Supplemental Data

Supplemental Table 1 Newcastle Ottawa Risk of Bias Scale: Case Control and Case Series Studies

		Selection (max 4)				**Comparability (max 2)**		**Exposure (max 3)**			
		Is the case definition adequate?	Representativeness of the cases	Selection of controls	Definition of controls	Study controls for comorbidities	Study controls for any other additional factors	Ascertainment of outcome	Same method of ascertainment for cases and controls	Non-response rate	
De Vecchi et al.		+	+	+	+		+	+	+	+	8
Lee at al.		+	+	+	+	+	+	+	+	+	9
Huang et al.		+	+	+	+		+	+	+	+	8
Marcus et al.		+	+					+		+	4

Supplemental Table 2 Newcastle Ottawa Risk of Bias Scale: Cohort Studies

		Selection (max 4)				**Comparibility (max 2)**		**Outcome (max 3)**			
		Representativeness of the exposed cohort	Selection of the non-exposed cohort	Ascertainment of exposure	Demonstration that outcomes of interest were not present at start of study	Study controls for comorbidities	Study controls for any other additonal factor	Assessment of outcome	Was follow up long enough for outcomes to occur	Adequacy of follow up of cohorts	
Artru et al.		+	+	+	+	+	+	+	+	+	9
Che-Yi et al.		+		+	+	+	+	+	+	+	8
Chien et al.		+	+	+	+	+	+	+	+	+	9
Deshpande et al.		+	+	+	+		+	+	+		7
Marcelli et al.			+	+	+	+	+	+	+		7
Espinosa et al.		+	+	+	+	+	+	+	+	+	9
Kim et al.		+	+	+	+	+	+	+	+	+	9
Mikolasevic et al.			+	+	+	+			+	+	6
Nakayama et al.		+	+	+	+	+	+	+	+	+	9

Supplemental Table 3 Newcastle Ottawa Risk of Bias Scale: Cross Sectional Studies

		Selection (max 4)				**Comparability (max 2)**		**Outcome (max 2)**		
		Representativeness of the exposed cohort	Sample size	Selection of non-exposed cohort	Ascertainment of exposure	Study controls for comorbidities	Study controls for any other additonal factors	Assessment of outcome	Appropriate statistical test	
Stolic et al.				+	+	+	+	+	+	6
Behairy et al.					+	+		+	+	4

Supplemental Table 4 Sensitivity Analyses

Analysis		Study (ies) removed	Reason for removal	Results summary with study (ies) removed
Severity of cirrhosis in ESKD patients (Table 2)		Marcus et al.	High risk of bias	Child-Pugh A (n= 464; 61%), Child-Pugh B (n = 171; 22%), Child-Pugh C (n = 131; 17%)
Aetiology of cirrhosis in ESKD patients (Table 3)		Marcus et al.	High risk of bias	Results unchanged
Prevalence of cirrhosis in dialysis patients by modality (Figure 2)		Marcus et al.	High risk of bias	Prevalence 4.97% (95% CI 3.76-6.18%), I^2 98%
Prevalence of cirrhosis in dialysis patients by modality (Figure 2)		Marcus et al., De Vecchi et al., Huang et al., Lee et al.	Case control and Case series studies	Prevalence 4.63% (95% CI 3.27-5.98), I^2 99%
Prevalence of NAFLD in dialysis patients (Figure 3)		Mikolasevic et al., Stolic et al., Behairy et al.	High risk of bias	No results – all studies at high risk of bias
Association between death in dialysis patients with and without cirrhosis or NAFLD (Figure 4)		Espinosa et al., Huang et al.	Outlier results	OR for mortality in cirrhosis subgroup 2.26 (1.51-3.37), I^2 85% (Supplemental Figure 3)

Supplemental Table 5 Relationship between severity of cirrhosis and mortality in ESKD patients

Study	Date of Publication	Length of follow up	Mortality
Artru et al.	2019	2 years	2 year mortality: 37.2% for patients with compensated cirrhosis; 55.9% for patients with decompensated cirrhosis
Che-Yi et al.	2016	6 years	Mortality hazard ratio of 8.92 (95% CI 6.73-11.82) per Child-Pugh class using a Cox-Proportional Hazard Regression Model
De Vecchi et al.	2002	3.2 years	Mortality: Child-Pugh Class A 20%, Child-Pugh Class B 40%, Child-Pugh Class C 50%
Marcus et al.	1992	2.1 years	Mortality: Child-Pugh Class B 43%, Child-Pugh Class C 50%

