Appendix

Sodium intake and blood pressure in children and adolescents: A systematic review and meta-analysis of experimental and observational studies

Magali Leyvraz, Angeline Chatelan, Bruno R da Costa, Patrick Taffé, Gilles Paradis, Pascal Bovet, Murielle Bochud, and Arnaud Chiolero

Supplementary Table 1. Four personalized criteria for assessing quality.

Quality level	Criteria
Method for exposure measurement	
High	Urinary sodium excretion by 24 hour urine collection and high quality of urine collection
Low	Urine spot test or questionnaire
Unclear	Insufficient information to permit judgment
Method and setting for measurement of outcome	
High	Measured multiple times, by trained professional and using standardized procedures. If measured by oscillometric method, the device is clinically validated.
Low	Otherwise (if not all criteria mentioned above are met)
Unclear	Insufficient information to permit judgment
External validity	
High	Characteristics of study population are relatively representative of, and generalizable to, the general population
Low	Characteristics of study population are present in only a specific part of the population (e.g. hypertensive children, obese children, etc.)
Unclear	Insufficient information to permit judgment
Reporting	
High	Complete report and if applicable trial registration
Low	Incomplete report (e.g. not all pre-specific primary outcomes are reported), source of financial support is missing or impartial
Unclear	Insufficient information to permit judgment

Supplementary Table 2. Full characteristics of experimental studies. Abbreviations: DBP: diastolic blood pressure; NA: Not available; RC: Regression coefficient; SBP: systolic blood pressure; SE: standard error of the mean.

Author and year of publication	Country	Study design	Sex	Age range	Sample size	Description of intervention	Quality of sodium intake measurement	Quality of blood pressure measurement	External validity	Quality of reporting	Net change in sodium intake [g/day] (SE)	Net change in SBP [mm Hg] (SE)	Net change in DBP [mm Hg] (SE)	RC for SBP [mm Hg/g] (SE)	RC for DBP [mm Hg/g] (SE)
Whitten & Stewart, 1980	United States	Non-randomized controlled trial	Boys	3-8 months	27	All foods and formula were provided during the 5-month intervention. Amount given to the children noted by the parents.	High	High	Low	Low	-1.0 (0.1)	-2.0 (2.1)	-1.0 (1.9)	2.0 (0.3)	1.0 (0.3)
Hofman et al, 1983	Netherlands	Randomized controlled trial	Boys and girls	0-6 months	476	All foods and formula provided for 25 weeks. Foods and formula with normal sodium content or with low sodium content. Allowed to breastfeed, but instructed not to give any other food, except for fruit juices.	Low	High	High	High	-0.2 (0.0)	-2.1 (1.1)	NA	9.9 (0.3)	NA
Cooper et al, 1984	United States	Randomized crossover trial	Boys and girls	14-18 years	124	All foods provided in the cafeteria, lacto-ovo-vegetarian diet. Participants received foods from two lines: one control line and one reduced sodium content line, for 24 days each, with a 5-day wash-out period.	High	High	Low	High	-0.9 (0.0)	-0.6 (0.1)	-1.4 (0.1)	0.7 (0.3)	1.5 (0.3)
Calabrese & Tuthill, 1985	United States	Randomized controlled trial	Boys and girls	9-10 years	153	The families of the selected children received bottled water with controlled sodium content, i.e. 110 mg/L (HI), 10+100 mg/L (LO+) or	Low	High	Low	High	-0.5 (0.1)	-0.8 (0.3)	-1.4 (0.4)	1.7 (0.3)	3.1 (0.3)

						10mg/L (LO), during 3 months. The school also received bottled water, but school lunches were not controlled.									
Tuthill & Calabrese, 1985	United States	Randomized controlled trial	Girls	14-18 years	191	Salt capsules of 0.8 g sodium in total per day were given mid-morning (water group) or evening (food group) compared with capsules with dextrose (placebo), during 8 weeks.	High	Unclear	Low	Low	-0.8 (0.1)	0.1 (1.1)	-1.4 (0.9)	-0.1 (0.3)	1.7 (0.3)
Miller et al, 1986	United States	Non-controlled trial	Boys and girls	2-18 years	149	Families were instructed to reduce their sodium intake to 1.4 g sodium or less, with the help of a dietician and basic diet instruction book, during 3 months.	High	High	Unclear	Low	-1.2 (0.1)	-0.7 (1.1)	-1.2 (1.1)	0.6 (0.3)	1.0 (0.3)
Ellison et al, 1989	United States	Non-randomized crossover trial	Boys and girls	14-18 years	650	Foods offered at the school were 15-20% lower in sodium, during 6 months.	Low	Low	High	High	-0.6 (0.0)	-1.7 (0.6)	-1.5 (0.5)	3.1 (0.3)	2.7 (0.3)
Rocchini et al, 1989	United States	Non-controlled trial	Boys and girls	10-16 years	78	2 weeks high salt (additional salt tablets) and 2 weeks low salt (i.e. meal plans with equal energy content, but with reduced sodium content equivalent to 0.5-0.7 g sodium per day).	High	High	Low	Low	-4.3 (0.3)	NA	-9.0 (2.9)	NA	2.1 (0.3)
Howe et al, 1991	Australia	Randomized crossover trial	Boys and girls	11-14 years	100	Weekly visits with individual dietary counseling, diet instructions, low salt bread and salt sachets donated, during 4 weeks.	Low	Low	Low	Low	-1.9 (0.3)	-1.0 (0.7)	-0.6 (0.7)	0.5 (0.2)	0.3 (0.2)
Pomeranz et al, 2002	Israel	Randomized controlled trial	Boys and girls	0-6 months	73	Formula was provided. Formula with low sodium content (LSMW), high sodium content (HSTW) or	Low	Low	Unclear	Low	NA	-1.9 (2.3)	-5.9 (2.7)	NA	NA

						breastfed (control), during 8 weeks.									
Palacios et al, 2004	United States	Randomized crossover trial	Girls	11-15 years	36	All foods and drinks were provided. 3 weeks low sodium (1g/d) and 3 weeks high sodium (4 g/d), with 2 weeks wash-out period. K, Ca, Mg, Ph, protein, fat and fiber remained constant. Participants were supervised at all times.	High	High	Low	High	-1.9 (0.1)	-0.9 (0.3)	0.6 (0.3)	0.4 (0.3)	-0.3 (0.3)
Colin-Ramirez et al, 2009	Mexico	Randomized controlled trial	Boys and girls	8-10 years	619	Children in the schools selected for the intervention were given education on nutrition and physical activity (group classes), improved environment at school (healthy snacks, more physical activity classes and health promotion), and promotion of participation of families, during 12 months.	Low	Unclear	High	Low	-1.1 (0.0)	-10.2 (0.1)	-6.9 (0.1)	9.3 (0.3)	6.3 (0.3)
Cotter et al, 2013	Portugal	Randomized controlled trial	Boys and girls	10-12 years	139	Children in the selected classes were either given regular lectures on the potential dangers of excessive salt intake (theory), or lectures with a practical project in the school gardening club, cultivating a garden of plants, from which they took home herbs as a salt substitute for food preparation (practice), or nothing (control), during 6 months.	High	Unclear	High	High	-0.3 (0.0)	4.7 (0.6)	5.8 (0.4)	-16.5 (0.3)	-20.3 (0.3)
He et al, 2015	China	Randomized controlled trial	Boys and girls	9-11 years	279	Intervention consisted of 40-min classes every 2 weeks for 3.5 months on salt	High	High	High	High	-0.8 (0.1)	-0.8 (1.1)	-1.2 (1.2)	1.0 (0.6)	1.6 (0.4)

						reduction, posters in classrooms, newsletters sent to parents and children were asked to advocate reducing salt at home. Salt use was monitored using a special container, which was weighed every 2 weeks.									

