

Methods of assessment of zinc status in humans: an updated review and meta-analysis

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This document contains the forest plots of the analyses conducted for the review as well as the forest plots, Galbraith plots and the leave one analysis conducted when the data was analysed.

Forest Plots of analyses included in the review

Plasma/serum zinc (mmol/L), only controlled trial studies

Overall analysis	1
Subgroup analysis by population	2
Subgroup analysis by sex	3
Subgroup analysis by status at baseline	4
Subgroup analysis by supplementation type	5
Subgroup analysis by study design	6

Plasma/serum zinc (mmol/L), before and after measurement

Overall analysis	7
Subgroup analysis by population	8
Subgroup analysis by sex	9
Subgroup analysis by status at baseline	10
Subgroup analysis by supplementation type	11

Urinary Zinc (µmol/d)

Overall analysis	12
Subgroup analysis by population	13
Subgroup analysis by sex	14
Subgroup analysis by supplementation type	15
Subgroup analysis by dose	16

Urinary Zinc (mmol/mol Creatinine)

Overall analysis	17
Subgroup analysis by population	18
Subgroup analysis by sex	19
Subgroup analysis by supplementation type	20
Subgroup analysis by dose	21

Urinary Zinc (µmol/L)

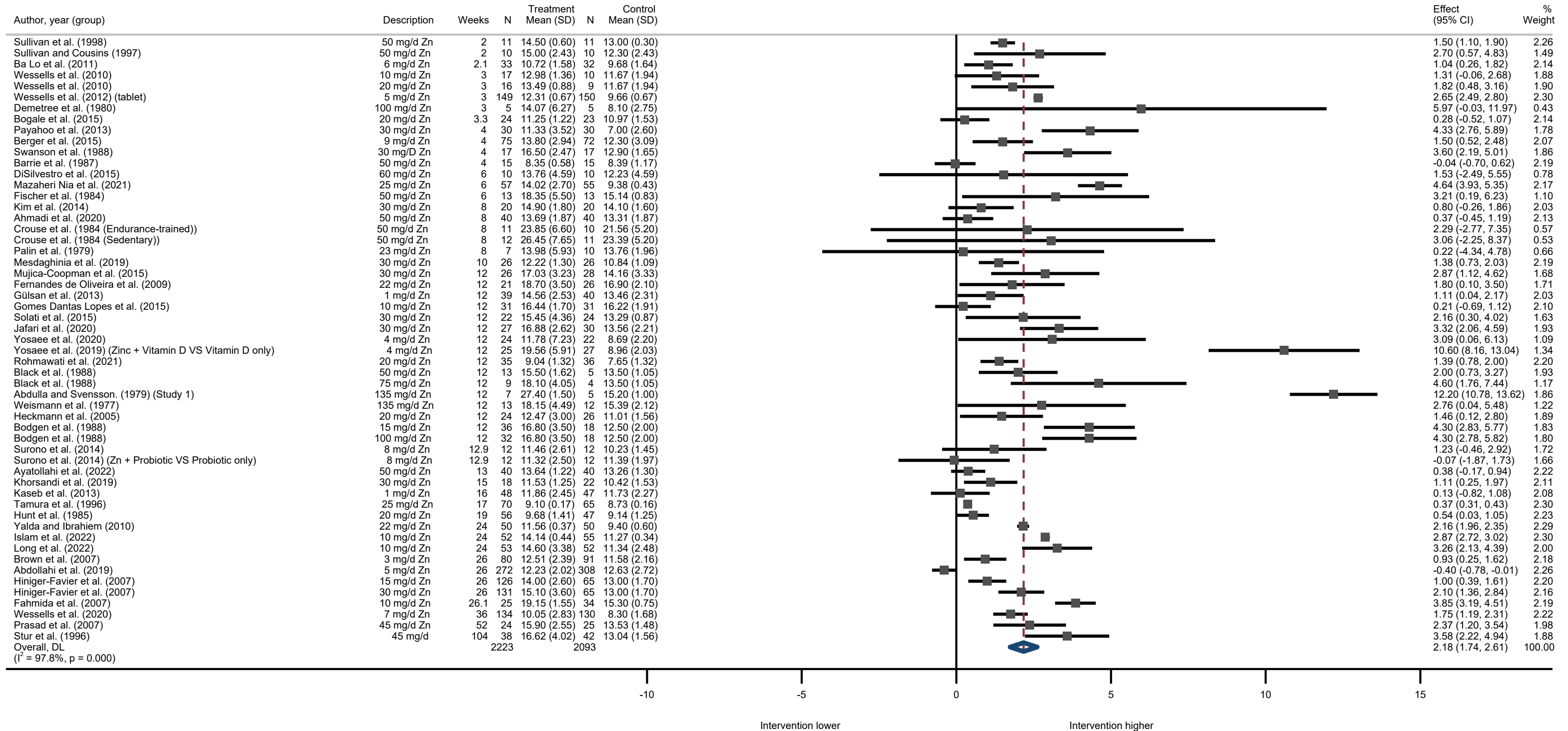
Overall analysis	22
Subgroup analysis by population	23
Subgroup analysis by sex	24

Subgroup analysis by supplementation type	25
Subgroup analysis by dose	26
Alkaline phosphatase (U/L)	
Overall analysis	27
Subgroup analysis by sex	28
Subgroup analysis by supplementation type	29
Subgroup analysis by dose	30
Hair Zn (µg/g)	31
Nail Zn (µg/g)	32
Serum superoxide dismutase (U/mL)	33
Erythrocyte superoxide dismutase (standardized meand difference)	34
Fasting Glucose (mg/dL)	
Overall analysis	35
Subgroup analysis by dose	36
Fasting Insulin (µIU/ml)	
Overall analysis	37
Subgroup analysis by sex	38
Insulin Resistance (HOMA-IR)	39
Interleukin 6 (pg/mL)	40
Insulin-like growth factor 1 (µg/L)	41
Brain-derived neutrophic factor(ng/mL)	42
Total antioxidant capacity (mmol/L)	43
Exchangeable Zinc pool (mg)	44
Funnel plots	
Serum zinc in controlled trial studies, overall analysis	45
Serum zinc in controlled trial studies by dose	46
Serum zinc in controlled trial studies by population	47
Serum zinc in controlled trial studies by sex	48
Serum zinc in controlled trial studies by supplementation type	49
Serum zinc in controlled trial studies by status at baseline	50
Serum zinc in controlled trial studies by status at study design	51
Serum zinc before-and-after studies, overall analysis	52
Serum zinc before-and-after studies by dose	53
Serum zinc before-and-after studies by population	54
Serum zinc before-and-after studies by sex	55
Serum zinc before-and-after studies by supplementation type	56
Serum zinc before-and-after studies by status at baseline	57
Urinary Zinc (µmol/L), overall analysis	58
Urinary Zinc (µmol/L) by dose	59

Urinary Zinc ($\mu\text{mol/L}$) by population	60
Urinary Zinc ($\mu\text{mol/L}$) by sex	61
Urinary Zinc ($\mu\text{mol/L}$) by supplementation type	62
Urinary zinc (mmol mol/creatinine), overall analysis	63
Urinary zinc (mmol mol/creatinine) by dose	64
Urinary zinc (mmol mol/creatinine) by population	65
Urinary zinc (mmol mol/creatinine) by sex	66
Urinary zinc (mmol mol/creatinine) by supplementation type	67
Urinary Zinc ($\mu\text{mol/d}$), overall analysis	68
Urinary Zinc ($\mu\text{mol/d}$) by dose	69
Urinary Zinc ($\mu\text{mol/d}$) by population	70
Urinary Zinc ($\mu\text{mol/d}$) by sex	71
Urinary Zinc ($\mu\text{mol/d}$) by supplementation type	72
Alkaline phosphatase (U/L), overall analysis	73
Alkaline phosphatase (U/L) by dose	74
Alkaline phosphatase (U/L) by sex	75
Alkaline phosphatase (U/L) by supplementation type	76
Hair Zn ($\mu\text{g/g}$)	77
Nail Zn ($\mu\text{g/g}$)	78
Serum superoxide dismutase (U/mL)	79
Erythrocyte superoxide dismutase (U/mL)	80
Fasting Glucose (mg/dL), overall analysis	81
Fasting Glucose (mg/dL) by dose	82
Fasting Glucose (mg/dL) by sex	83
Fasting Insulin ($\mu\text{IU/ml}$)	84
Insulin Resistance (HOMA-IR)	85
Interleukin 6 (pg/mL)	86
Insulin-like growth factor1 ($\mu\text{g/L}$)	87
Brain-derived neutrophilic factor (ng/mL)	88
Total Antioxidant Capacity (mmol/L)	89
Galbraith plot to assess heterogeneity and detect potential outliers of studies	
Serum zinc in controlled trial studies.	90
Serum zinc before and after intervention	91
Urinary zinc ($\mu\text{mol/L}$)	92
Urinary zinc (mmol mol/creatinine)	93
Urinary zinc ($\mu\text{mol/d}$)	94
Alkaline phosphatase (U/L)	95
Hair Zn ($\mu\text{g/g}$)	96
Nail Zn ($\mu\text{g/g}$)	97
Serum superoxide dismutase (U/mL)	98
Fasting Glucose (mg/dL)	99
Fasting Insulin ($\mu\text{IU/ml}$)	100
Insulin Resistance (HOMA-IR)	101
Interleukin 6 (pg/mL)	102
Insulin-like growth factor1 ($\mu\text{g/L}$)	103

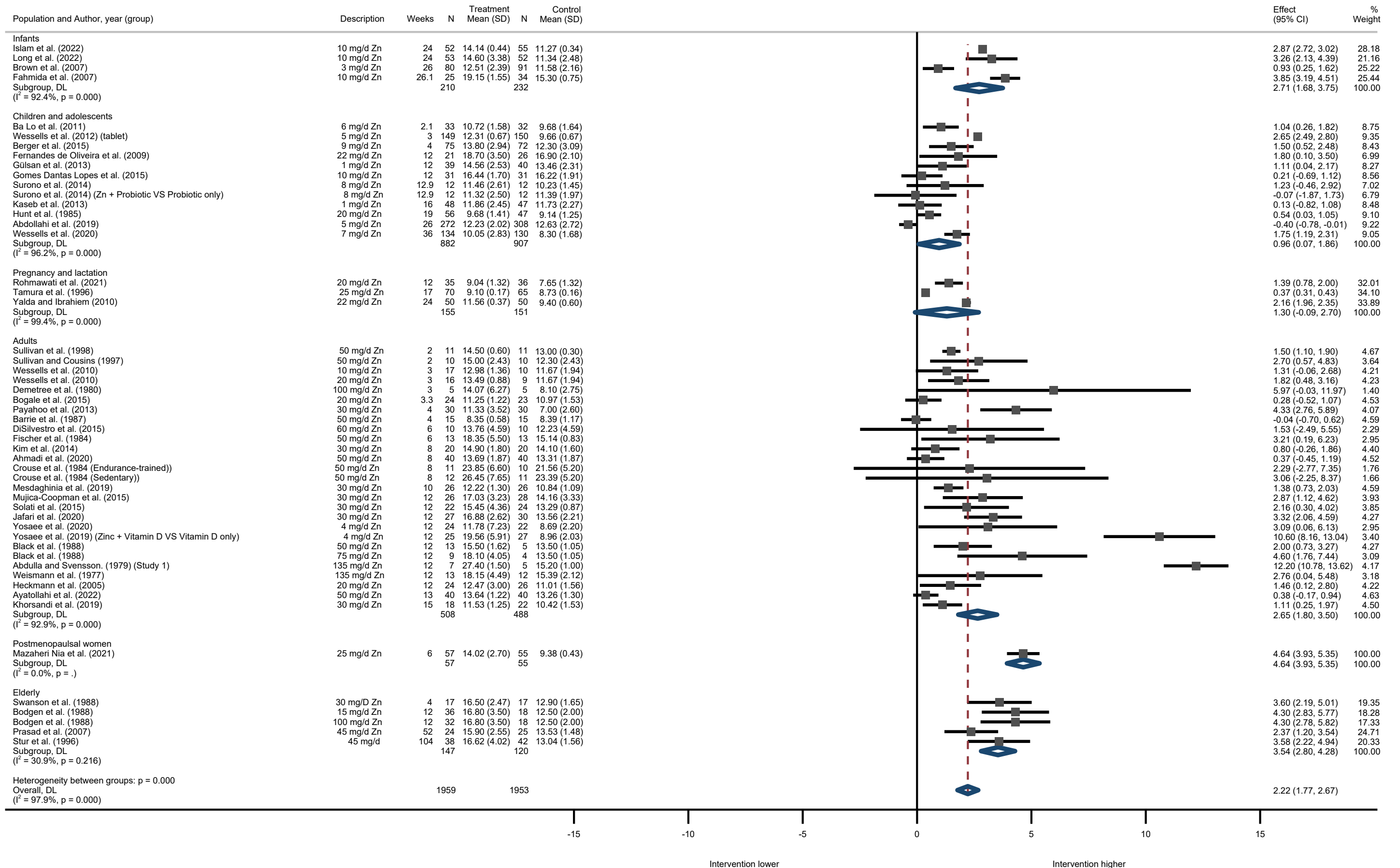
Brain-derived neutrophic factor (ng/mL)	104
Total Antioxidant Capacity (mmol/L)	105
Leave-one-out sensitivity analysis	
Serum zinc controlled trials, without Abdulla 1979	106
Serum zinc controlled trials, without Abdulla 1979 by dose	107
Serum zinc controlled trials, without Abdulla 1979 by population	108
Serum zinc controlled trials, without Abdulla 1979 by sex	109
Serum zinc controlled trials, without Abdulla 1979 by status at baseline	110
Serum zinc controlled trials, without Abdulla 1979 by supplementation type	111
Serum zinc controlled trials, without Yosae 2019	112
Serum zinc controlled trials, without Yosae 2019 by dose	113
Serum zinc controlled trials, without Yosae 2019 by population	114
Serum zinc controlled trials, without Yosae 2019 by sex	115
Serum zinc controlled trials, without Yosae 2019 by status at baseline	116
Serum zinc controlled trials, without Yosae 2019 by supplementation type	117
Urinary Zinc (mmol/creatinine), without Donangelo 2022	118
Urinary Zinc (mmol/creatinine), without Donangelo 2022 by dose	119
Urinary Zinc (mmol/creatinine), without Donangelo 2022 by population	120
Urinary Zinc (mmol/creatinine), without Donangelo 2022 by sex	121
Urinary Zinc (mmol/creatinine), without Donangelo 2022 by supplementation type	122
Urinary Zinc ($\mu\text{mol/d}$), without Thomas 1992	123
Urinary Zinc ($\mu\text{mol/d}$), without Thomas 1992 by dose	124
Urinary Zinc ($\mu\text{mol/d}$), without Thomas 1992 by population	125
Urinary Zinc ($\mu\text{mol/d}$), without Thomas 1992 by sex	126
Urinary Zinc ($\mu\text{mol/d}$), without Thomas 1992 by supplementation type	127
Fasting glucose (mg/dL) without Marques 2011	128
Fasting insulin ($\mu\text{IU/ml}$) Marques 2012	129
Insulin resistance (HOMA-IR) Marques 2013	130

Plasma/serum zinc (µmol/L) Controlled trials



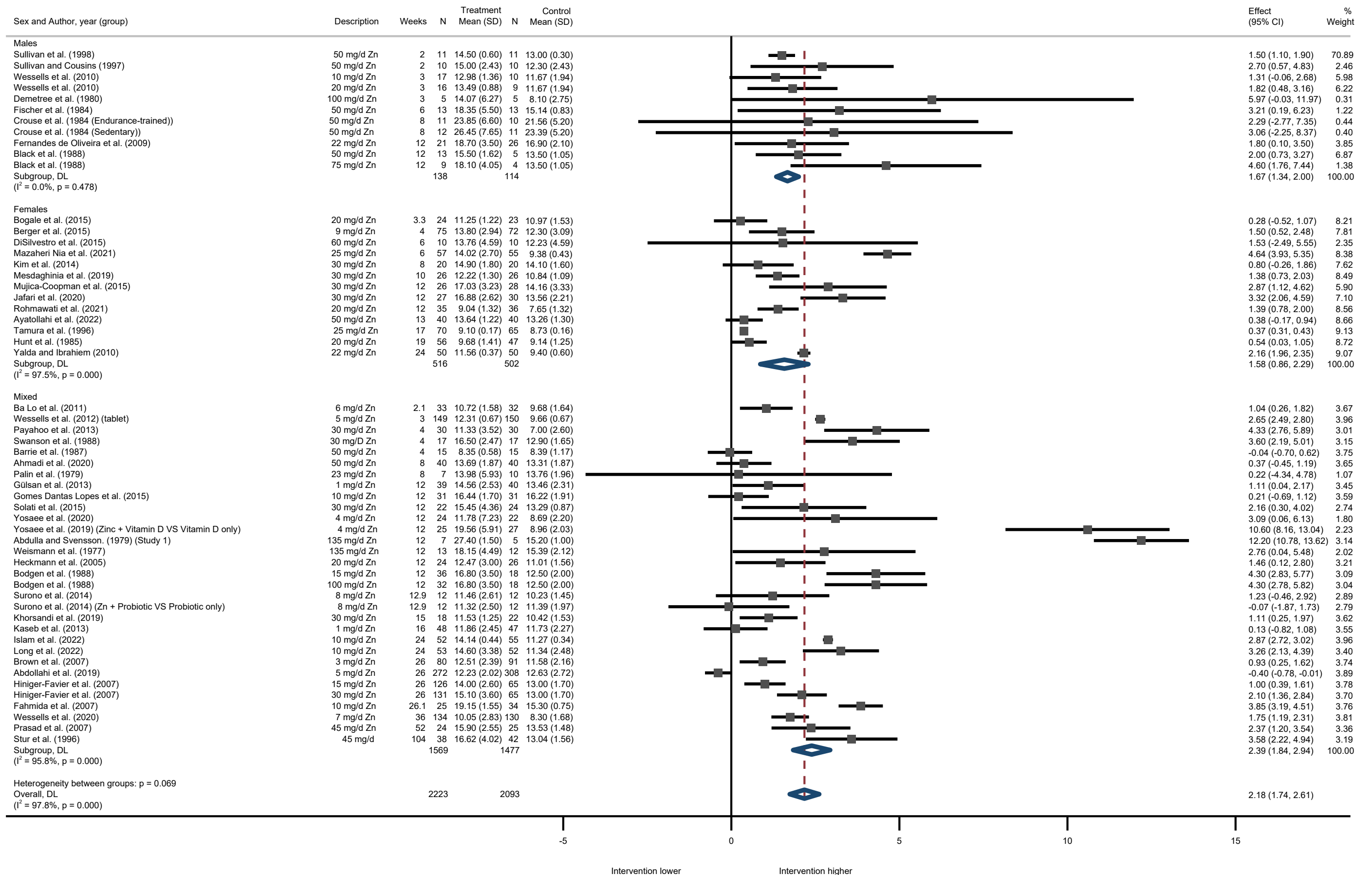
Plasma/serum zinc (µmol/L) by population

Controlled trials

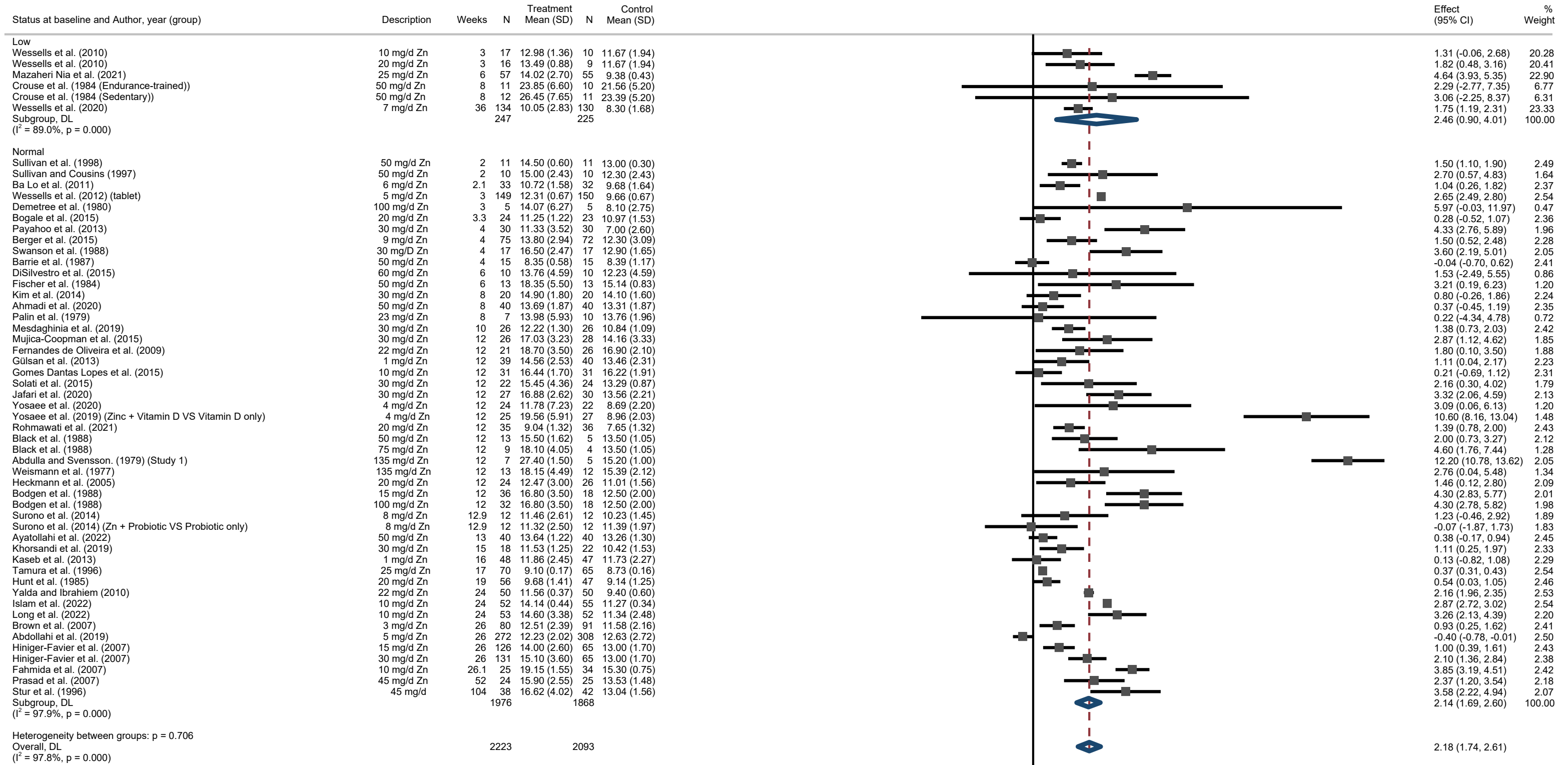


Plasma/serum zinc ($\mu\text{mol/L}$) by sex

Controlled trials

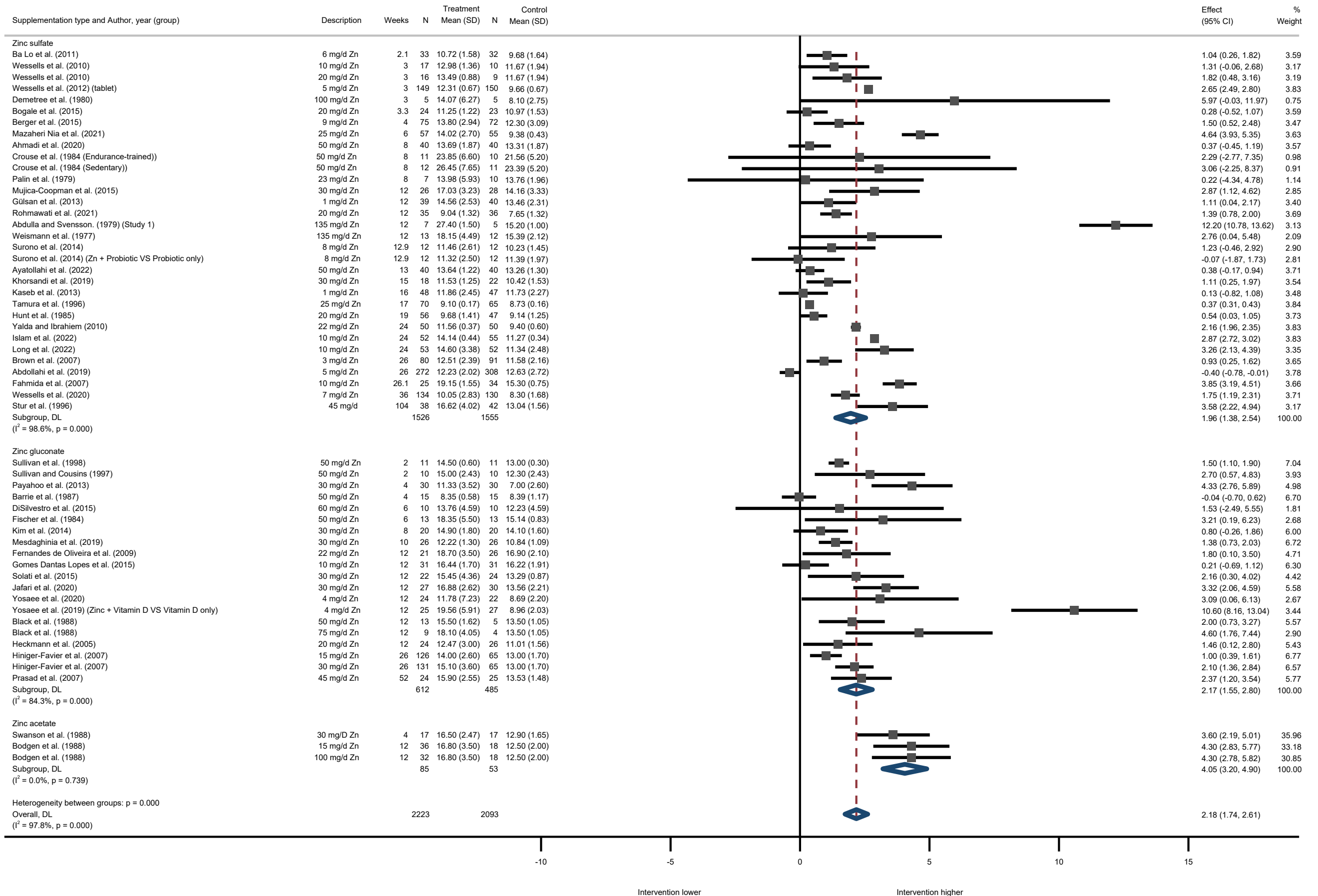


Plasma/serum zinc (µmol/L) by status at baseline Controlled trials

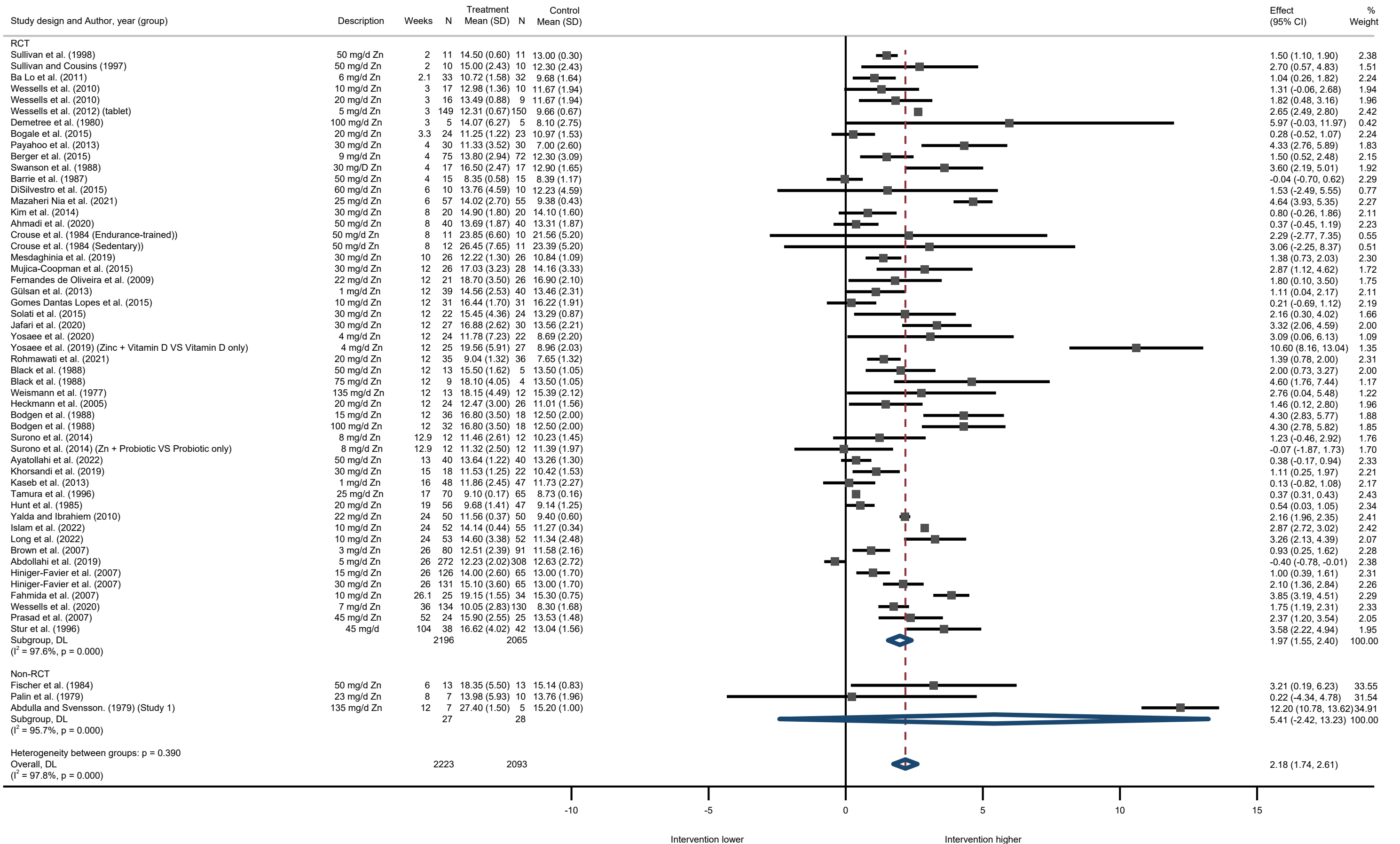


Plasma/serum zinc ($\mu\text{mol/L}$) by supplementation type

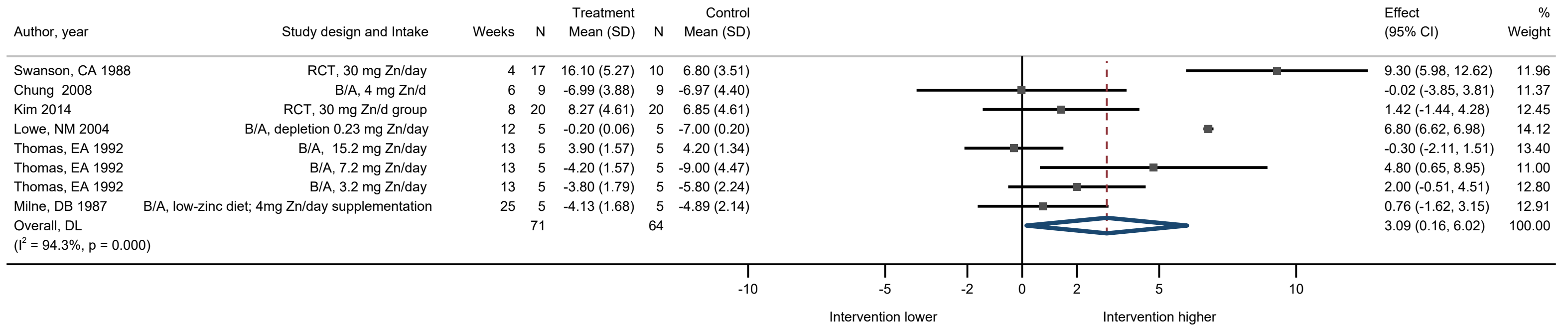
Controlled trials



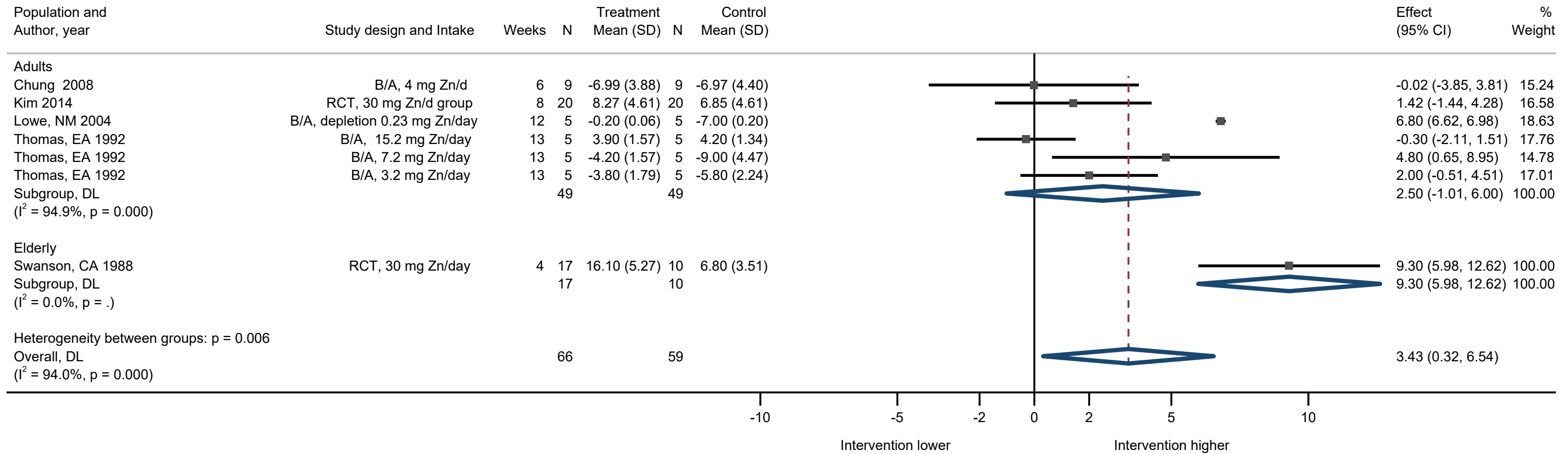
Plasma/serum zinc (µmol/L) by stude desing Controlled trials



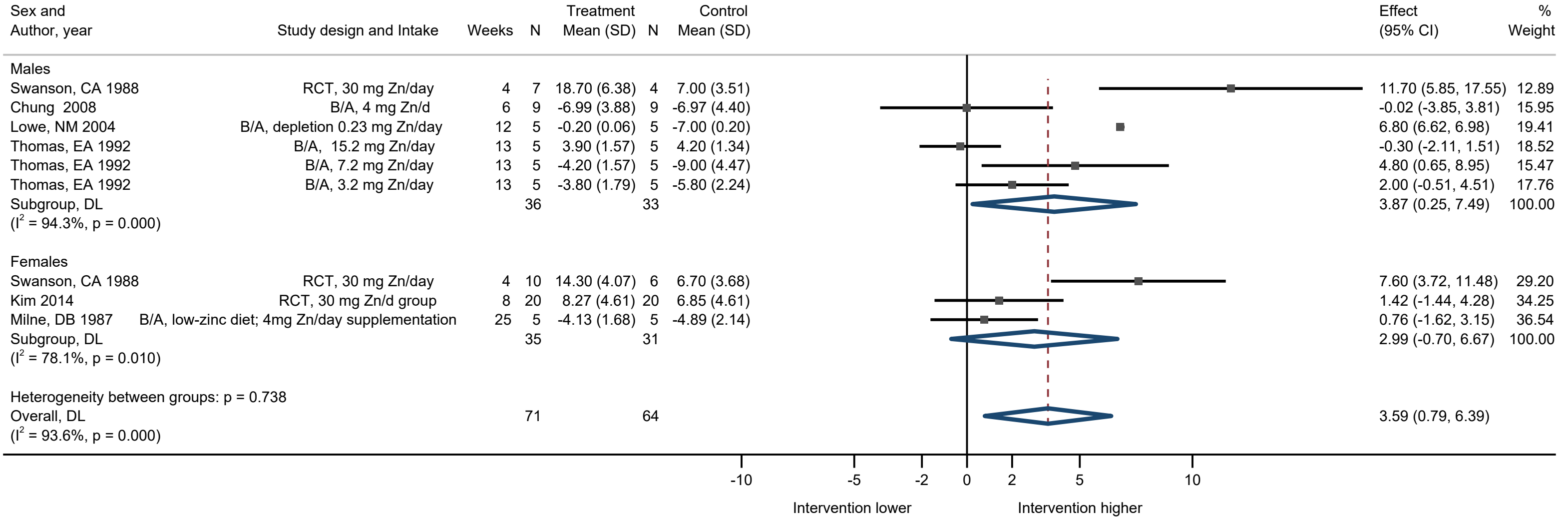
Urinary zinc ($\mu\text{mol/d}$)



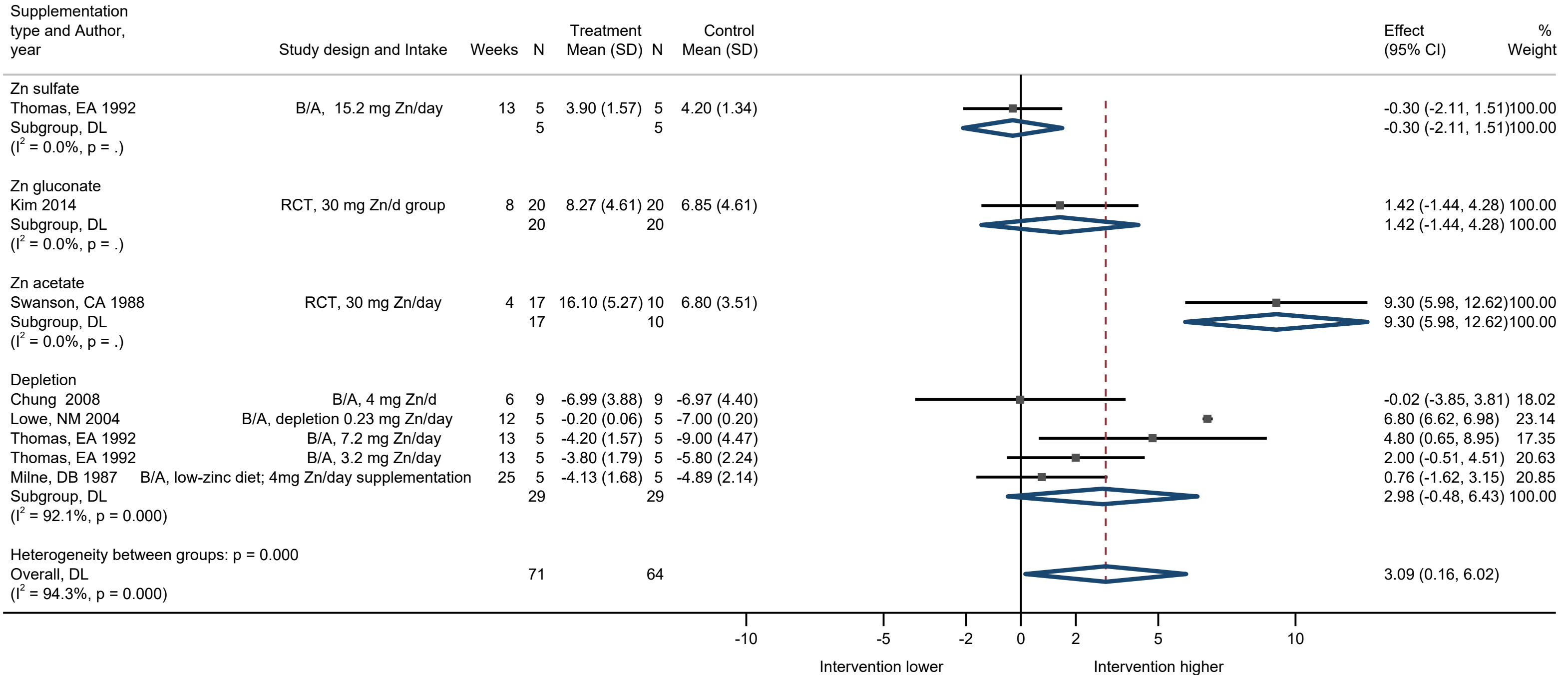
Urinary zinc ($\mu\text{mol/d}$) by population