Supplemental Table 6 PRISMA 2020 Abstract Checklist

Section and Topic	Item #	Checklist item	Reported (Yes/No)
TITLE			
Title	1	Identify the report as a systematic review.	Yes
BACKGROUND			
Objectives	2	Provide an explicit statement of the main objective(s) or question(s) the review addresses.	Yes
METHODS			
Eligibility criteria	3	Specify the inclusion and exclusion criteria for the review.	Inclusion criteria only specified due to word limit constraints
Information sources	4	Specify the information sources (e.g. databases, registers) used to identify studies and the date when each was last searched.	Yes
Risk of bias	5	Specify the methods used to assess risk of bias in the included studies.	Not included due to word limit constraints
Synthesis of results	6	Specify the methods used to present and synthesise results.	Not included due to word limit constraints
RESULTS			
Included studies	7	Give the total number of included studies and participants and summarise relevant characteristics of studies.	Yes
Synthesis of results	8	Present results for main outcomes, preferably indicating the number of included studies and participants for each. If meta-analysis was done, report the summary estimate and confidence/credible interval. If comparing groups, indicate the direction of the effect (i.e. which group is favoured).	Yes
DISCUSSION			
Limitations of evidence	9	Provide a brief summary of the limitations of the evidence included in the review (e.g. study risk of bias, inconsistency and imprecision).	Yes

Section and Topic	Item #	Checklist item	Reported (Yes/No)
Interpretation	10	Provide a general interpretation of the results and important implications.	Yes
OTHER			
Funding	11	Specify the primary source of funding for the review.	N/A
Registration	12	Provide the register name and registration number.	Registration number not included due to word limit constraints

Supplemental Table 7 PRISMA 2020 Main Checklist

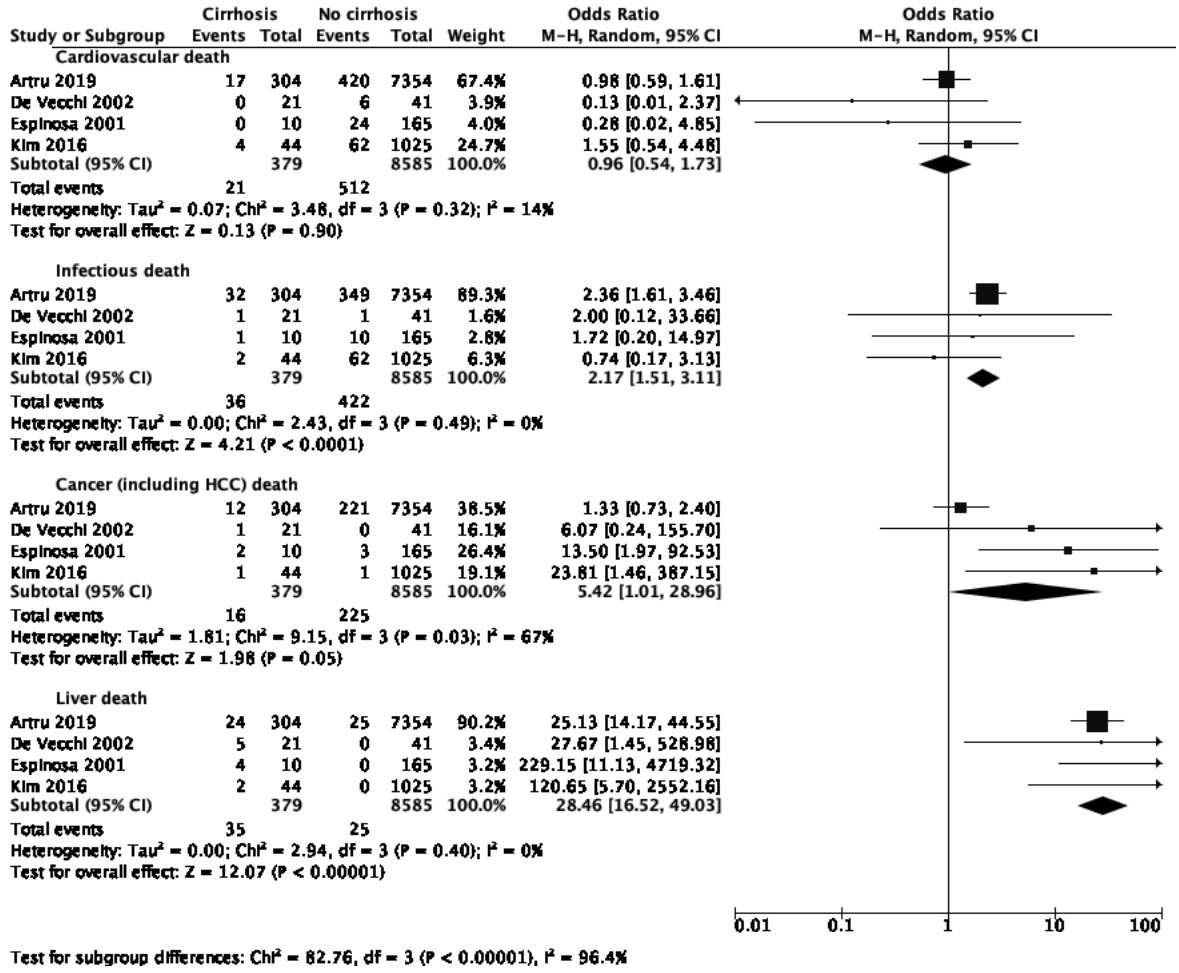
Topic	No.	Item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	Page 1
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist	
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Page 2
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Page 3
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Page 3-4
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.	Page 3
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Available via URL link on page 3
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.	Page 3-4
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.	Page 3-4