Supplementary Table 3. Full characteristics of observational studies. Abbreviations: SBP: systolic blood pressure; DBP: diastolic BP; SE: standard error of the mean; NA: Not available.

Author and year of publication	Country	Study design	Sex	Age range	Sample size	Quality of sodium intake measurement	Quality of blood pressure measurement	External validity	Quality of reporting	Mean sodium intake [g/day] (SE)	Mean SBP [mm Hg] (SE)	Mean DBP [mm Hg] (SE)	RC for SBP [mm Hg/g] (SE)	RC for DBP [mm Hg/g] (SE)
Schachter et al, 1976	United States	Cross-sectional study	Boys and girls	3 days	247	Unclear	High	Low	Low	NA	75.4 (1.1)	NA	2.7 (0.8)	NA
Berenson et al, 1979	United States	Cross-sectional study	Boys and girls	7-15 years	278	High	High	Low	Low	2.4 (0.1)	104.9 (0.0)	61.2 (0.0)	NA	NA
Schachter et al, 1979	United States	Prospective cohort study	Boys and girls	0-6 months	392	Low	High	Low	Low	0.5 (0.1)	86.6 (0.5)	48.2 (0.4)	-0.8 (0.4)	-0.7 (0.6)
Cooper et al, 1980	United States	Cross-sectional study	Boys and girls	11-14 years	73	High	High	Low	Low	3.1 (0.1)	94.1 (1.2)	57.8 (1.1)	0.1 (0.0)	0.7 (1.1)
Ellison et al, 1980	United States	Cross-sectional study	Boys and girls	16-17 years	248	Low	Low	High	Low	2.2 (0.1)	117.3 (0.6)	58.9 (0.5)	-0.5 (0.6)	NA
Hofman et al, 1980	Netherlands	Cross-sectional study	Boys and girls	7-11 years	348	High	High	Low	Low	2.3 (0.1)	102.2 (0.6)	58.8 (0.5)	0.0 (0.7)	0.1 (0.5)
Armstrong et al, 1982	Australia	Cross-sectional study	Boys and girls	12-14 years	635	Low	High	High	Low	2.8 (0.1)	98.2 (3.4)	48.4 (1.7)	1.1 (1.0)	-0.1 (1.0)
Faust, 1982	United States	Cross-sectional study	Boys and girls	0-17 years	295	Low	High	High	Low	2.4 (0.3)	100.4 (2.4)	67.2 (1.4)	4.4 (2.2)	2.2 (1.5)
Tochikubo et al, 1982	Japan	Case-control study	Boys and girls	16-18 years	283	High	Unclear	Low	Low	4.6 (0.1)	NA	NA	NA	NA
Fujishima et al, 1983	Japan	Case-control study	Boys	15-18 years	159	Unclear	Low	Low	Low	4.8 (0.1)	131.6 (1.5)	69.3 (0.7)	NA	NA
Connor et al, 1984	United States	Cross-sectional study	Boys and girls	6-15 years	115	High	High	High	High	2.3 (0.1)	96.0 (0.7)	60.0 (0.8)	0.6 (0.6)	1.0 (0.7)
Persson et al, 1984	Sweden	Cross-sectional study	Boys and girls	4-13 years	738	Low	Low	High	Low	2.6 (0.0)	105.2 (0.4)	65.8 (0.4)	NA	NA
Luque Otero et al, 1985	Spain	Cross-sectional study	Boys and girls	6-14 years	441	Unclear	High	High	Low	3.5 (0.0)	105.2 (0.3)	62.4 (0.2)	NA	NA
Liebman et al, 1986	United States	Prospective cohort study	Girls	12-16 years	532	Low	Low	High	Low	NA	107.6 (0.5)	69.3 (0.4)	0.0 (0.6)	0.0 (0.4)

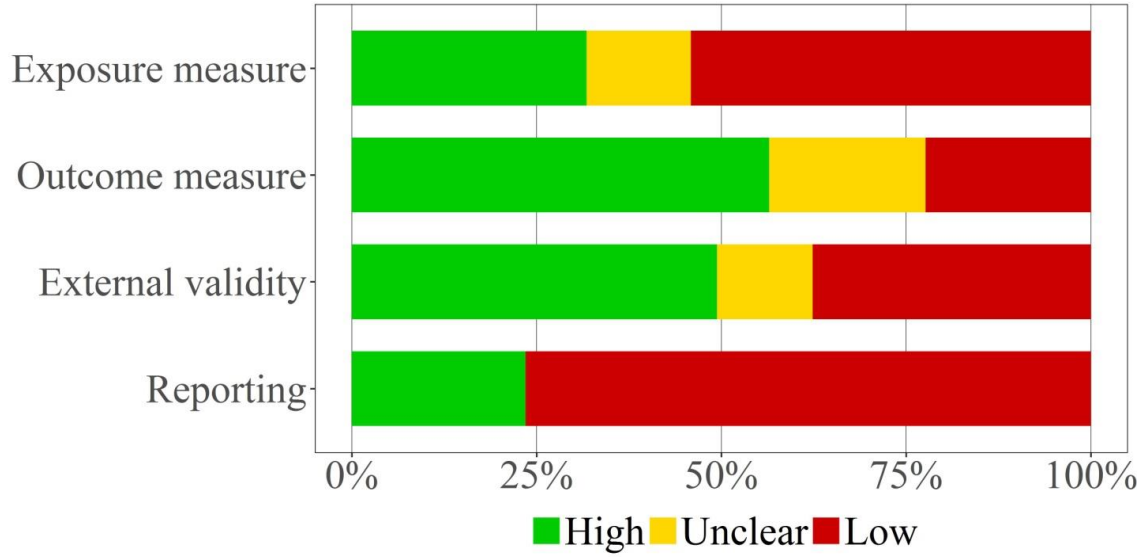
Tochikubo et al, 1986	Japan	Case-control study	Boys	15-18 years	405	High	Unclear	Low	Low	4.6 (0.1)	131.7 (1.0)	67.0 (0.5)	NA	NA
Maiorano et al, 1987	Italy	Cross-sectional study	Boys and girls	11-14 years	120	High	High	High	Low	4.1 (0.2)	122.3 (1.4)	78.2 (1.2)	1.6 (0.5)	1.0 (0.5)
Melby et al, 1987	United States	Cross-sectional study	Boys and girls	9-12 years	323	Low	High	Unclear	Low	2.5 (0.1)	96.3 (0.7)	58.1 (0.7)	2.9 (1.1)	2.4 (1.0)
Rocchini et al, 1987	United States	Cross-sectional study	Boys and girls	10-16 years	60	Unclear	Unclear	Low	High	4.6 (0.2)	122.3 (1.9)	74.2 (1.6)	NA	NA
Strazzullo et al, 1987	Italy	Cross-sectional study	Boys	10-13 years	146	High	High	High	Low	NA	103.2 (0.8)	57.9 (0.7)	1.9 (0.9)	1.0 (0.6)
Zhu et al, 1987	China	Cross-sectional study	Boys	7-8 years	148	High	High	High	Low	3 (0.1)	91.4 (0.6)	50.9 (0.6)	0.4 (0.7)	0.0 (0.7)
Baranowski et al, 1988	United States	Cross-sectional study	Boys and girls	8-12 years	163	Low	High	High	Low	3.9 (0.2)	97.3 (0.6)	60.5 (0.7)	NA	NA
Jenner et al, 1988	Australia	Cross-sectional study	Boys and girls	7-10 years	884	Low	Low	High	High	2.5 (0.0)	115.7 (0.3)	69.5 (0.3)	-0.5 (0.3)	-0.5 (0.2)
Knuiman et al, 1988	Austria, Belgium, Bulgaria, Finland, Germany, Greece, Hungary, Italy, Netherlands, Poland, Portugal, Spain, Sweden	Cross-sectional study	Boys	8-9 years	887	High	High	High	Low	2.6 (0.0)	98.8 (0.3)	60.0 (0.3)	NA	NA
Ito et al, 1989	Japan	Case-control study	Boys and girls	6-14 years	114	Unclear	Low	Low	Low	2.5 (0.1)	120.4 (1.3)	61.1 (1.1)	NA	NA
Martell-Claros et al, 1989	Spain	Cross-sectional study	Boys and girls	14-18 years	128	Unclear	High	Unclear	Low	NA	NA	NA	2.1 (1.1)	NA
Bernstein et al, 1990	South Africa	Cross-sectional study	Boys and girls	6 weeks	124	Low	Unclear	High	Low	0.2 (0.0)	86.1 (0.9)	NA	NA	NA
Ekpo et al, 1990	Nigeria	Cross-sectional study	Boys and girls	12-14 years	78	High	Low	High	Low	2.3 (0.2)	111.4 (1.7)	68.9 (1.1)	0.1 (0.1)	0.0 (0.1)