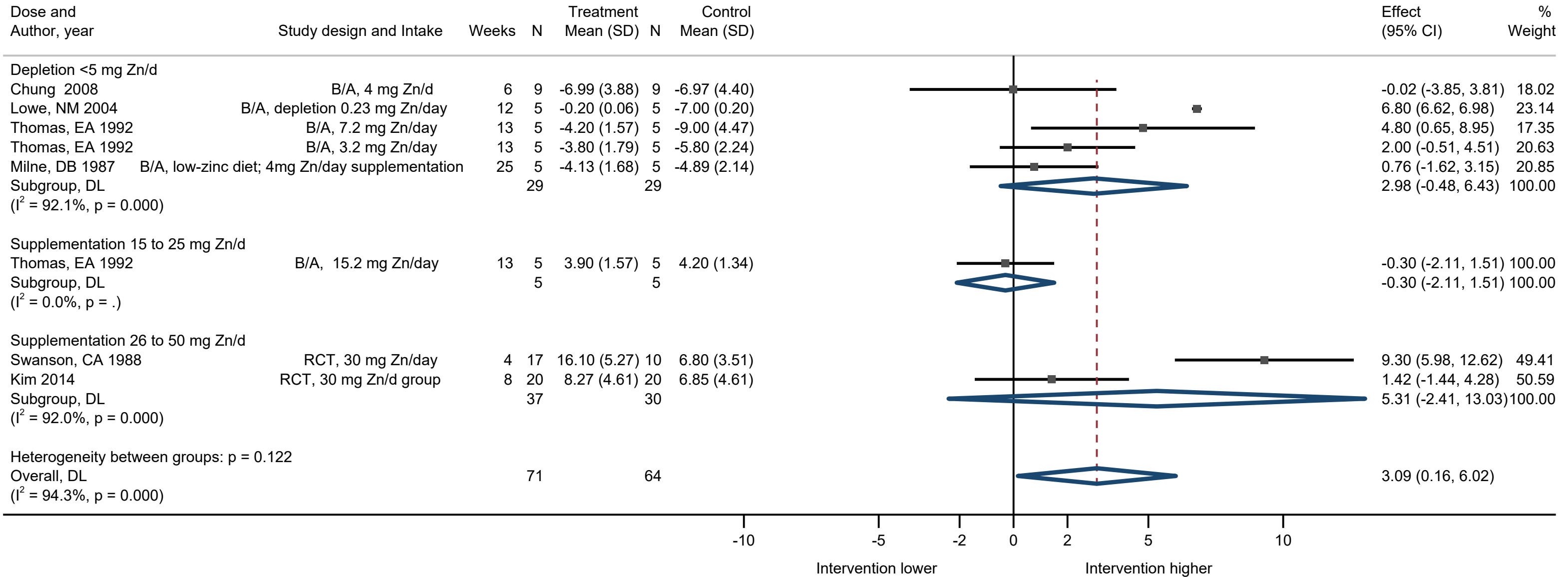
Urinary zinc ($\mu\text{mol/d}$) by sex



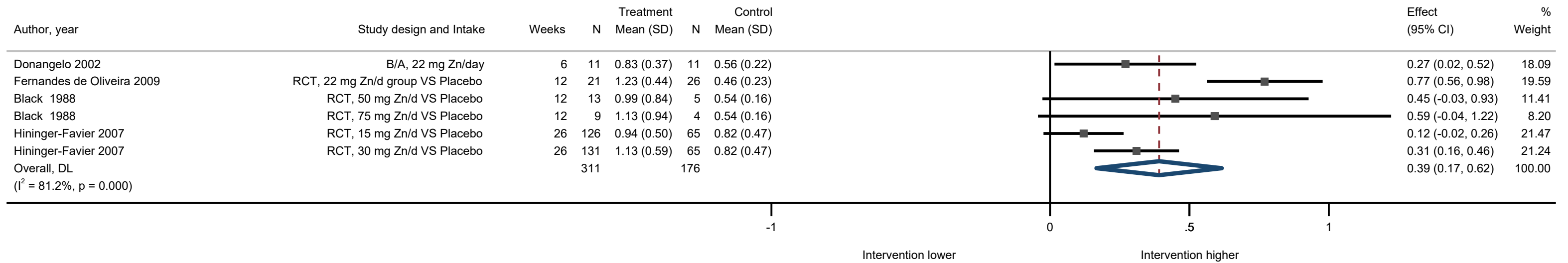
Urinary zinc ($\mu\text{mol/d}$) by supplementation type



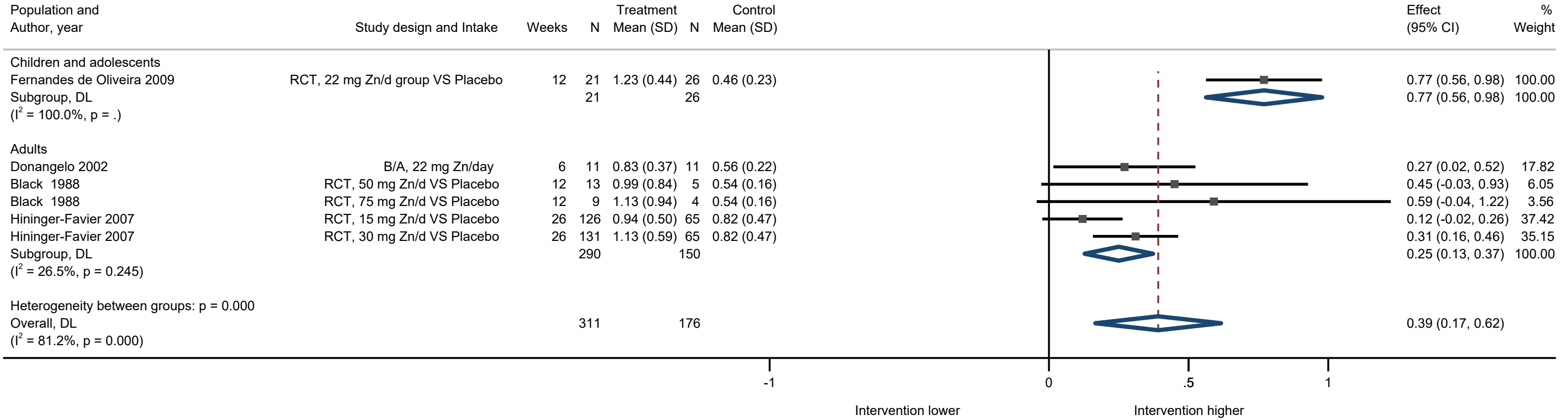
Urinary zinc ($\mu\text{mol/d}$) by dose



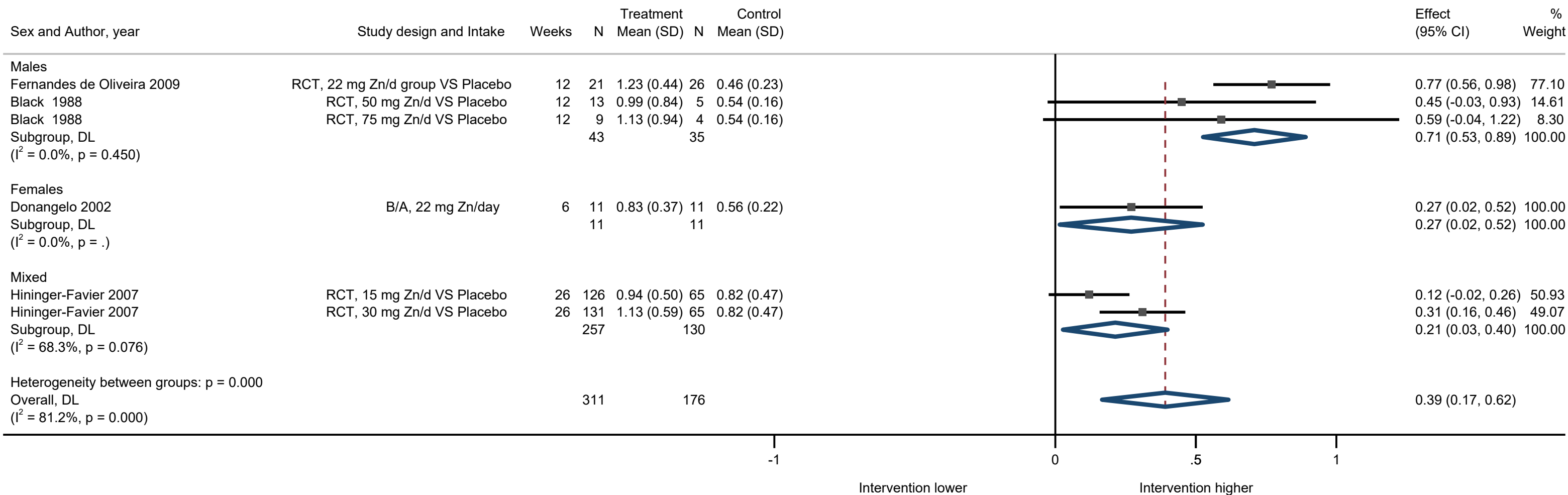
Urinary zinc (mmol/mol creatinine)



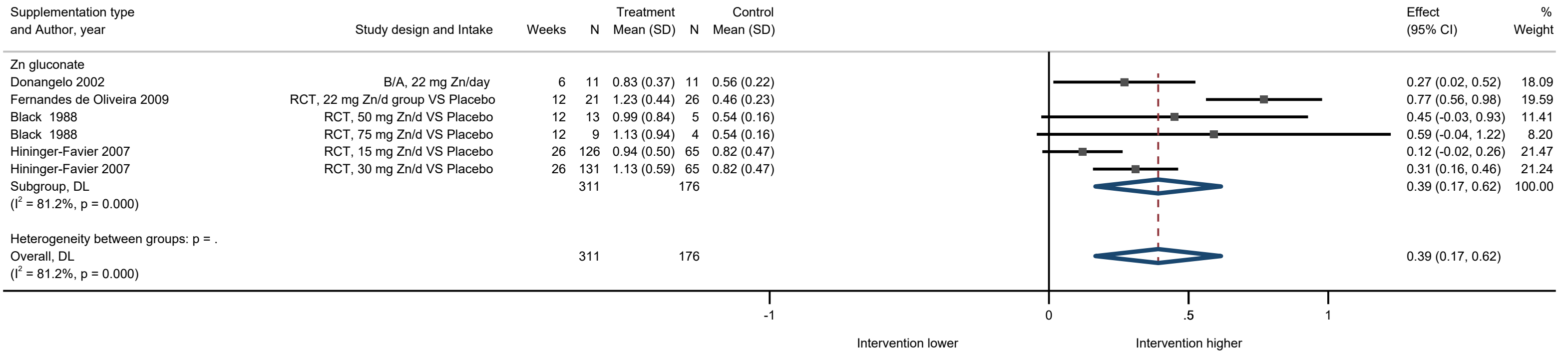
Urinary zinc (mmol/mol creatinine) by population



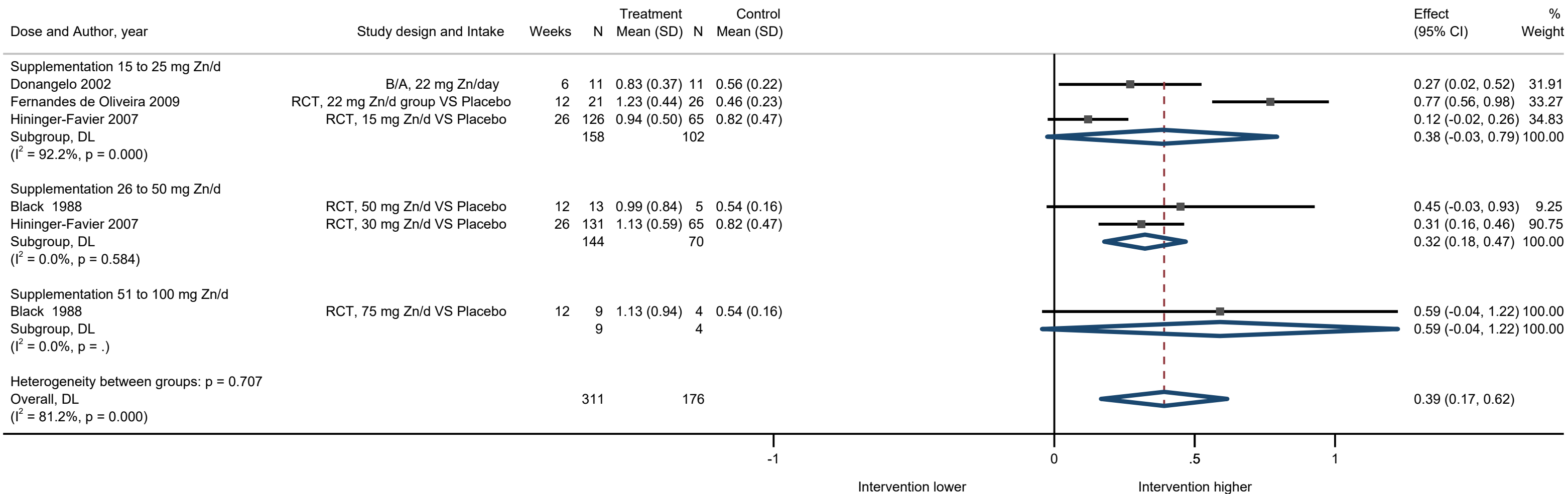
Urinary zinc (mmol/mol creatinine) by sex



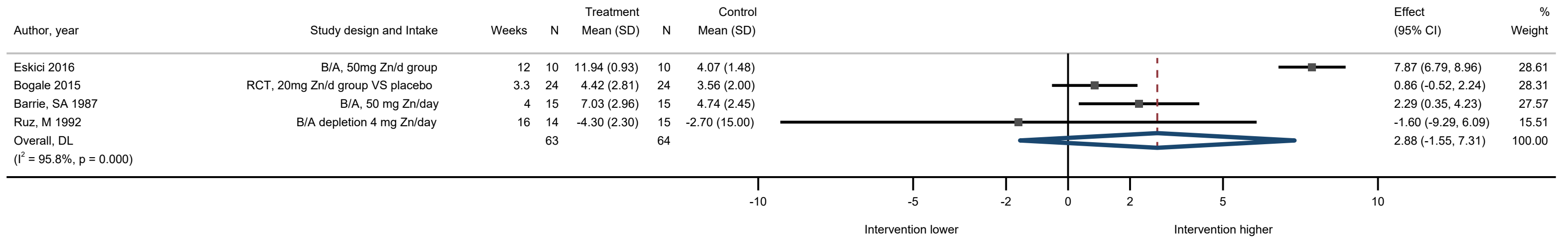
Urinary zinc (mmol/mol creatinine) by supplementation type



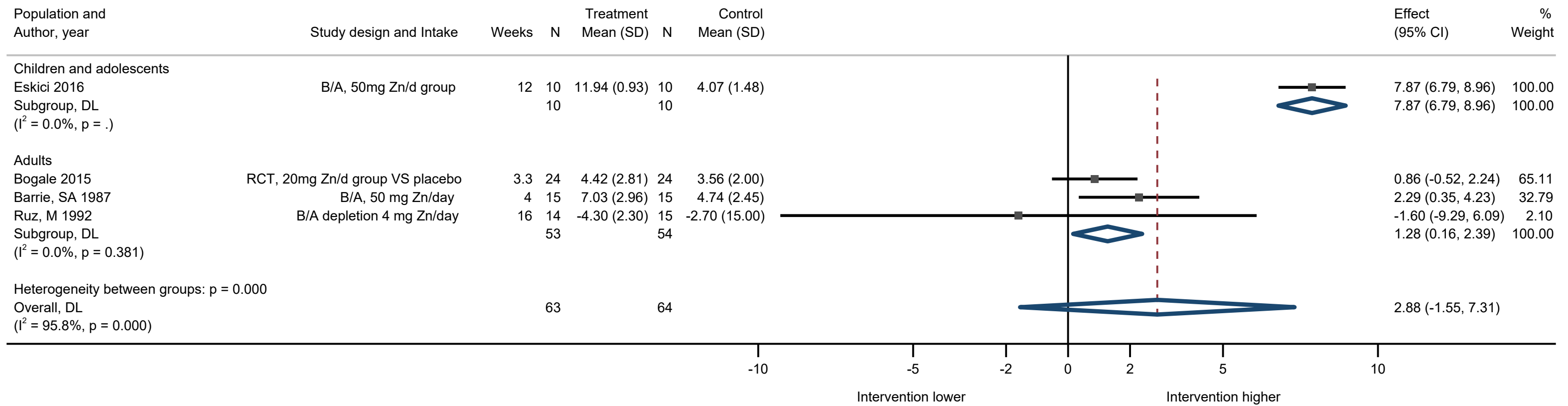
Urinary zinc (mmol/mol creatinine) by dose



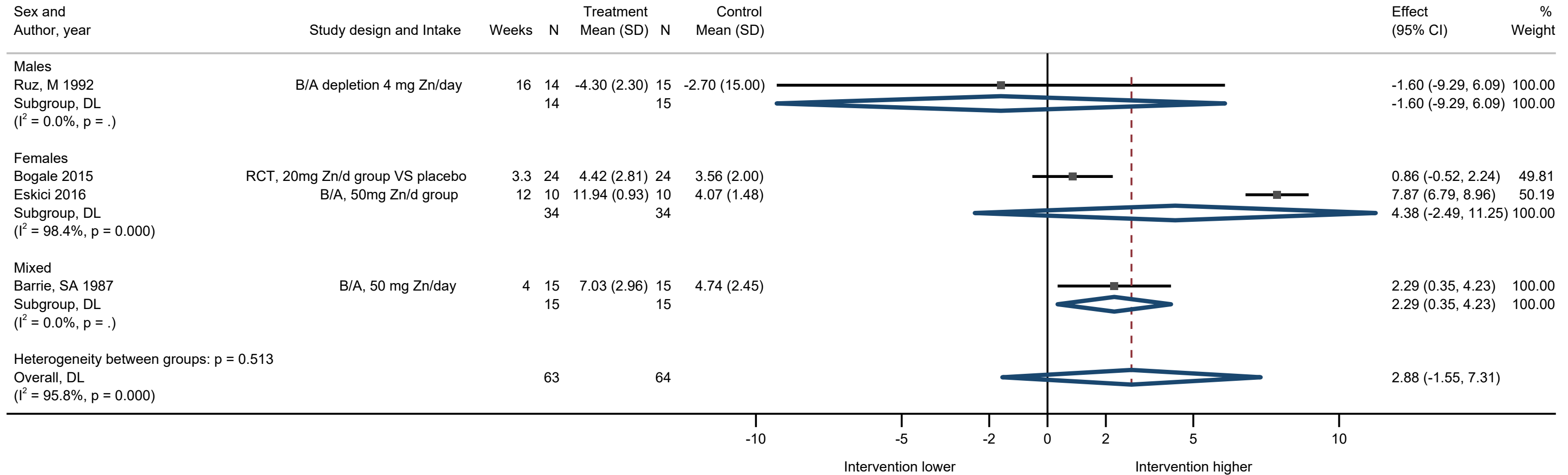
Urinary zinc ($\mu\text{mol/L}$)



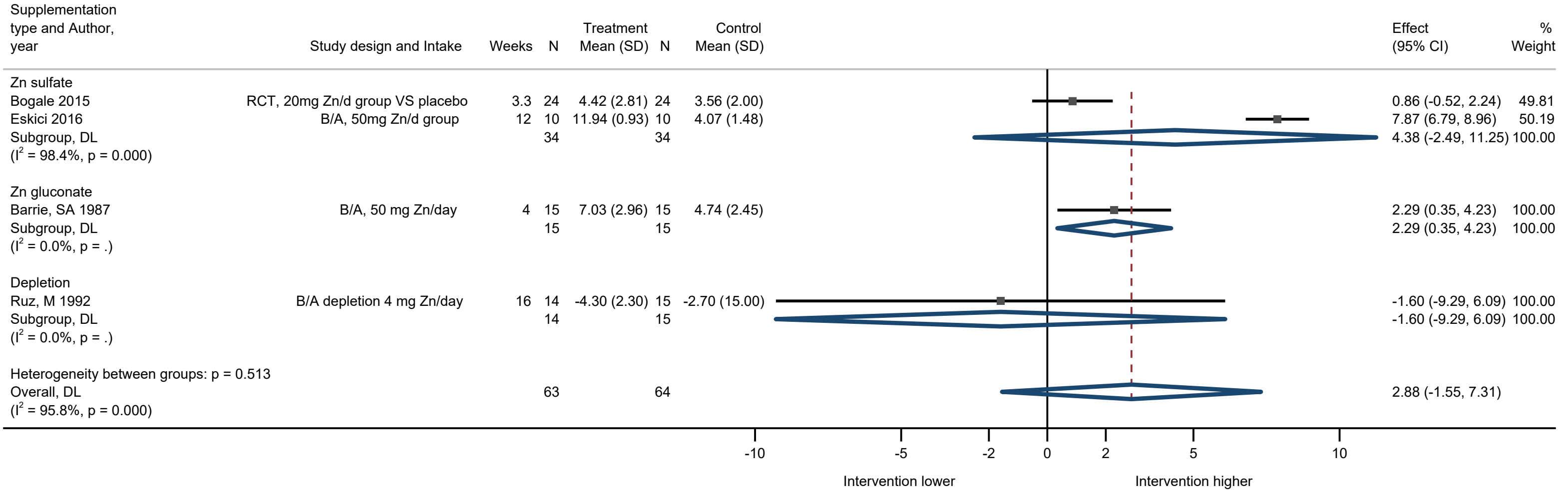
Urinary zinc ($\mu\text{mol/L}$) by population



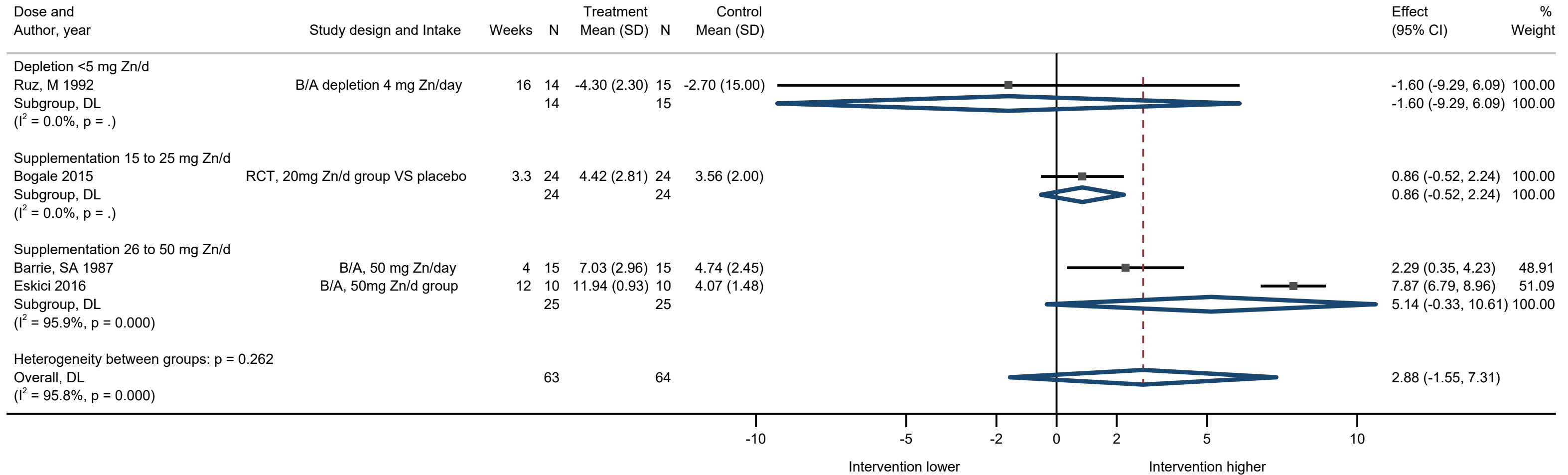
Urinary zinc ($\mu\text{mol/L}$) by sex



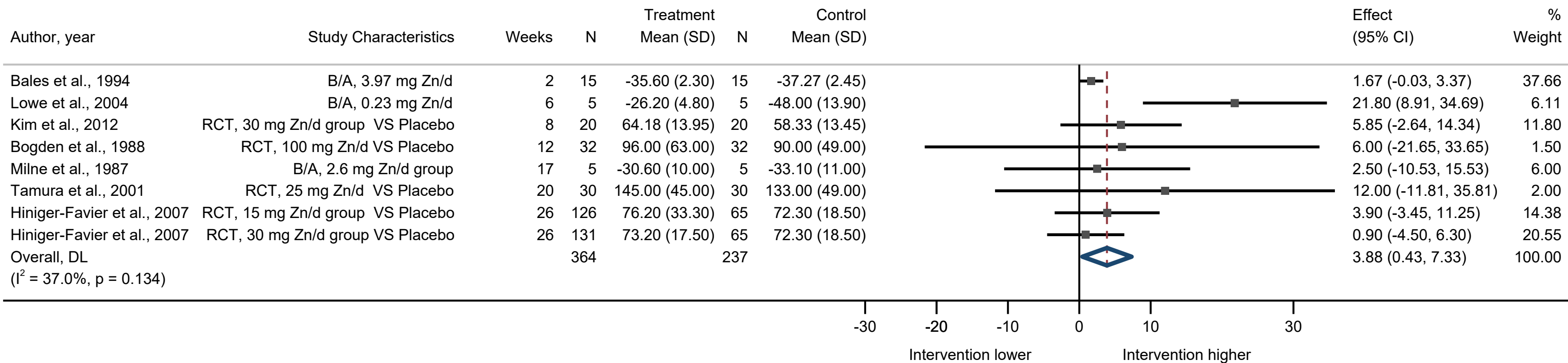
Urinary zinc (μmol/L) by supplementation type



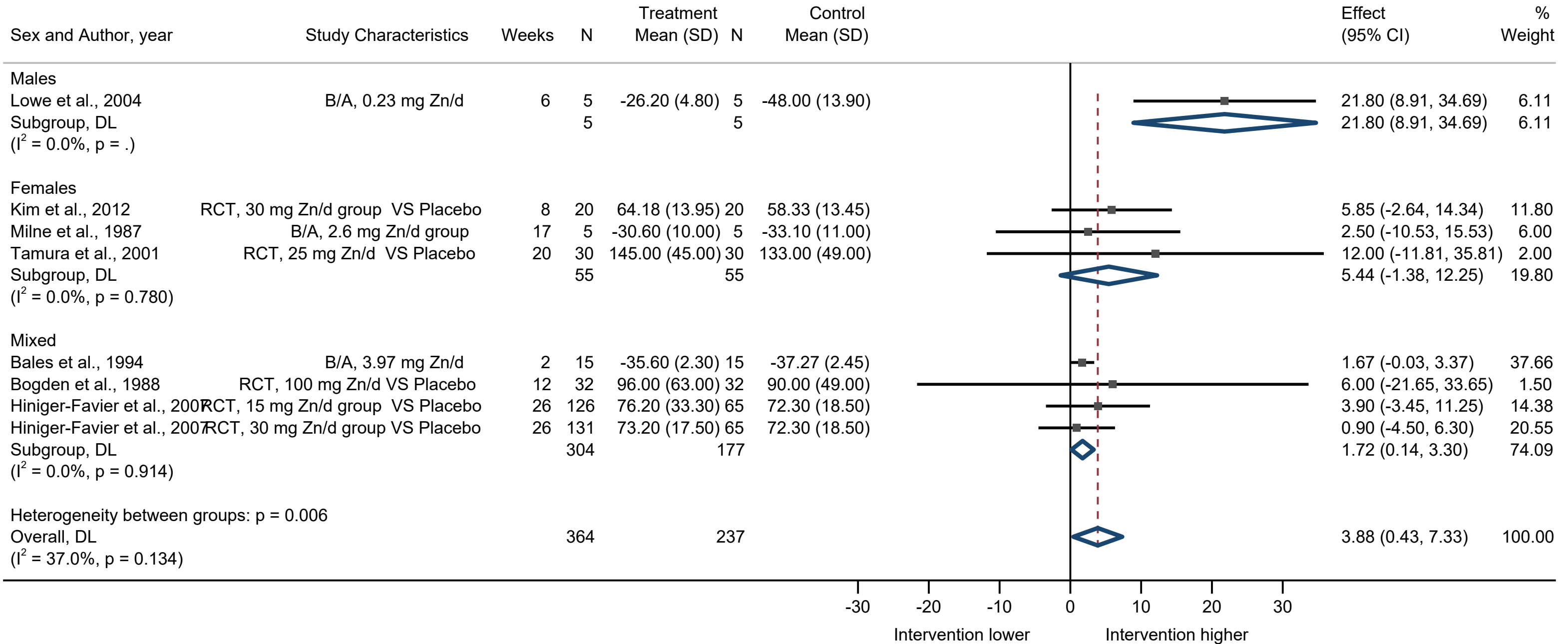
Urinary zinc ($\mu\text{mol/L}$) by dose



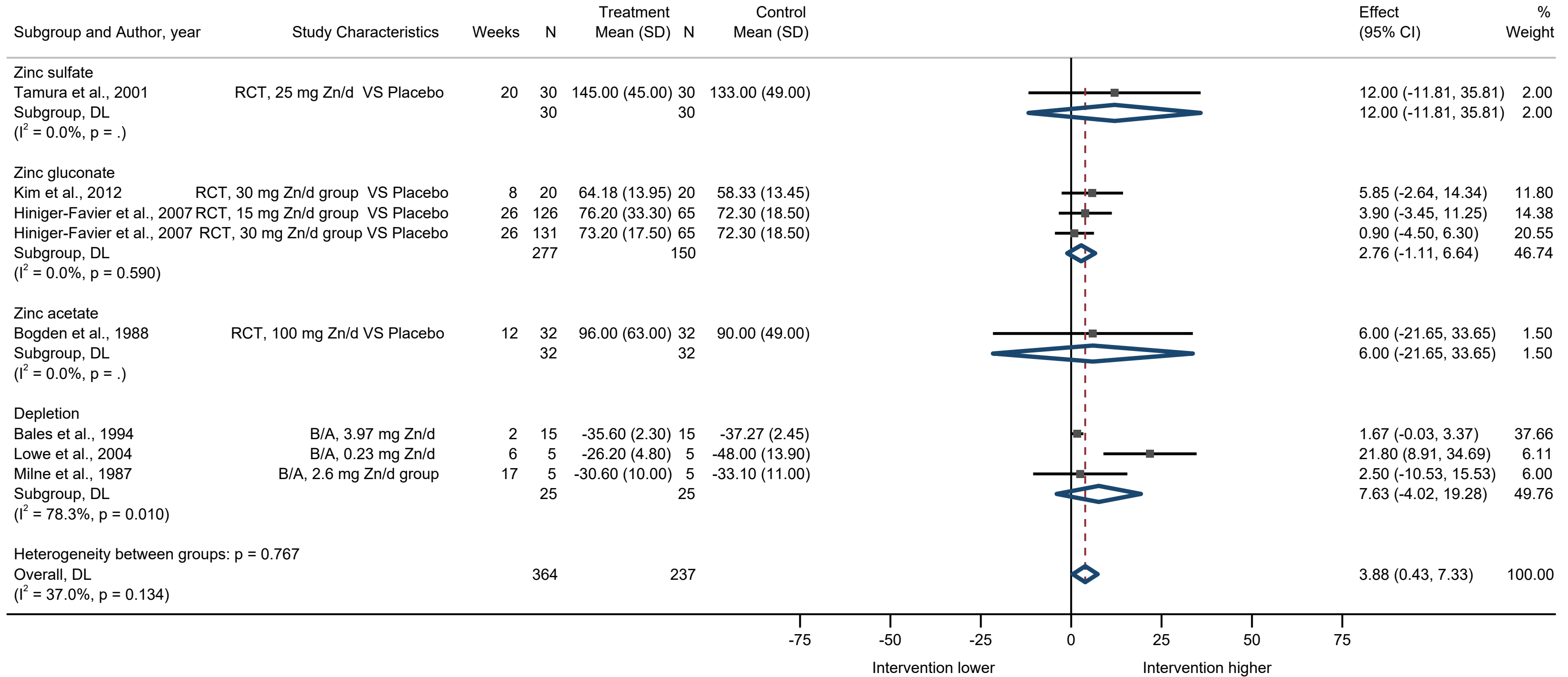
Alkaline phosphatase activity (U/L)



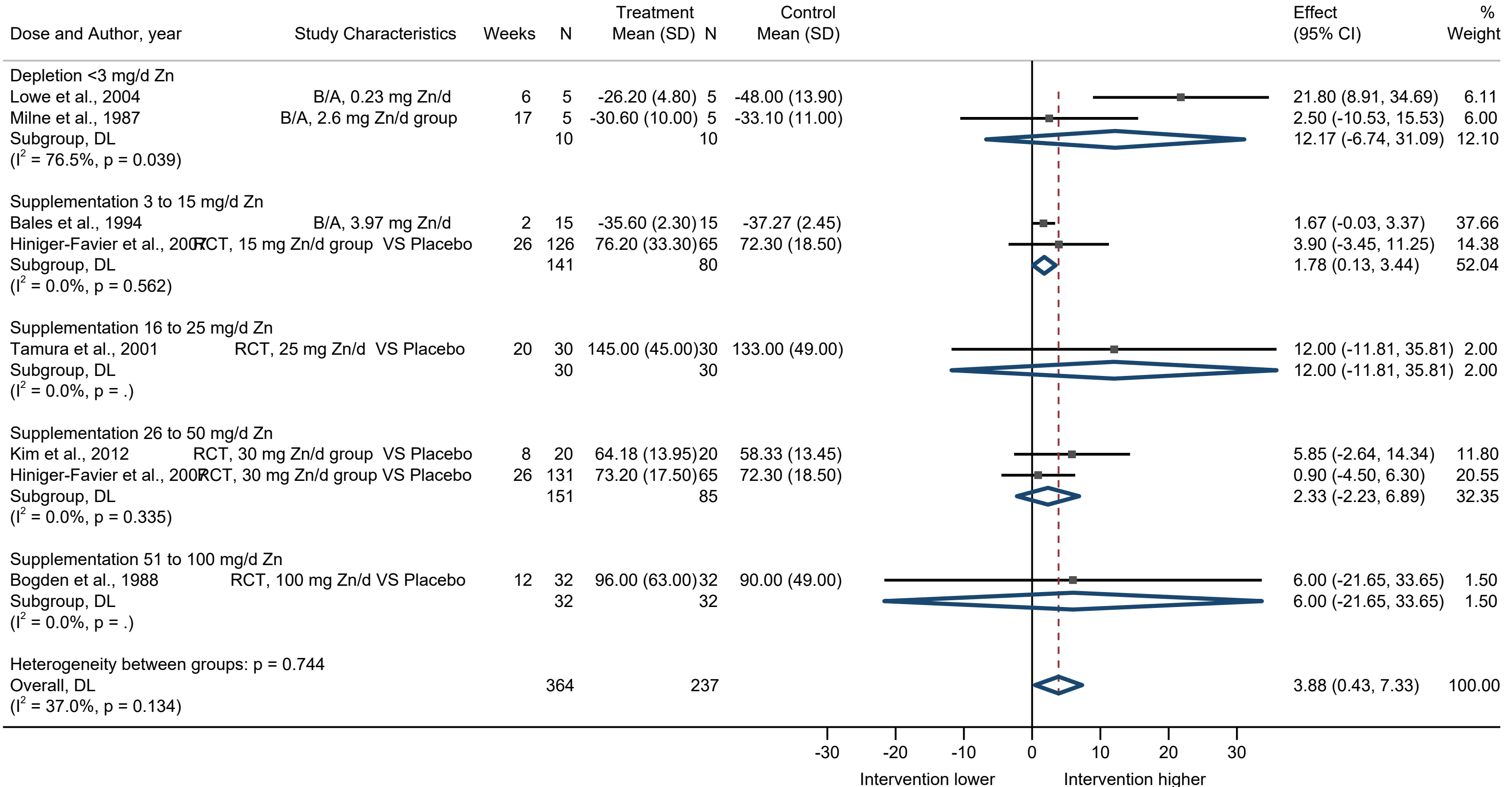
Alkaline phosphatase activity (U/L) by sex



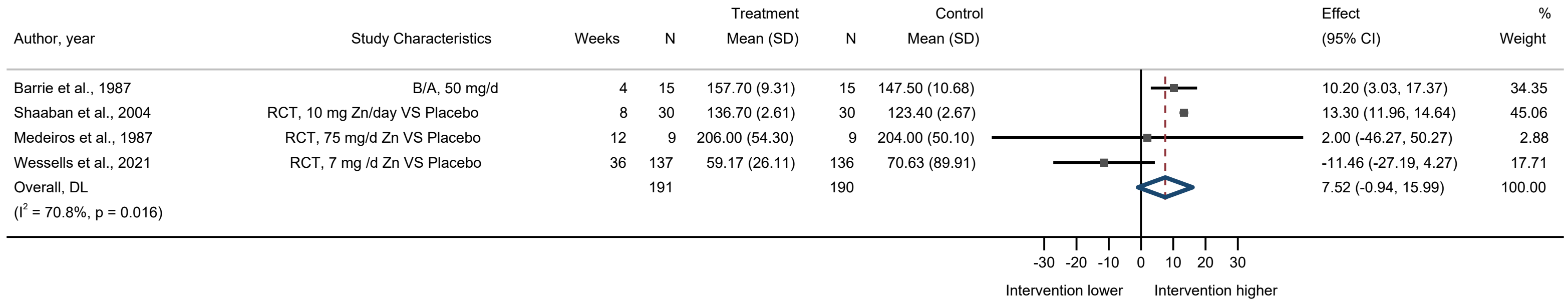
Alkaline phosphatase activity (U/L) by supplementation type



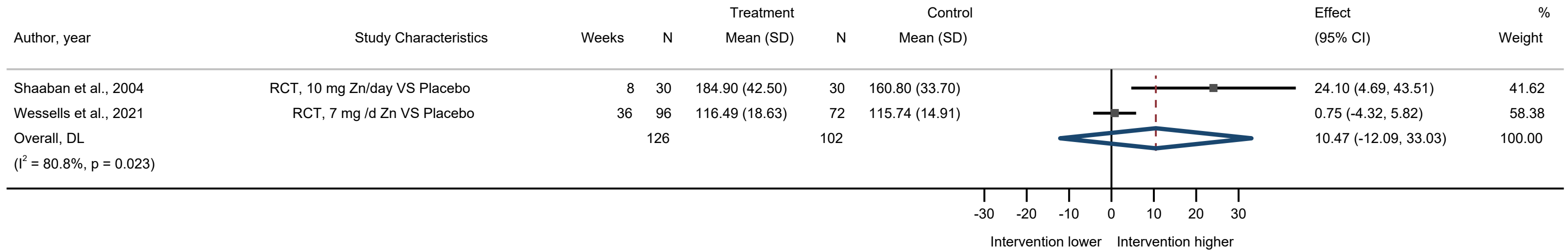
Alkaline phosphatase activity (U/L) by dose



