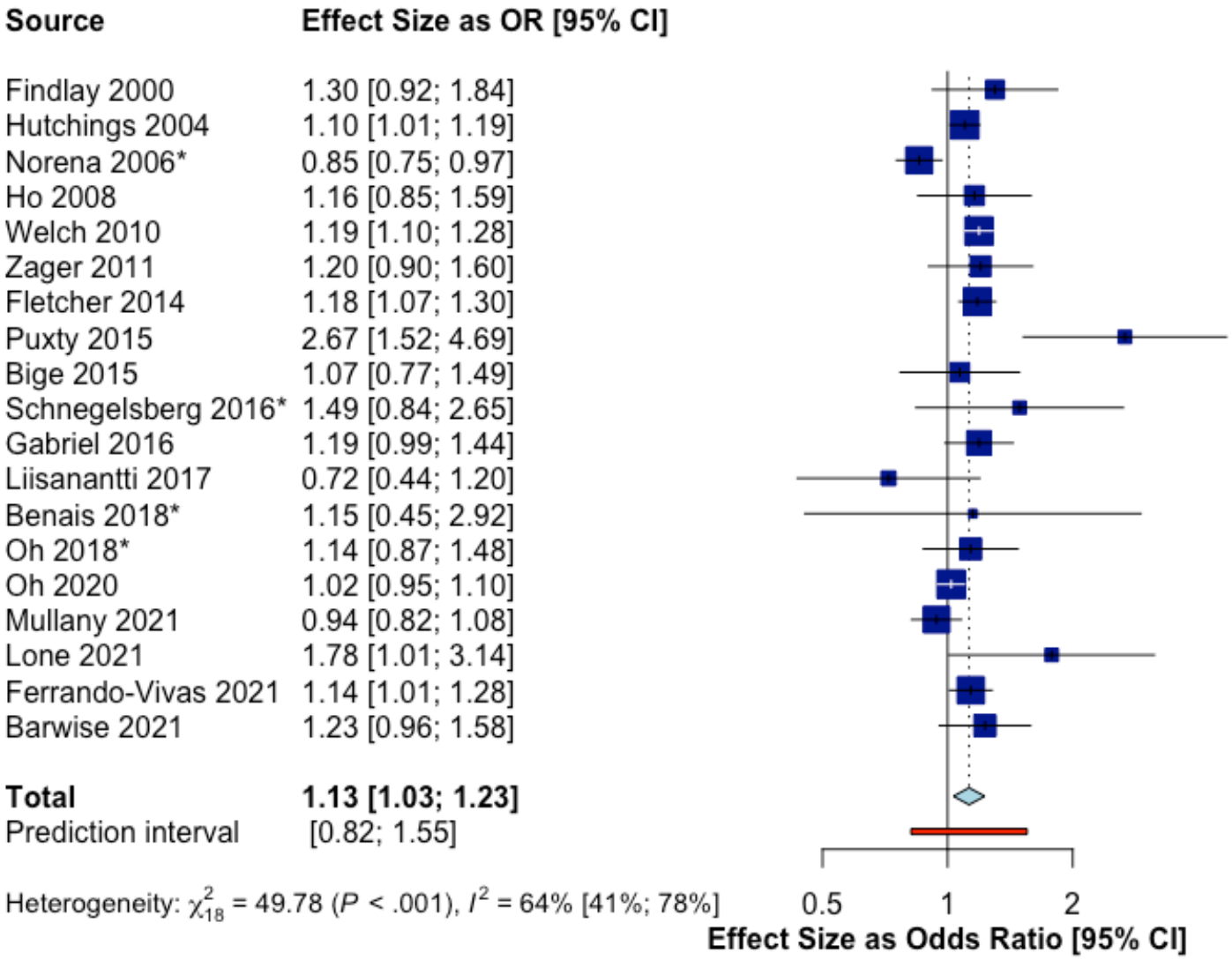
Supplementary Table 4. Table of studies included in meta-analysis of mortality, demonstrating adjustments for potentially confounding variables present in each study (where studies have presented multiple models with varying levels of adjustment, the model with adjustment for the greatest number of confounding variables is presented).