ten Berge-van der Schaaf & May, 1990	Netherlands	Cross-sectional study	Boys and girls	10-13 years	750	Unclear	Low	Unclear	Low	NA	111.6 (0.4)	65 (0.4)	NA	NA
Harschfield et al, 1991	United States	Cross-sectional study	Boys and girls	10-18 years	140	High	Low	Low	Low	3.1 (0.1)	NA	NA	3.6 (0.8)	NA
Zwiauer et al, 1991	Austria	Cross-sectional study	Boys and girls	8-9 years	72	High	High	High	High	3.7 (0.1)	101.0 (1.2)	60.0 (0.9)	3.2 (2.7)	2 (2.1)
Lipp, 1992	United States	Cross-sectional study	Boys	14-18 years	82	Low	High	Low	Low	5.4 (0.2)	120.0 (1.3)	76.6 (0.9)	0.7 (0.6)	0.4 (0.4)
Whincup et al, 1992	United Kingdom	Cross-sectional study	Boys and girls	5-7 years	3321	Low	Unclear	Unclear	Low	NA	NA	NA	-0.2 (0.1)	-0.1 (0.2)
Wilson et al, 1992	United States	Prospective cohort study	Boys and girls	3-8 years	204	Low	Low	Low	Low	NA	NA	NA	10.0 (5.0)	1.3 (5.0)
Herreros Fernandez et al, 1994	Spain	Cross-sectional study	Boys and girls	6-18 years	992	Low	High	High	Low	2.2 (0.0)	NA	NA	3.9 (1.2)	2.2 (1.3)
Simon et al, 1994	United States	Cross-sectional study	Girls	9-10 years	2030	Low	High	High	High	2.9 (0.0)	101.6 (0.2)	57.3 (0.3)	-0.5 (0.2)	-0.6 (0.3)
Sinaiko et al, 1994	United States	Case-control study	Boys and girls	11-14 years	283	Unclear	High	Low	Low	1.6 (0.0)	111.7 (0.6)	64.1 (0.6)	NA	NA
Yamauchi et al, 1994	Japan	Cross-sectional study	Boys and girls	6-11 years	322	Low	Low	Low	Low	3 (0.1)	99.6 (0.5)	52.9 (0.4)	-0.4 (0.4)	-0.4 (0.3)
Csabi et al, 1996	Hungary	Cross-sectional study	Boys and girls	7-18 years	60	Unclear	High	Low	Low	2.5 (0.1)	122.5 (2.1)	76.1 (1.2)	-4.6 (2.3)	-2.5 (2.1)
Gupta et al, 1998	India	Cross-sectional study	Boys and girls	13-17 years	237	Low	High	High	Low	5.1 (0.2)	123.4 (0.7)	81.5 (0.5)	1.1 (0.5)	0.8 (0.5)
Bunjaroonsilp, 1999	United States	Cross-sectional study	Boys and girls	6-11 years	174	Low	High	Low	Low	3.2 (0.1)	104.6 (0.8)	60.4 (0.5)	0.3 (0.1)	0.2 (0.1)
Dei-Cas et al, 1999	Argentina	Cross-sectional study	Boys and girls	15 years	363	Low	Low	High	Low	3.5 (0.1)	NA	NA	-1.0 (0.3)	-0.2 (0.4)
Maldonaldo-Martin et al, 2002	Spain	Cross-sectional study	Boys and girls	6-14 years	553	High	High	High	Low	3.1 (0.1)	110.9 (0.6)	61.1 (0.4)	-0.4 (0.0)	-0.4 (0.0)
Brion et al, 2008	United Kingdom	Prospective cohort study	Boys and girls	0- 7 years	745	Low	Low	Low	Low	NA	98.4 (0.3)	56.4 (0.2)	0.3 (0.2)	NA
He et al, 2008	United Kingdom	Cross-sectional study	Boys and girls	4-18 years	1658	Low	Low	High	High	2.4 (0.0)	108.3 (0.3)	55.7 (0.2)	1.0 (0.4)	NA