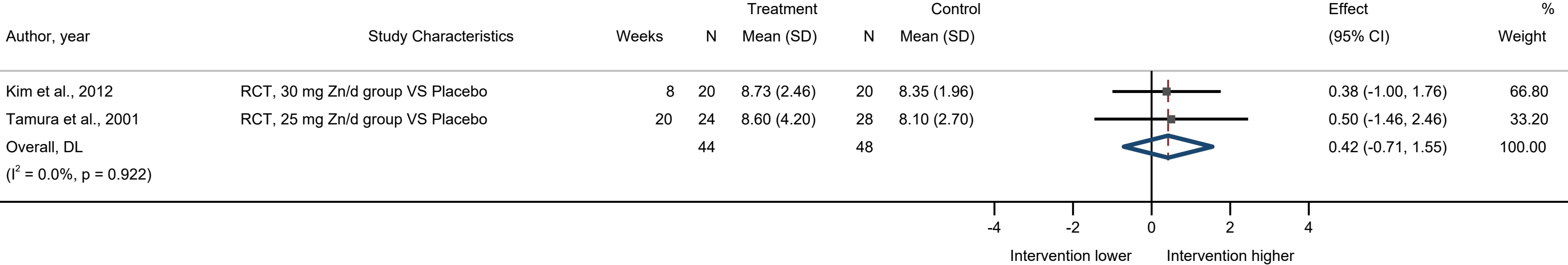
Hair zinc ($\mu\text{g/g}$)



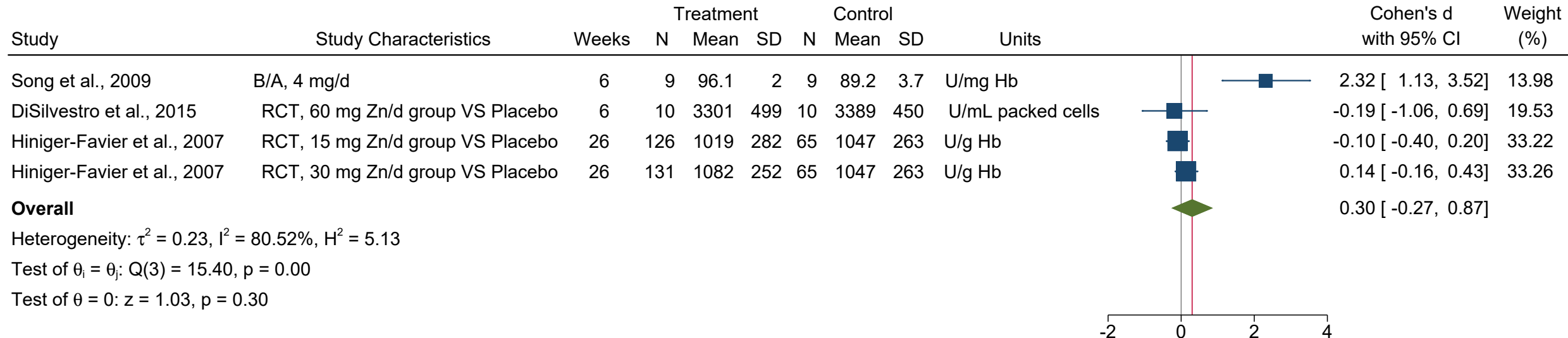
Nail zinc ($\mu\text{g/g}$)



Serum superoxide dismutase (U/mL)



Erythrocyte superoxide dismutase (standardized meand difference)



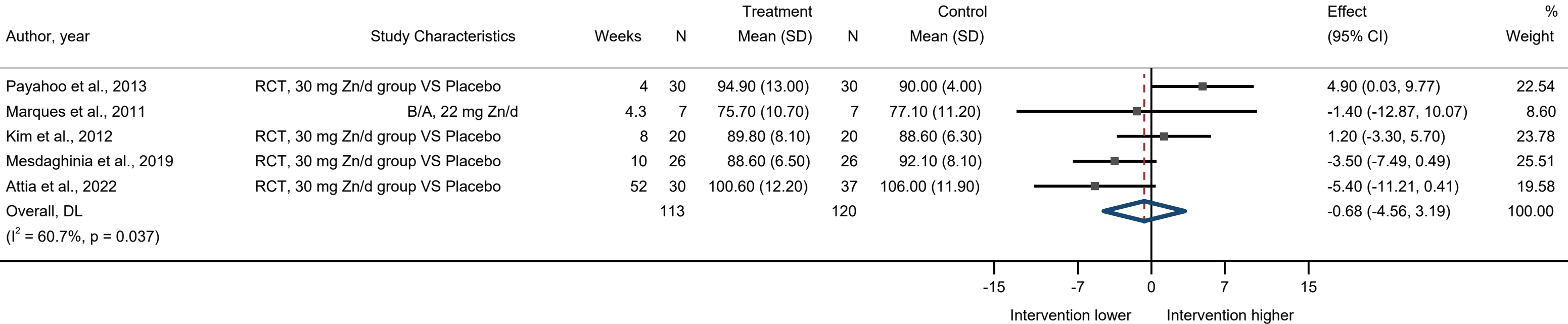
Overall

Heterogeneity: $\tau^2 = 0.23$, $I^2 = 80.52\%$, $H^2 = 5.13$

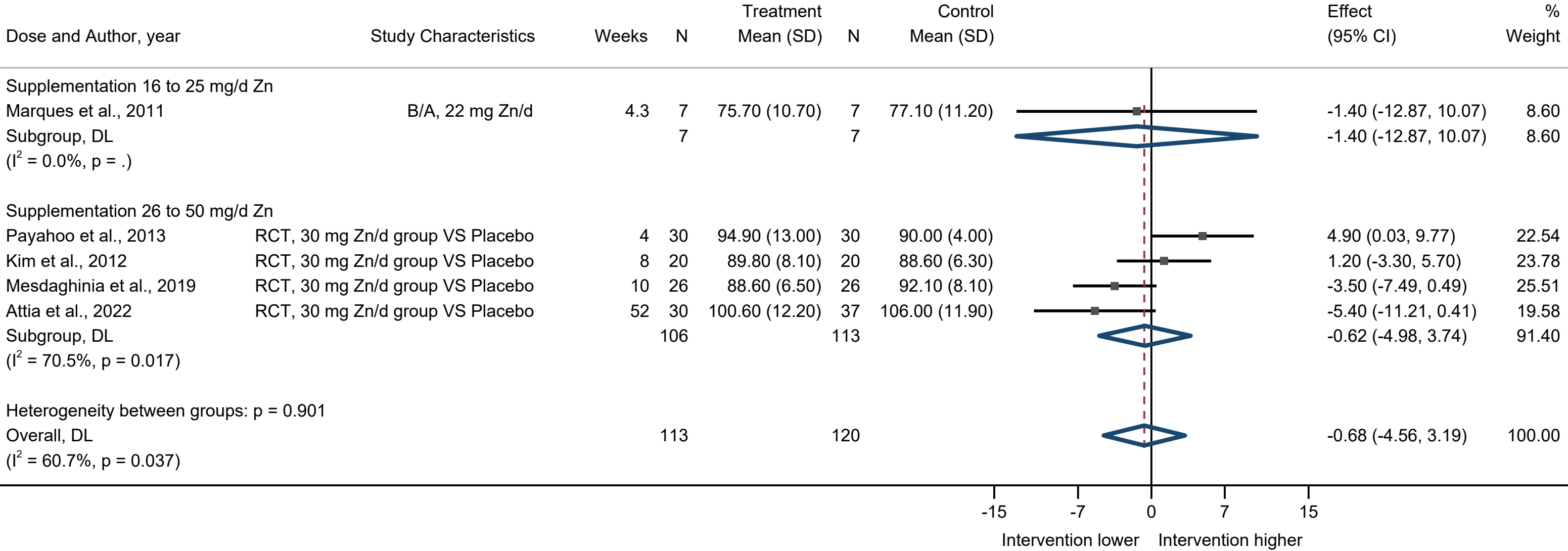
Test of $\theta_i = \theta_j$: $Q(3) = 15.40$, $p = 0.00$

Test of $\theta = 0$: $z = 1.03$, $p = 0.30$

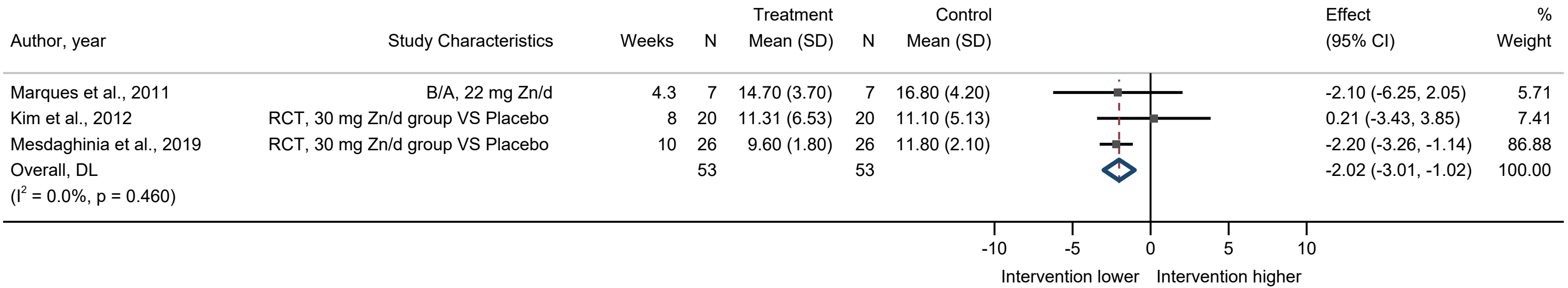
Fasting glucose (mg/dL)



Fasting glucose (mg/dL) by dose

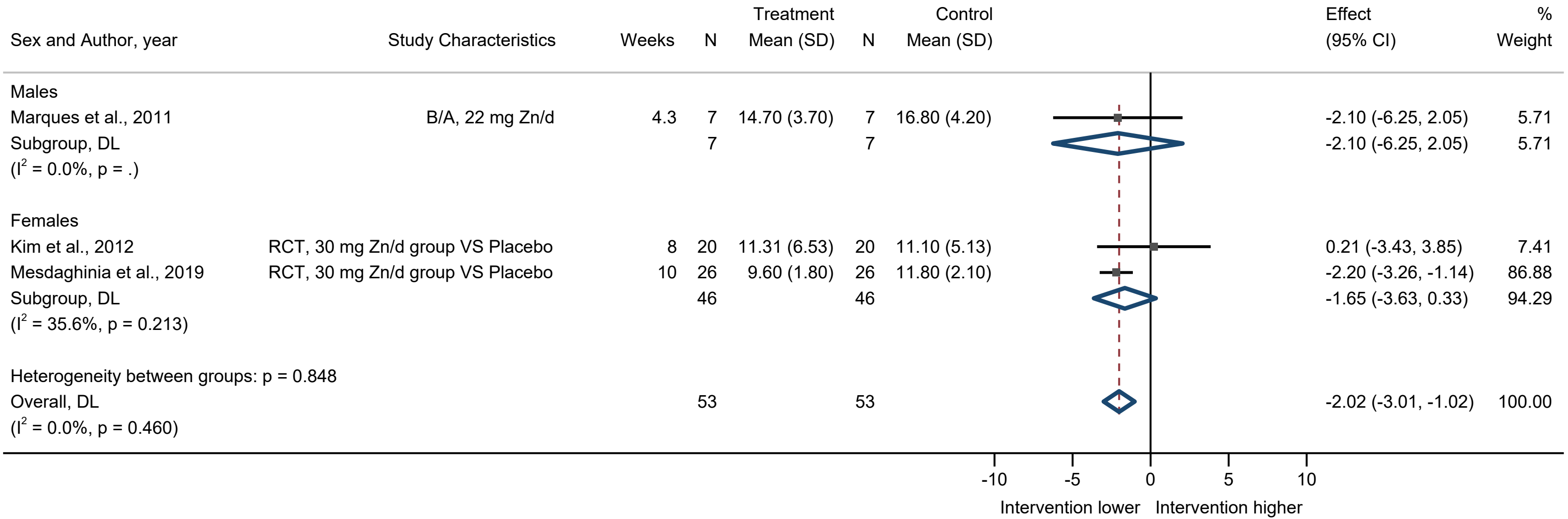


Fasting insulin (µIU/ml)

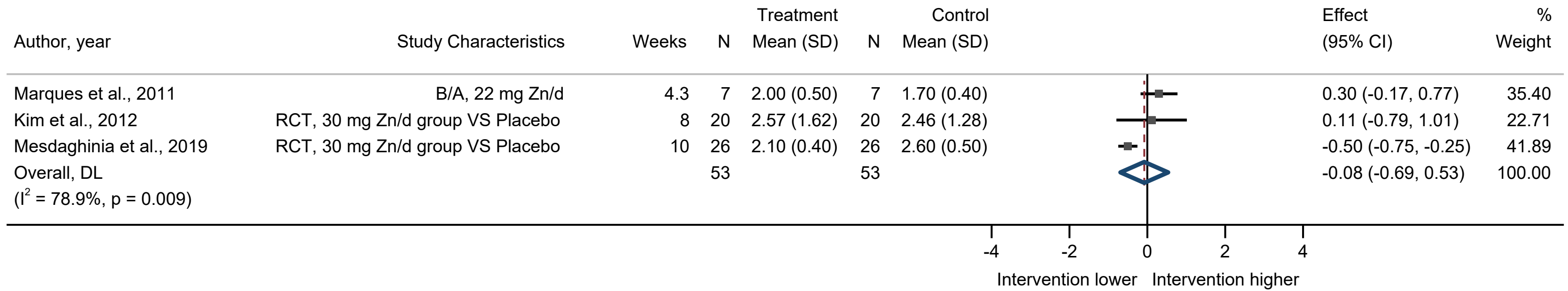


Overall, DL
($I^2 = 0.0\%$, $p = 0.460$)

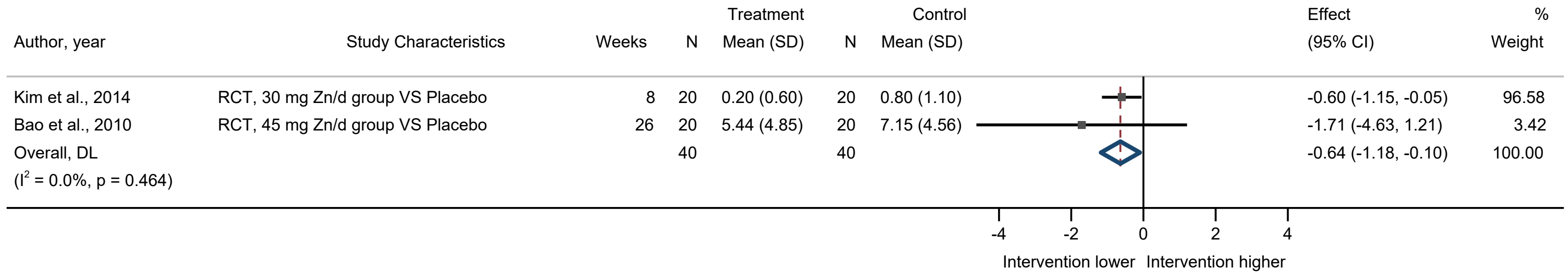
Fasting insulin ($\mu\text{IU/ml}$) by sex



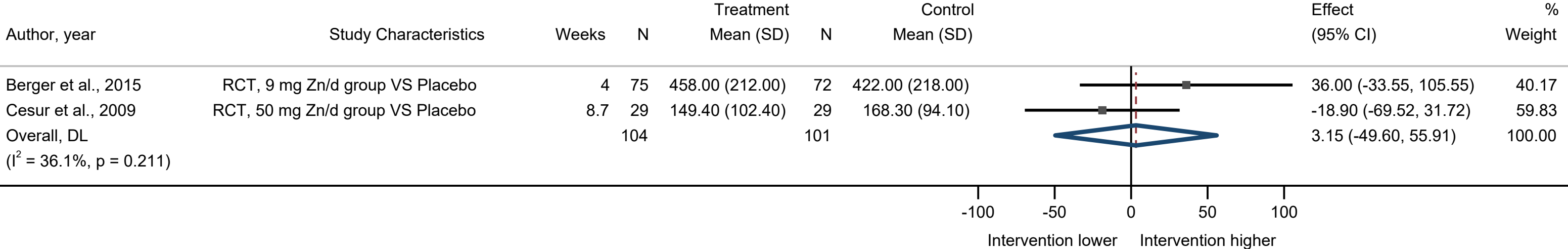
Insulin resistance (HOMA-IR)



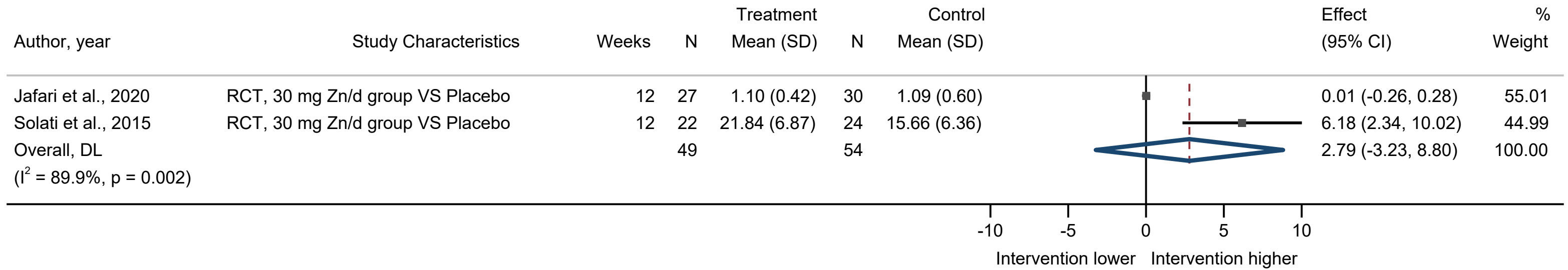
Interleukin 6 (pg/mL)



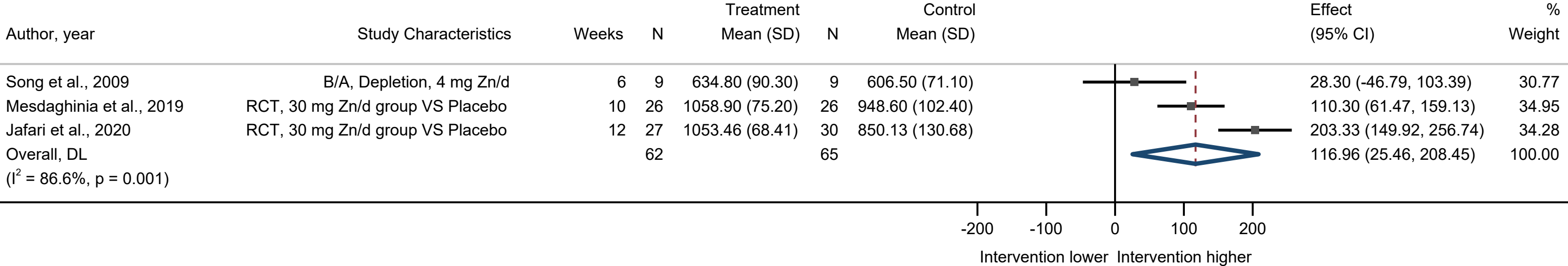
Insulin-like growth factor 1 (µg/L)



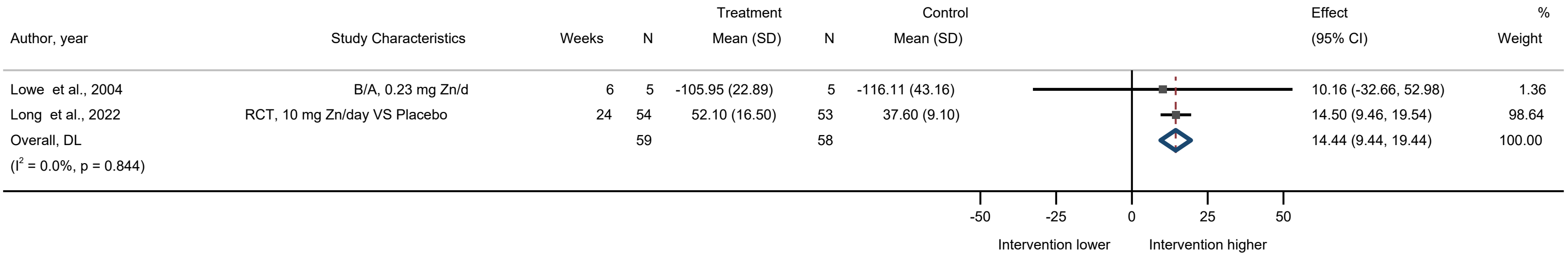
Brain-derived neurotrophic factor (ng/mL)



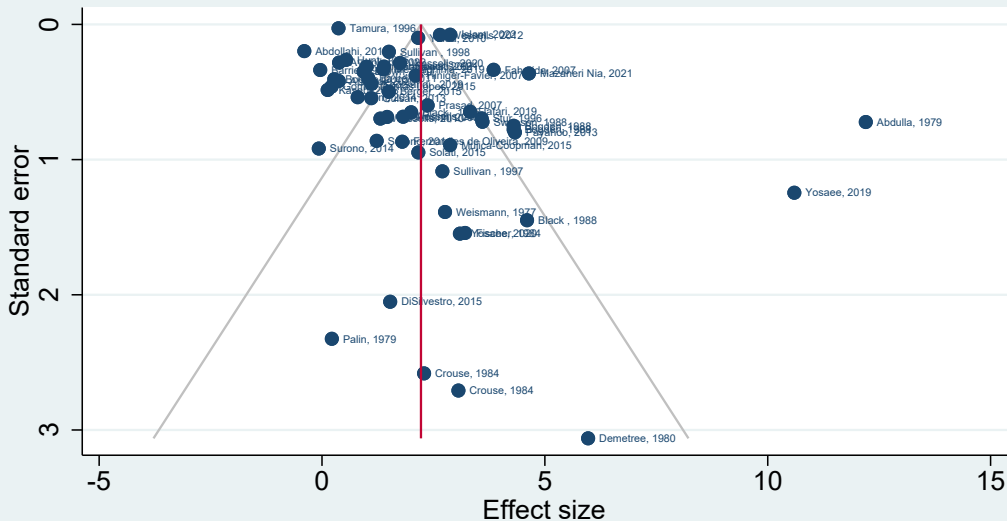
Total antioxidant capacity (μmol/L)



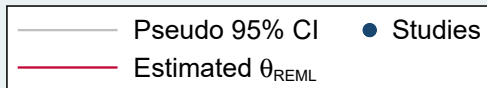
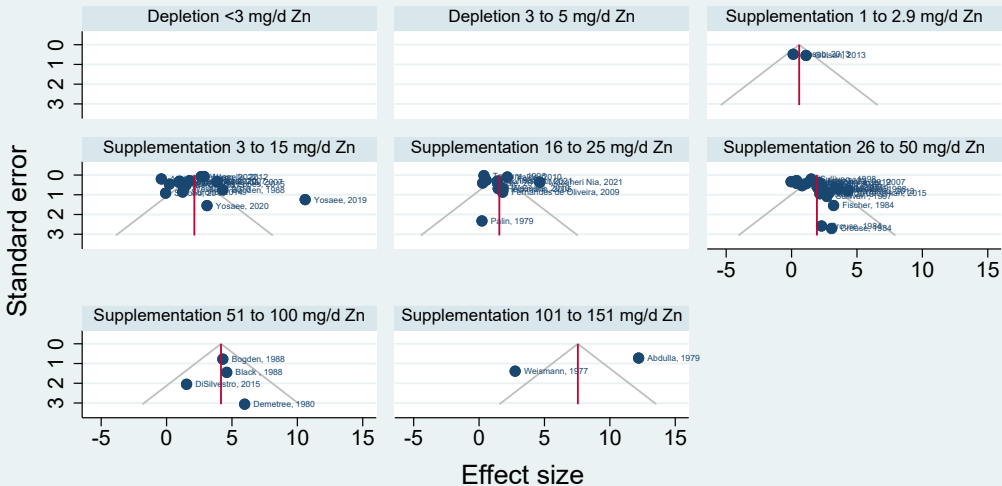
Exchangeable zinc pool (mg)



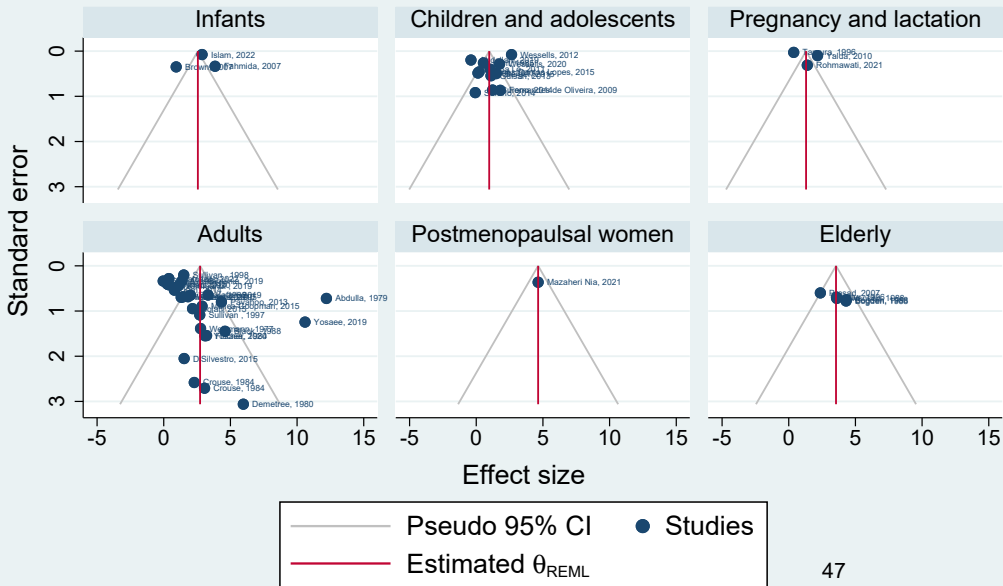
Plasma/serum zinc ($\mu\text{mol/L}$) Controlled trials



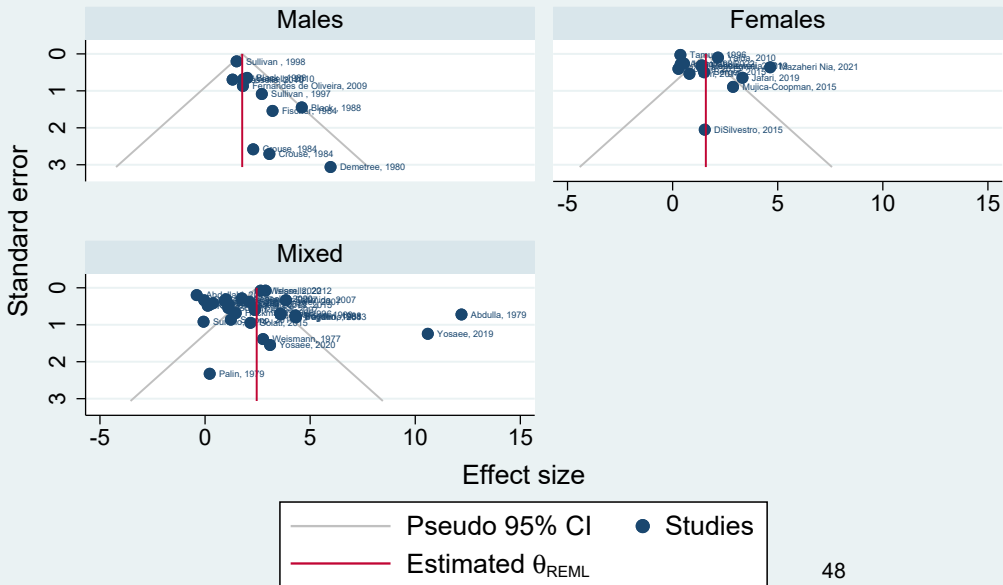
Plasma/serum zinc ($\mu\text{mol/L}$) Controlled trials



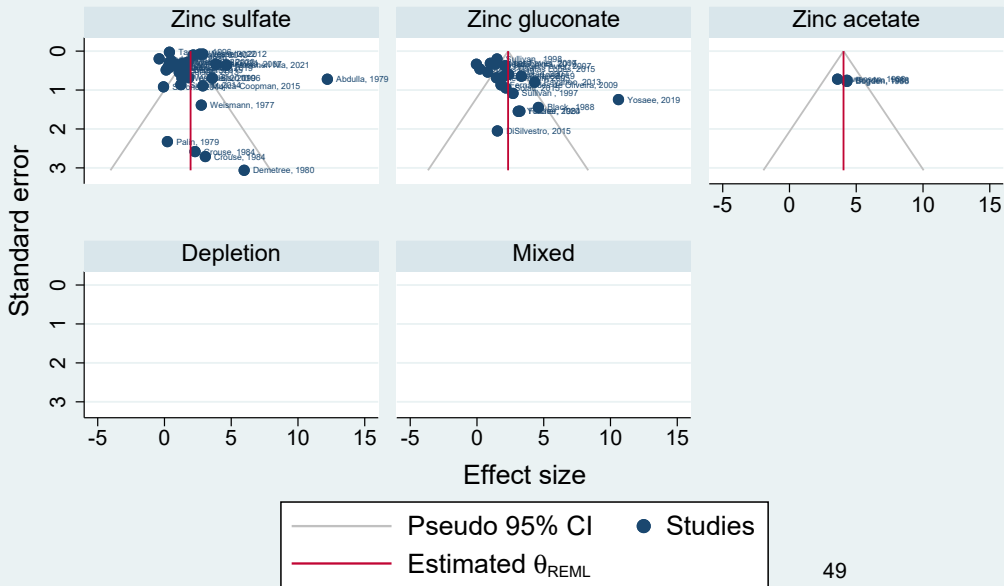
Plasma/serum zinc ($\mu\text{mol/L}$) Controlled trials



Plasma/serum zinc ($\mu\text{mol/L}$) Controlled trials

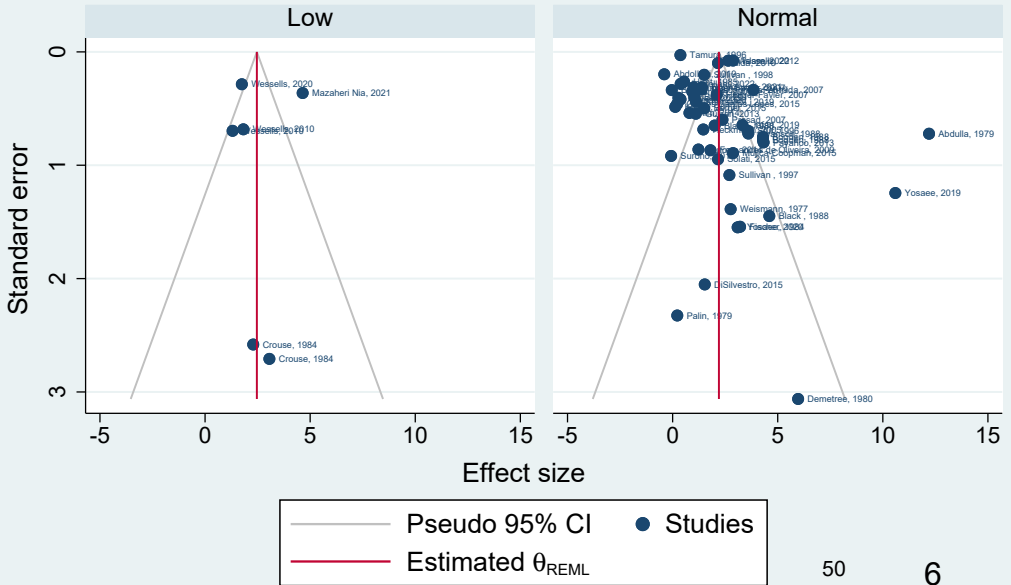


Plasma/serum zinc ($\mu\text{mol/L}$) Controlled trials



Graphs by Supplementation type

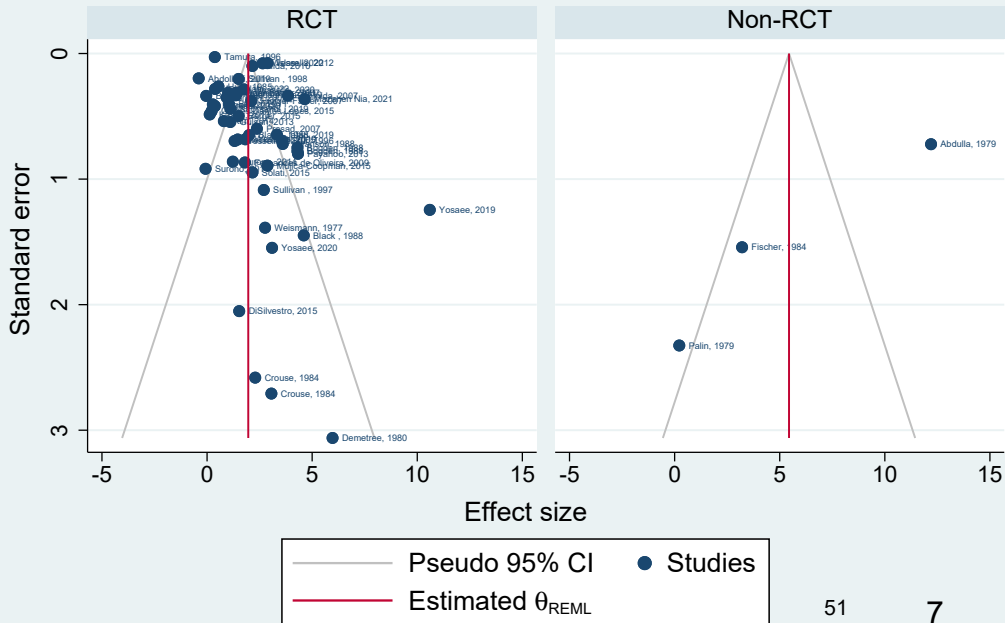
Plasma/serum zinc (µmol/L) Controlled trials



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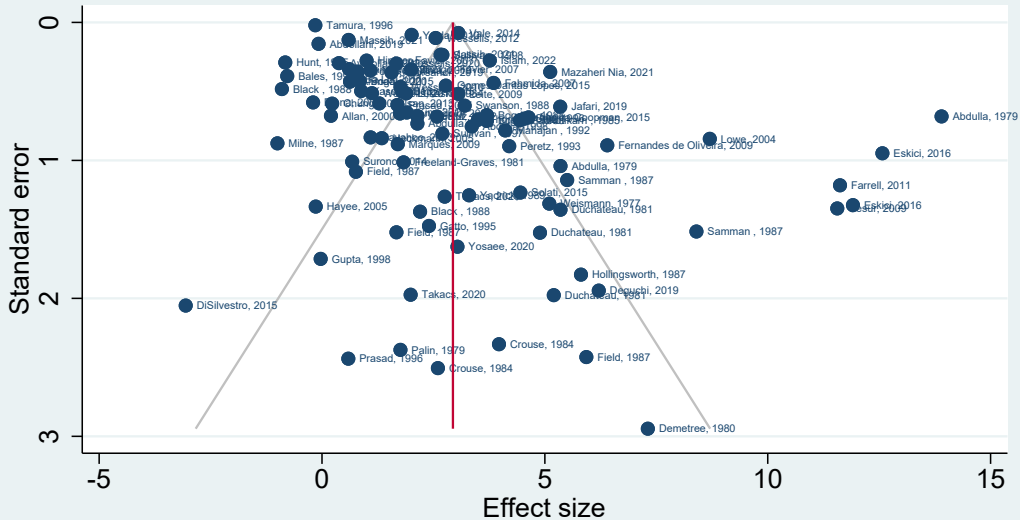
Plasma/serum zinc ($\mu\text{mol/L}$) Controlled trials



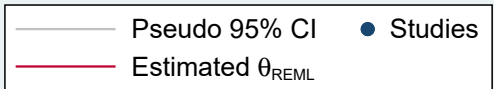
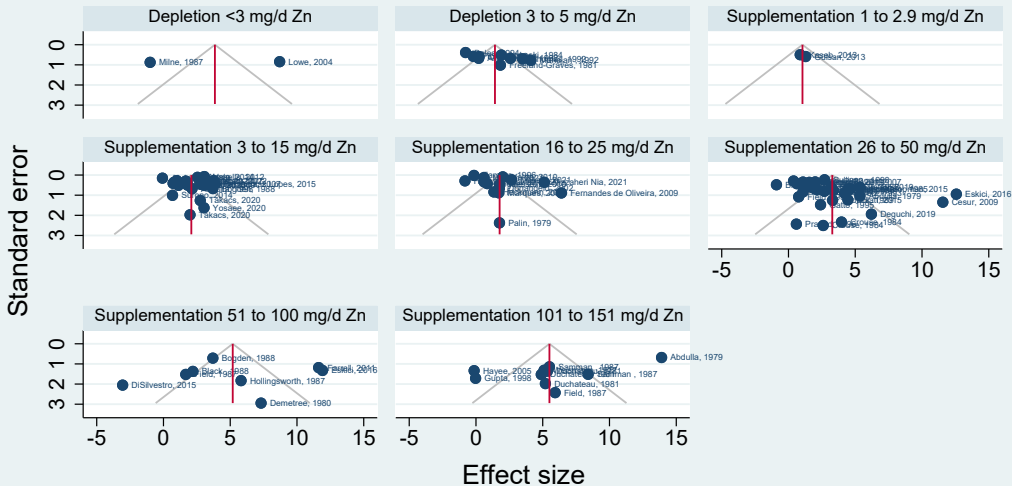
51

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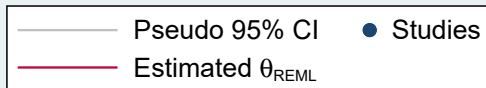
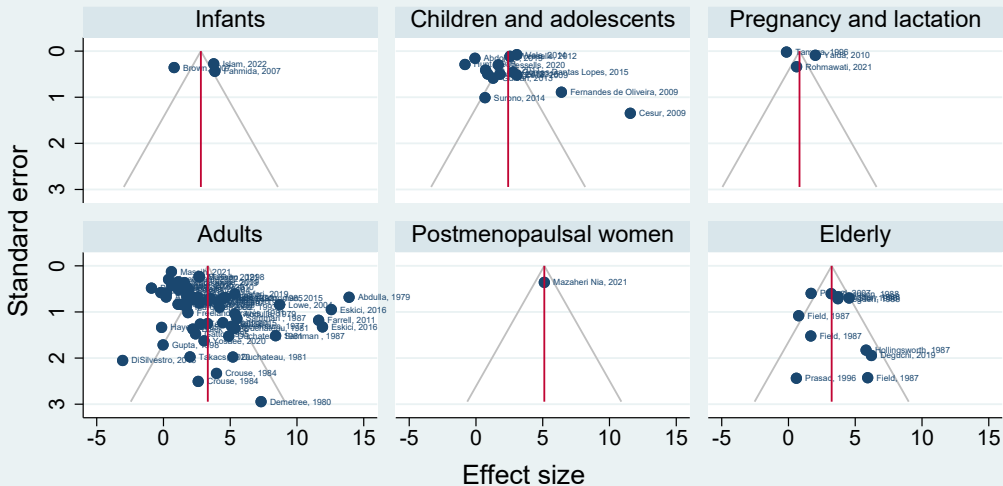
Serum Zinc ($\mu\text{mol/L}$) Before and after measurement