Topic	No.	Item	Location where item is reported
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.	Page 4
	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.	Page 4
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.	Page 5-6
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.	Page 5
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)).	Page 6, Figure 1 on Page 23
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	Page 5-6
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	Page 4-6
	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.	Page 5-6
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	Page 5-6
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	Page 6

Topic	No.	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).	Page 5
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	Page 5-6
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.	Figure 1, page 23
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	N/A
Study characteristics	17	Cite each included study and present its characteristics.	Table 1, Page 18-19
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	Supplemental Tables 1-3
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.	Tables 2-3, Page 20-1, Figures 2-4, Page 23-5, Supplemental Figures 1-2
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	Page 7-9
	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.	Figures 2-4, Page 23-5
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	Supplemental Figures 3-6
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	Supplemental Table 4
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	Supplemental Figure 7
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	Page 7-9

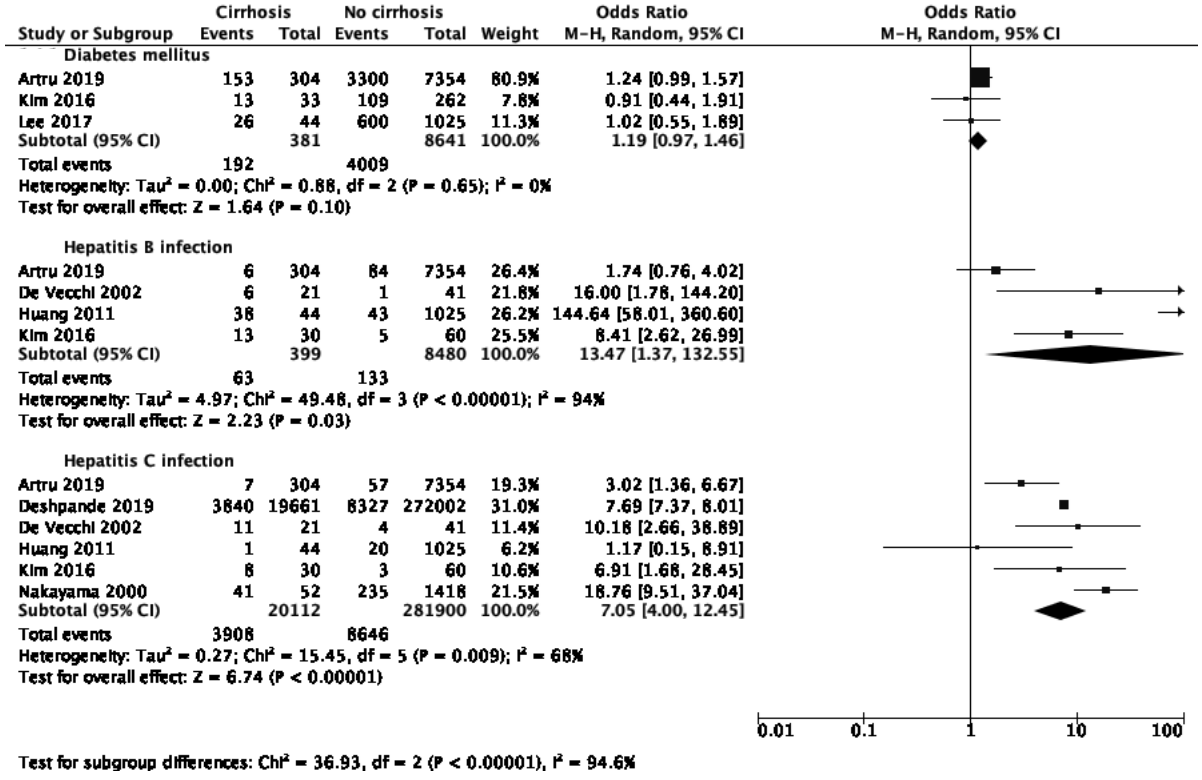
Topic	No.	Item	Location where item is reported
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	Pages 10-14
	23b	Discuss any limitations of the evidence included in the review.	Pages 10-14
	23c	Discuss any limitations of the review processes used.	Pages 10-14
	23d	Discuss implications of the results for practice, policy, and future research.	Pages 13-14
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	Page 3
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	Page 3
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	Can be reviewed via PROSPERO
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	N/A
Competing interests	26	Declare any competing interests of review authors.	N/A
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.	See statement on page 3