Study	Adjustment Present	Age	Sex/Gender	Race/ Ethnicity	Charlson Comorbidity Index	SAPS/SAPSII	APACHE/APACHE II/APACHE III	Source of Admission	Admitting Diagnosis	Year of Admission	Laboratory Values	Other SES Variables	ICU of Admission	Other
Latour et al. 1991 (38)	Yes[a]	X				X							X	Therapeutic Intervention Scoring System
Ho et al. 2008 (46)	Yes	X		X	X		X							Accessibility/Remoteness Index of Australia
Findlay et al. 2000 (44)	Yes	X					X	X	X					IWRisk Score calculated from APACHE II & admitting diagnosis[b]
Hutchings et al. 2004 (4)	Yes	X			X		X	X	X	X			X	Severe medical history[b]
Zager et al. 2011 (22)	Yes	X	X	X	X			X	X[b]	X	X[b]			Distance from Hospital
Norena et al. 2006 (48)	Yes	X	X		X		X	X	X			X[b]		
Welch et al. 2010 (6)	Yes	X	X		X								X	ICNARC Physiology Score Severe medical history[b]
Puxty et al. 2015 (33)	Yes	X	X					X	X[b]	X			X[b]	Organ Support[b]
Bigé et al. 2015 (30)	Yes	X	X			X								
Fletcher et al. 2014 (47)	Yes	X												ICNARC Model[b]
Mullany et al. 2021 (7)	Yes		X				X	X	X[b]	X				Hospital Type[b] Comorbidities[b]
Gabriel et al. 2016 (23)	Yes	X					X	X	X	X		X[b]		
Docking et al. 2014 (43)	No													
Schnegelsberg et al. 2016 (32)	Yes		X		X	X								
Bastian et al. 2018 (20)	Yes[a]	X	X		X	X						X		SOFA Lifestyle Factors[b] Comorbidities[b]
Barwise et al. 2021 (3)	Yes	X	X	X			X							
Oh et al. 2018 (39)	Yes	X	X		X		X	X		X				BMI Comorbidities[b]
Quenot et al. 2020 (40)	Yes	X			X	X							X	Activities of Daily Living Score[b]
Oh et al. 2020 (34)	Yes	X	X							X				ECMO Use Area of Residence[b] Comorbidities[b]
Liisanantti et al. 2017 (50)	No													
Benaïs et al. 2018 (37) *Letter	Yes		X			X								BMI
Lone et al. 2021 (18)	Yes	X	X	X	X		X[c]							Emergency Hospital Admission in past year

Ferrando-Vivas et al. 2021 (31)	Yes	X	X	X							X[b]			BMI Comorbidities[b] Dependency prior Initial sedation Physiological variables[b] Mechanical Ventilation

[a]Unadjusted effect utilised for meta-analysis as adjusted effect size not presented
[b]Further defined in the study publication
[c]Acute Physiology Score component

Supplementary Figure 2. Subgroup meta-analysis and pooled effect sizes of the association between socioeconomic status and mortality up to 30 days following admission to critical care, including only studies reporting adjusted effect size.