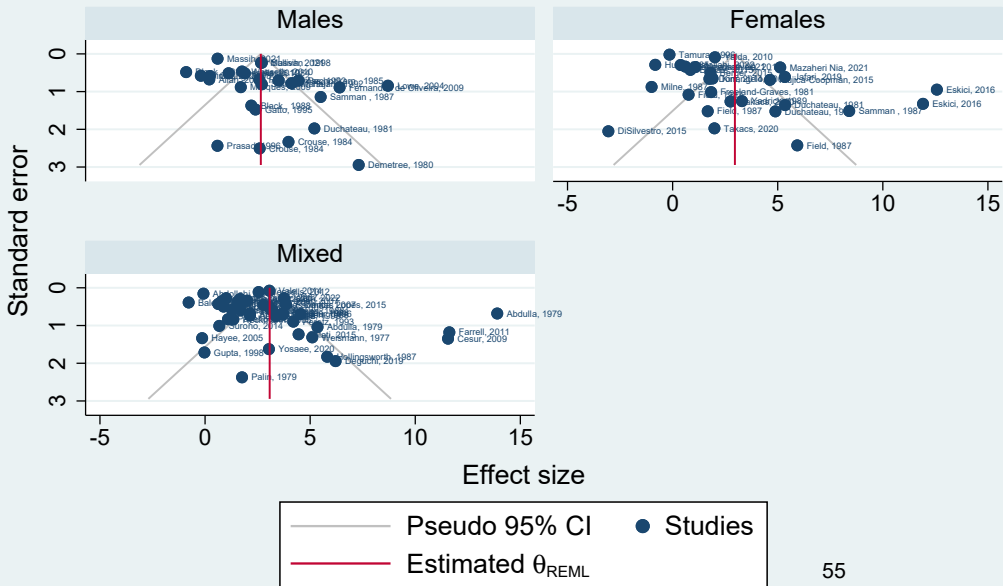
Plasma/serum zinc ($\mu\text{mol/L}$) Before and after measurement



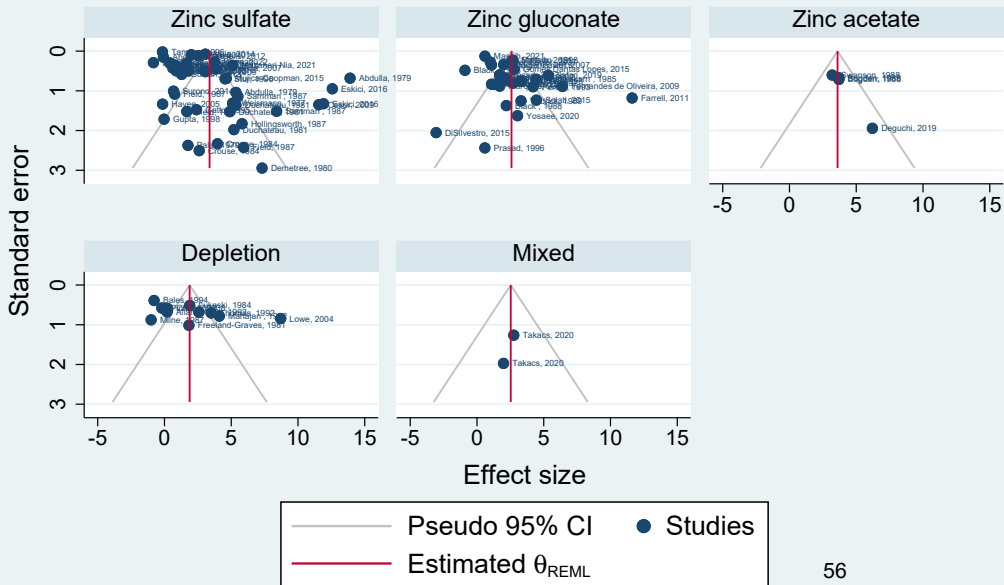
Plasma/serum zinc ($\mu\text{mol/L}$) Before and after measurement



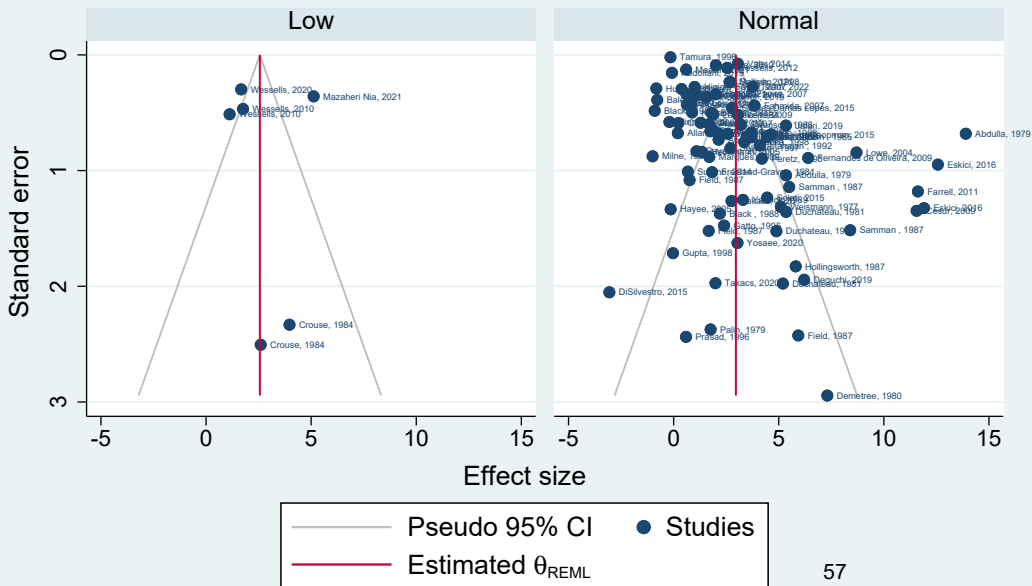
Plasma/serum zinc ($\mu\text{mol/L}$) Before and after measurement



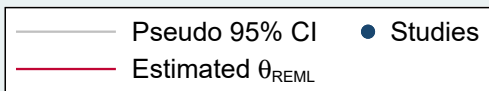
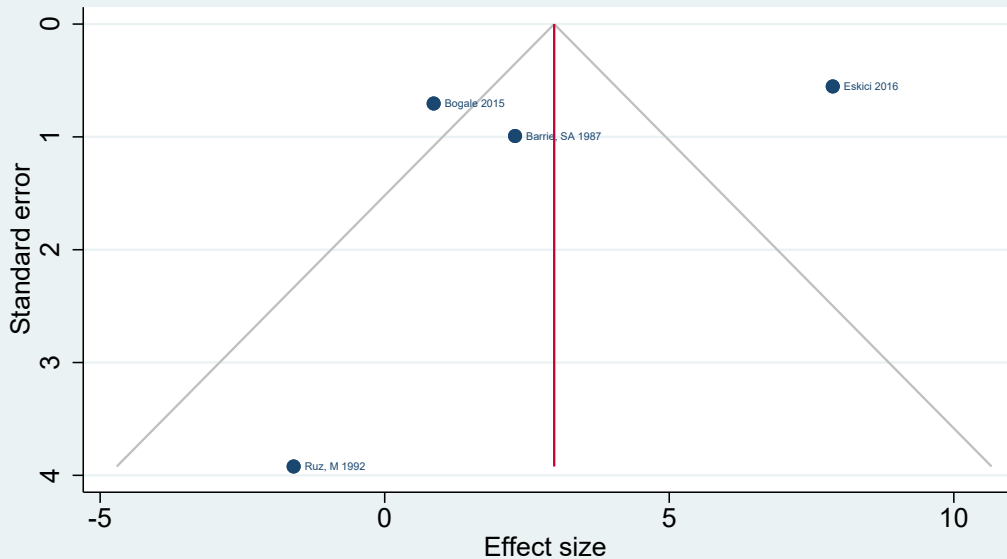
Plasma/serum zinc ($\mu\text{mol/L}$) Before and after measurement



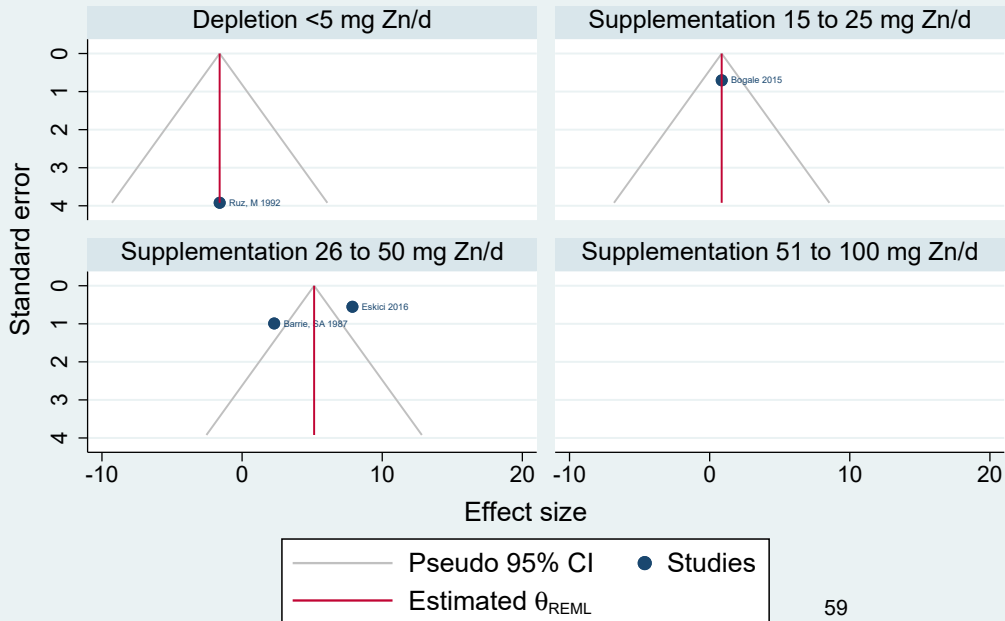
Plasma/serum zinc ($\mu\text{mol/L}$) Before and after measurement



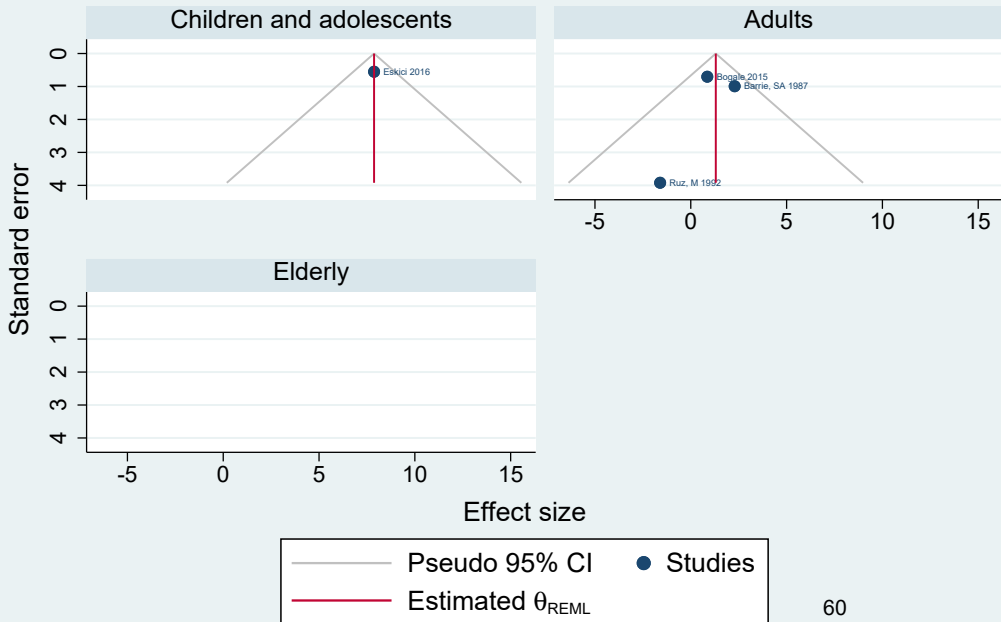
Urinary zinc ($\mu\text{mol/L}$)



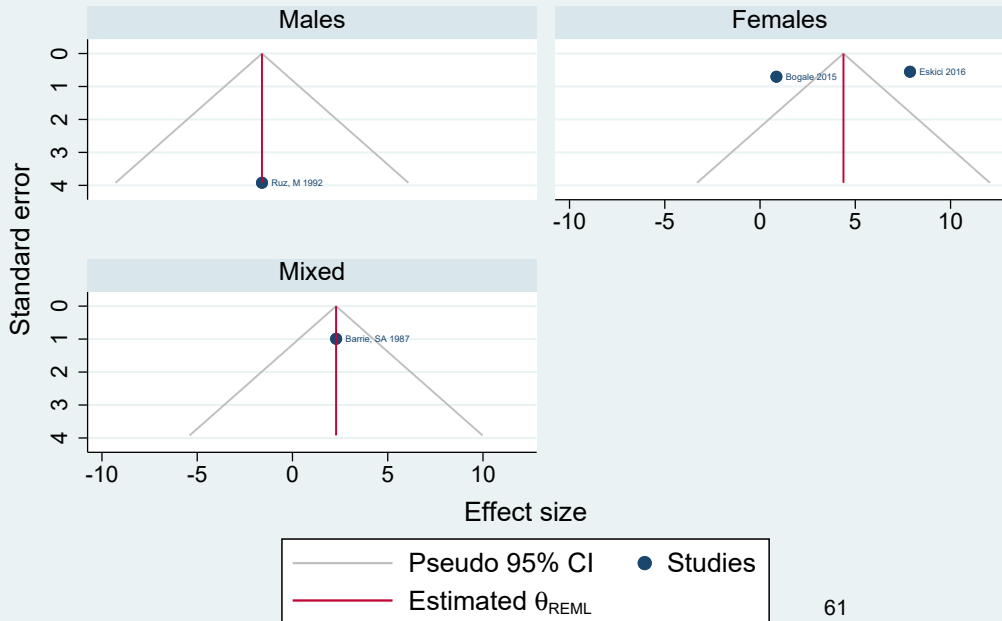
Urinary zinc ($\mu\text{mol/L}$)



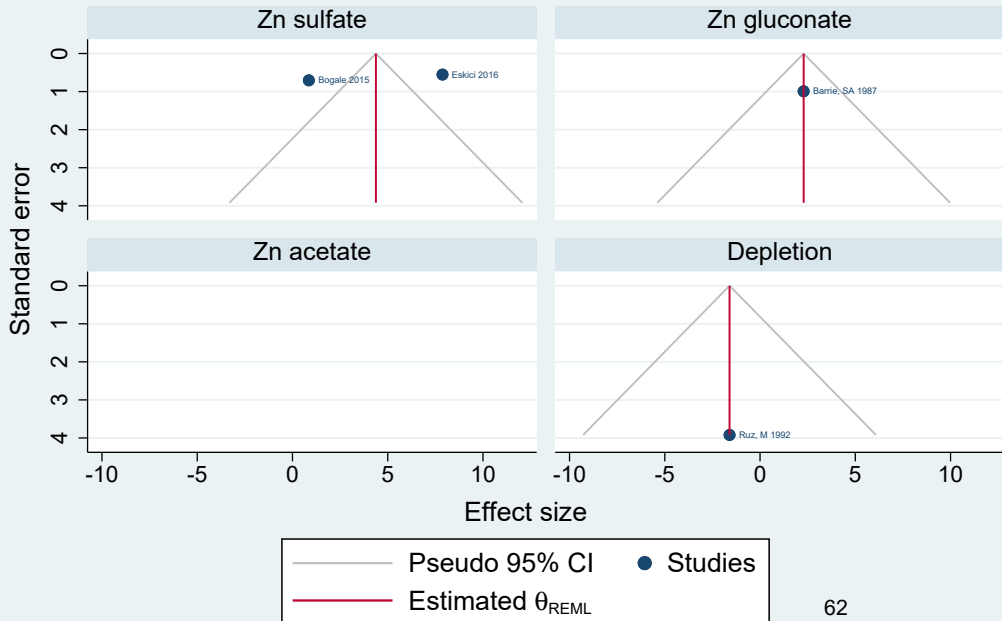
Urinary zinc ($\mu\text{mol/L}$)



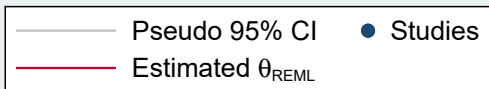
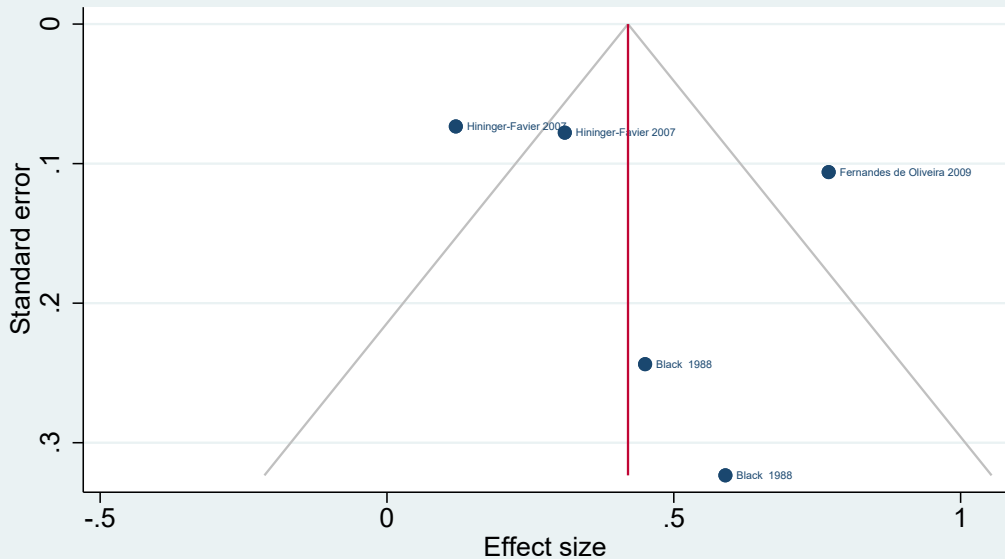
Urinary zinc ($\mu\text{mol/L}$)



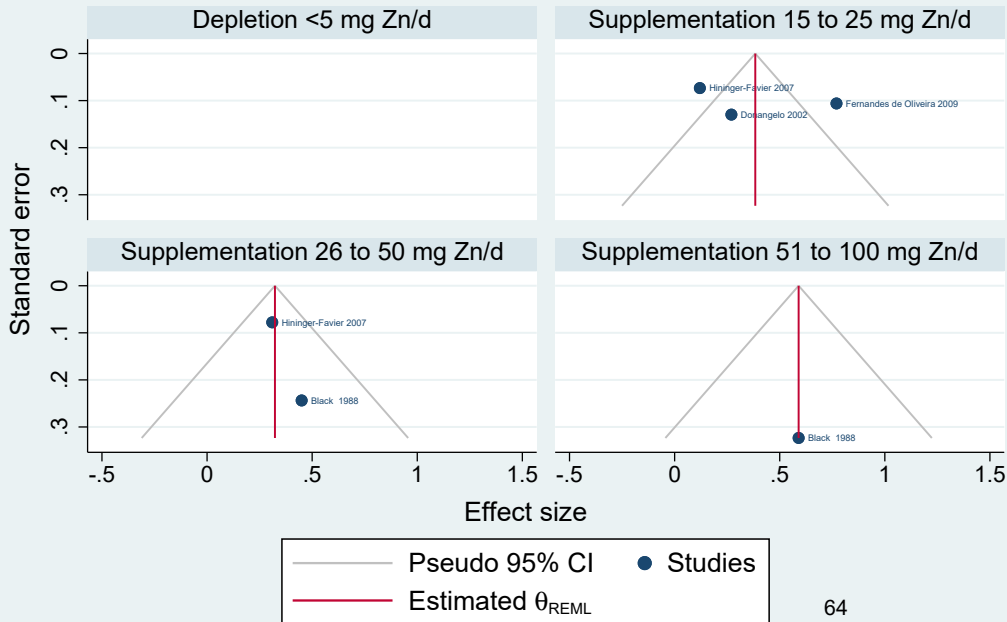
Urinary zinc ($\mu\text{mol/L}$)



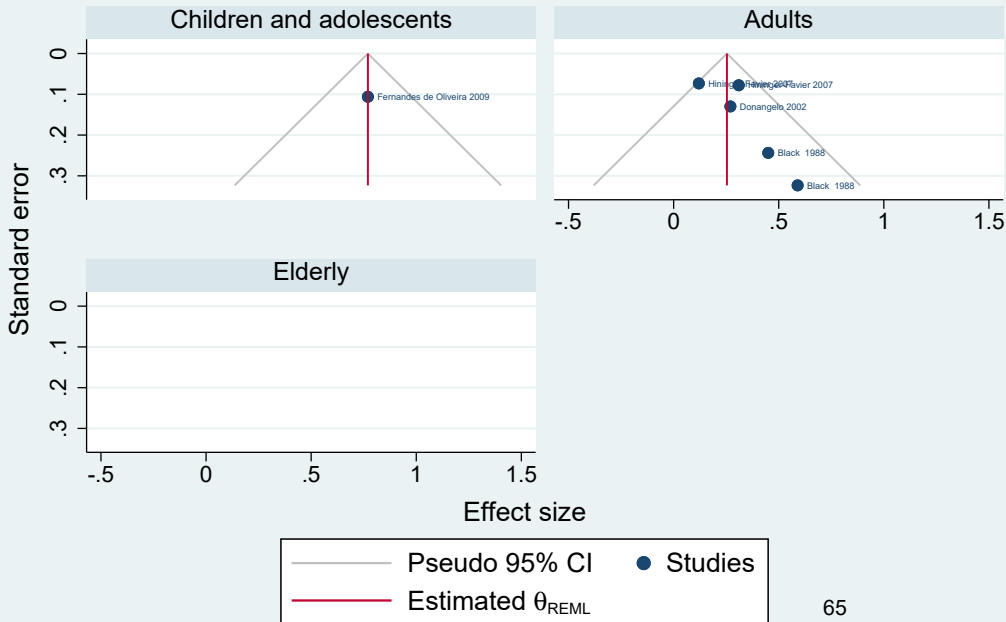
Urinary zinc (mmol/creatinine) without Donangelo



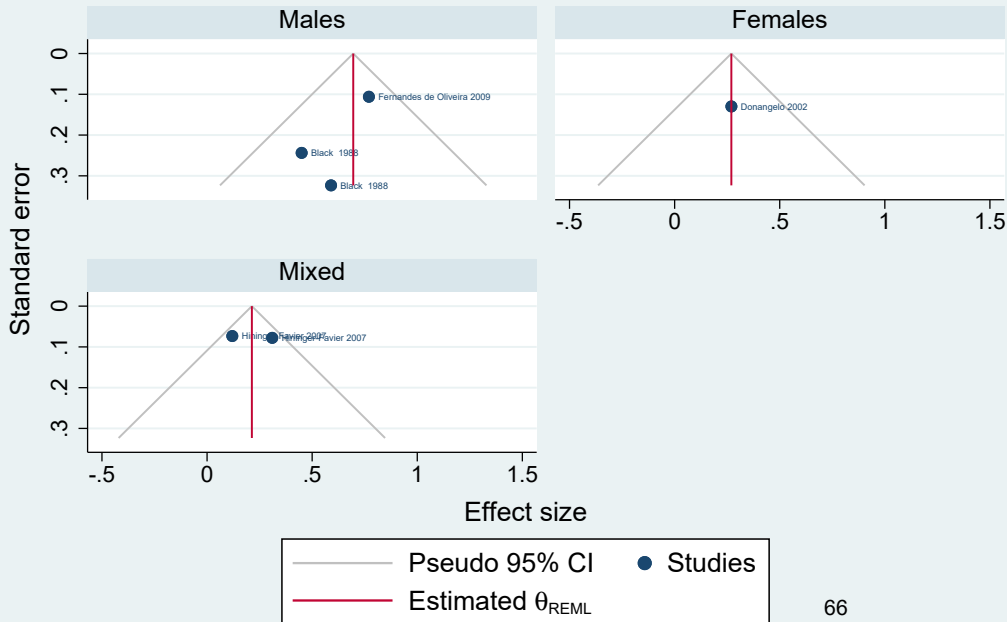
Urinary zinc (mmol/creatinine)



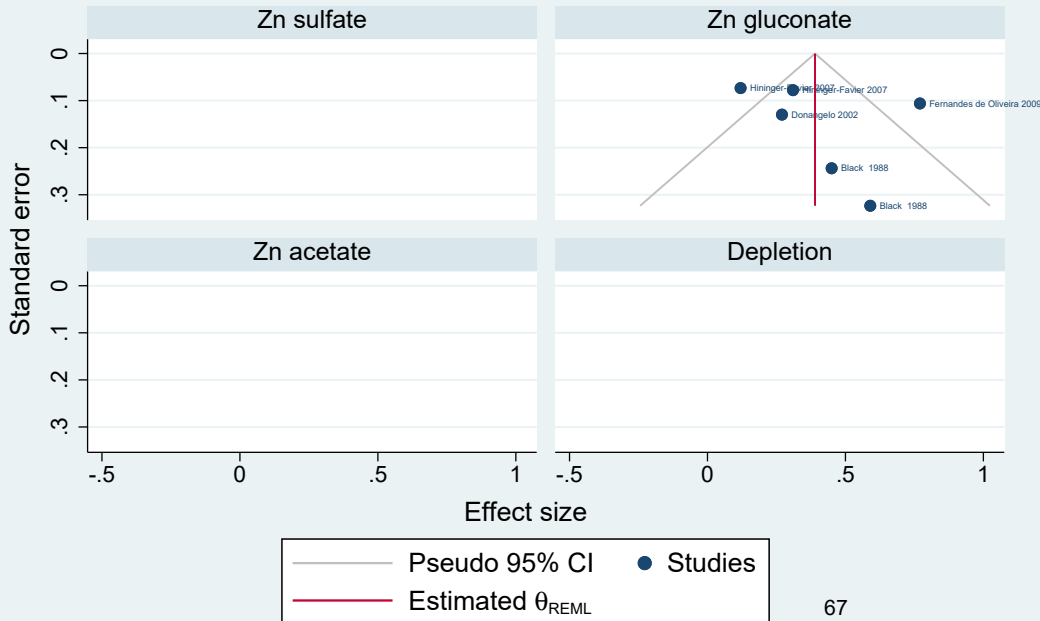
Urinary zinc (mmol/creatinine)



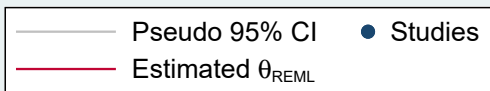
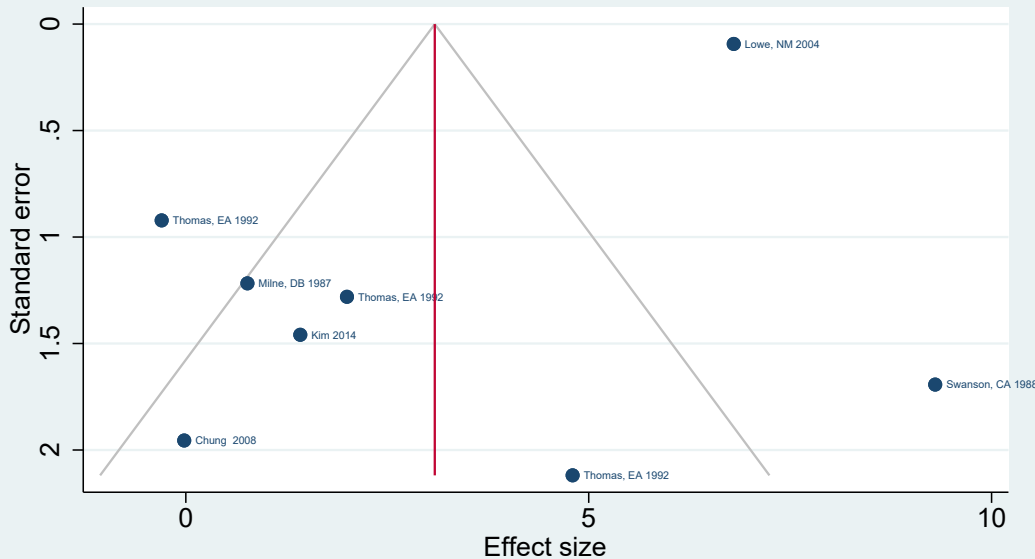
Urinary zinc (mmol/creatinine)



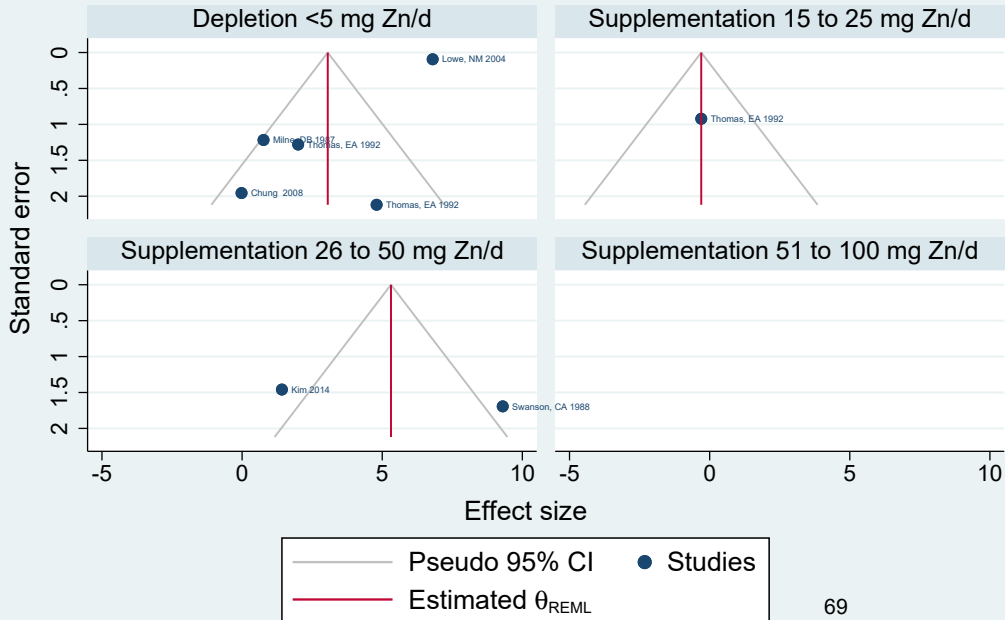
Urinary zinc (mmol/creatinine)



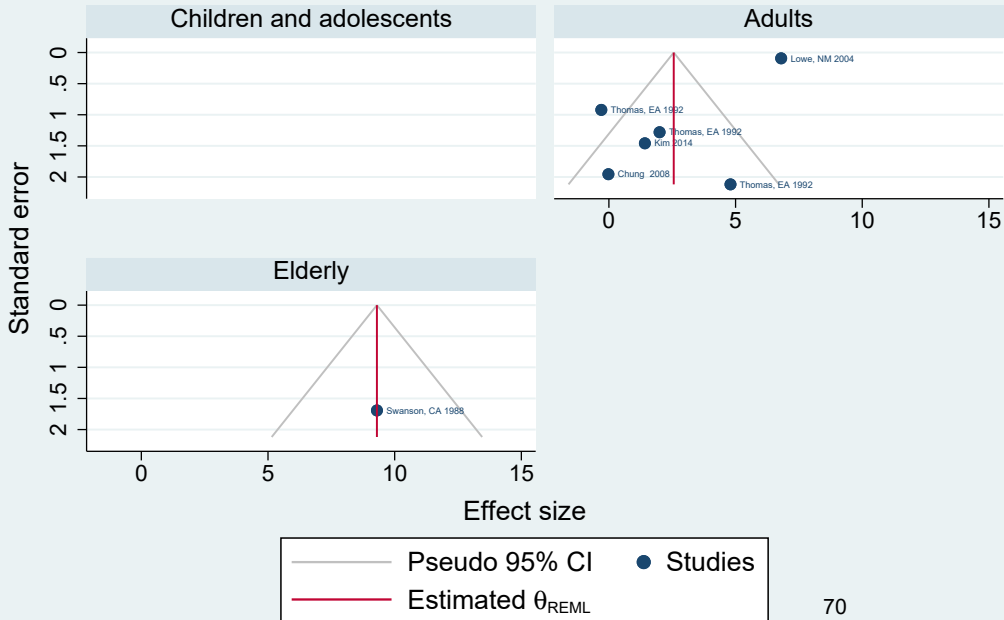
Urinary zinc ($\mu\text{mol/d}$)



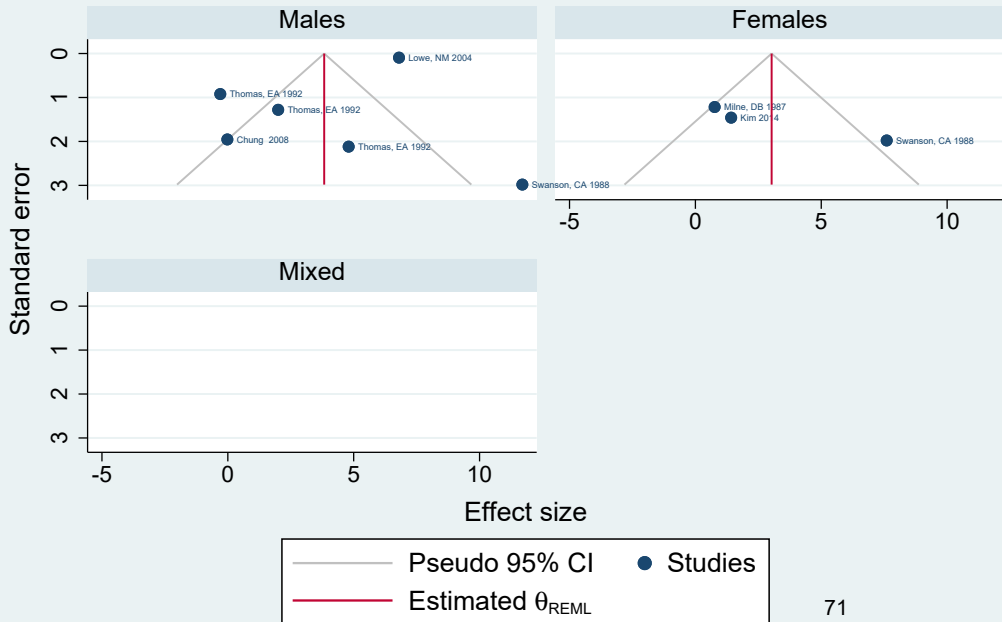
Urinary zinc ($\mu\text{mol/d}$)



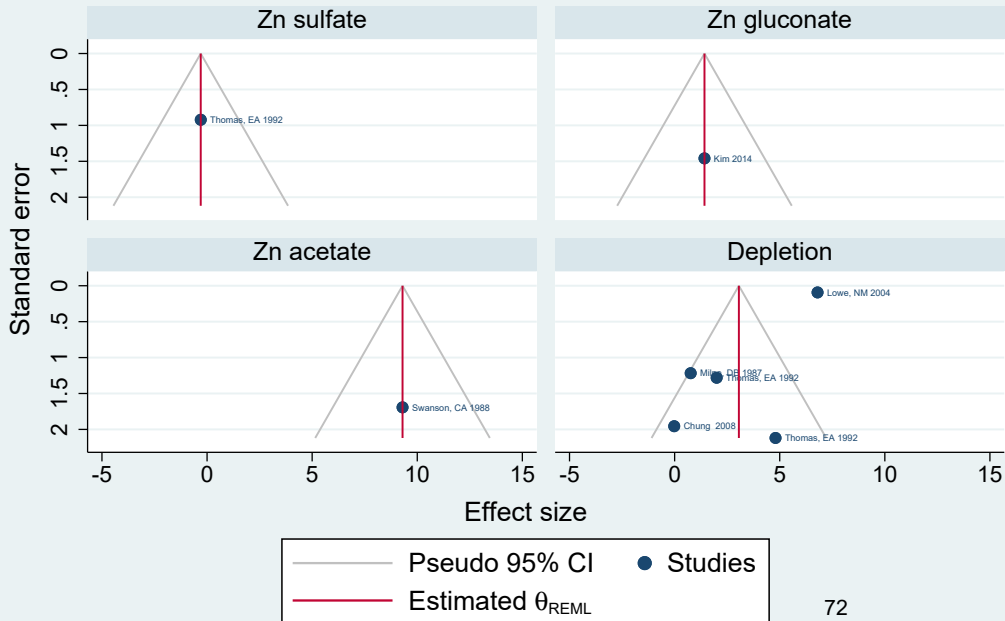
Urinary zinc ($\mu\text{mol/d}$)



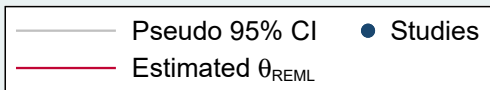
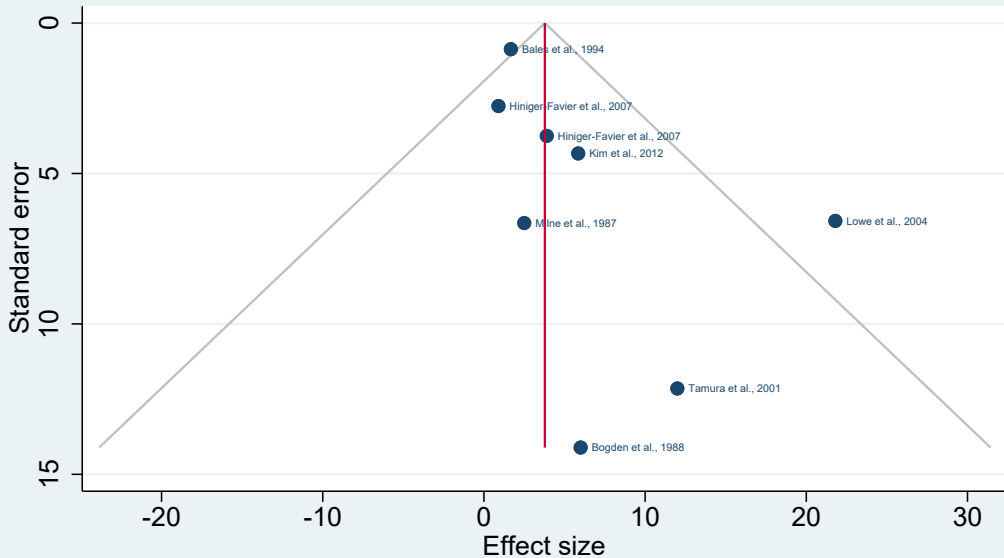
Urinary zinc ($\mu\text{mol/d}$)



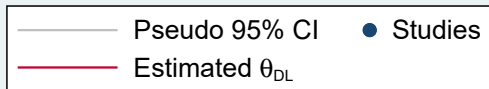
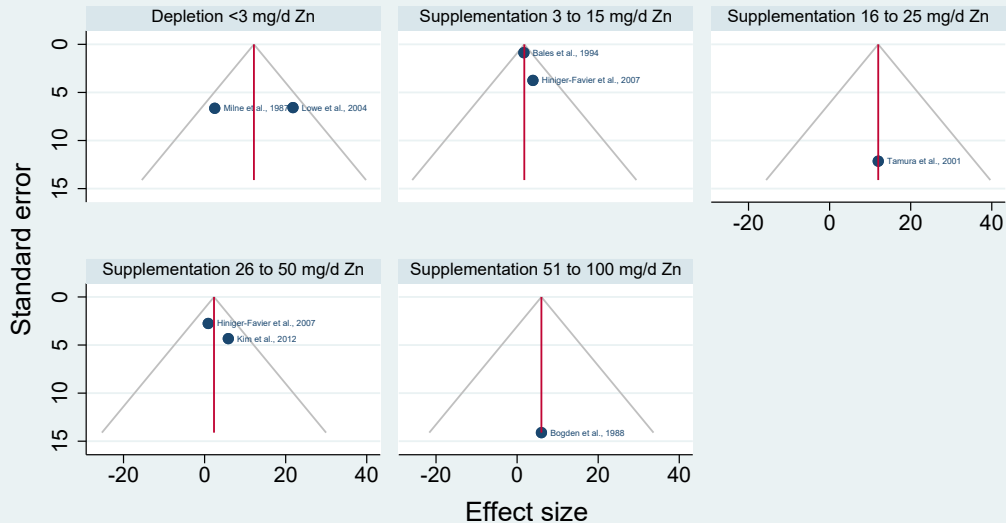
Urinary zinc ($\mu\text{mol/d}$)