Supplemental Figure 1 Association between cardiovascular death, infectious death, cancer death and liver death in dialysis patients with and without cirrhosis



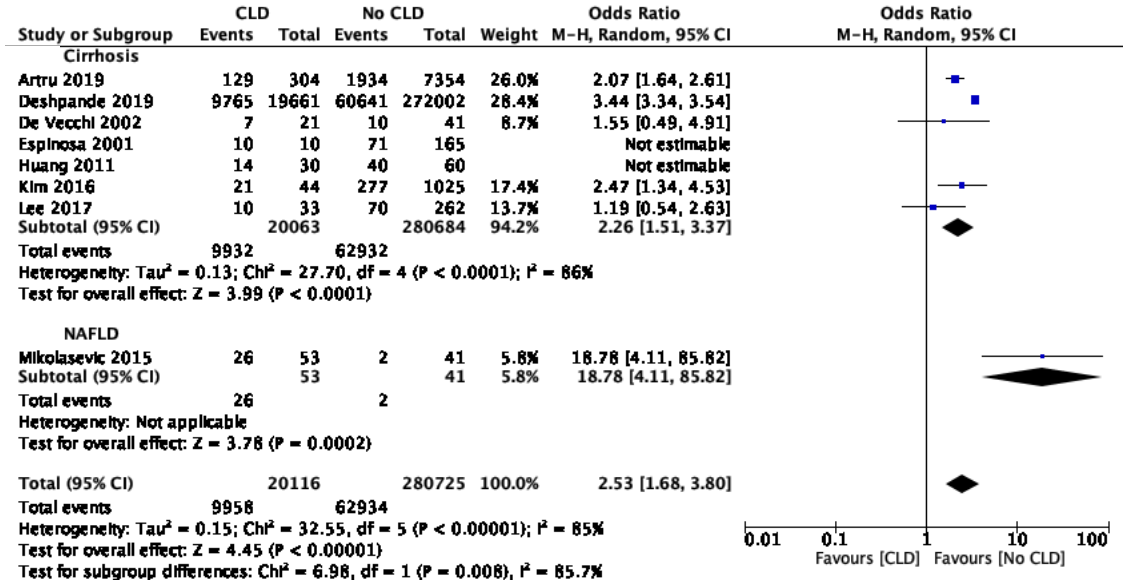
M-H = Mantel-Haenszel; CI = Confidence Interval; df = degrees of freedom; p = p-value; I^2 = total variability due to heterogeneity

Supplemental Figure 2 Association between diabetes mellitus, hepatitis B and hepatitis C infection and development of cirrhosis in dialysis patients