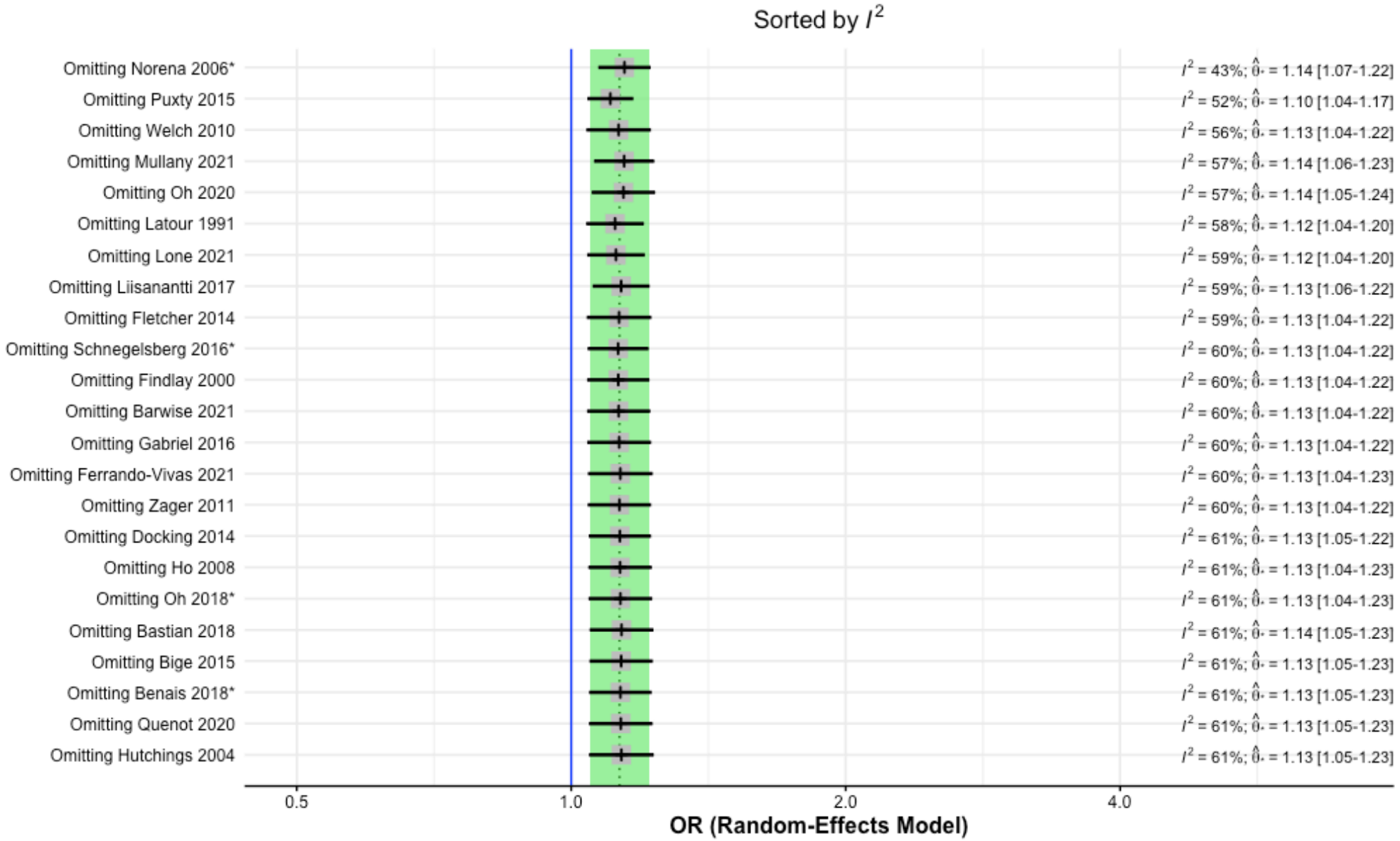


*Using educational attainment socioeconomic status measure

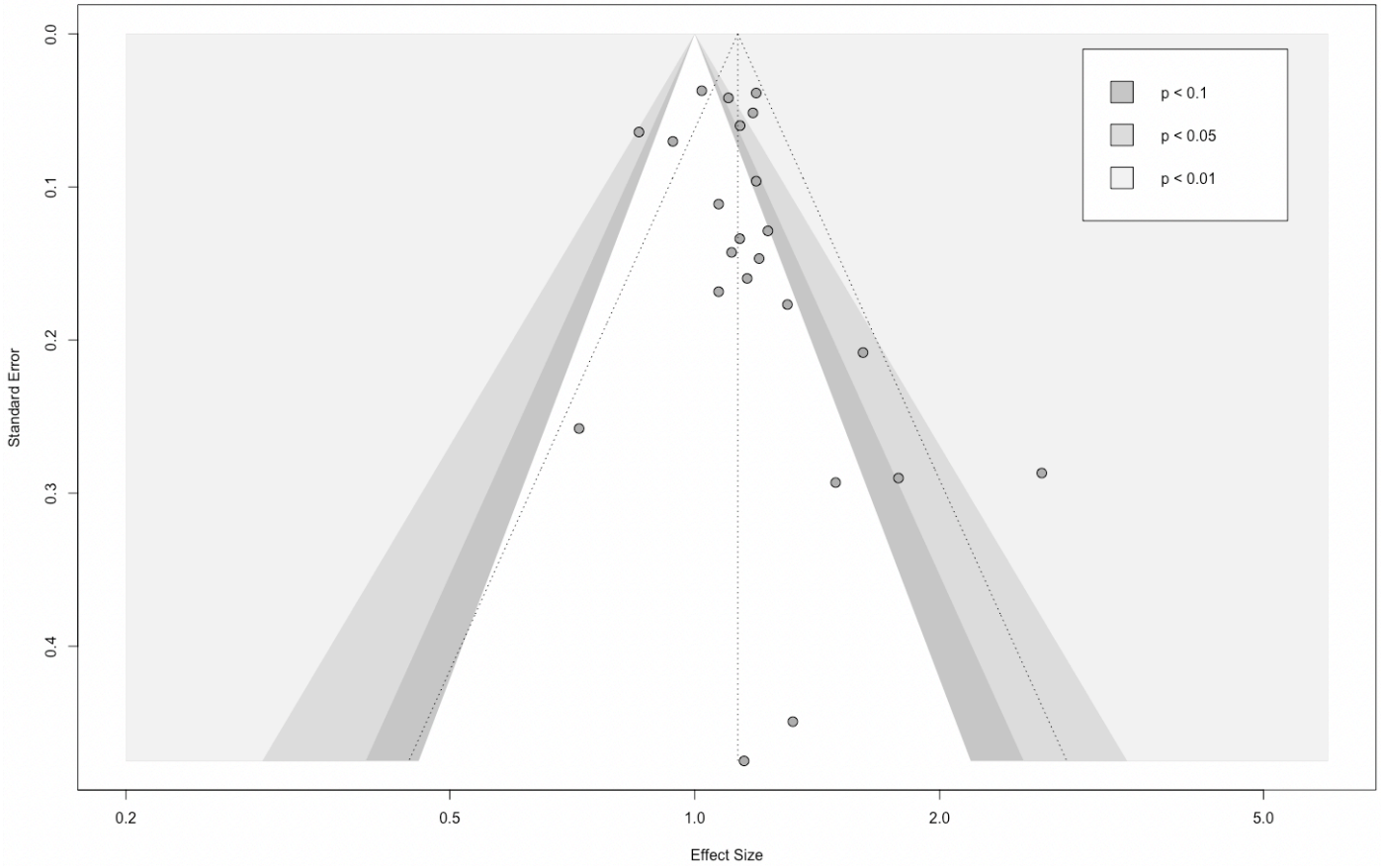
Supplementary Table 5. Multiple meta-regression of studies included in meta-analysis with year of publication, and population size as continuous variables, and continent of study, type of socioeconomic indicator (area- or individual-level), adjustment for confounders, and measure of effect (HR or OR) as categorical variables.

Mixed-Effects Model (k = 23; tau^2 estimator: DL)					
Tau^2 (estimated amount of residual heterogeneity): 0.0174 (SE = 0.0155) tau (square root of estimated tau^2 value): 0.1318 I^2 (residual heterogeneity / unaccounted variability): 59.44% H^2 (unaccounted variability / sampling variability): 2.47 R^2 (amount of heterogeneity accounted for): 0.00%					
Test for Residual Heterogeneity: QE(df = 12) = 29.5837, p-val = 0.0032					