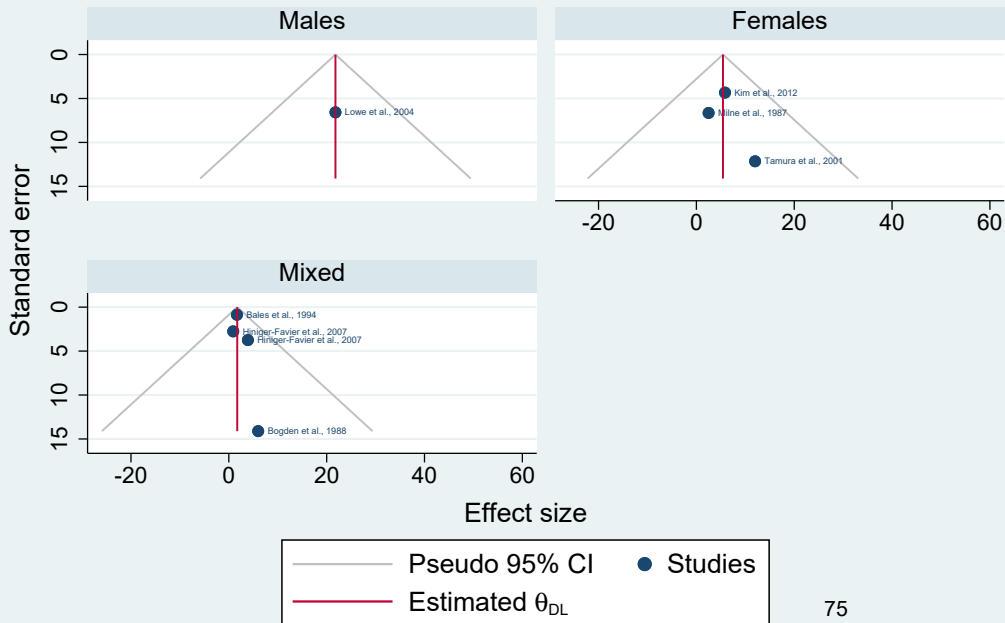
Alkaline phosphatase activity (U/L)



Alkaline phosphatase activity (U/L)

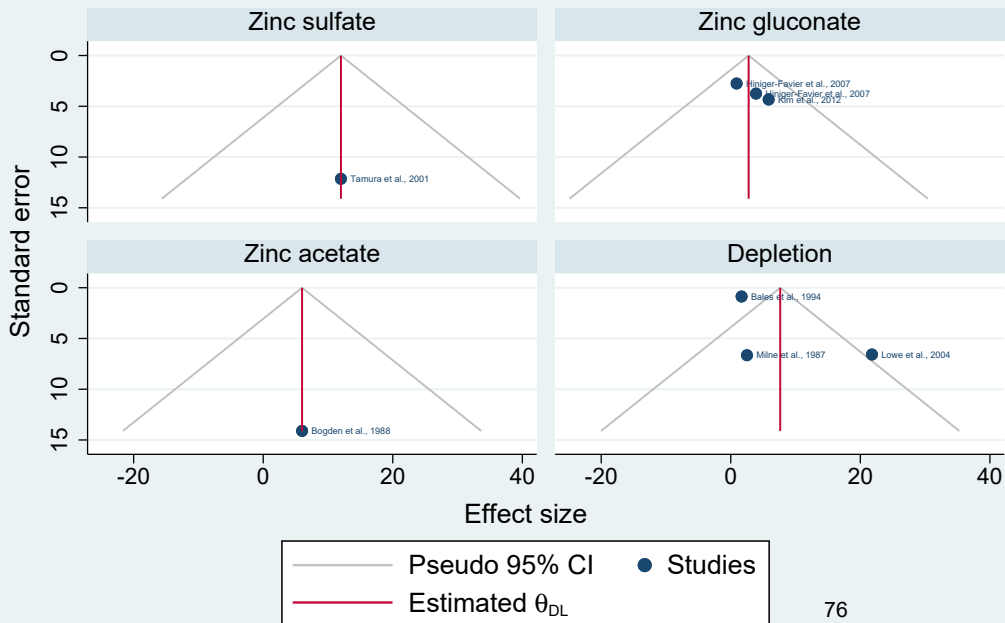


Alkaline phosphatase activity (U/L)

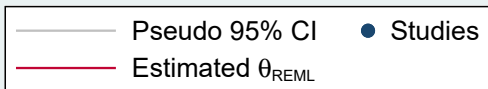
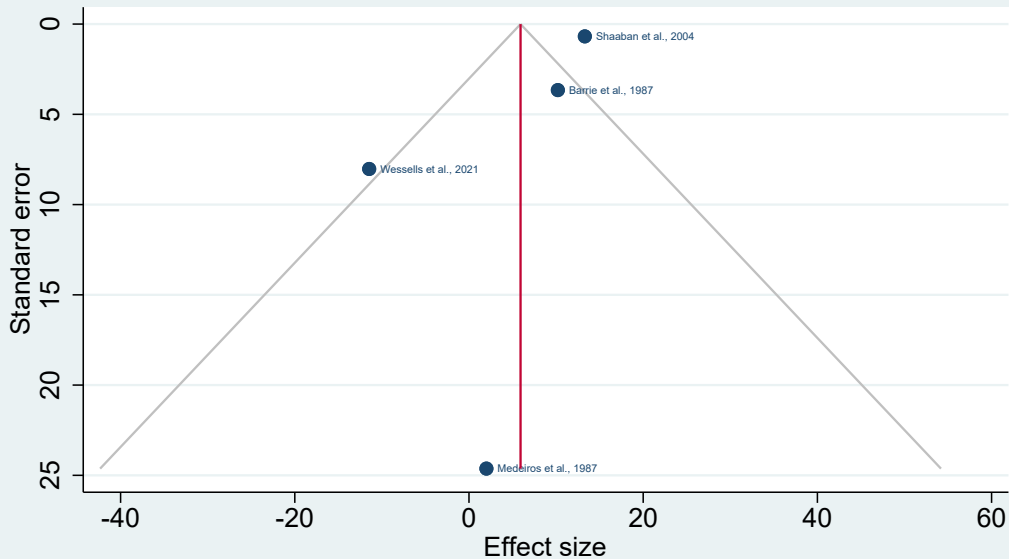


Graphs by Sex

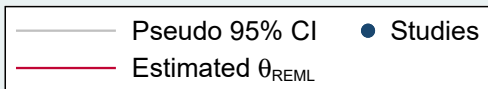
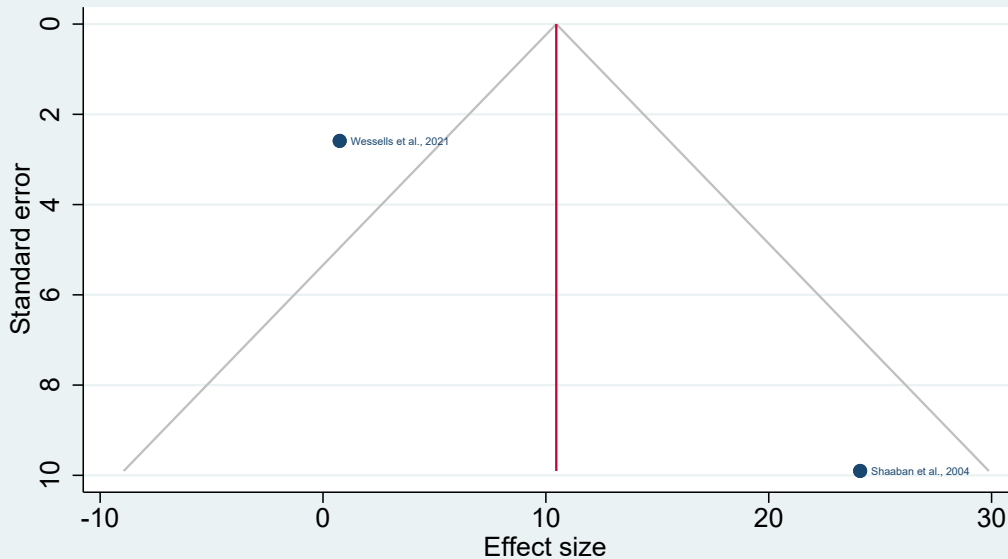
Alkaline phosphatase activity (U/L)



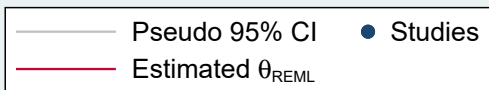
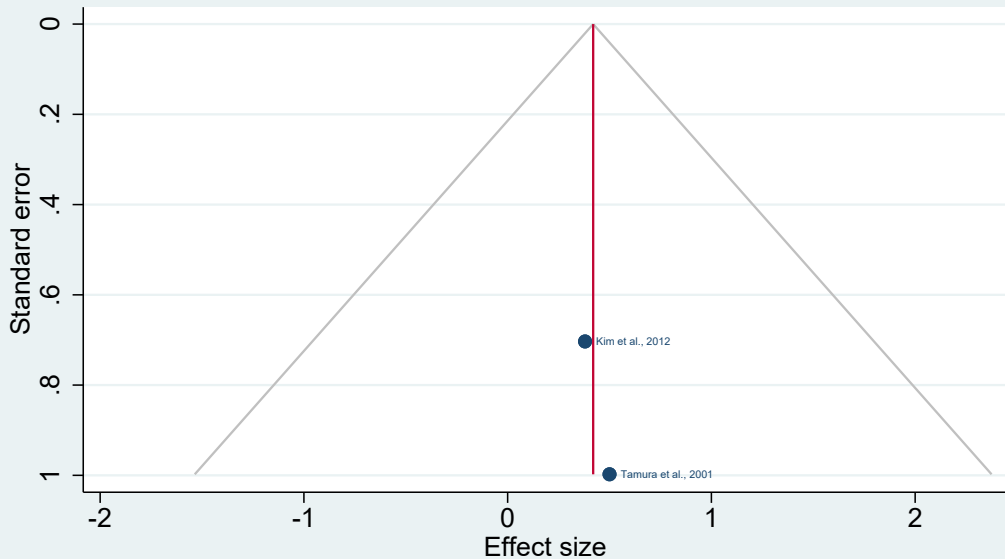
Hair zinc ($\mu\text{g/g}$)



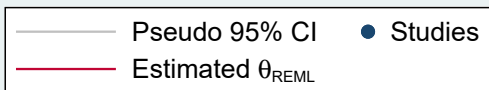
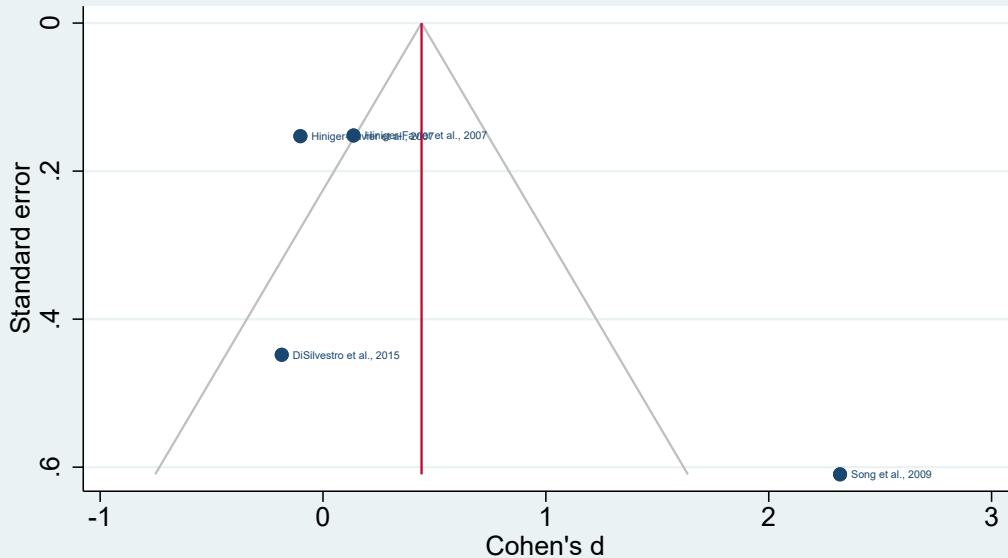
Nail zinc ($\mu\text{g/g}$)



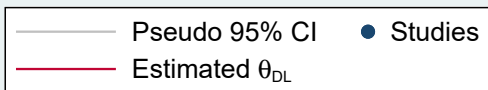
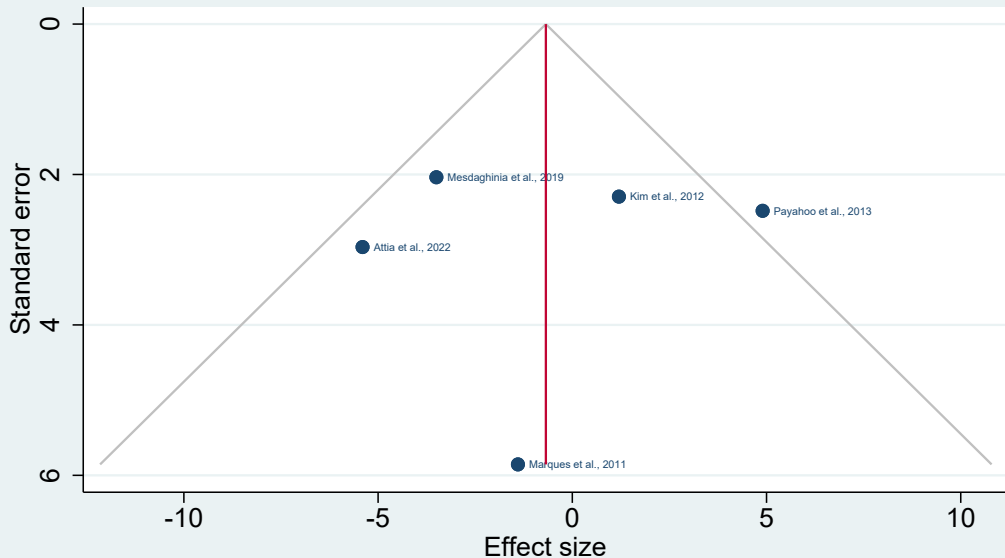
Serum superoxide dismutase (U/mL)



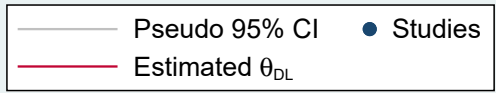
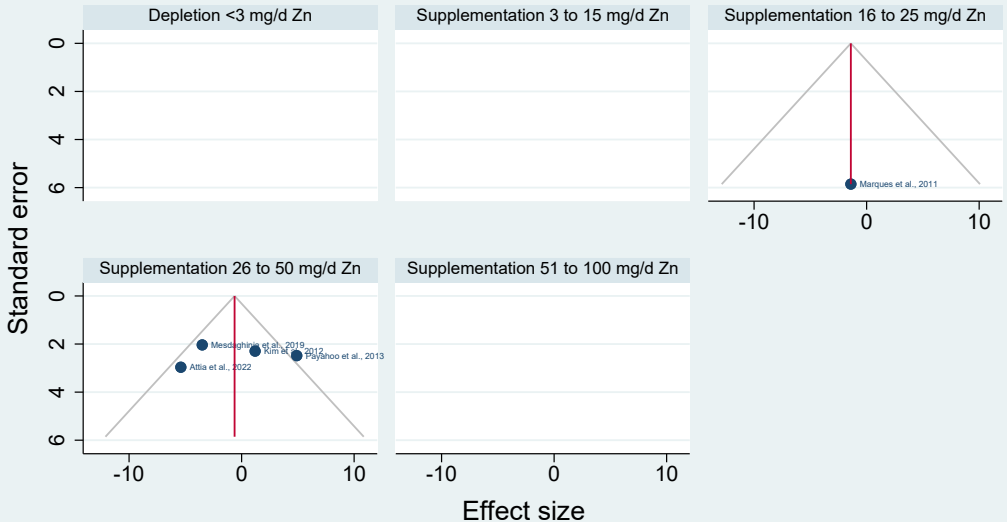
Erythrocyte superoxide dismutase



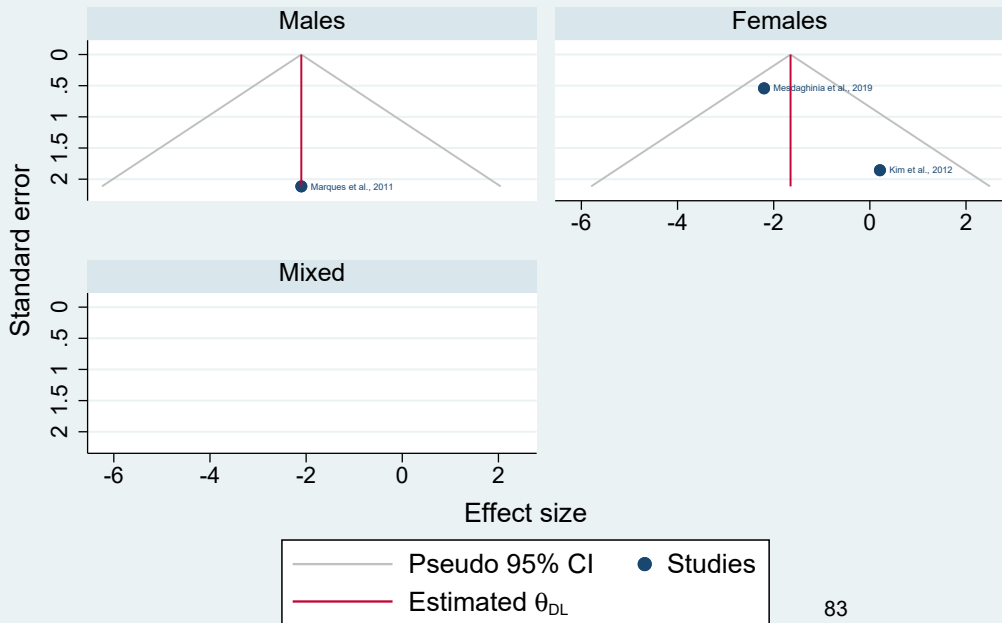
Fasting glucose (mg/dL)



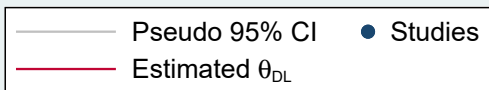
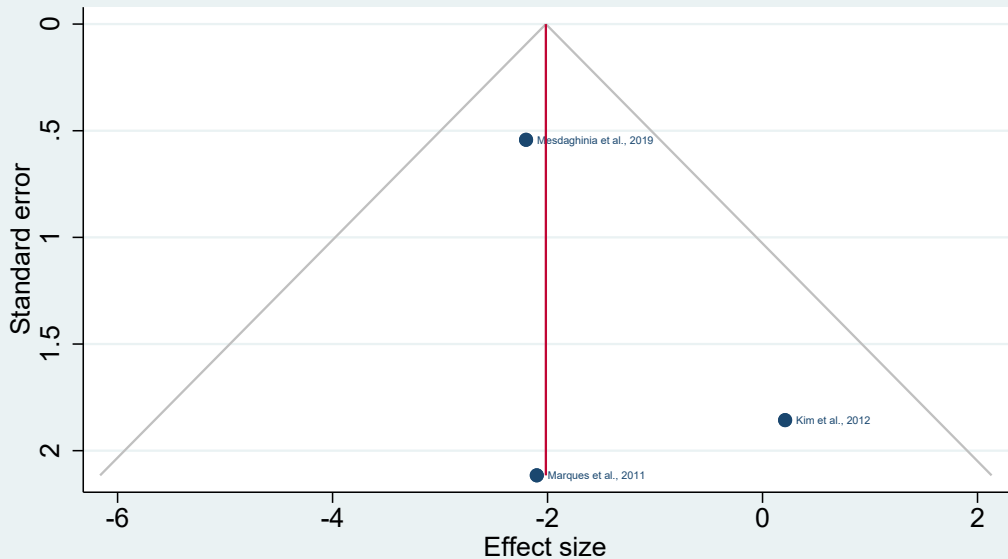
Fasting glucose (mg/dL)



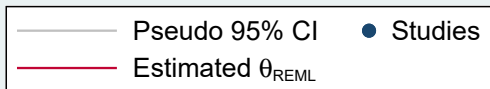
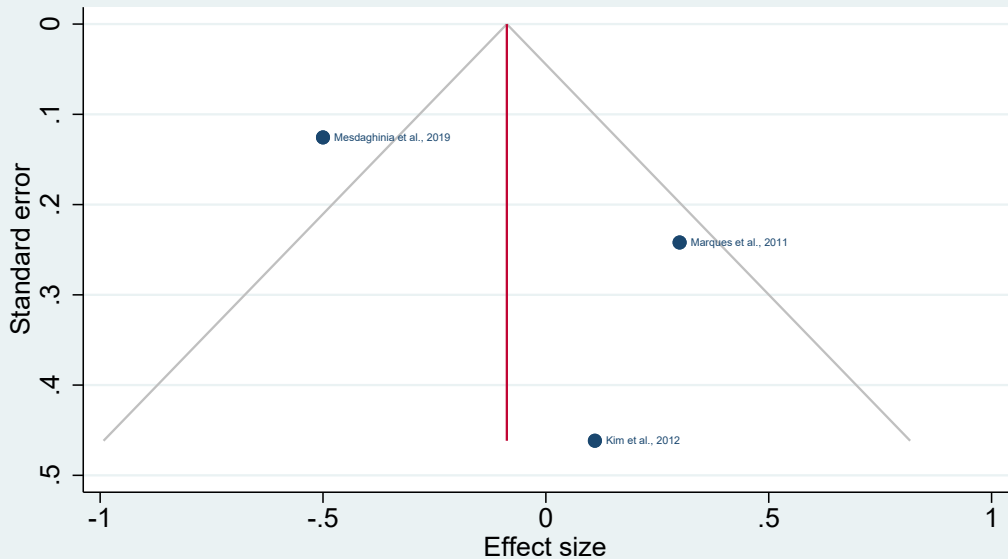
Fasting insulin ($\mu\text{IU}/\text{ml}$)



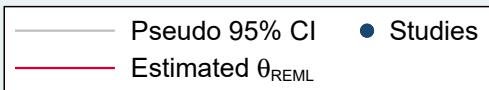
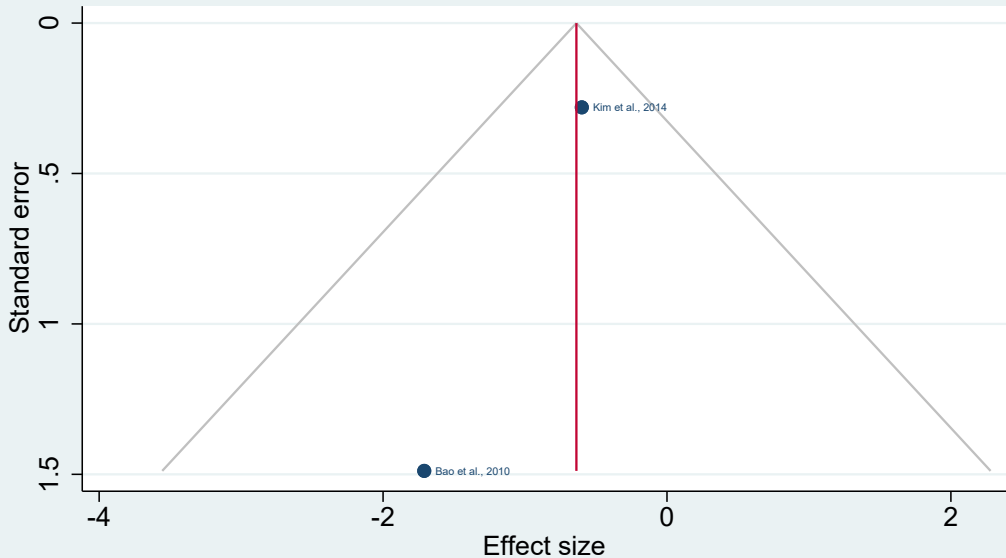
Fasting insulin ($\mu\text{IU/ml}$)



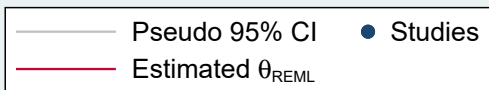
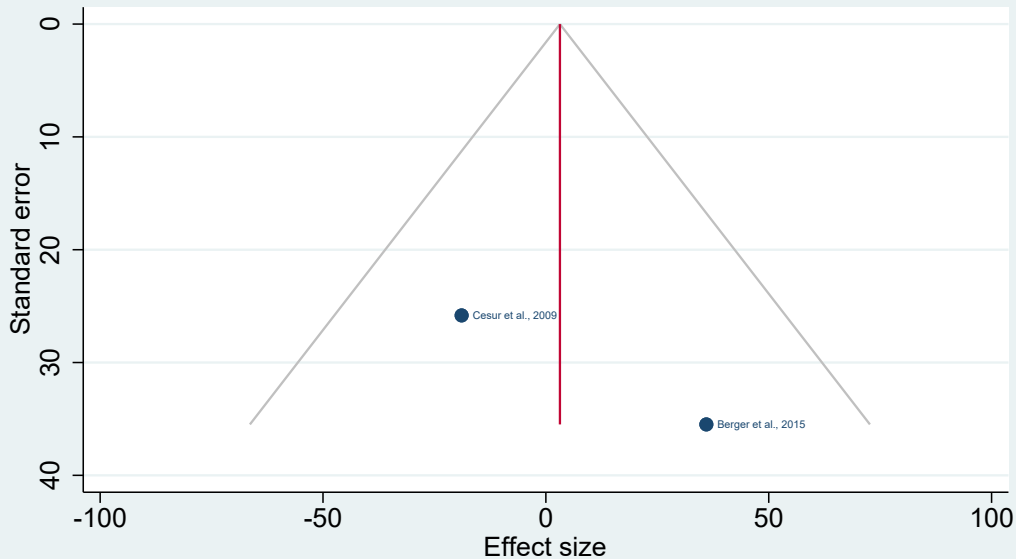
Insulin resistance (HOMA-IR)



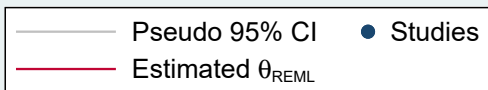
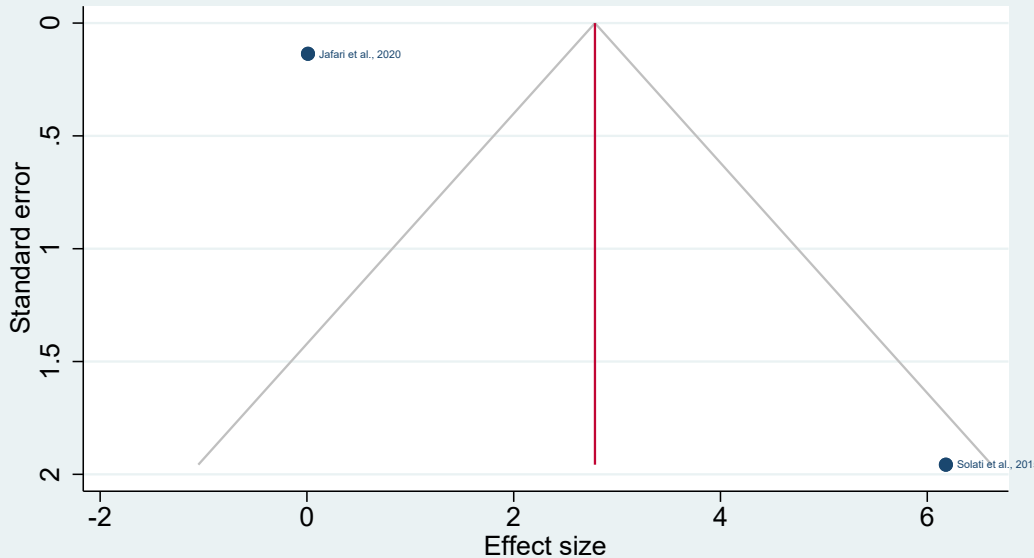
Interleukin 6 (pg/mL)



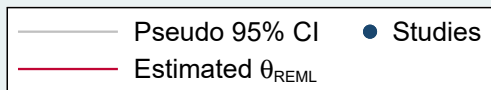
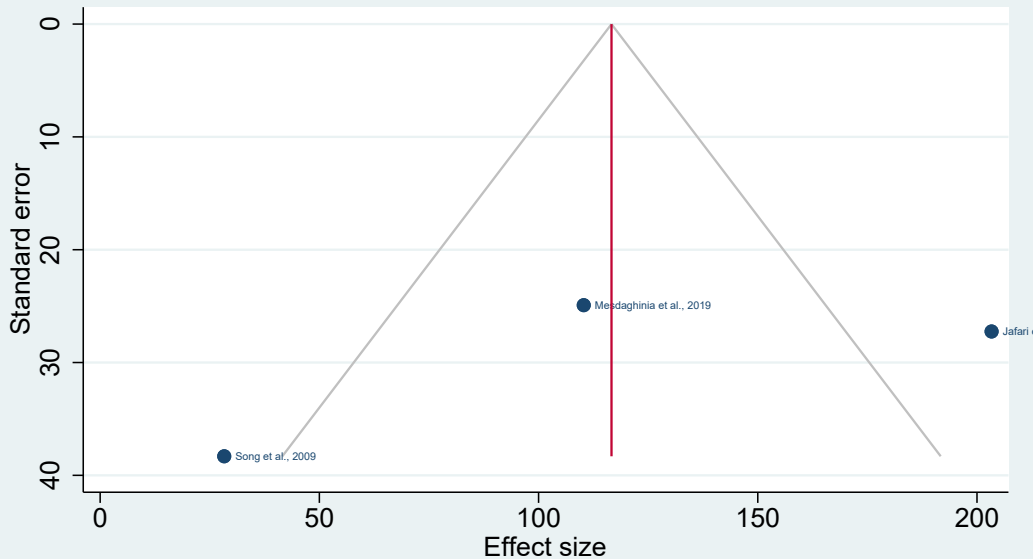
Insulin-like growth factor 1 ($\mu\text{g/L}$)

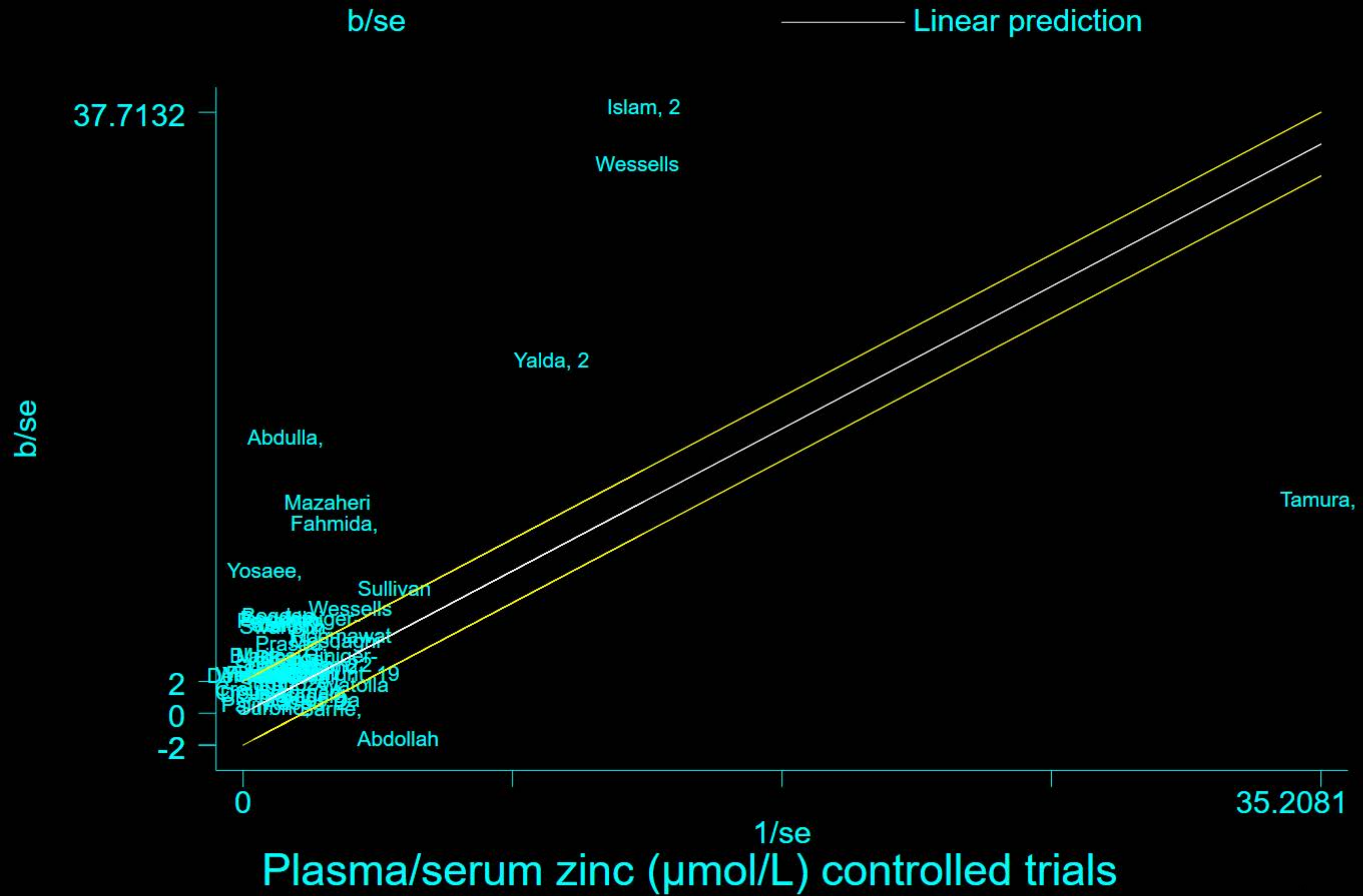


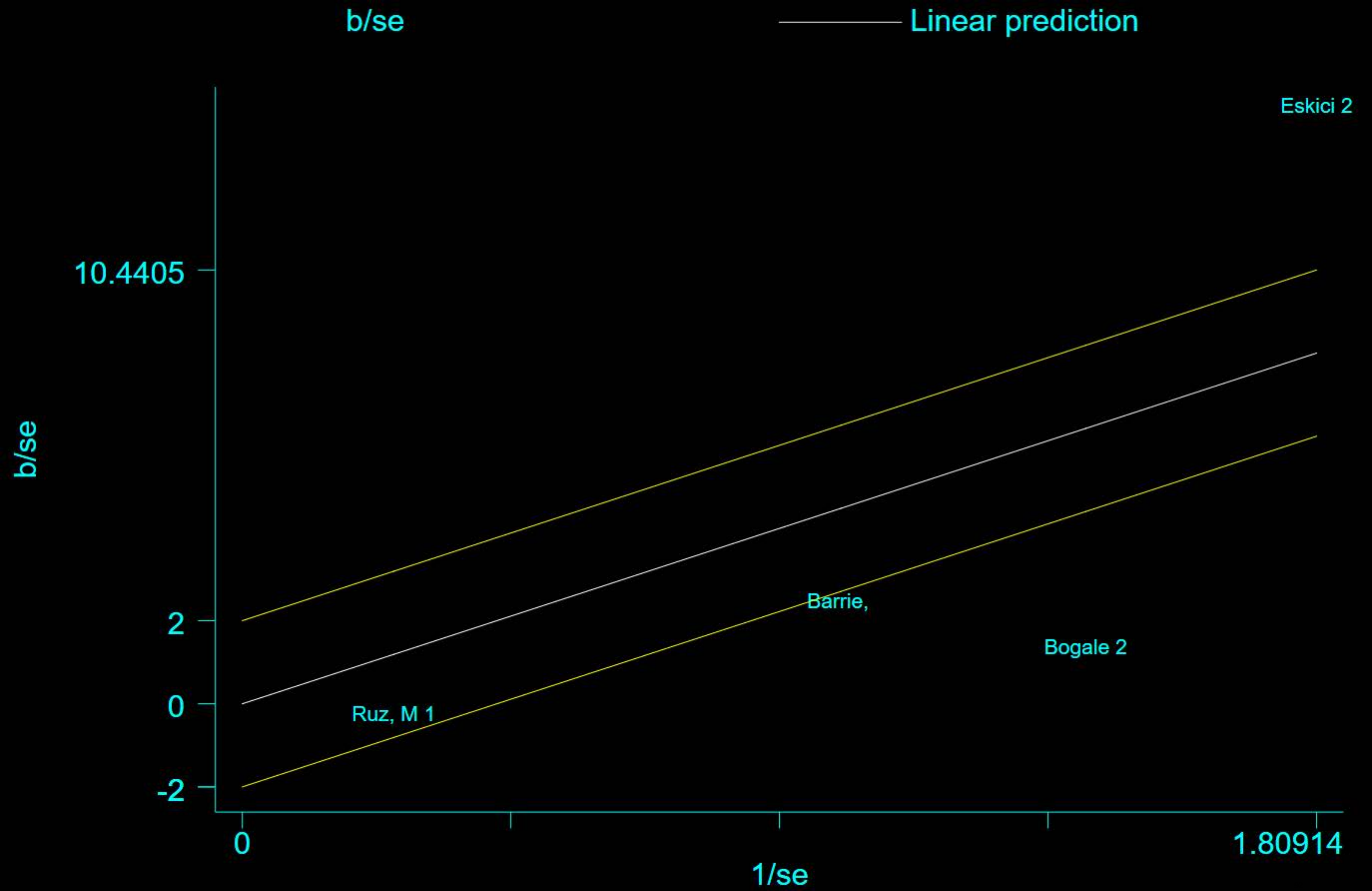
Brain-derived neurotrophic factor (ng/mL)