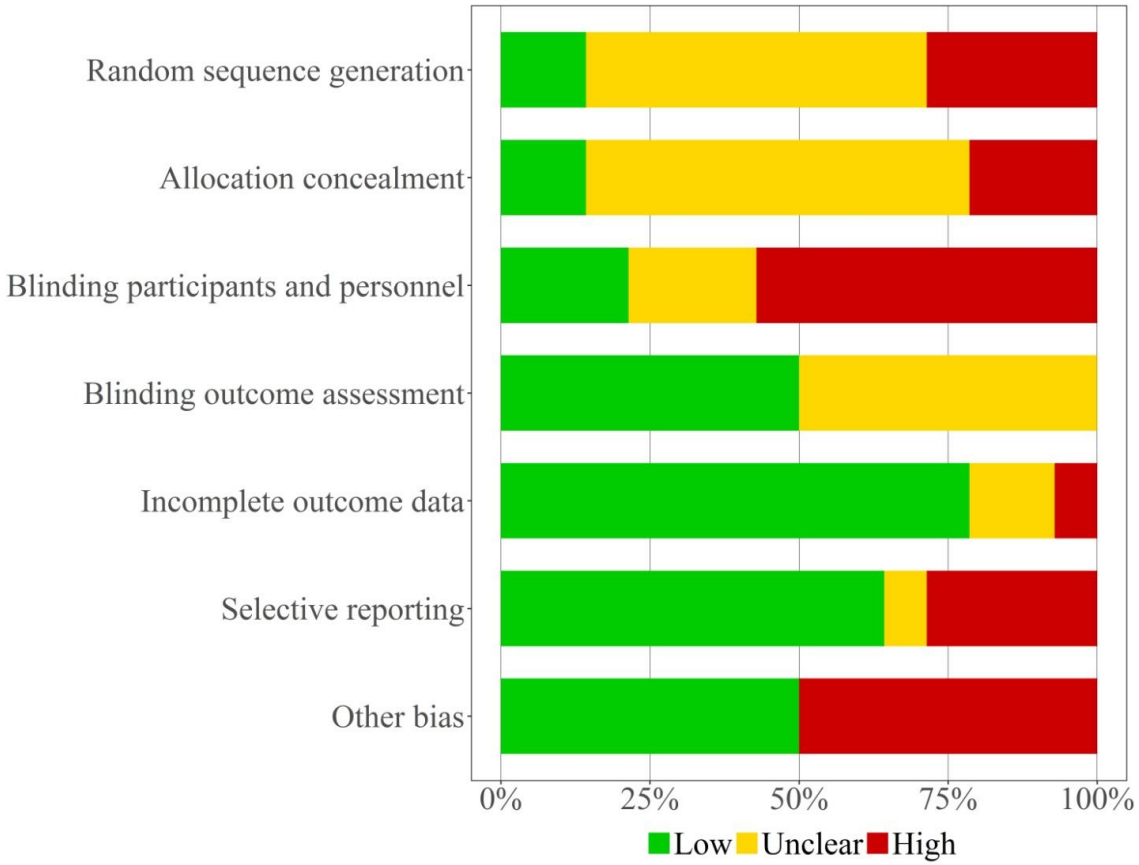
Reddy et al, 2008	United States	Cross-sectional study	Girls	8-10 years	303	Low	High	Low	Low	2.5 (0.1)	100.0 (0.6)	56.3 (0.4)	-0.1 (0.5)	1.0 (0.4)
Colin-Ramirez et al, 2009	Mexico	Cross-sectional study	Boys and girls	8-10 years	1239	Low	High	Low	High	1.5 (0.0)	107.8 (0.5)	75.0 (0.4)	5.7 (2.4)	2.7 (2.3)
Mori et al, 2012	Japan	Cross-sectional study	Boys	16-18 years	152	Unclear	Unclear	Unclear	Low	3.7 (0.1)	NA	NA	NA	NA
De Rovetto et al, 2012	Colombia	Cross-sectional study	Boys and girls	7-18 years	2807	Low	Unclear	High	Low	NA	104.1 (0.3)	61.3 (0.2)	1.4 (0.4)	NA
Yang et al, 2012, Rosner et al, 2013, Xi et al, 2016 (NHANES)	United States	Cross-sectional study	Boys and girls	8-18 years	14947	Low	High	High	High	3.3 (0.0)	105.6 (0.2)	58.0 (0.3)	0.1 (0.0)	-0.2 (0.1)
De Filippo et al, 2013	France	Cross-sectional study	Boys and girls	3-17 years	111	Unclear	Unclear	Low	Low	3 (0.1)	112.0 (1.1)	63.0 (0.9)	NA	NA
Kelishadi et al, 2013	Iran	Cross-sectional study	Boys and girls	3-10 years	241	Low	High	High	Low	4.1 (0.0)	102.0 (1.0)	64.3 (0.9)	1.7 (1.5)	1.3 (1.6)
Le-Ha et al, 2013	Australia	Cross-sectional study	Boys and girls	17 years	1248	Low	High	Low	Low	2.9 (0.0)	113.3 (0.3)	58.8 (0.3)	0.5 (0.2)	0.2 (0.2)
Pratt et al, 2013	United States	Cross-sectional study	Boys and girls	15-17 years	560	Unclear	Unclear	Unclear	Low	NA	NA	NA	NA	NA
Tayel et al, 2013	Egypt	Cross-sectional study	Boys and girls	12-18 years	300	Low	High	High	Low	2.6 (0.1)	NA	NA	NA	NA
Vitolo et al, 2013	Brazil	Cross-sectional study	Boys and girls	3-4 years	331	Low	High	High	Low	1.1 (0.0)	91.3 (0.5)	NA	NA	NA
Kell et al, 2014	United States	Cross-sectional study	Boys and girls	7-12 years	320	Low	Low	Low	High	3.2 (0.1)	103.3 (0.6)	60.1 (0.4)	-1.0 (6.4)	-6.1 (4.9)
Shi et al, 2014	Germany	Prospective cohort study	Boys and girls	4-18 years	435	High	High	High	High	2.8 (0.1)	111.0 (0.6)	68.5 (0.6)	1.2 (0.2)	-1.2 (0.1)
Woodruff et al, 2014	Canada	Cross-sectional study	Boys and girls	10-14 years	1068	Low	High	High	Low	2.8 (0.0)	108.3 (0.3)	66.0 (0.2)	-0.4 (0.2)	-0.3 (0.2)
Aoji et al, 2015	Japan	Cross-sectional study	Boys and girls	12-15 years	245	Low	Unclear	Unclear	Low	7.6 (0.1)	NA	NA	0.2 (0.4)	NA
Aparicio et al, 2015	Spain	Cross-sectional study	Boys and girls	7-11 years	205	High	High	High	High	3.1 (0.1)	100.6 (1.0)	65.1 (0.8)	1.8 (0.1)	1.8 (0.0)
Buendia et al, 2015	United States	Cross-sectional study	Girls	9-10 years	2185	Low	High	High	High	3.1 (0.0)	101.2 (0.2)	57.2 (0.3)	-0.2 (0.0)	0.3 (0.0)

Campanozzi et al, 2015	Italy	Cross-sectional study	Boys and girls	6-18 years	1424	High	Unclear	High	Low	2.8 (0.0)	NA	NA	24.0 (23.7)	NA
Farajian et al, 2015	Greece	Cross-sectional study	Boys and girls	10-12 years	2024	Low	Low	High	Low	1.8 (0.0)	NA	NA	1.3 (0.7)	1.2 (0.8)
Lakatos et al, 2015	Hungary	Cross-sectional study	Boys and girls	1-18 years	200	High	High	Low	Low	2.8 (0.1)	114.6 (1.0)	68.9 (0.6)	4.0 (2.4)	NA
Nishide et al, 2015	Japan	Cross-sectional study	Boys and girls	9-10 years	358	Low	Unclear	High	Low	2.3 (0.1)	NA	NA	NA	NA
Ponzo et al, 2015	Italy	Cross-sectional study	Boys and girls	11-13 years	400	Low	High	High	Low	3.1 (0.0)	109.3 (0.6)	65.4 (0.4)	26.7 (9.2)	7.5 (5.9)
Chun et al, 2016	Korea	Cross-sectional study	Boys and girls	13-18 years	1353	Low	High	High	High	3.6 (0.1)	108.7 (0.4)	69.4 (0.3)	0.3 (0.0)	-0.1 (0.1)
Correia-Costa et al, 2016	Portugal	Cross-sectional study	Boys and girls	8-9 years	298	High	High	Low	Low	2.5 (0.1)	103.3 (0.7)	64.6 (0.6)	0.3 (0.2)	0.0 (0.1)
Vergara Castañeda et al, 2016	Mexico	Cross-sectional study	Boys and girls	9-16 years	242	Low	Unclear	Unclear	Low	NA	101.5 (0.7)	NA	NA	NA
Marventano et al, 2017	Italy	Cross-sectional study	Boys and girls	11-15 years	1643	Low	Unclear	High	Low	2.5 (0.0)	112.4 (0.4)	74.9 (0.2)	NA	NA
Setayeshgar et al, 2017	Canada	Prospective cohort study	Boys and girls	10-18 years	448	Low	Unclear	Unclear	Low	NA	NA	NA	1.4 (3.5)	21.4 (1.7)