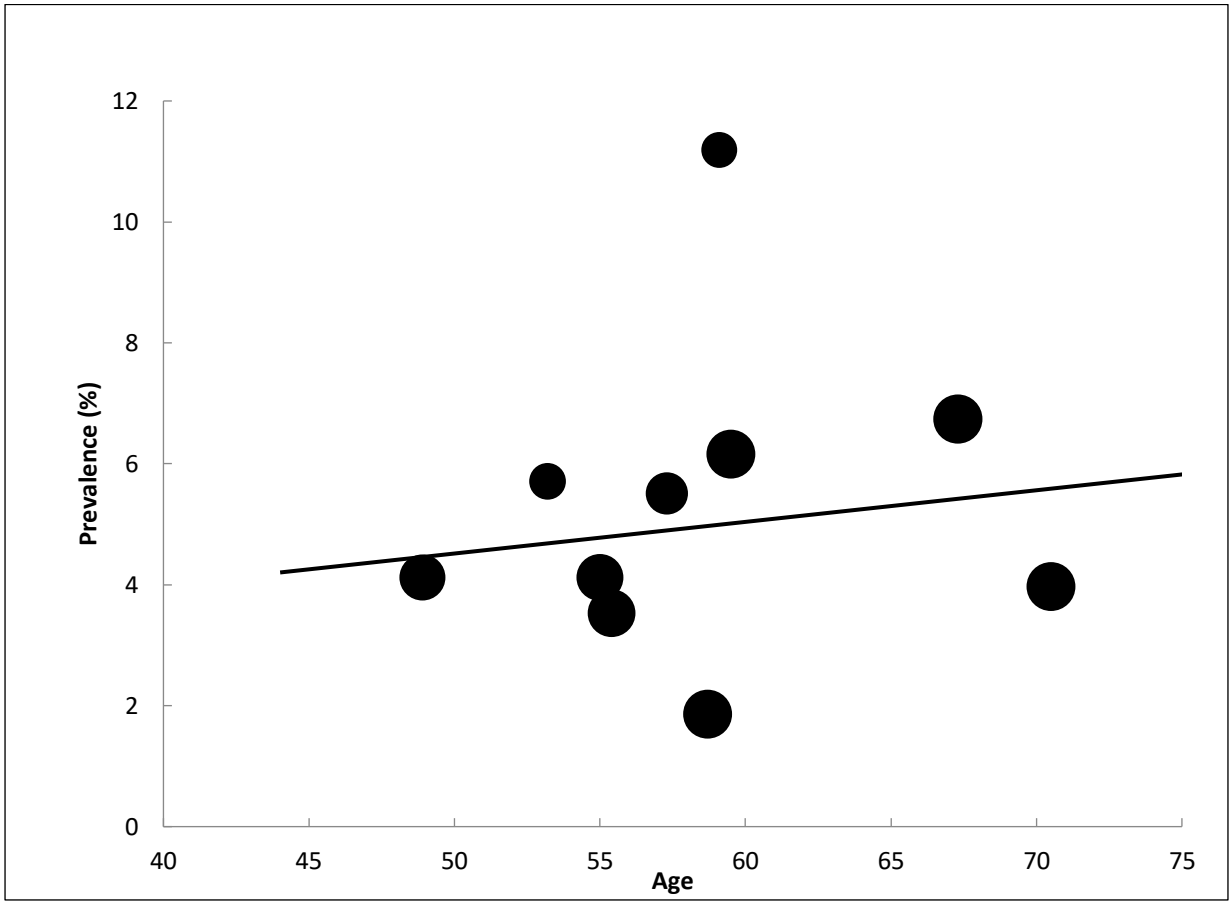


M-H = Mantel-Haenszel; CI = Confidence Interval; df = degrees of freedom; p = p-value; I^2 = total variability due to heterogeneity

Supplemental Figure 3 Association between death in dialysis patients with and without cirrhosis or NAFLD (with data from outlier studies removed)