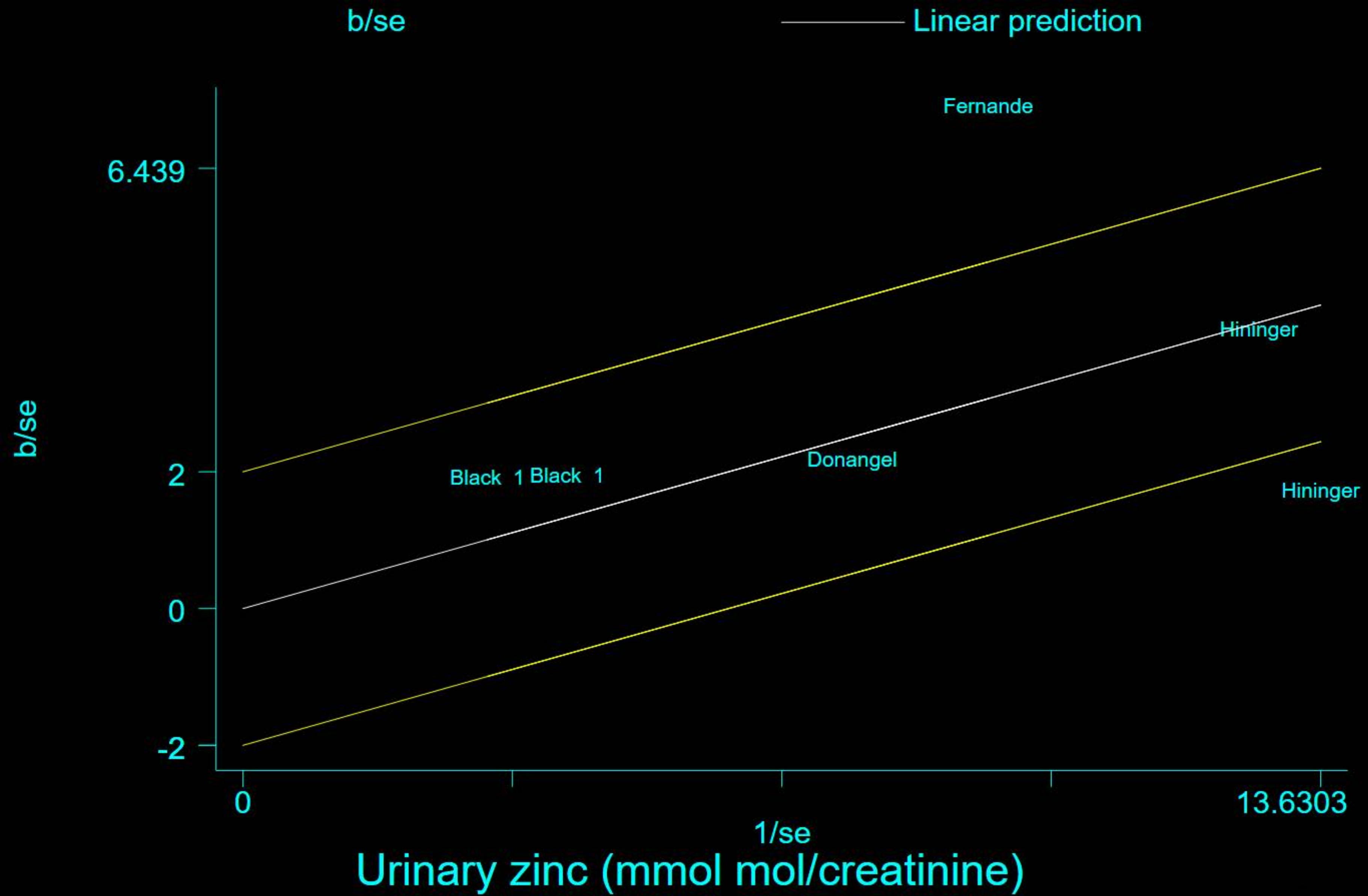


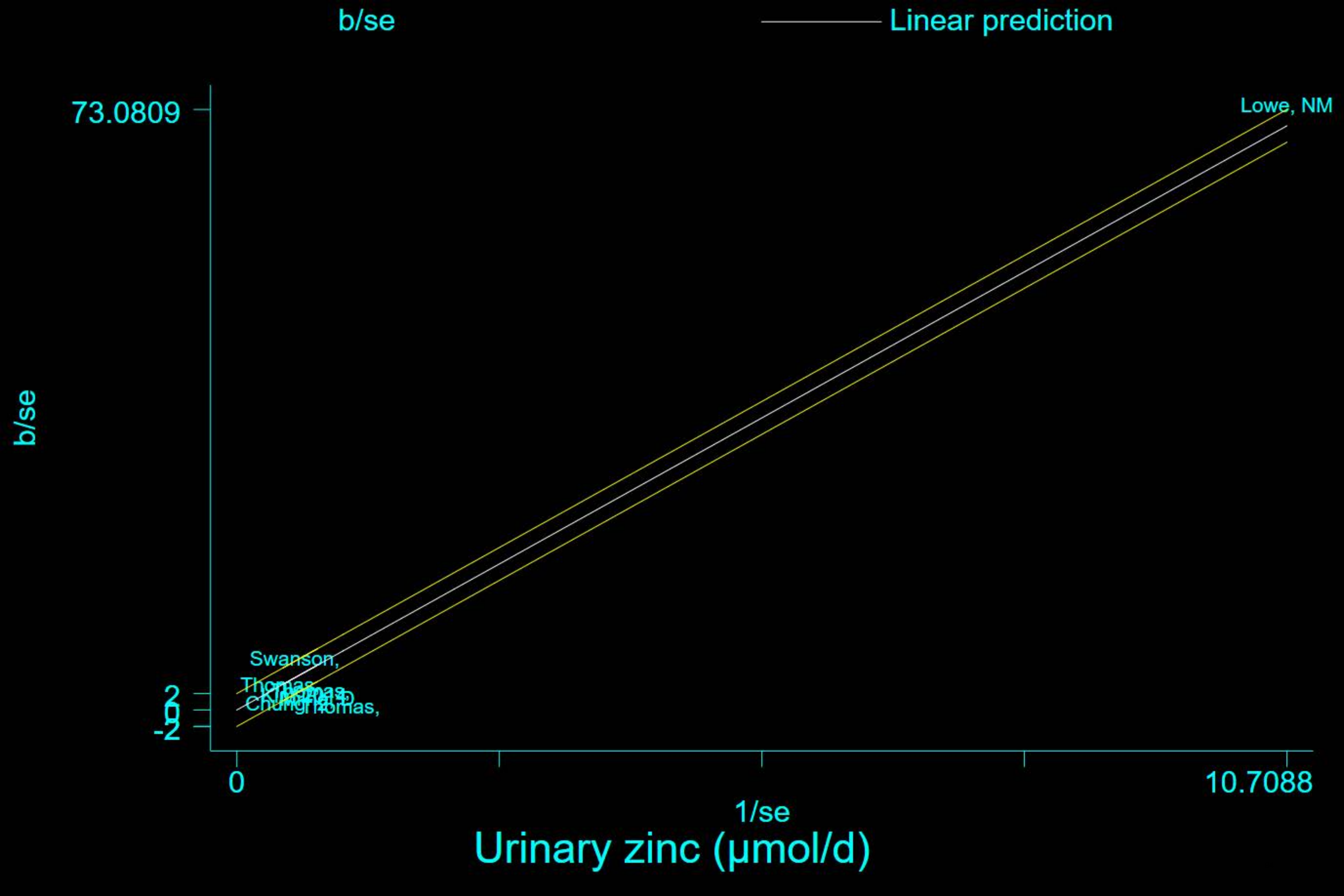
Total antioxidant capacity (mmol/L)