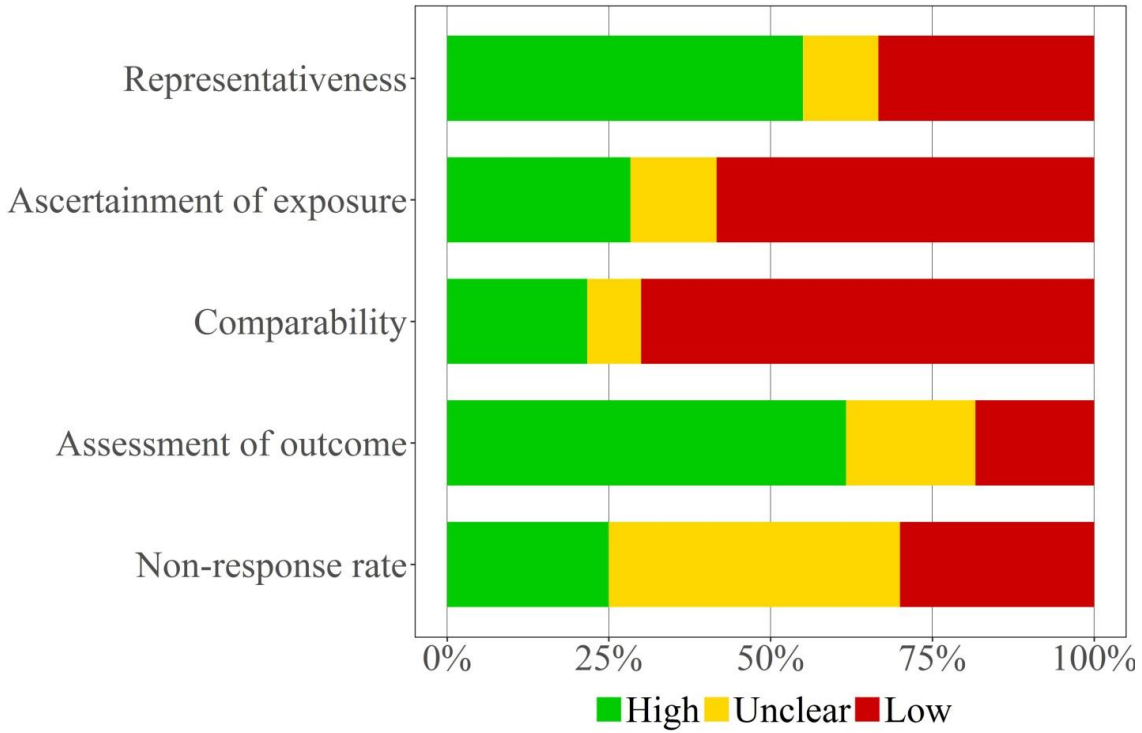
Supplementary Figure 1. Quality assessment of all studies (n=85)



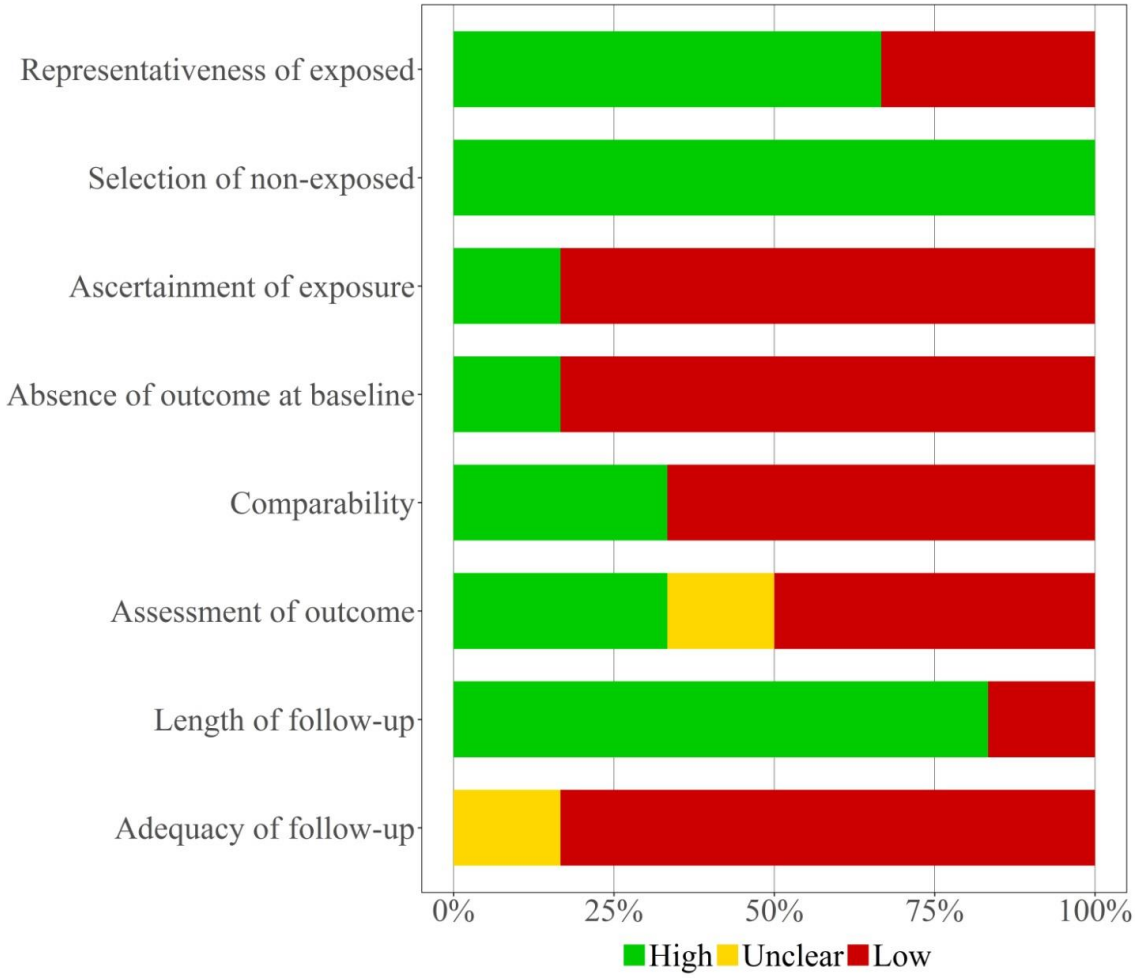
Supplementary Figure 2. Risk of bias in experimental studies assessed by Cochrane collaboration's risk of bias tool (n=14)