Test of Moderators (coefficients 2:11): F(df1 = 10, df2 = 12) = 0.4524, p-val = 0.8910					
	Estimate	Standard Error	t value	p value	95% Confidence Intervals
Intercept	12.6098	18.8312	0.6696	0.5158	-28.4199-53.6394
Type of Indicator: Individual	0.1232	0.1623	0.7596	0.4622	-0.0266-0.4768
Study Year	-0.0063	0.0093	-0.6711	0.5149	-0.0266-0.0141
Population Size	-0.0000	0.0000	-0.5896	0.5664	-0.0000-0.0000
Adjustment: Unadjusted	-0.0235	0.1904	-0.1234	0.9038	-0.4384-0.3914
Effect Measure: OR	-0.0183	0.1543	-0.1543	0.9075	-0.3545-0.3179
Continent: Australia	0.3484	0.2953	1.1797	0.2610	-0.3545-0.9918
Continent: Europe	0.3212	0.2322	1.3835	0.1917	-0.1847-0.8271
Continent: North America	0.1425	0.2327	0.6123	0.5517	-0.3645-0.6495
Mortality Time Point: In-Hospital	-0.1521	0.1523	-0.9989	0.3376	-0.4838-0.1797
Mortality Time Point: ICU	-0.1495	0.2782	-0.5373	0.6009	-0.7555-0.4566