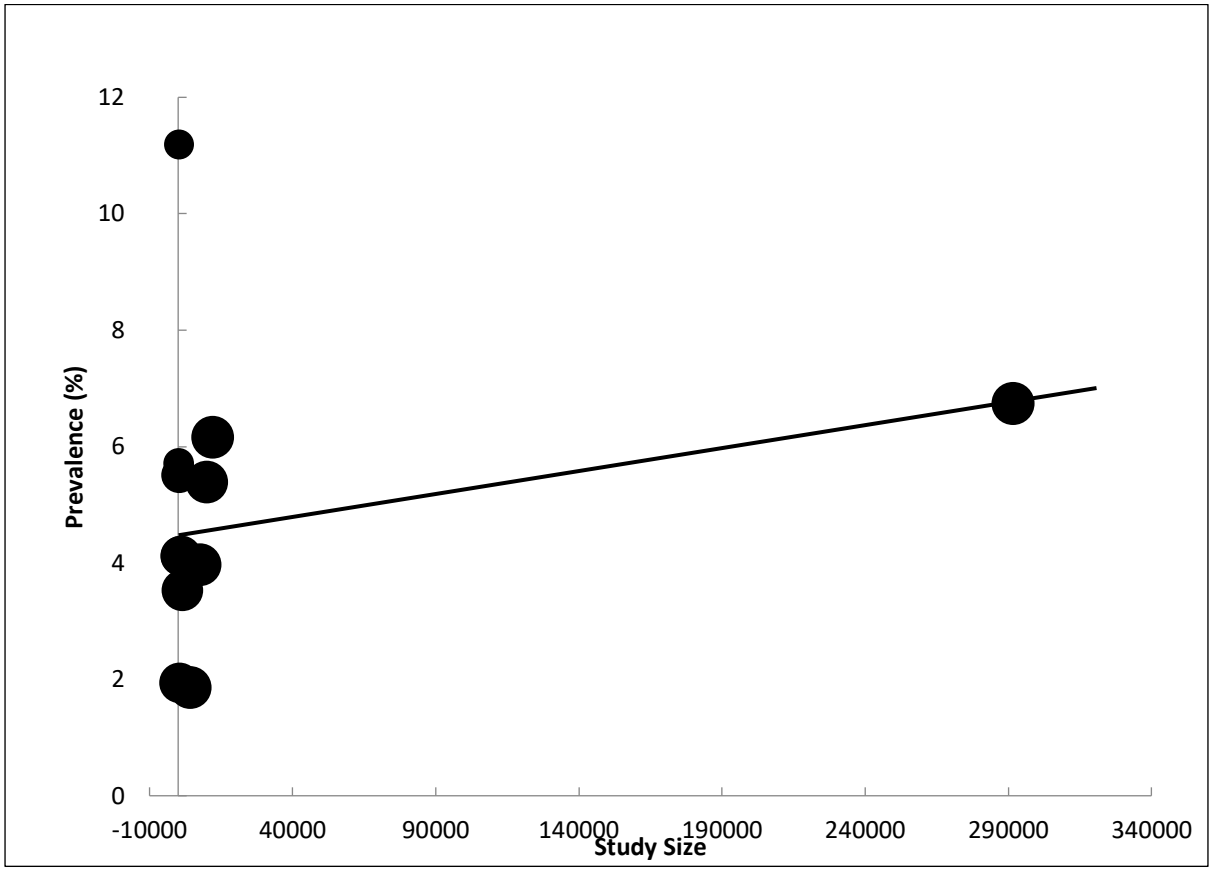


Supplemental Figure 4 Moderator analysis of the effect of age on cirrhosis prevalence in dialysis patients