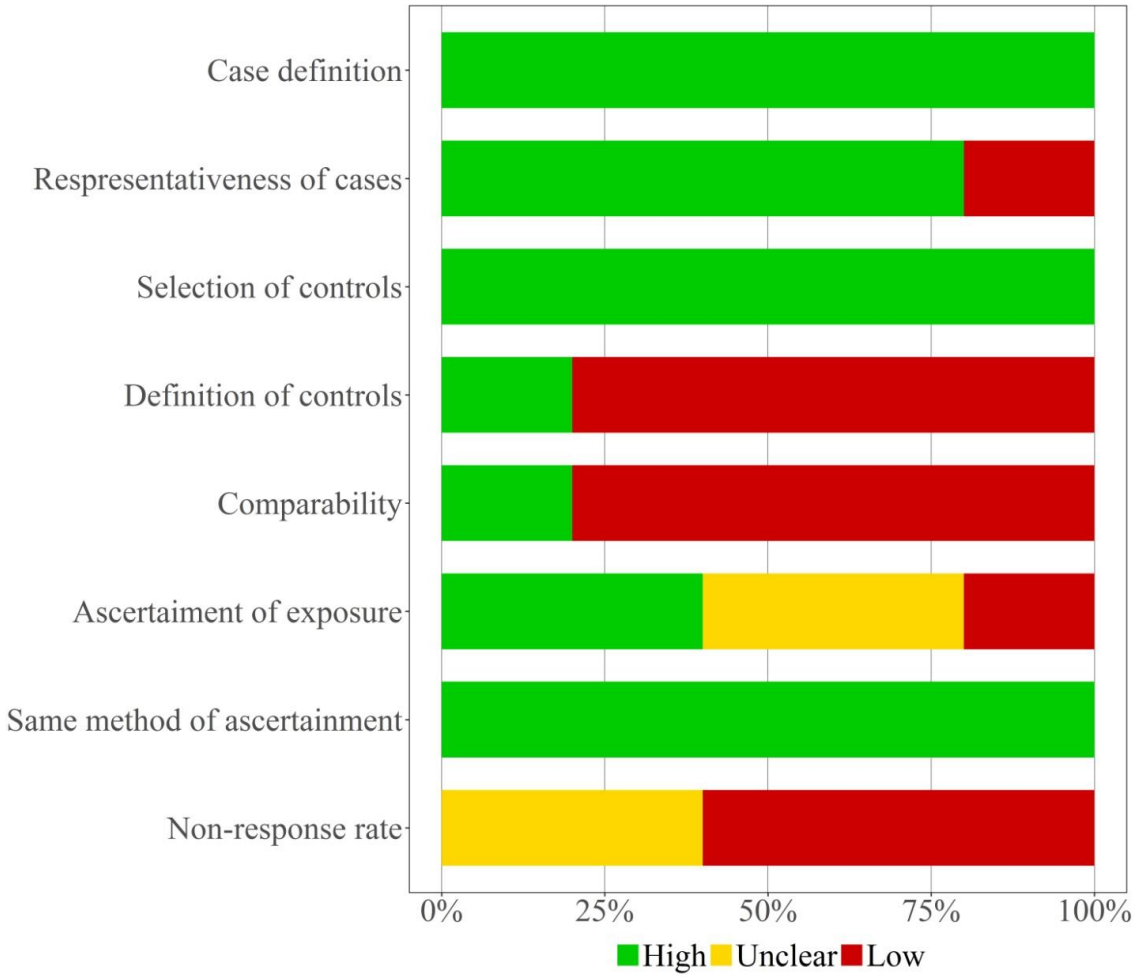
Supplementary Figure 3. Quality of cross-sectional studies assessed by Newcastle-Ottawa scale (n=60)



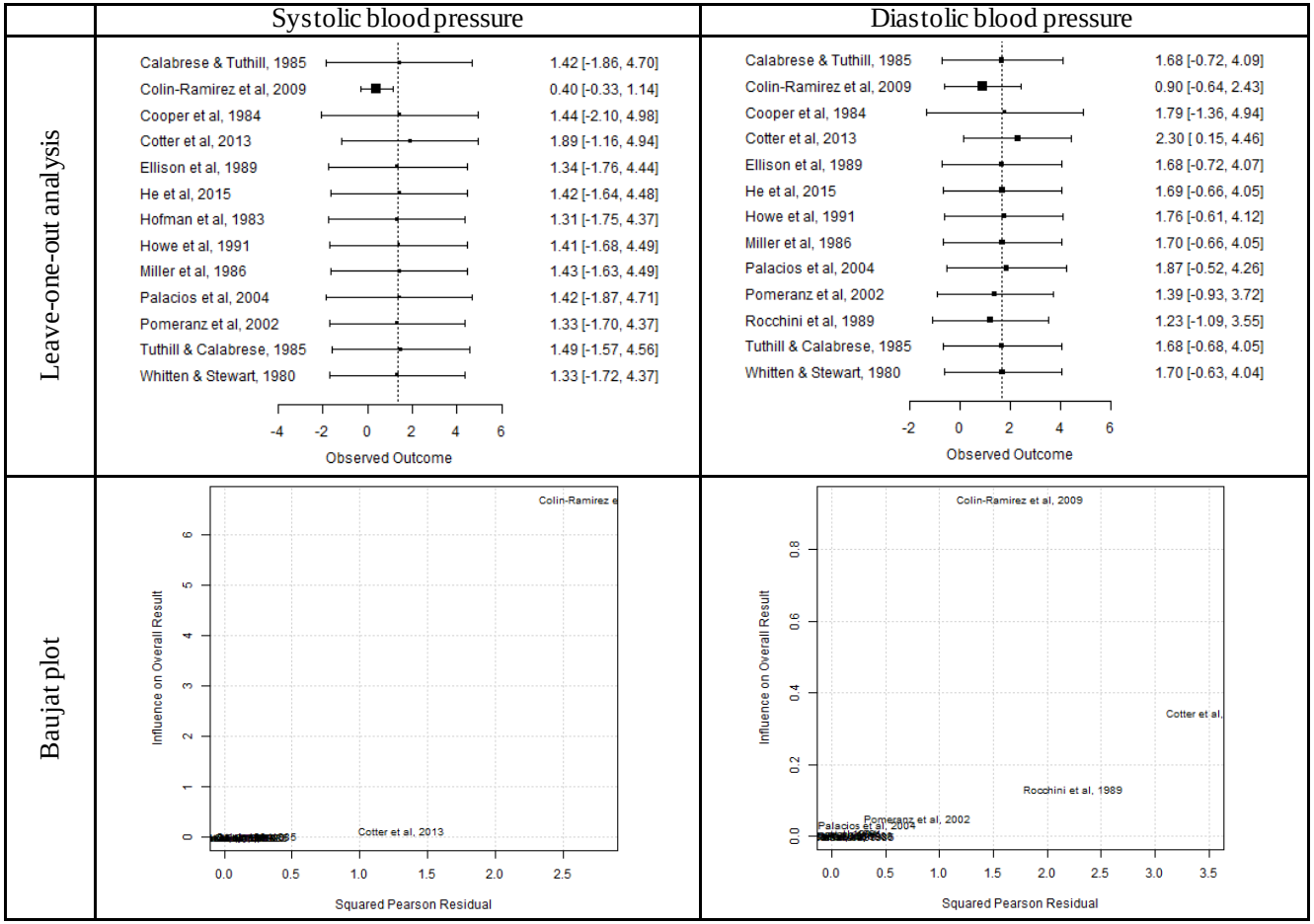
Supplementary Figure 4. Quality of cohort studies assessed by Newcastle-Ottawa scale (n=6)



Supplementary Figure 5. Quality of case-control studies assessed by Newcastle-Ottawa scale (n=5)



Supplementary Figure 6. Leave-one-out analyses and Baujat plots for experimental studies. The leave-one-out analyses and the Baujat plots indicate that there are two outlying and highly influential studies for systolic and diastolic blood pressure (i.e. Colin-Ramirez et al, 2009 and Cotter et al, 2013).