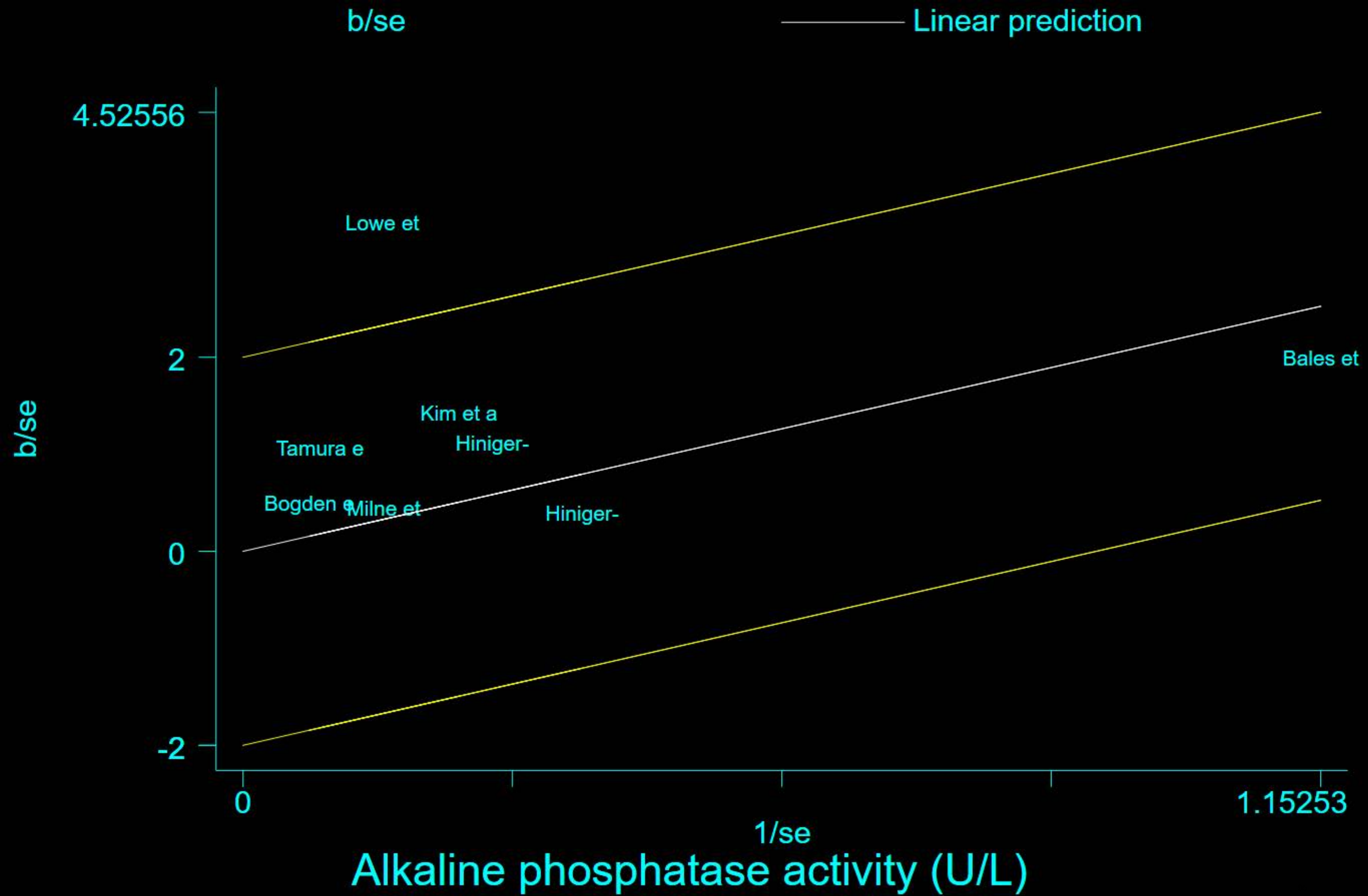


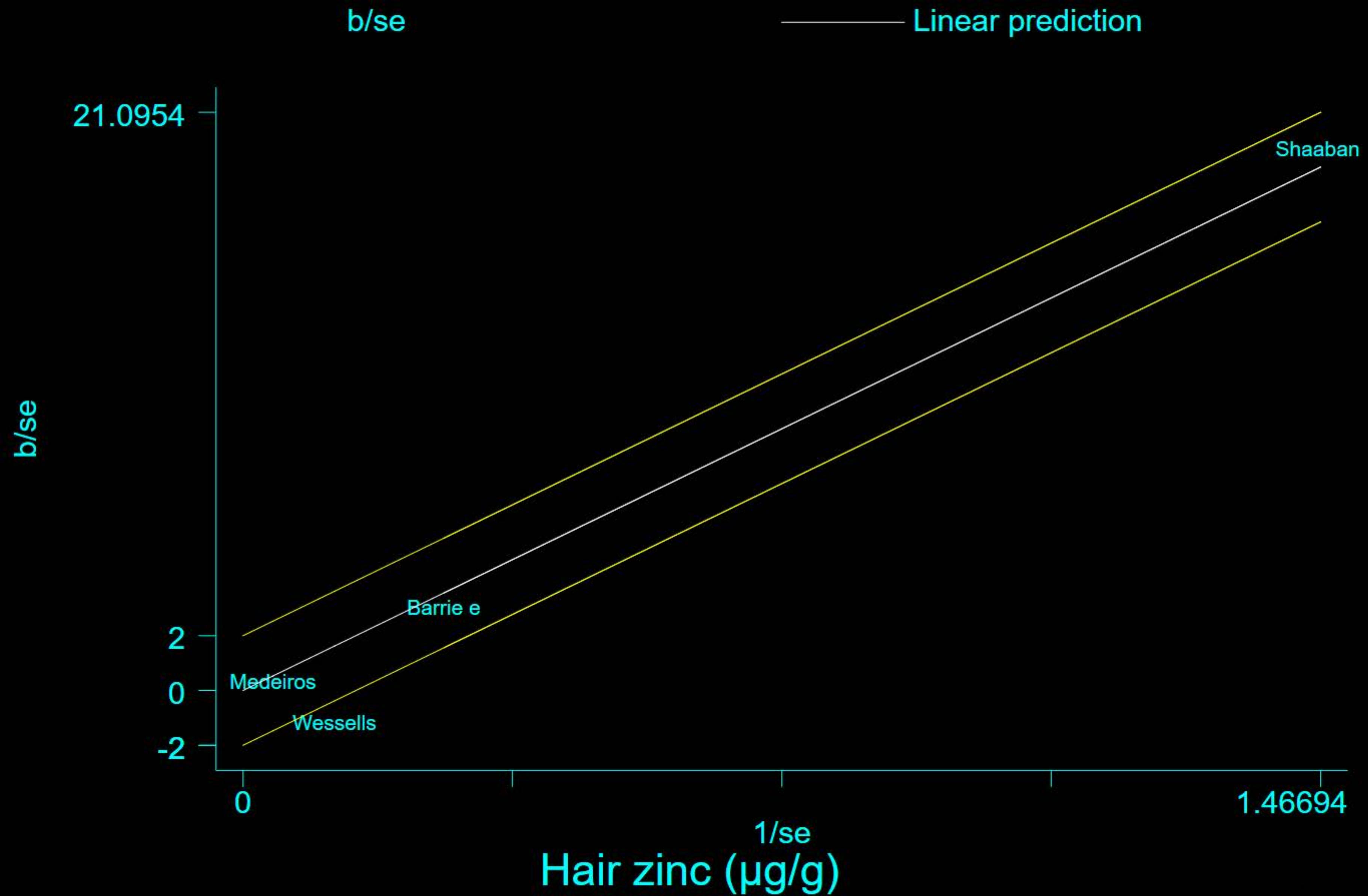


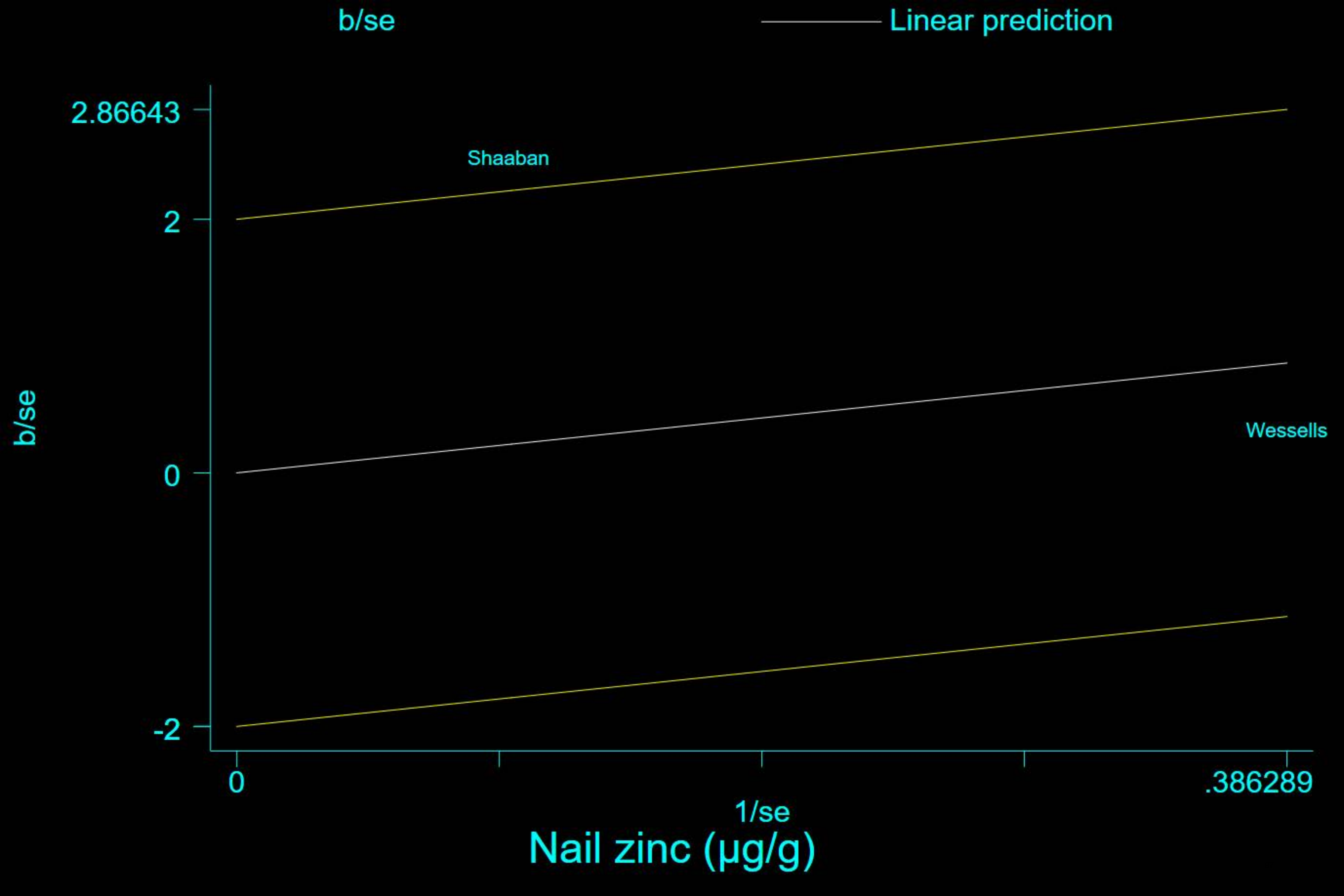


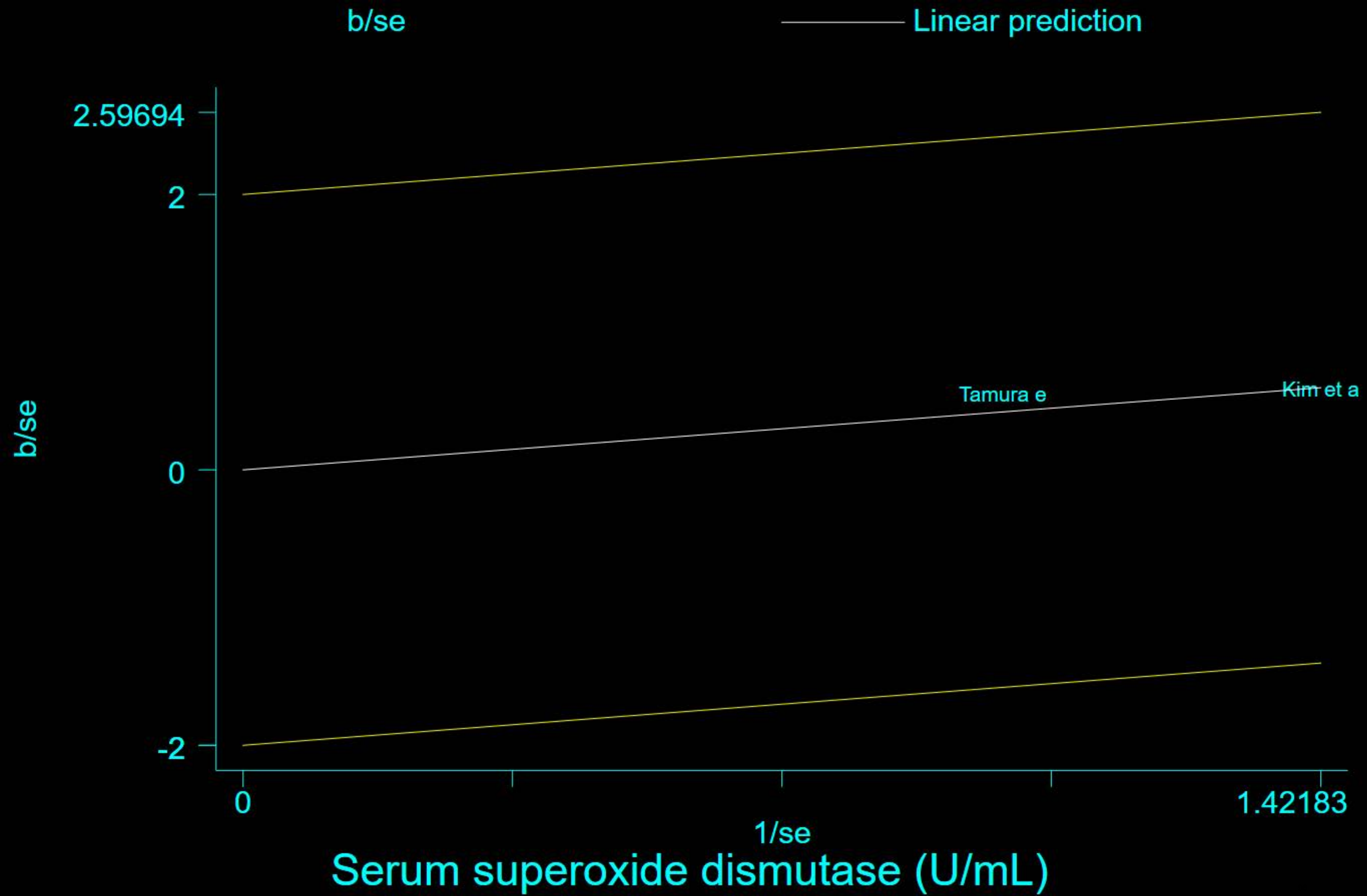


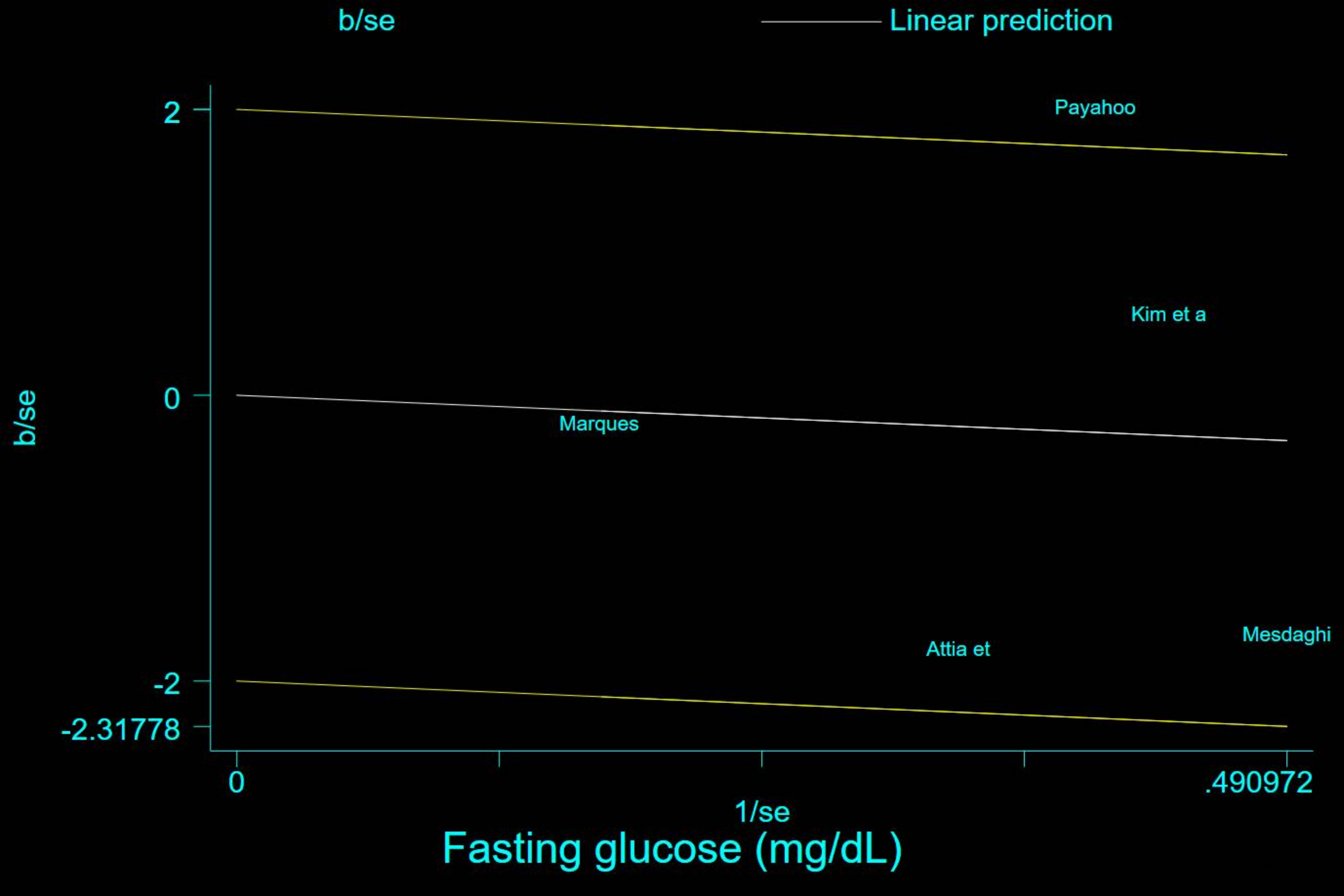


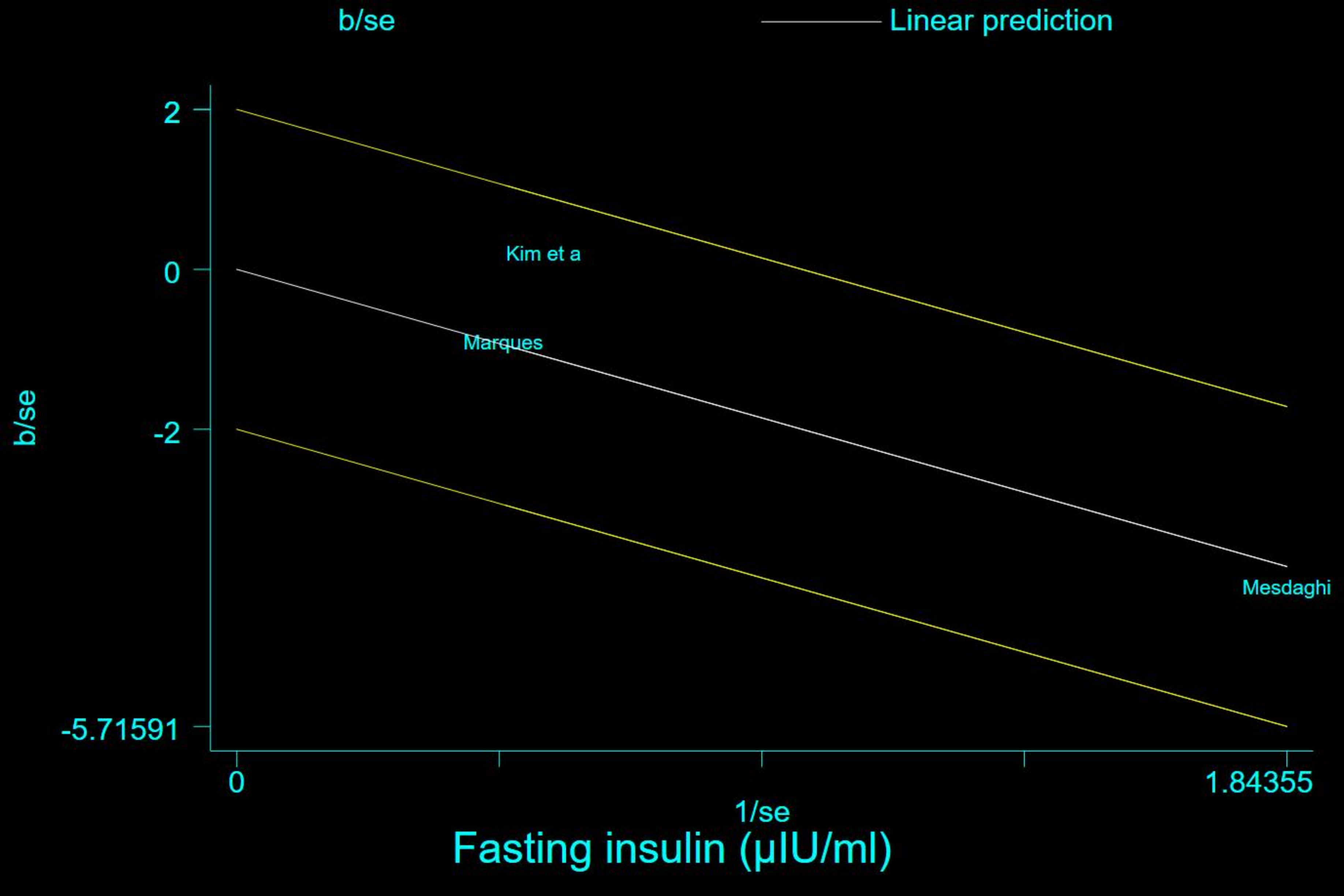


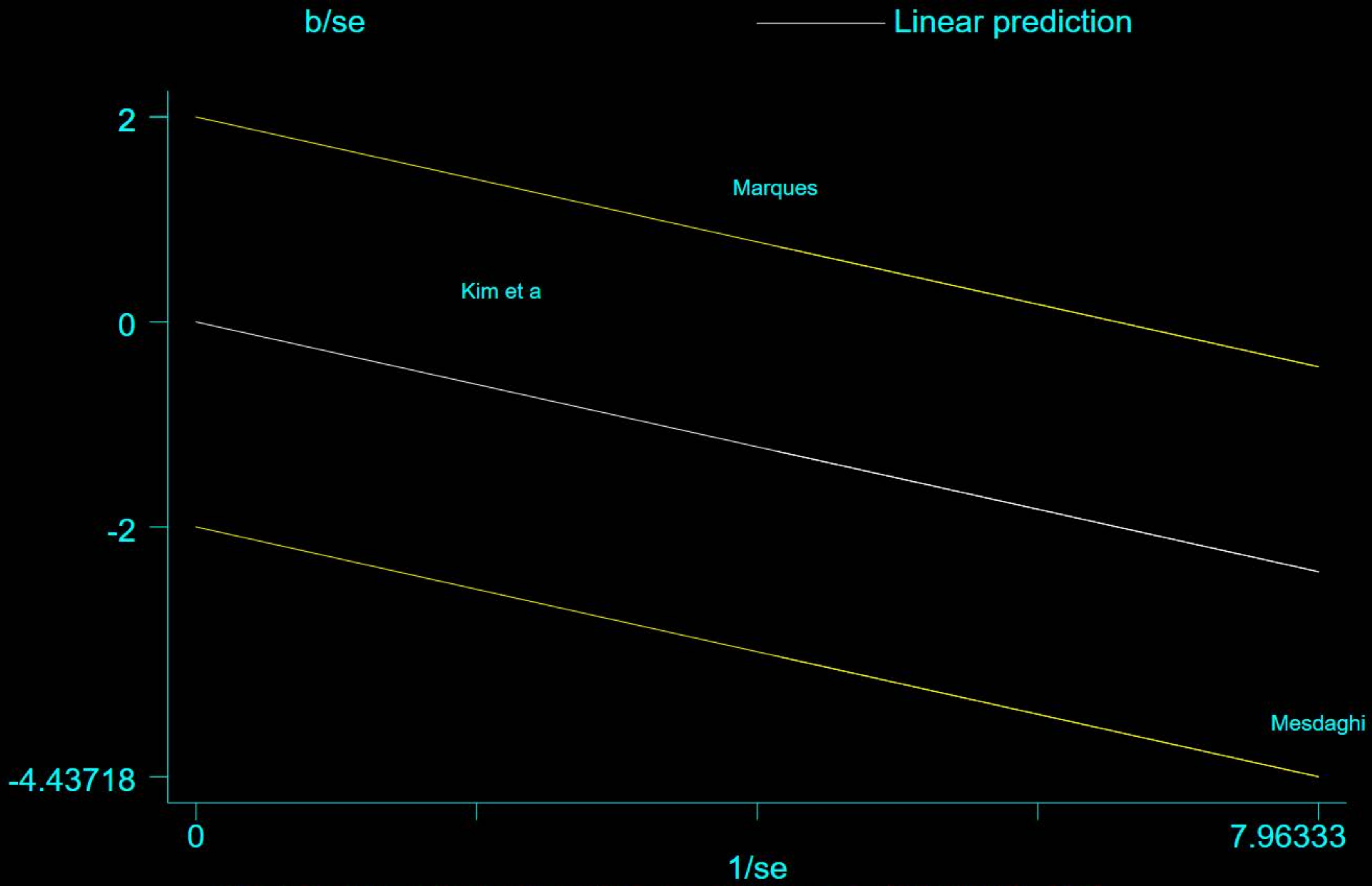




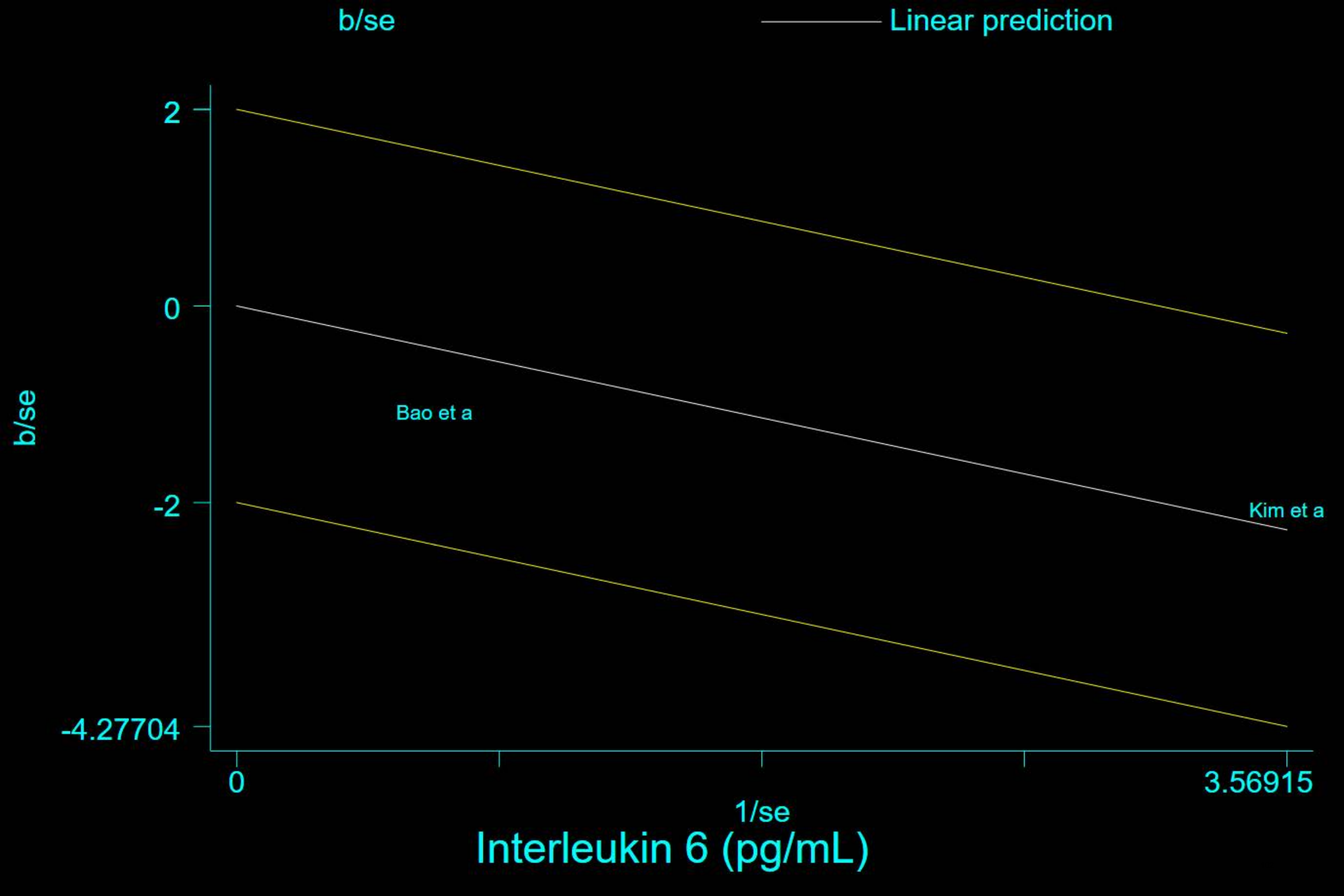


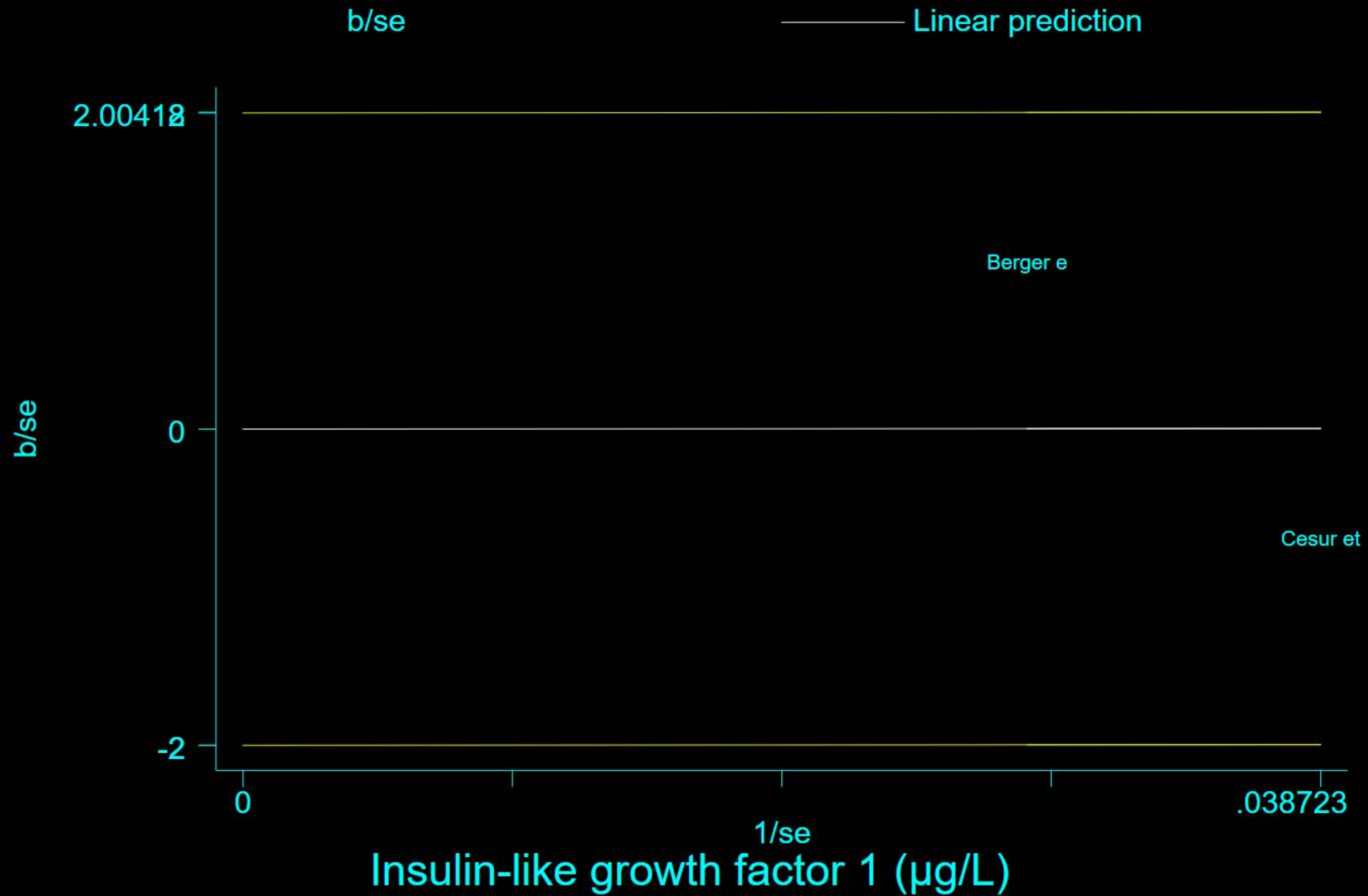


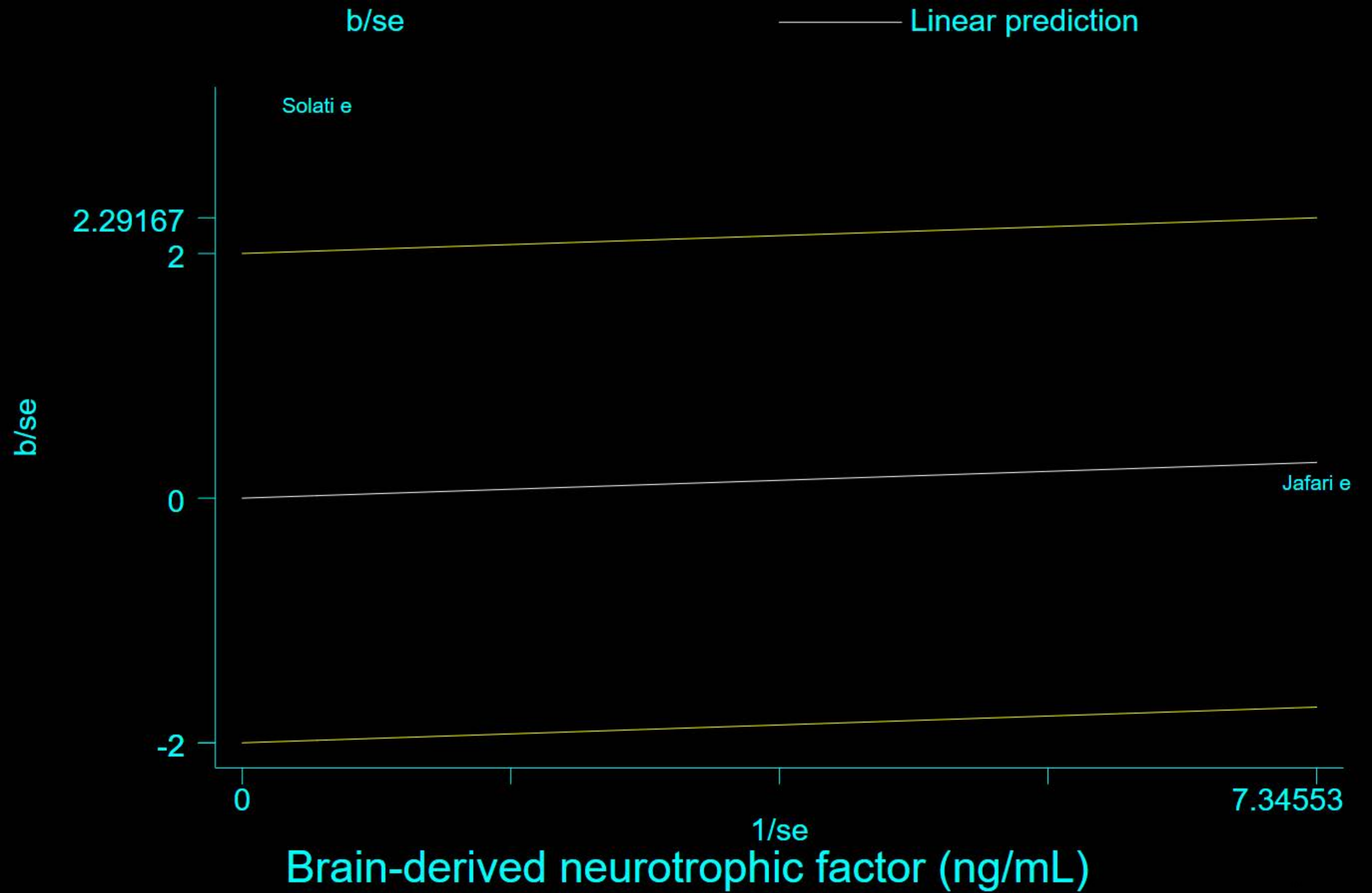


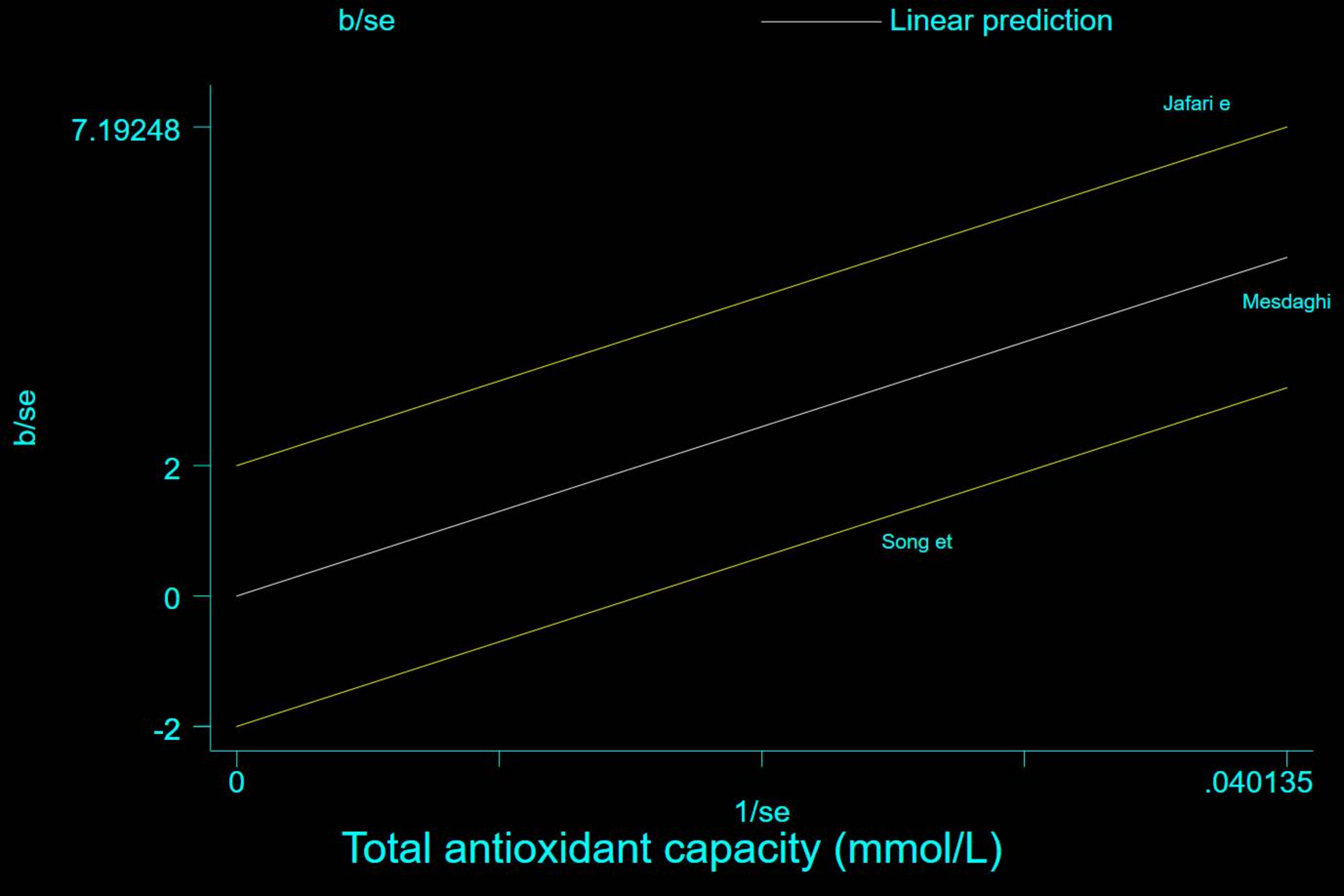


Galbraith plot: Insulin resistance (HOMA-IR)



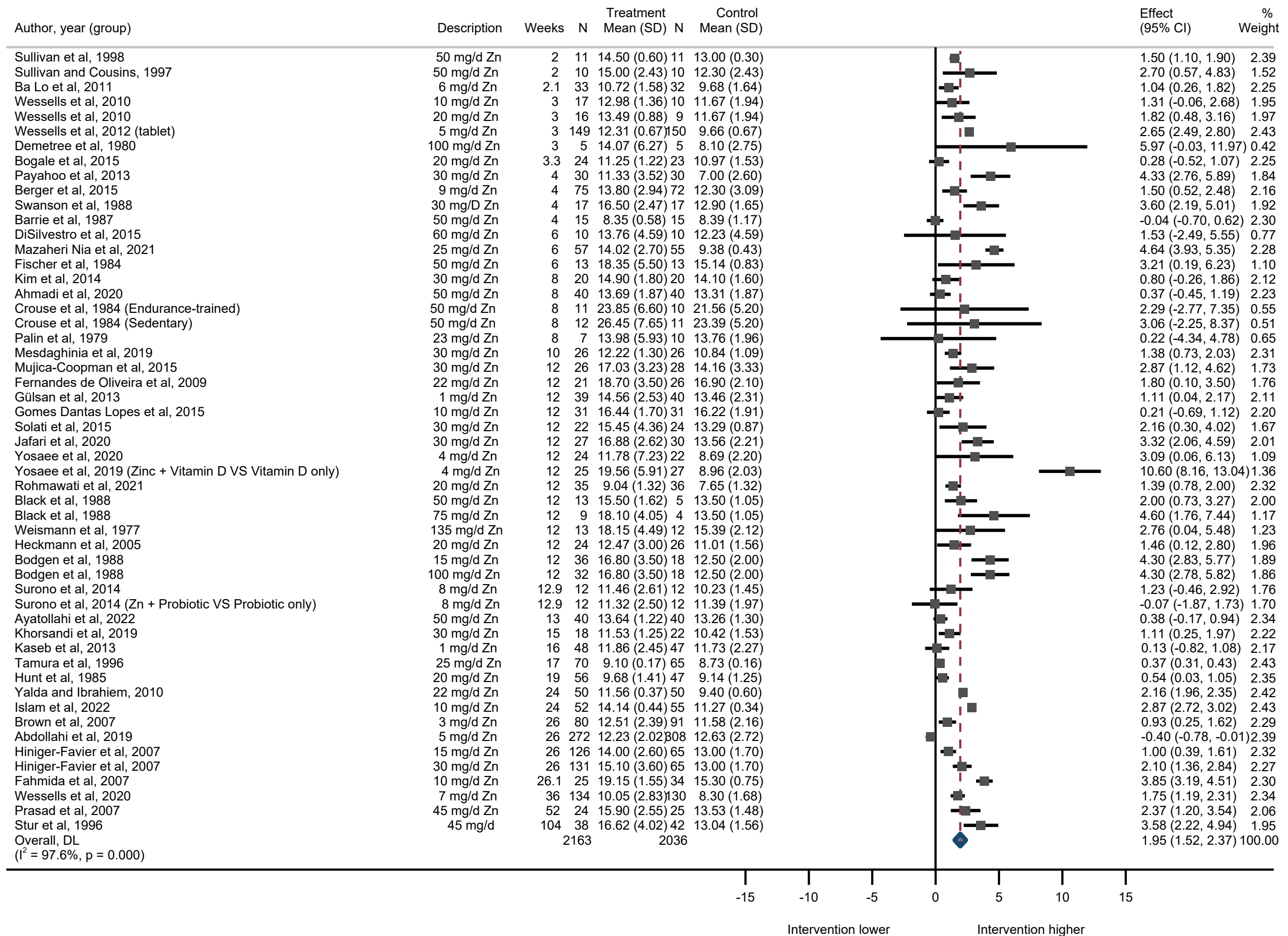






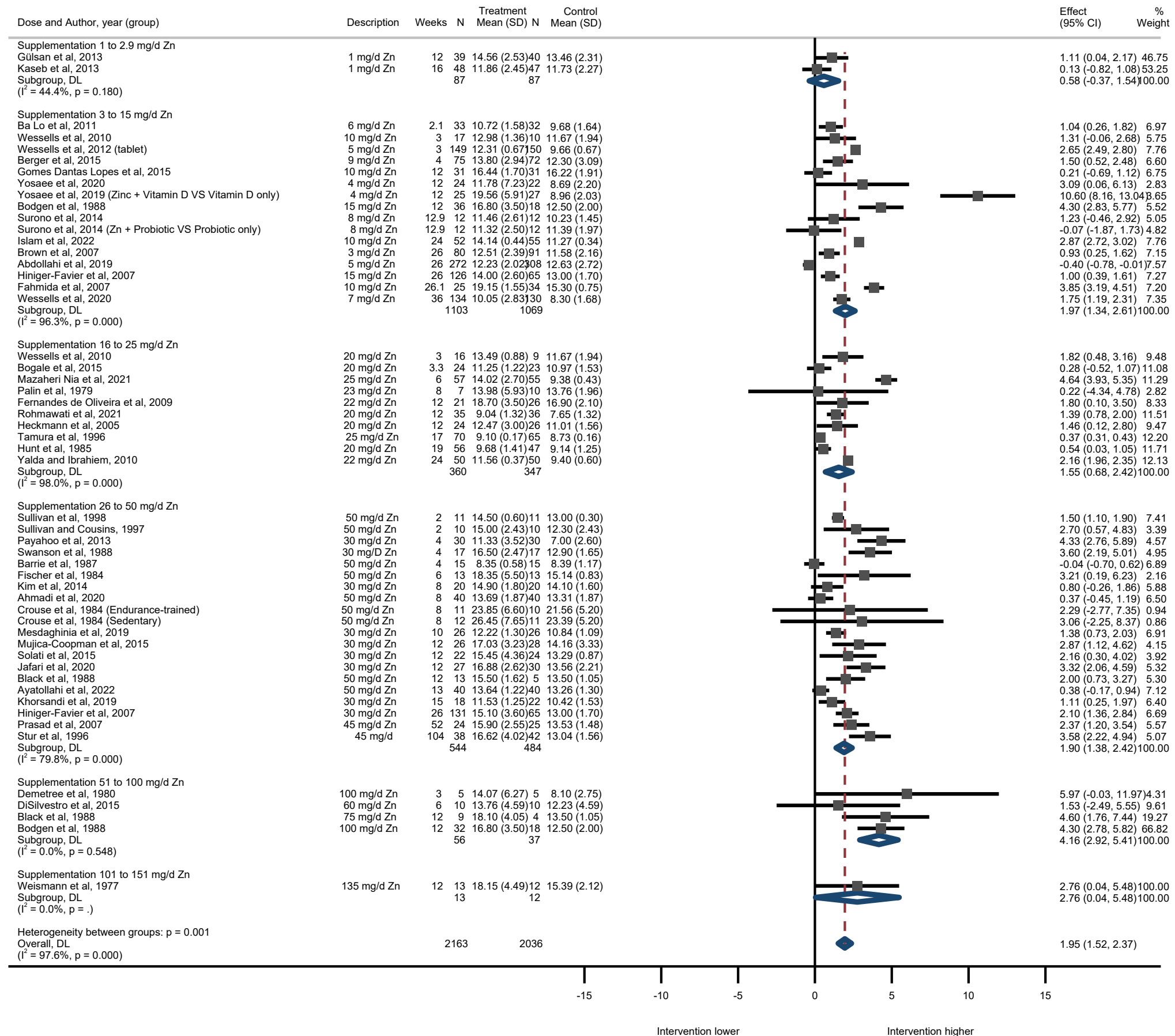
Plasma/serum zinc ($\mu\text{mol/L}$)

Controlled trials (without Abdulla 1979)



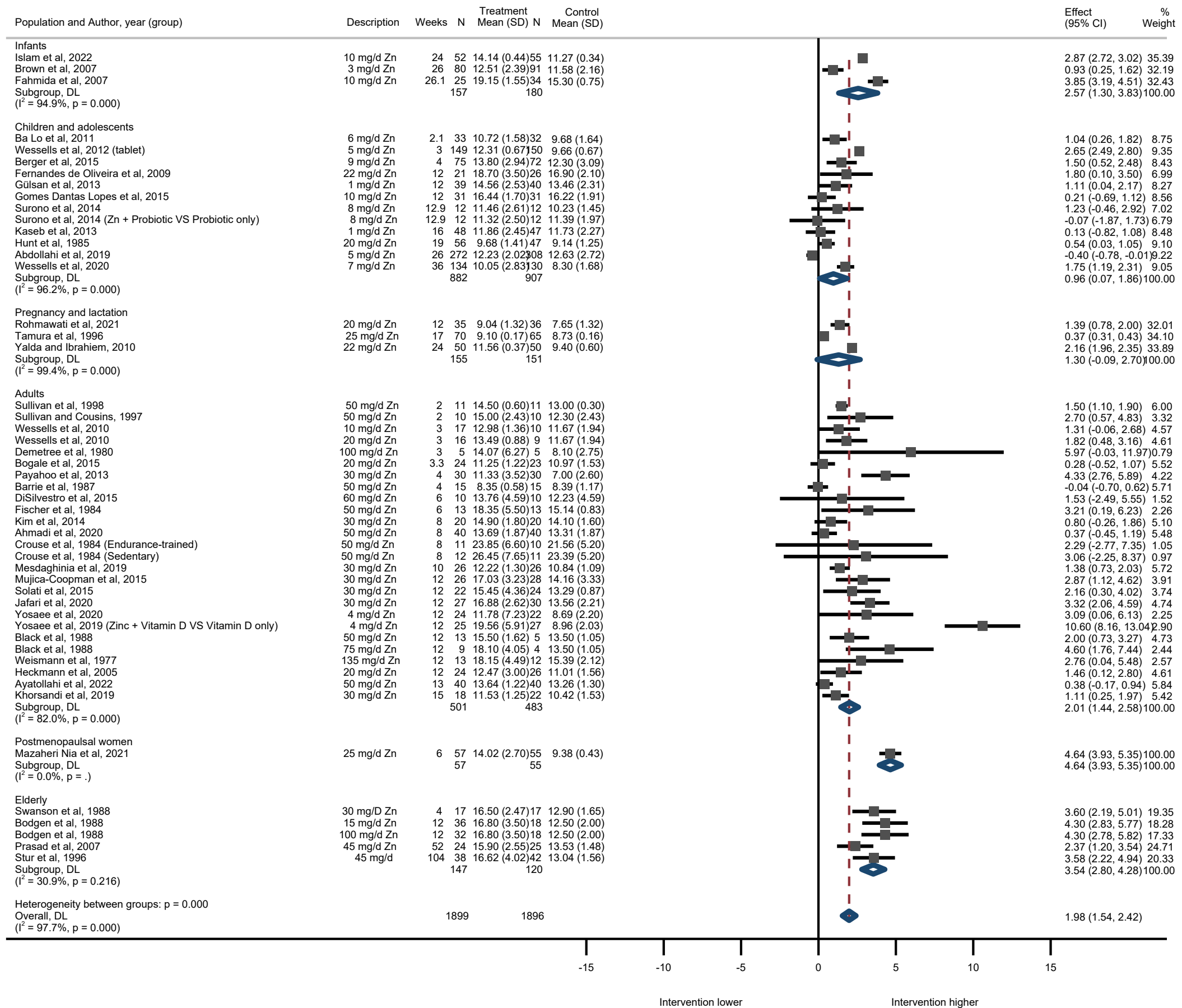
Plasma/serum zinc ($\mu\text{mol/L}$) by dose

Controlled trials (without Abdulla 1979)



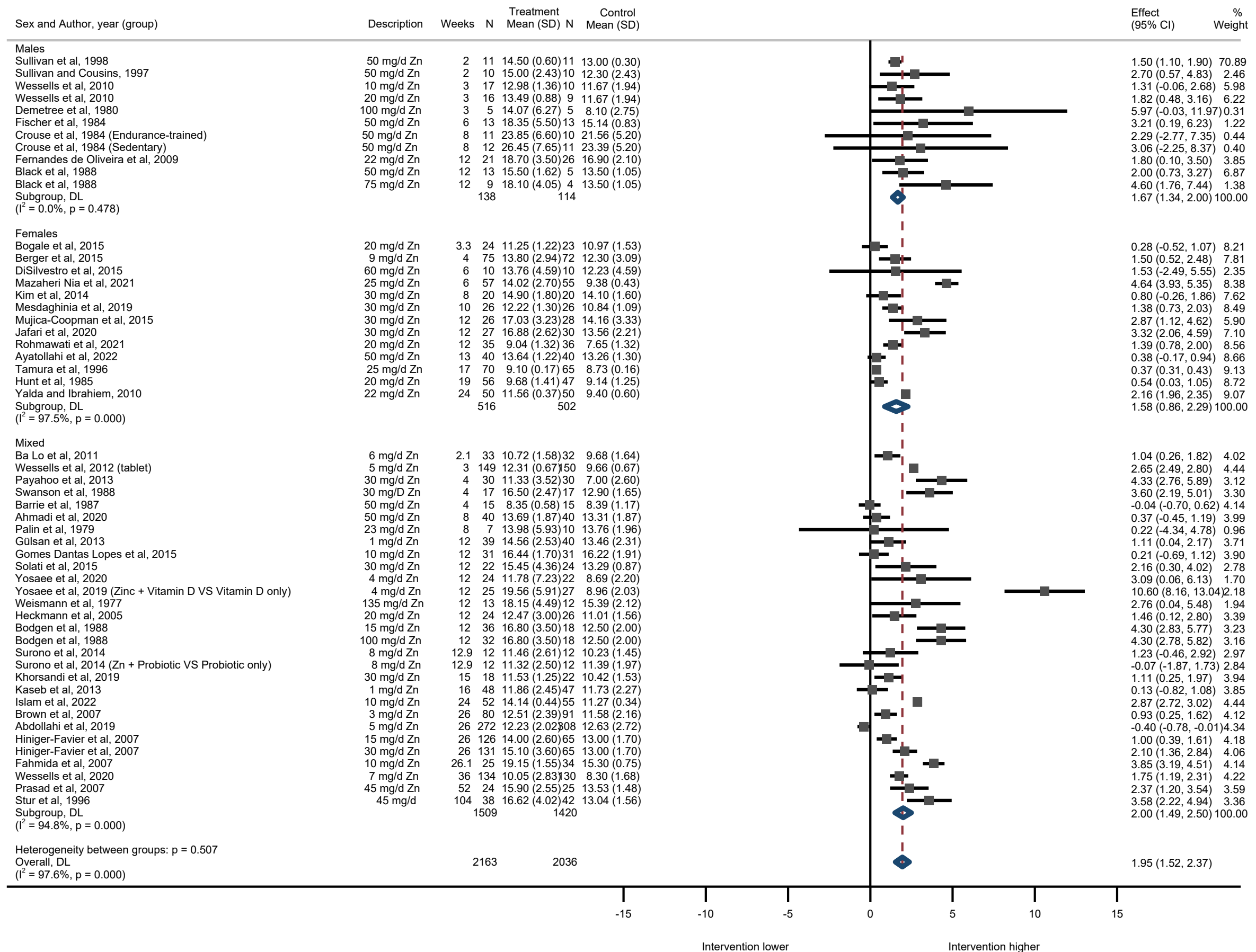
Plasma/serum zinc (µmol/L) by population

Controlled trials (without Abdulla 1979)



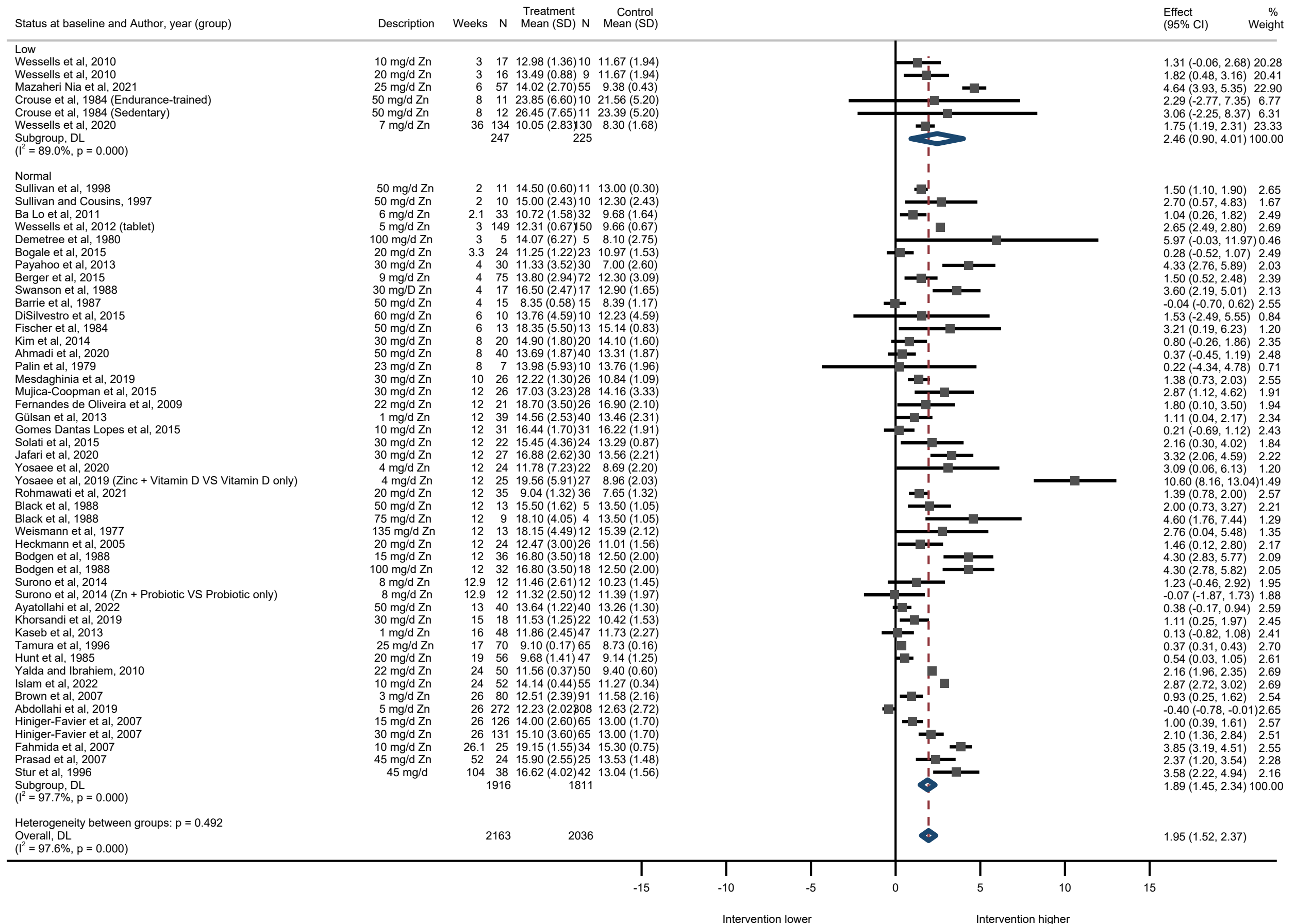
Plasma/serum zinc (µmol/L) by sex

Controlled trials (without Abdulla 1979)



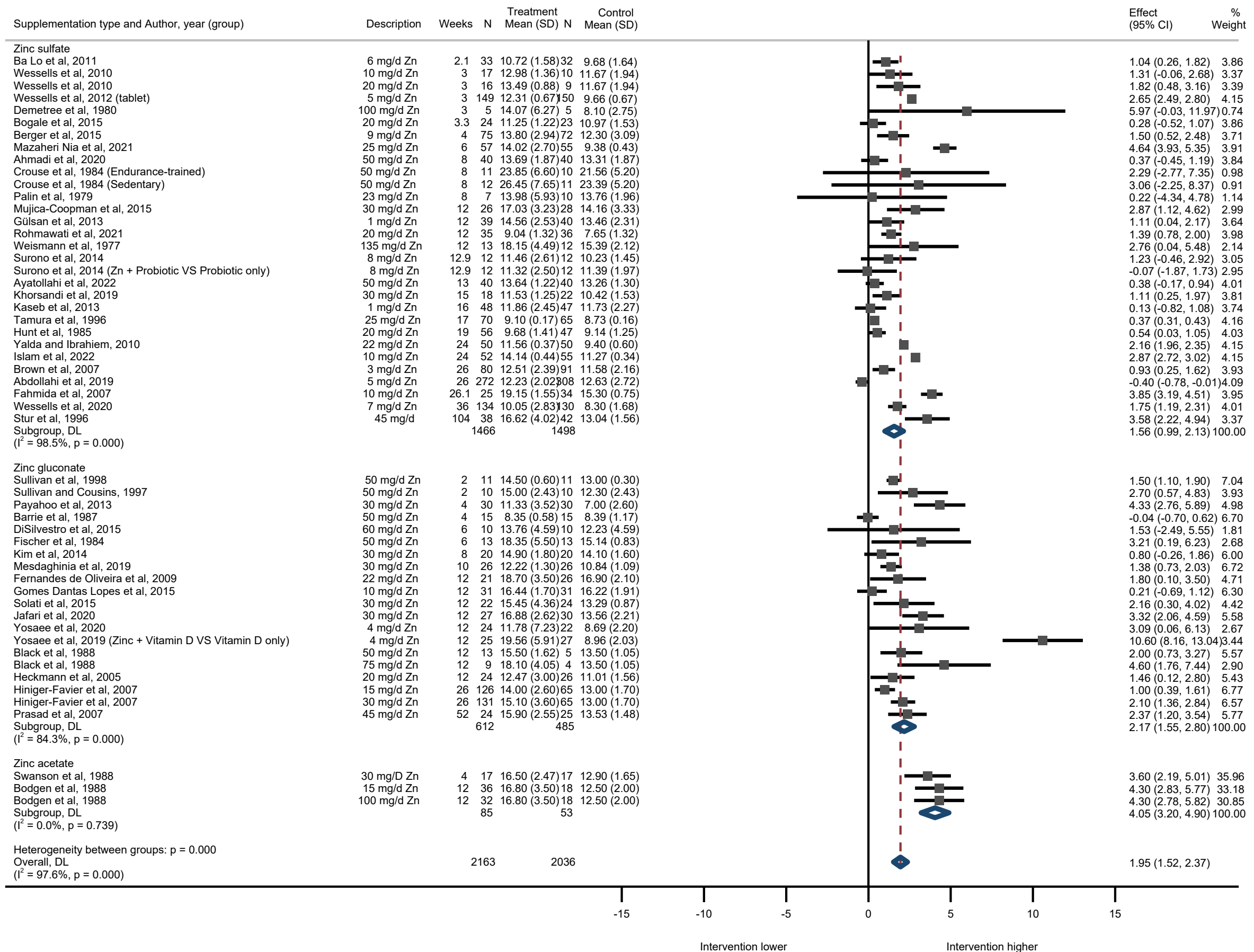
Plasma/serum zinc (µmol/L) by status at baseline

Controlled trials (without Abdulla 1979)

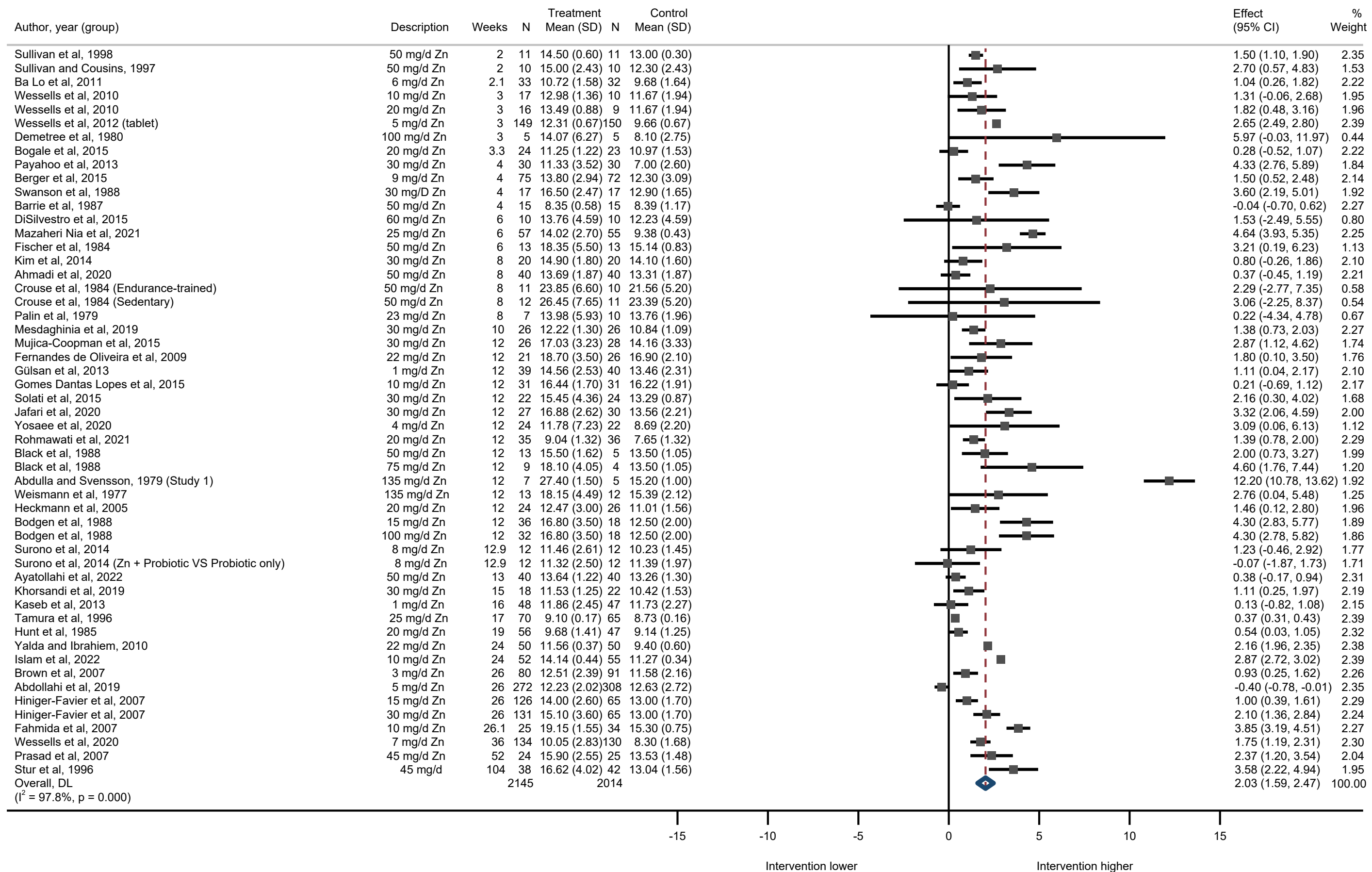


Plasma/serum zinc ($\mu\text{mol/L}$) by supplementation type

Controlled trials (without Abdulla 1979)

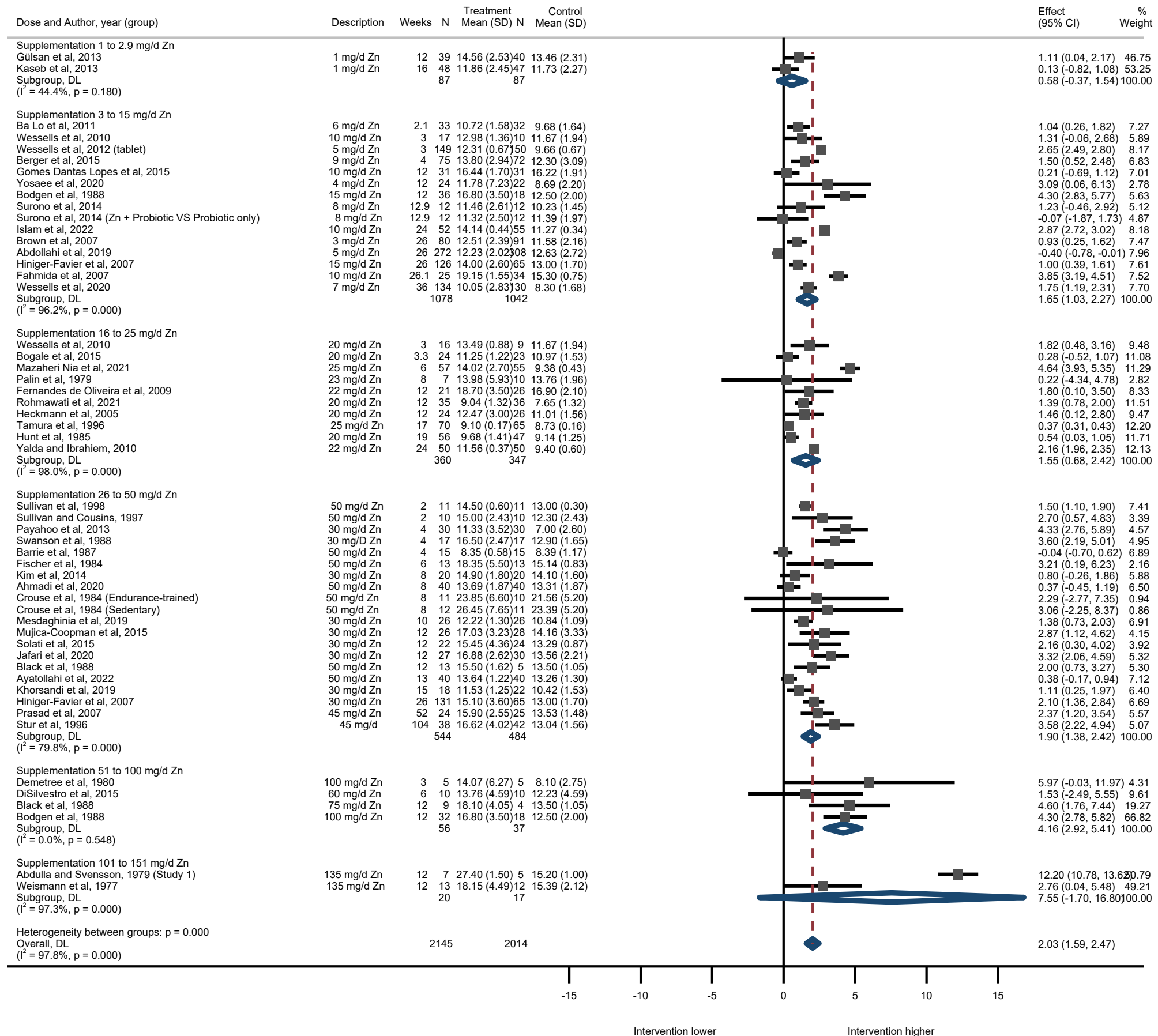


Plasma/serum zinc (μmol/L) Controlled trials (without Yosae 2019)