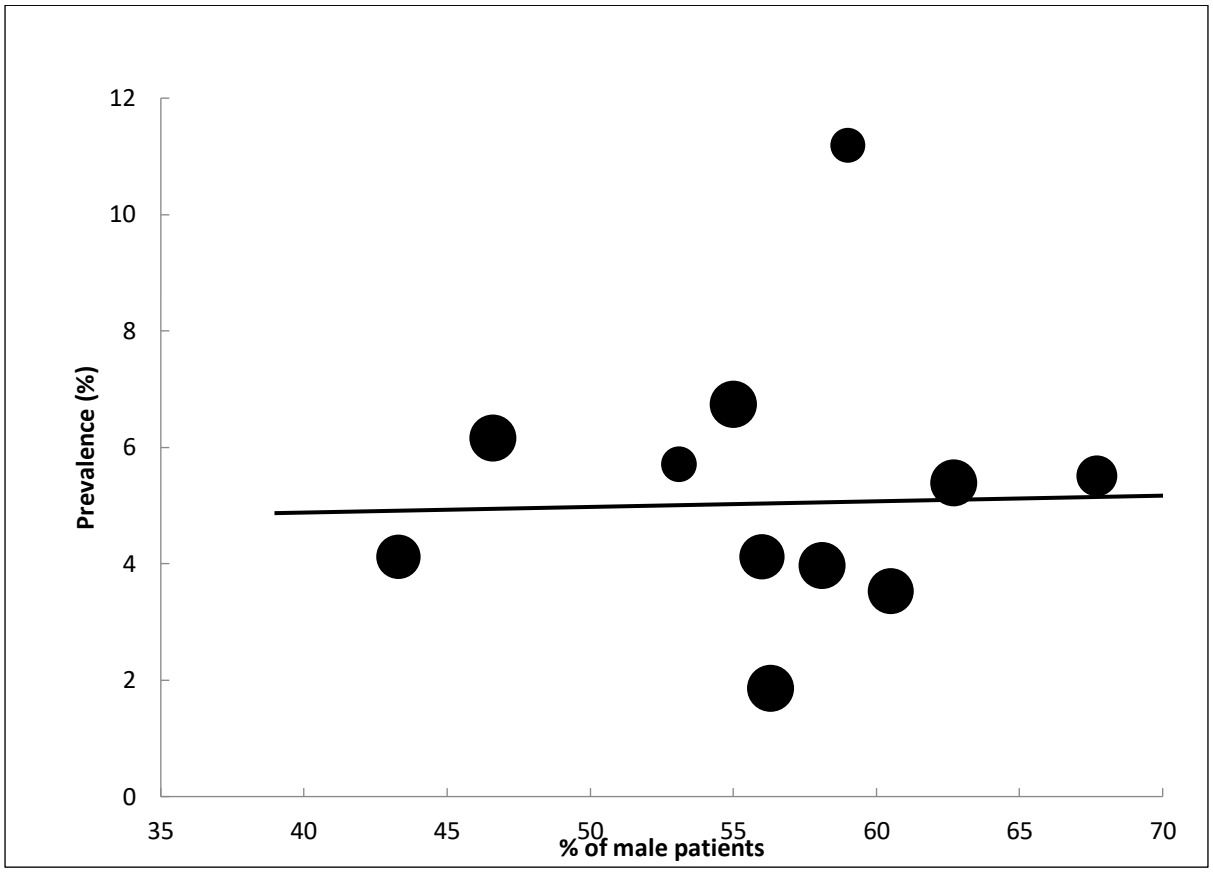
P = 0.673

Supplemental Figure 5 Moderator analysis of the effect of study size on cirrhosis prevalence in dialysis patients