Supplementary Table 4. Meta-regressions. Abbreviations: CI: Confidence interval.

Adjustment variable	Number of studies	Regression coefficient[a] (95% CI)	Adjustment variable[b] (95% CI)	I^2	p-value for slope
Systolic blood pressure					
Age	61	2.3 (1.6, 2.9)	-0.1 (-0.2, -0.1)	99.2%	<0.001
Age (above 1 year)	57	0.2 (-0.8, 1.1)	0.0 (-0.1, 0.1)	99.1%	0.647
Percentage overweight	47	0.4 (-0.2, 1.1)	0.4 (-0.2, 1.1)	99.6%	0.546
Sample size	61	0.7 (0.4, 0.9)	0.0 (0.0, 0.0)	99.2%	0.424
Potassium intake	25	4.0 (3.4, 4.7)	-1.8 (-2.2, -1.5)	99.20%	<0.001
Diastolic blood pressure					
Age	51	0.2 (-1.1, 1.5)	0.0 (-0.1, 0.1)	99.4%	0.992
Age (above 1 year)	49	0.2 (-1.6, 2.0)	0.0 (-0.2, 0.2)	99.6%	0.999
Percentage overweight	44	0.1 (-0.4, 0.6)	0.1 (-0.4, 0.6)	97.9%	0.199
Sample size	51	0.2 (-0.2, 0.7)	0.0 (0.0, 0.0)	99.4%	0.794
Potassium intake	21	2.8 (1.8, 3.7)	-1.3 (-1.8, -0.8)	99.30%	<0.001

[a] Represents the outcome variable, i.e. regression coefficient - Δ mmHg blood pressure / Δ g sodium intake per day - when adjustment variable is 0. [b] Represents the effect of the explanatory variable on the outcome variable, i.e. Δ regression coefficient / Δ adjustment variable.

Supplementary Table 5. Sub-group analyses with studies with sodium intake and blood pressure measurement methods of high quality only. Sub-group meta-analyses of regression coefficients of the association between sodium intake and systolic, and respectively, diastolic blood pressure, from studies with high quality of sodium intake and blood pressure measurement methods (in mm Hg / g sodium per day).
Abbreviations: n: Number of studies; CI: confidence interval; p: p-value for test for the difference between sub-groups.

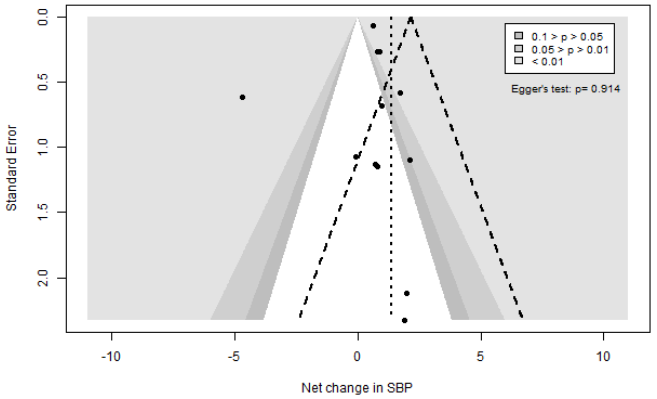
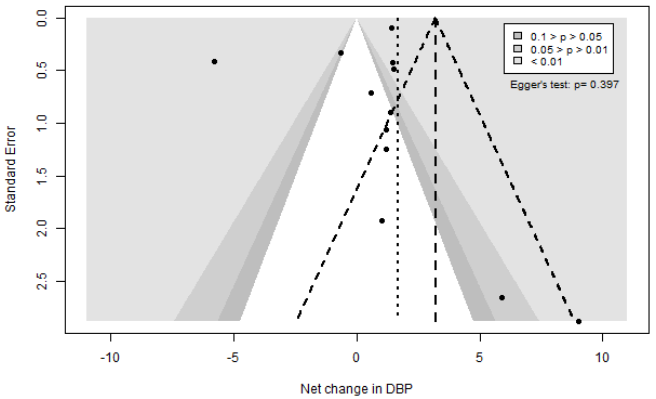
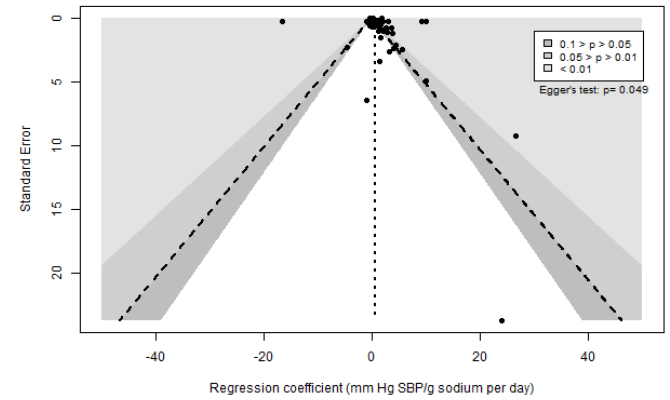
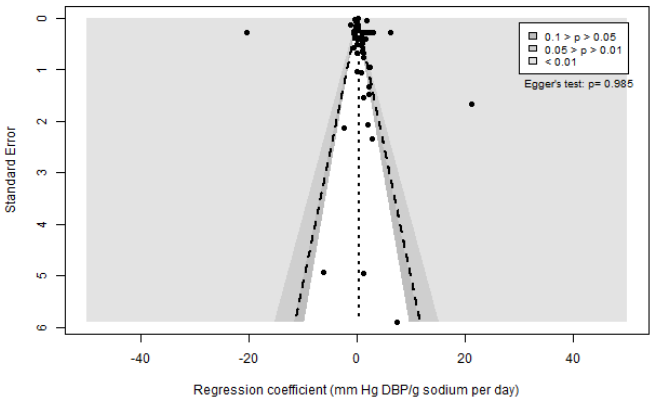
	Systolic blood pressure				Diastolic blood pressure			
	n	**Estimate (95% CI)**	**I^2**	**p**	**n**	**Estimate (95% CI)**	**I^2**	**p**
All	17	0.8 (0.4, 1.3)	99.0%	-	17	0.7 (0.0, 1.4)	99.2%	-
Study type								
Experimental	5	0.9 (0.3, 1.5)	77.6%	0.665	6	1.1 (0.4, 1.8)	88.5%	0.232
Observational	12	0.8 (0.4, 1.3)	99.3%		11	0.4 (-0.5, 1.3)	99.5%	
Age								
0-1 year	4	3.5 (-1.8, 8.7)	99.5%		2	0.2 (-1.4, 1.9)	85.4%	
2-11 years	31	0.1 (-0.2, 0.5)	99.5%	<0.001	22	0.5 (0.1, 0.8)	94.0%	0.198
12-18 years	26	0.5 (0.3, 0.7)	90.8%		27	0.0 (-0.6, 0.6)	99.7%	
Weight status								
Normal	4	0.5 (-0.3, 1.4)	92.4%		4	-0.2 (-0.4, 0.1)	0.0%	
Normal and overweight	11	0.9 (0.1, 1.7)	95.7%	0.235	10	0.4 (-0.1, 1.0)	93.5%	0.021
Overweight	2	1.8 (-0.2, 3.8)	99.0%		2	1.5 (-1.1, 4.1)	98.6%	
Potassium intake[a]								
High intake	6	0.1 (-0.4, 0.5)	98.2%	<0.001	5	0.3 (-0.6, 1.3)	84.4%	0.681
Low intake	5	1.4 (1.0, 1.9)	72.8%		5	0.8 (-1.1, 2.7)	99.3%	

[a]Above or below median potassium intake, i.e., 1.6 g per day.