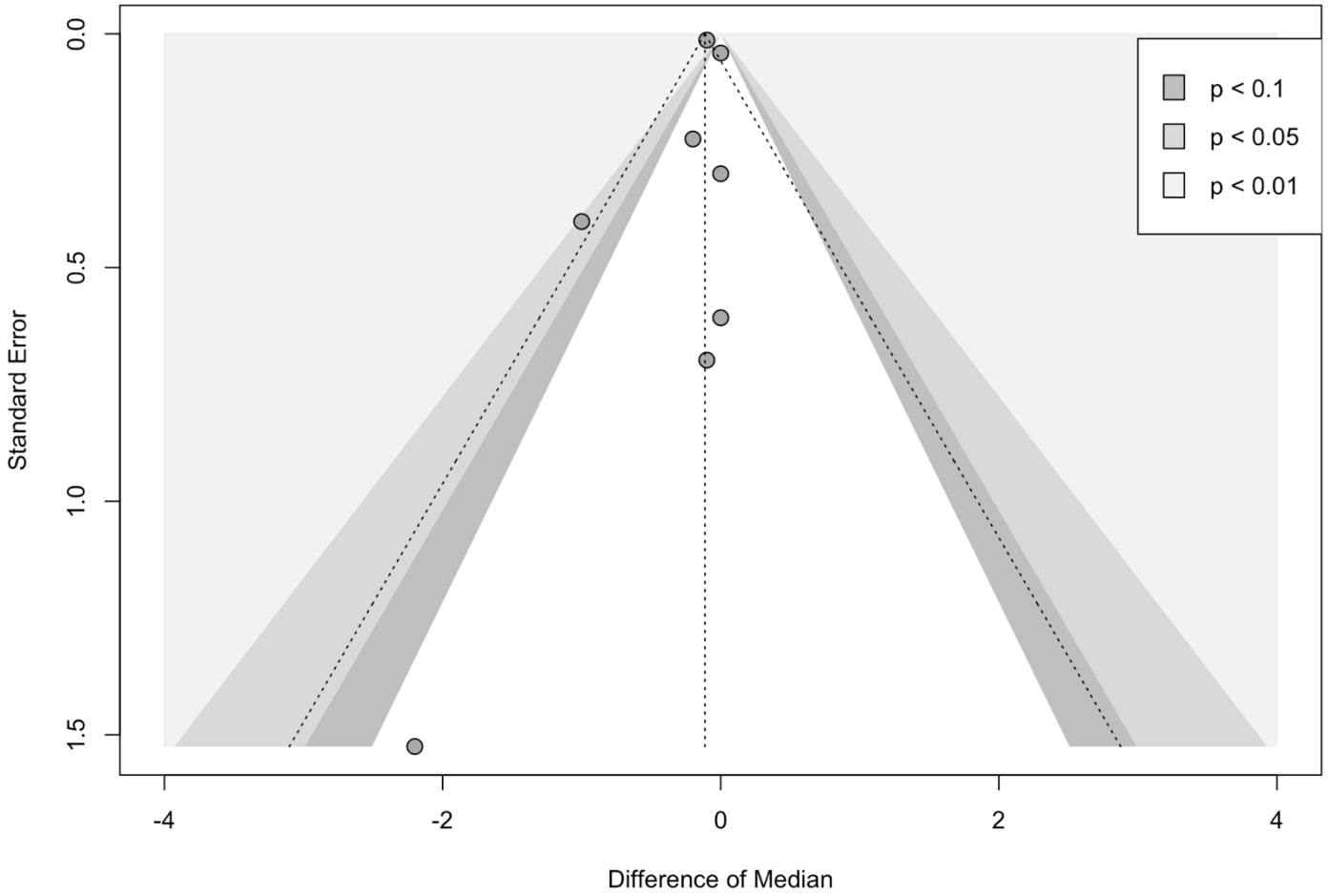
Supplementary Figure 3. Leave-one-out sensitivity analysis, sorted by I^2, of studies included in meta-analysis of the association between socioeconomic status and mortality up to 30 days following admission to critical care.



Supplementary Figure 4. Contour-enhanced funnel plot of the association between socioeconomic status and mortality up to 30 days following admission to critical care units.



Supplementary Figure 5. Contour-enhanced funnel plot & Egger's test of the association between socioeconomic status and ICU length of stay.



Egger's test intercept = -0.347 (95% CI -1.49-0.79, t = -0.598, p 0.57)