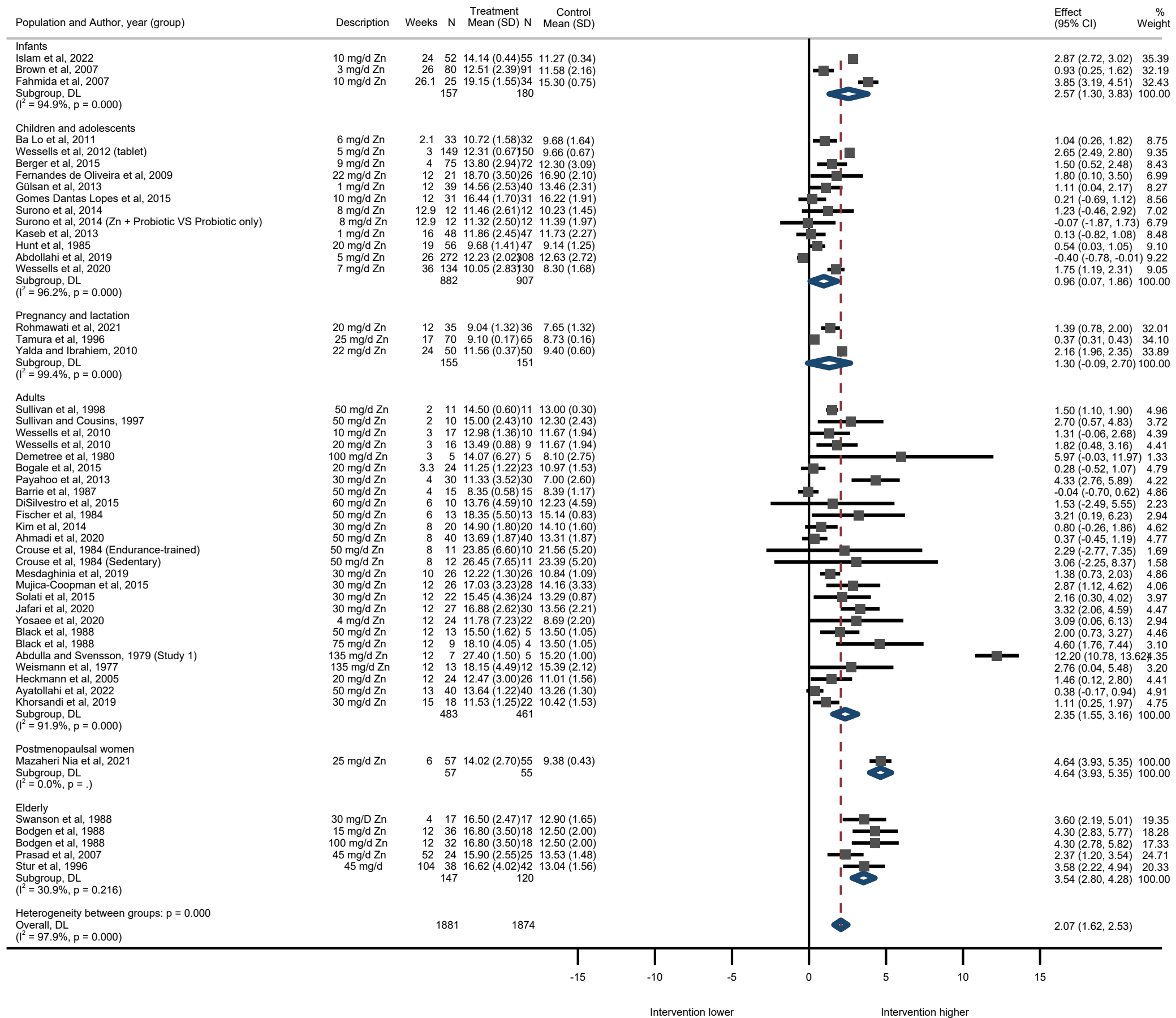
Plasma/serum zinc (µmol/L) by dose

Controlled trials (without Yosae 2019)



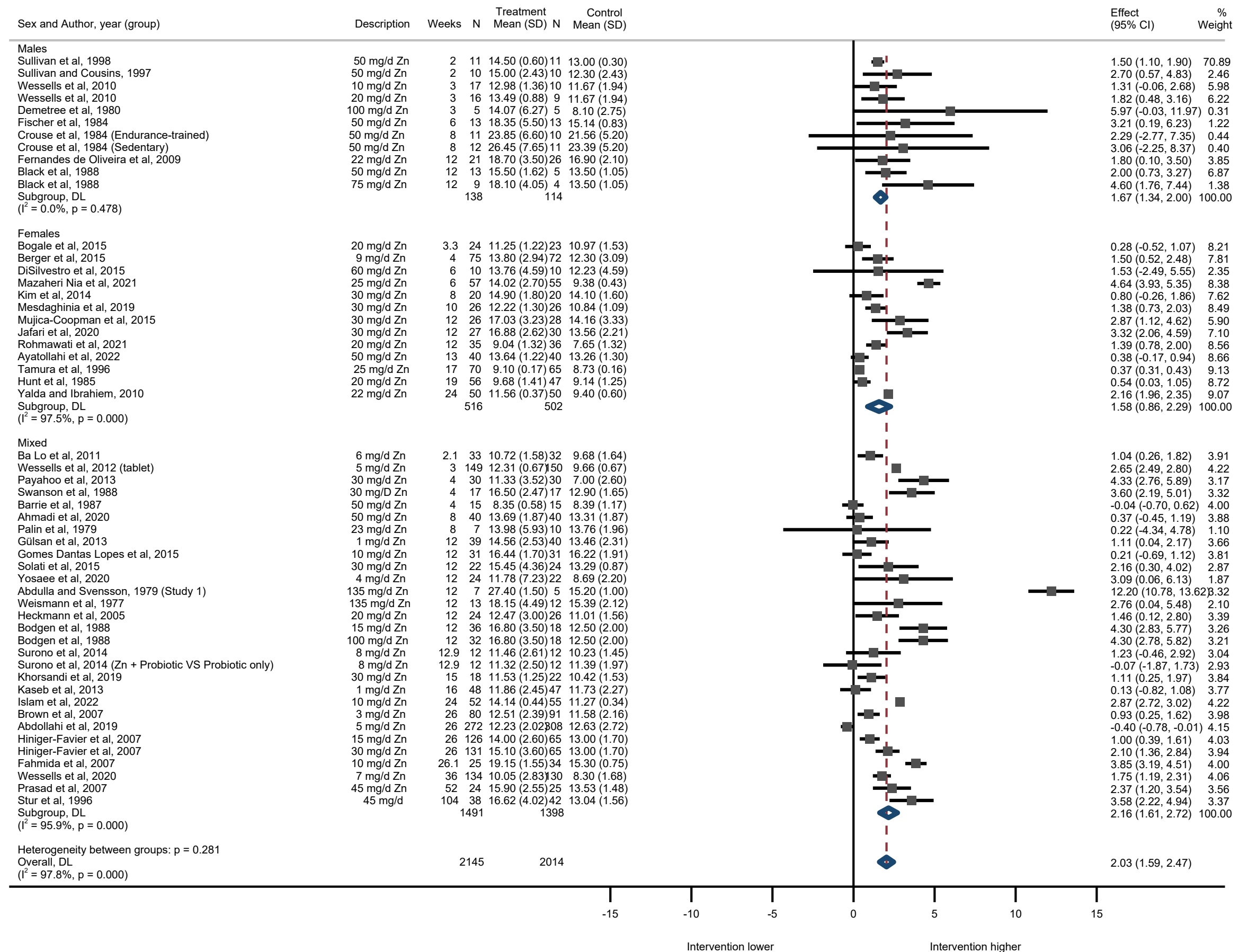
Plasma/serum zinc (µmol/L) by population

Controlled trials (without Yosae 2019)



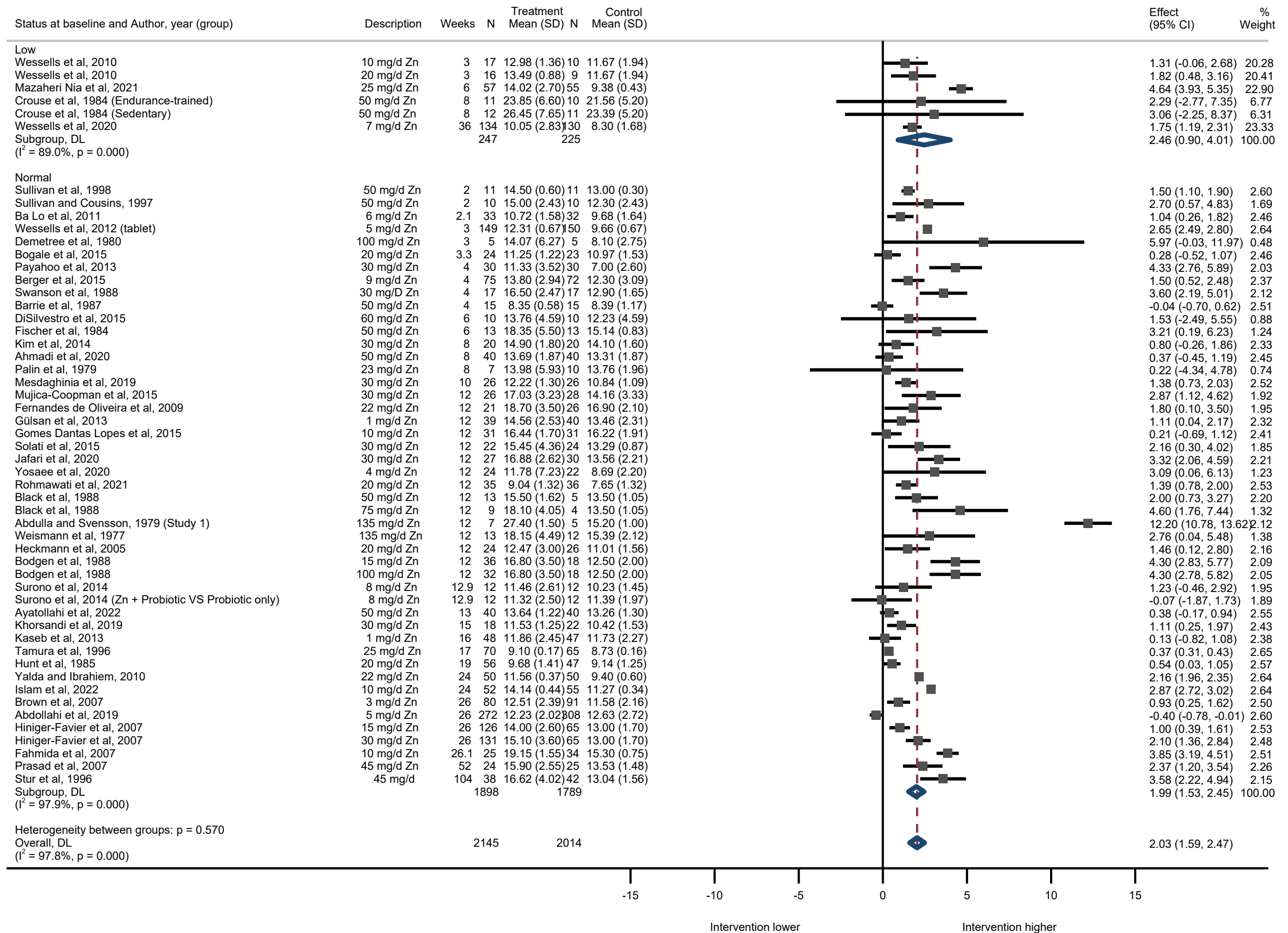
Plasma/serum zinc (µmol/L) by sex

Controlled trials (without Yosae 2019)



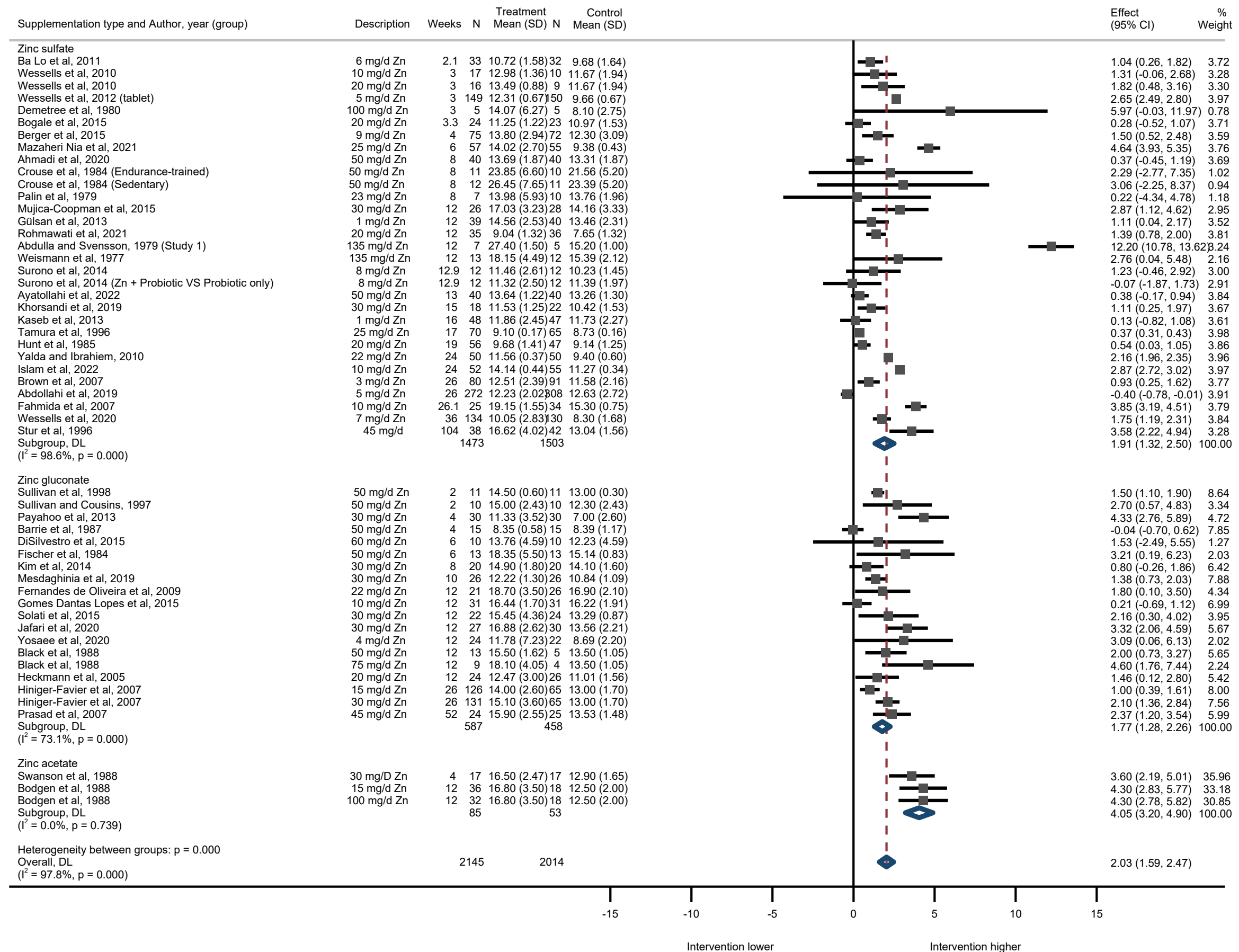
Plasma/serum zinc ($\mu\text{mol/L}$) by status at baseline

Controlled trials (without Yosae 2019)

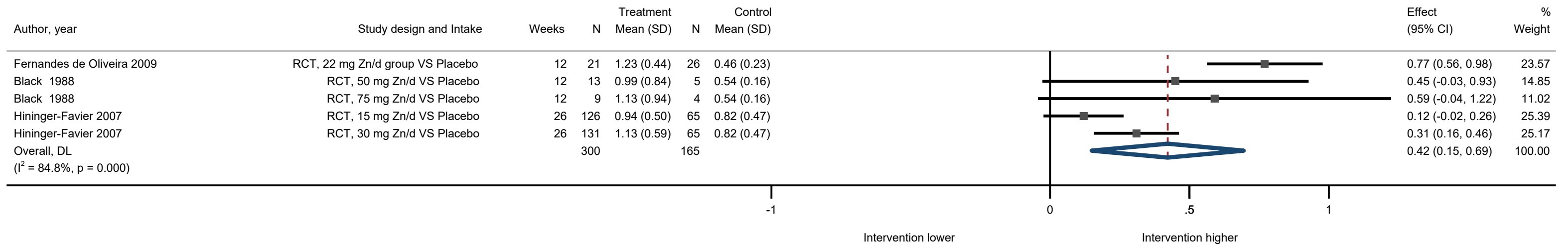


Plasma/serum zinc (µmol/L) by supplementation type

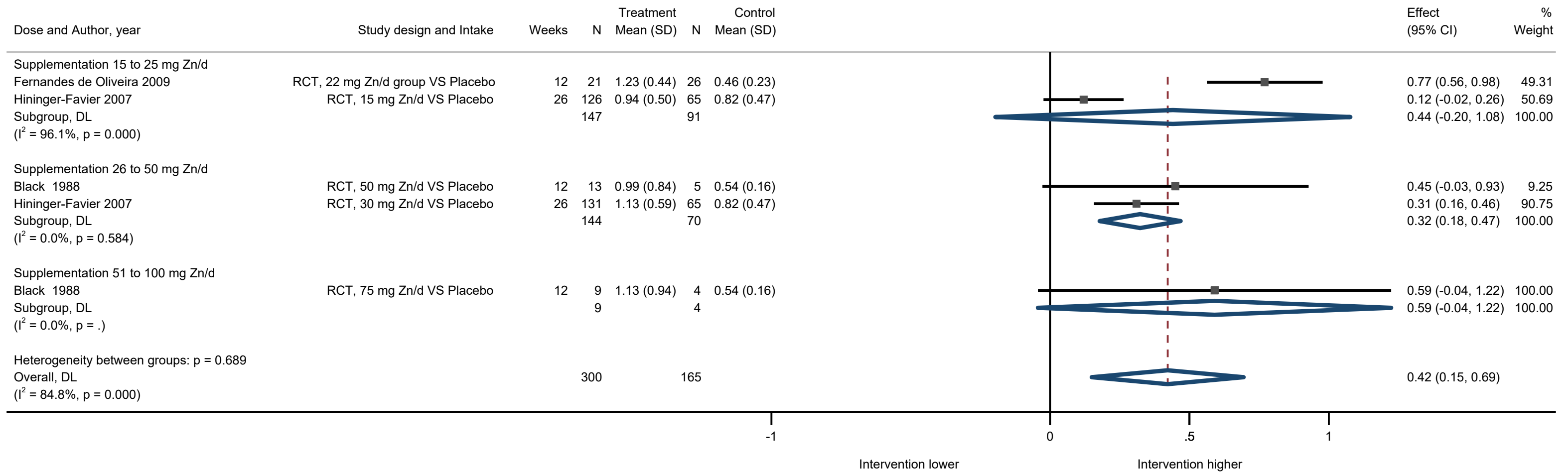
Controlled trials (without Yosae 2019)



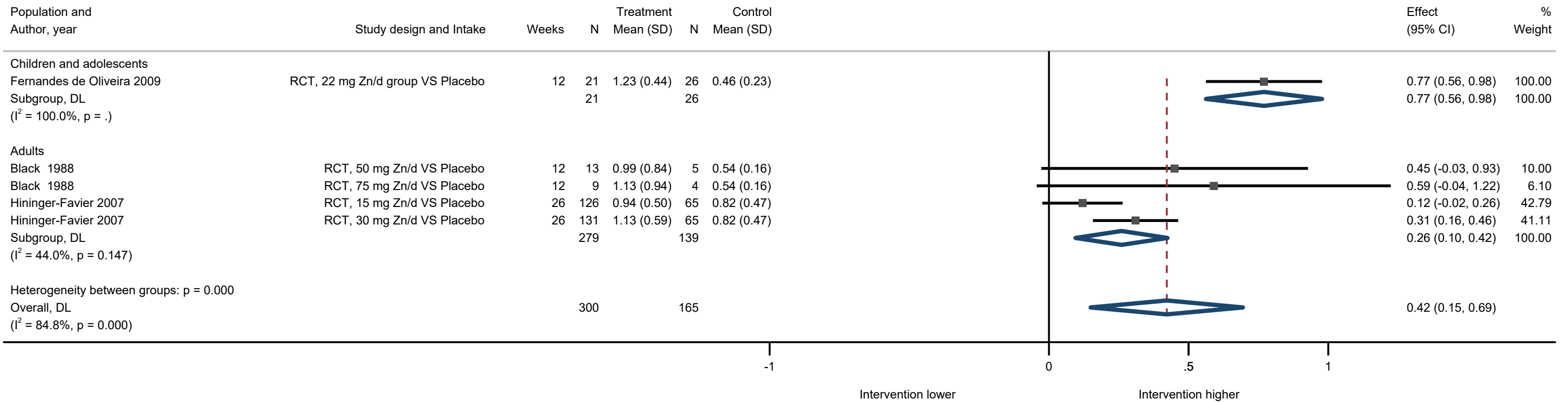
Urinary zinc (mmol/mol creatinine) without Donangelo 2022



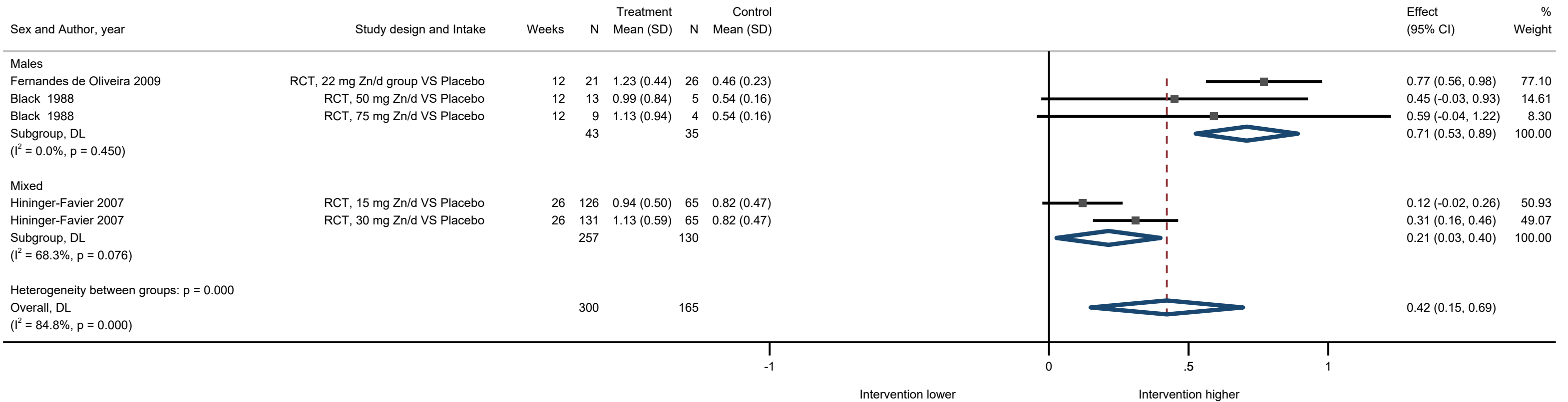
Urinary zinc (mmol/mol creatinine) by dose Without Donangelo 2022



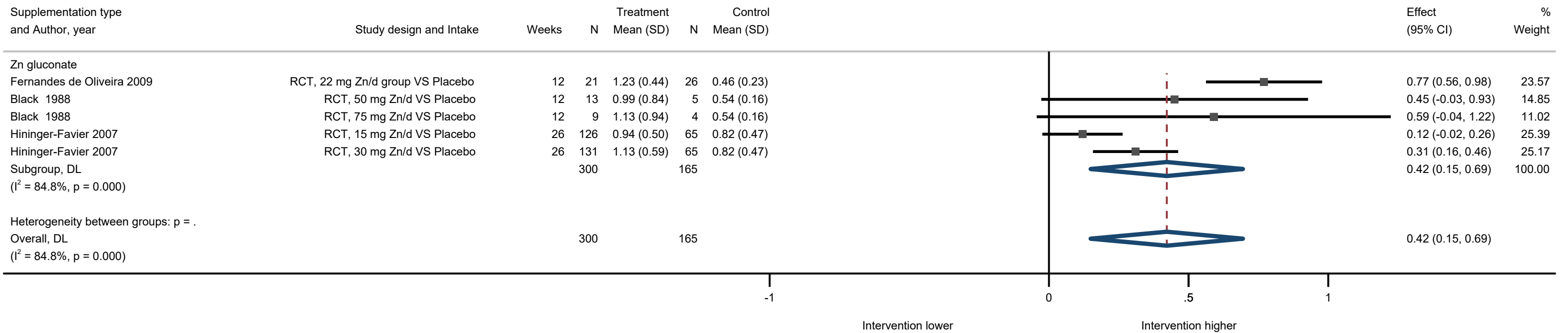
Urinary zinc (mmol/mol creatinine) by population Without Donangelo 2022



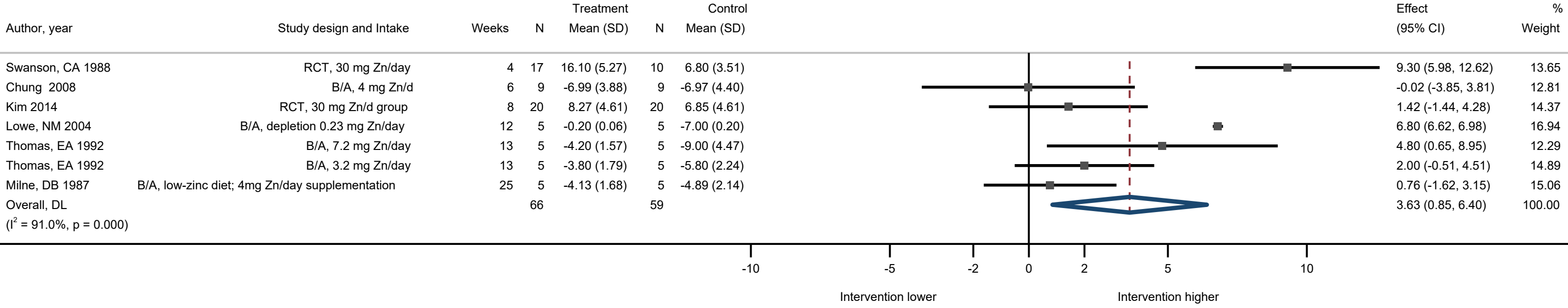
Urinary zinc (mmol/mol creatinine) by sex Without Donangelo 2022



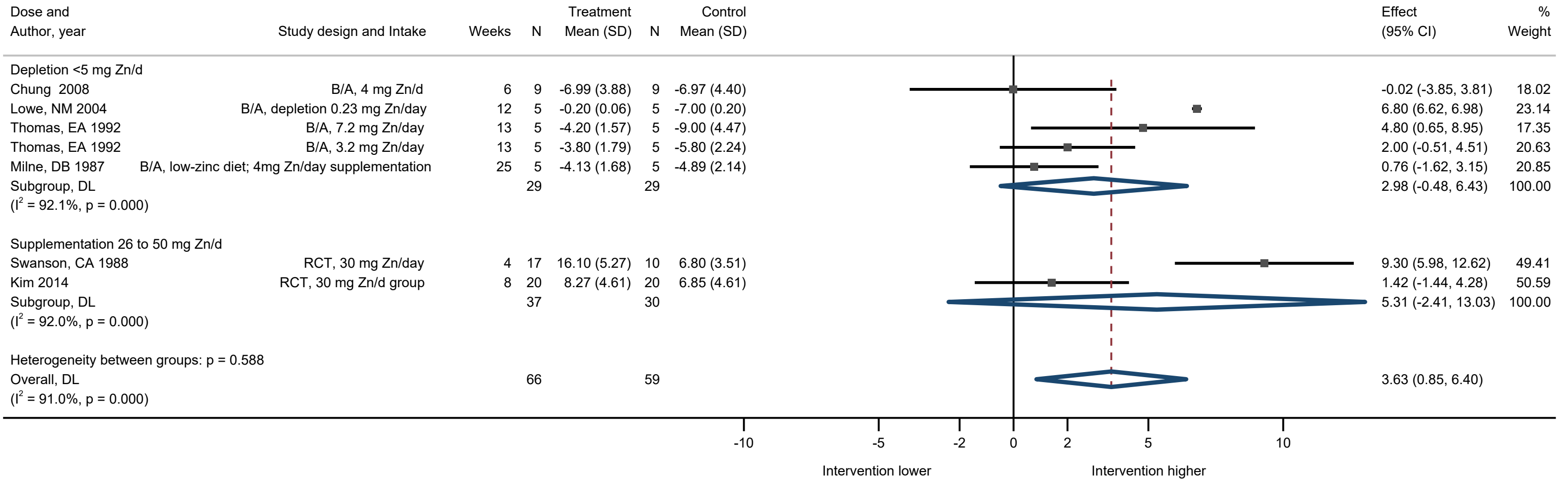
Urinary zinc (mmol/mol creatinine) by supplementation type Without Donangelo 2022



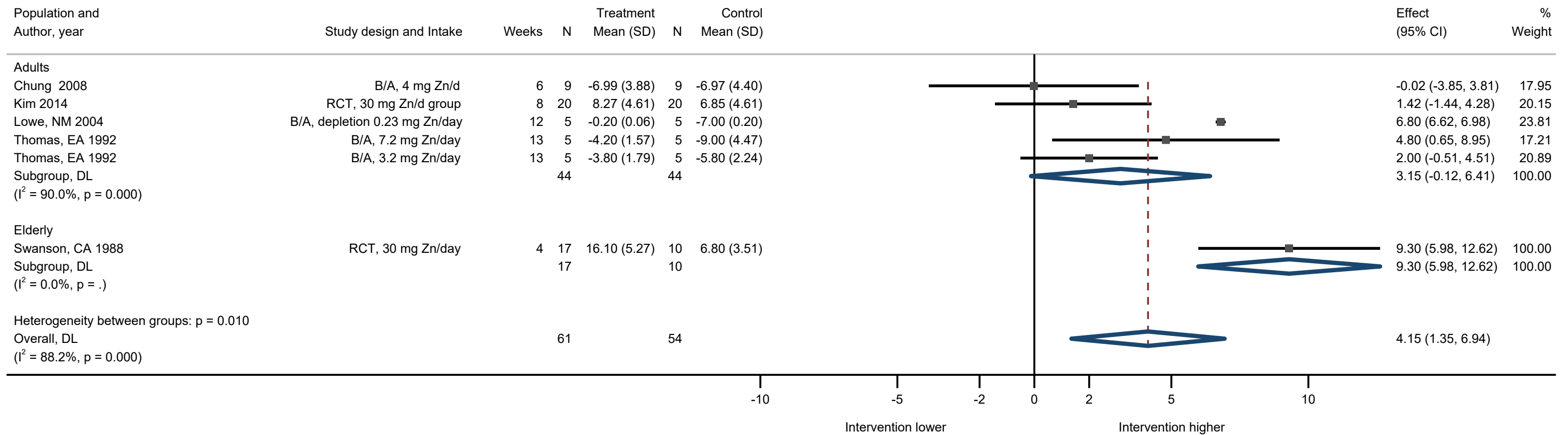
Urinary zinc ($\mu\text{mol/d}$) Without Thomas 1992 (15 mg zn/d)



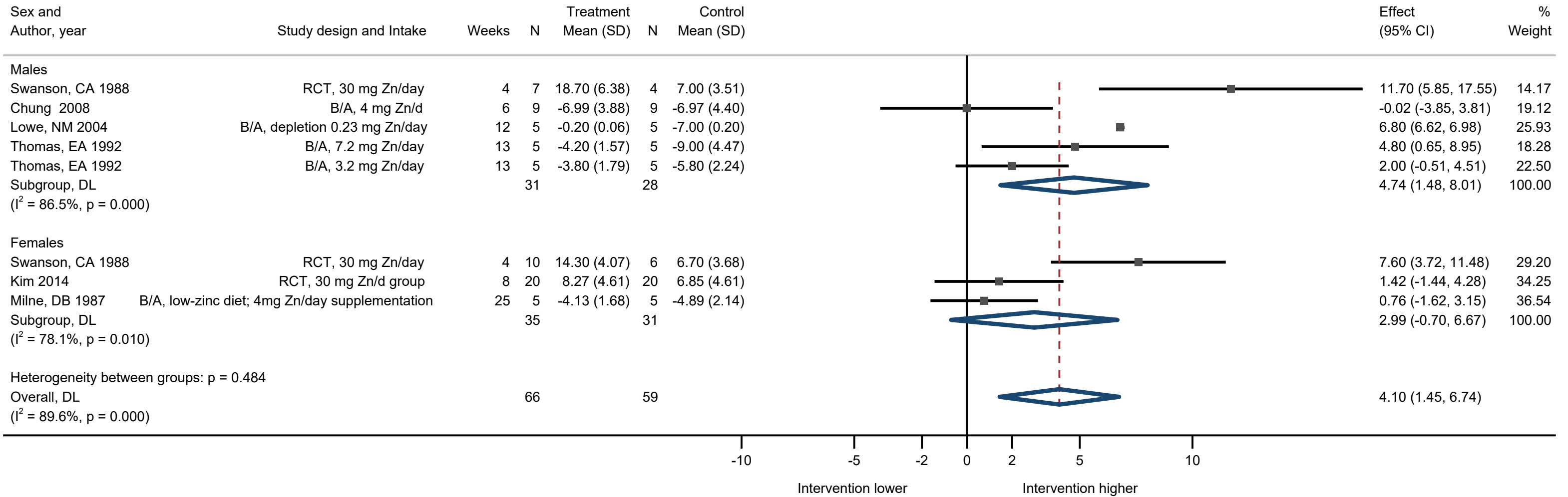
Urinary zinc ($\mu\text{mol/d}$) by dose without Thomas 1992 (15 mg zn/d)



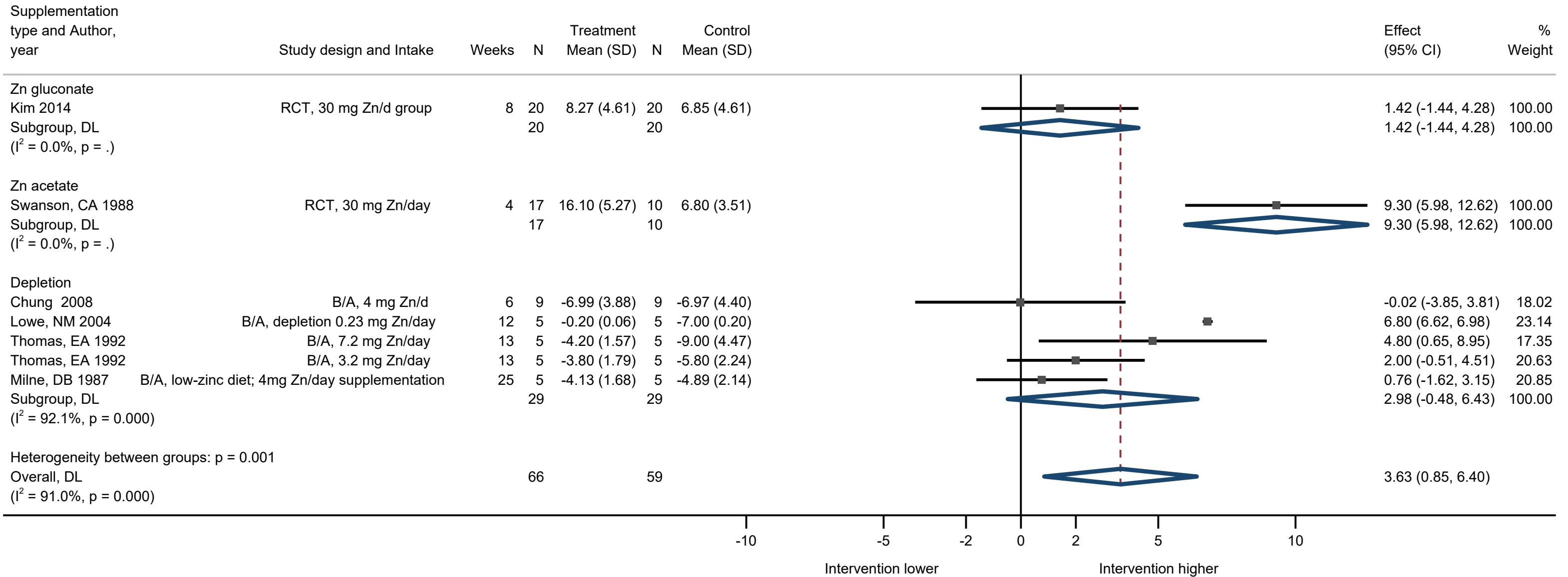
Urinary zinc ($\mu\text{mol/d}$) by population without Thomas 1992 (15 mg zn/d)



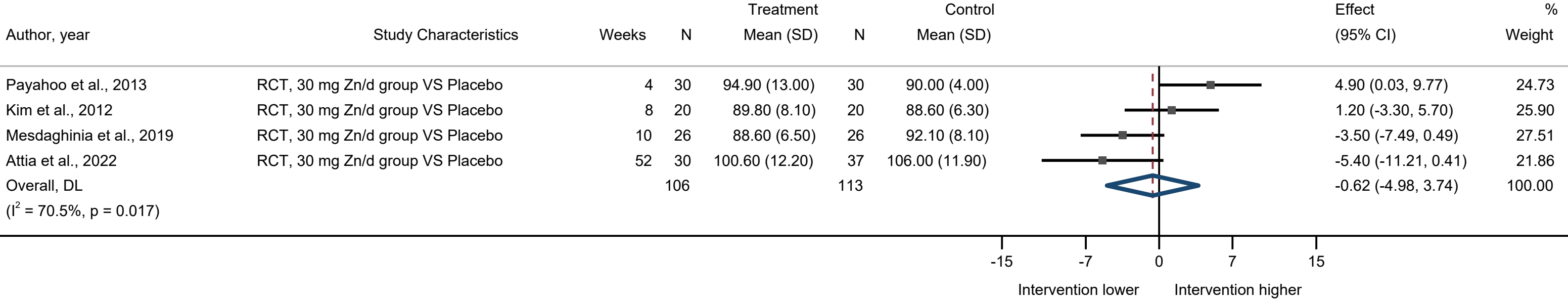
Urinary zinc ($\mu\text{mol/d}$) by sex without Thomas 1992 (15 mg zn/d)



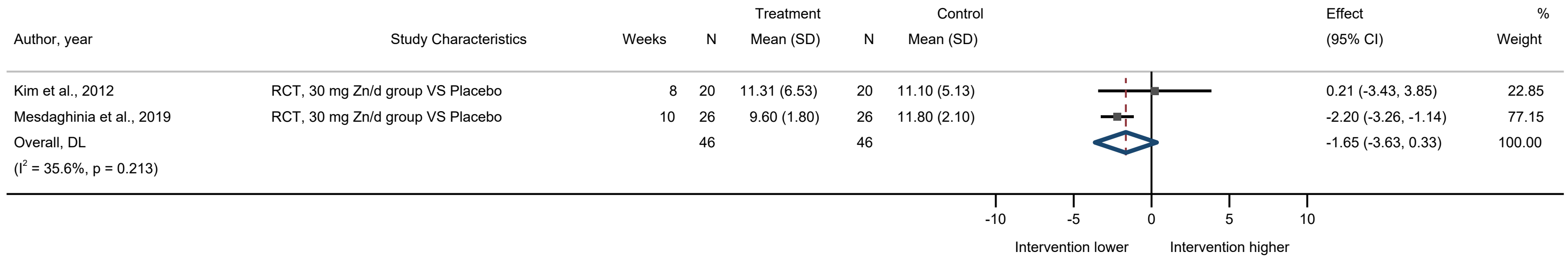
Urinary zinc ($\mu\text{mol/d}$) by supplementation type without Thomas 1992 (15 mg zn/d)



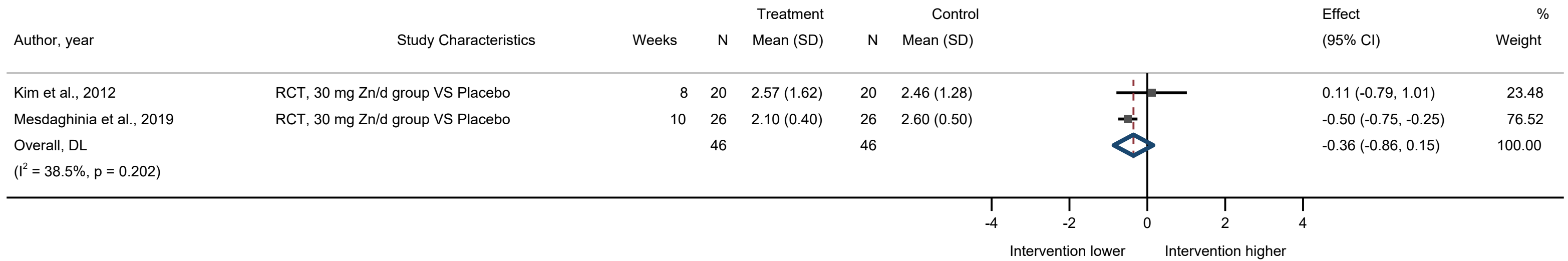
Fasting glucose (mg/dL) without Marques B/A



Fasting insulin ($\mu\text{IU/ml}$) without Marques B/A



Insulin resistance (HOMA-IR) without Marques B/A



(I² = 38.5%, p = 0.202)