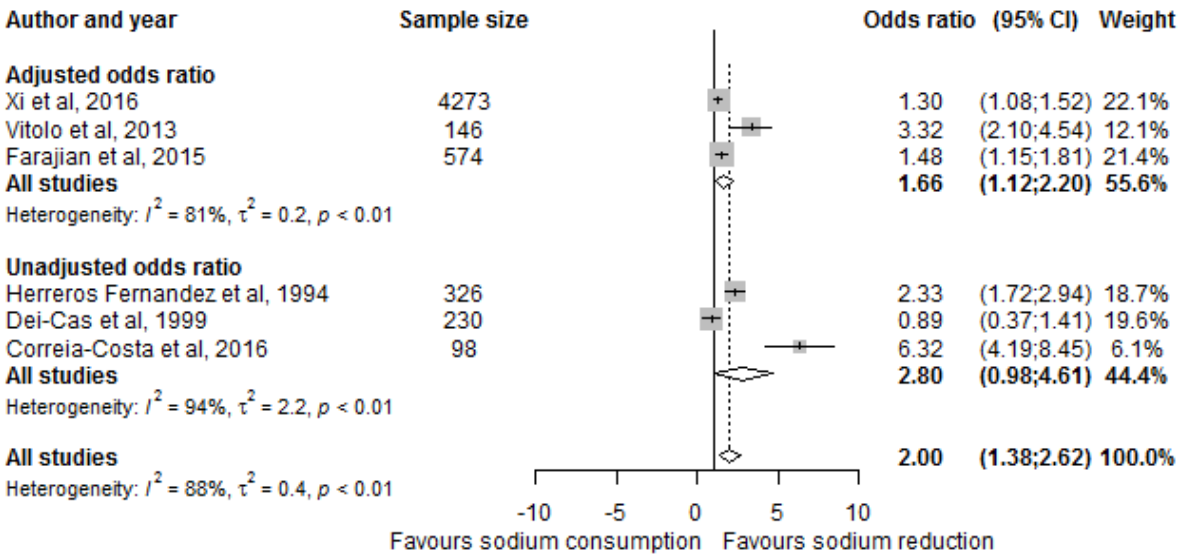
Supplementary Table 6. Sensitivity analyses. Abbreviations: n: Number of studies; CI: Confidence interval.

	Systolic blood pressure			Diastolic blood pressure		
	n	**Estimate (95% CI)**	**I^2**	**n**	**Estimate (95% CI)**	**I^2**
All studies	61	0.6 (0.4, 0.8)	99.2%	51	0.2 (-0.2, 0.6)	99.4%
Large sample size (n>=200)	35	1.1 (0.8, 1.3)	99.2%	27	0.5 (0.1, 0.8)	99.1%
Adjusted estimates	27	0.4 (0.0, 0.7)	98.4%	21	0.2 (-0.4, 0.8)	99.0%
Untransformed estimates	16	0.3 (-0.1 , 0.7)	99.10%	14	0.1 (-0.6 , 0.8)	99.30%

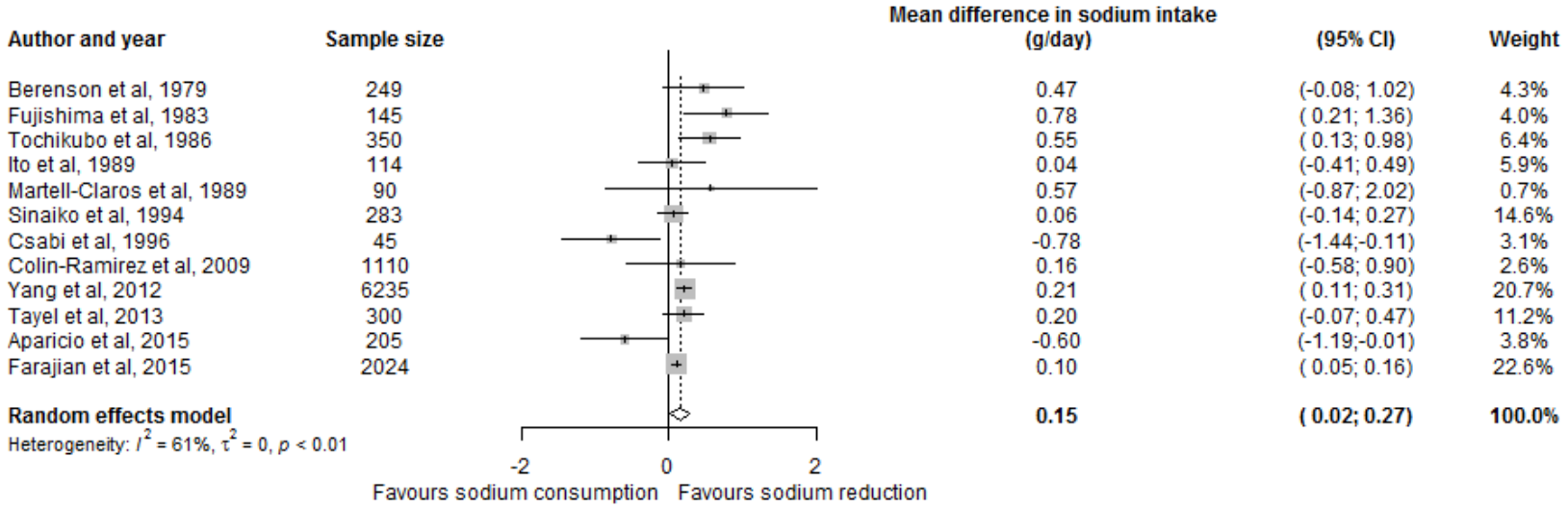
Supplementary Table 7. Enhanced funnel plots with Egger's test. Funnel plots and Egger's test did not show evidence of asymmetry whatever the study type.

	Systolic blood pressure	Diastolic blood pressure
Net change - Experimental studies		
Regression coefficient - All studies		

Supplementary Table 8. Forest plot of odds ratio. Odds of having high blood pressure when consuming higher amounts of sodium when compared to consuming lower amounts of sodium. Children with highest intakes of sodium had a higher odds (i.e. 2.00, 95% CI 1.38-2.62) of having high blood pressure than children with a lowest intake. The odds ratios were higher for unadjusted ratios (2·80 OR 95% CI 0·98, 4·61) than for adjusted odds ratios (1·66 OR 95% CI 1·12, 2·20).



Supplementary Table 9. Forest plot of mean difference in sodium intake between children with normal and high blood pressure. Children with high blood pressure consume on average 0.15 g (95% CI 0.02, 0.27) of sodium more per day than children with normal blood pressure.



Supplementary Figure 10. Sodium intake (g per day) and systolic (left) and diastolic (right) blood pressure (mm Hg) from seven studies which investigated the dose-response relationship. The studies are from Marventano et al 2017 (pink), Chun et al 2016 (green), He et al 2008 (turquoise), Xi et al 2016 (yellow), Simon et al 1994 (grey), Buendia et al 2015 (red), and Cooper et al 1980 (blue).