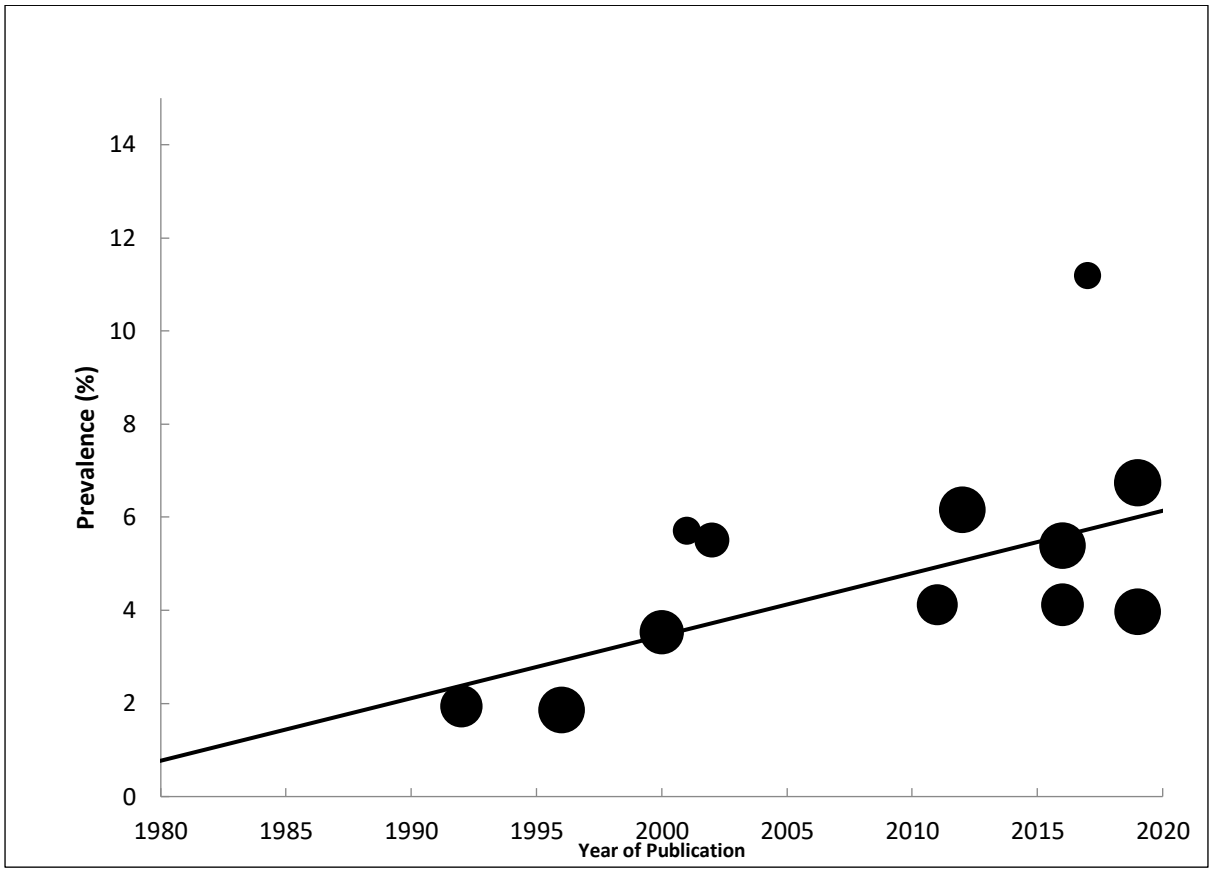
P = 0.309

Supplemental Figure 6 Moderator analysis of the effect of gender on cirrhosis prevalence in dialysis patients



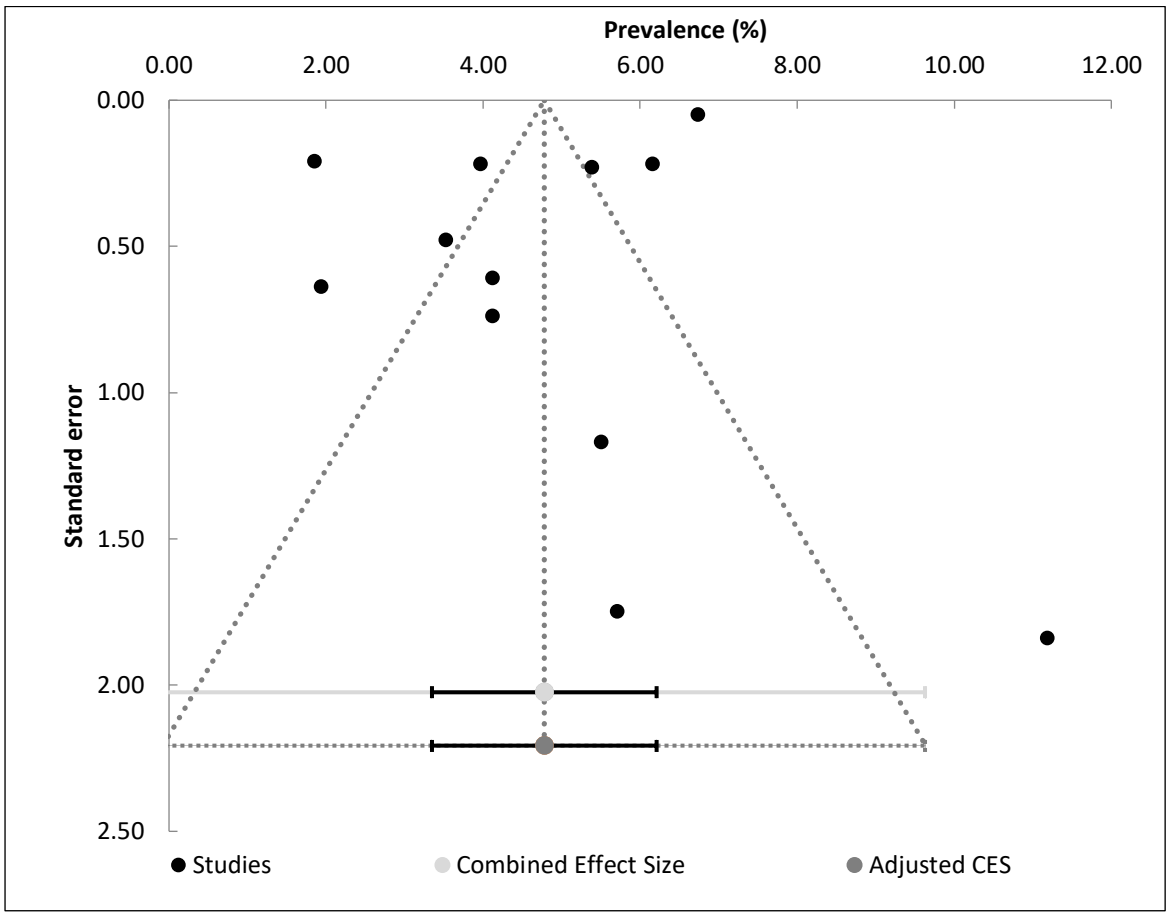
P = 0.928

Supplemental Figure 7 Moderator analysis of the effect of year of study publication on cirrhosis prevalence in dialysis patients



P = 0.027

Supplemental Figure 8 Funnel plot for prevalence data



Egger Regression Test p = 0.058; CES = Combined Effect Size