Supplemental File C

GRADE ratings and meta-analyses for physical size outcomes

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Table 1. Summary of available outcomes

Outcome	Exposure/ Diagnosis	Data	# studies
Birth weight	Exposure – light, moderate, heavy, very heavy, any level, confirmed-level unquantifiable	SGA (all definitions) as adj OR; crude OR/RR, % or number of cases (all grouped together for unadj OR)	**22 studies** across all exposure levels
		LBW as adj OR; crude OR/RR, % or number of cases (all grouped together for unadj OR)	**21 studies** across exposure levels
		Mean/SD or mean diff/95% CI; or median/IQR	**34 studies** across exposure levels
		Mean/SD percentiles	**2 studies** across exposure levels
	Diagnosed– FASD, FAS, pFAS, Other FASDs (e.g., ARND, non-syndromal)	SGA (< 10th percentile)	**1 study** across FAS, pFAS and ARND
		LBW	**0 studies**
		Mean/SD	**11 studies** across diagnostic groups
		Mean/SD percentiles	**1 study** across FAS, pFAS and ARND
Birth length	Exposure – light, moderate, heavy, very heavy, any level, confirmed-level unquantifiable	Mean/SD	**14 studies** across exposure levels
		Mean/SD percentiles	**1 study** with light, moderate and heavy exposure levels
	Diagnosed – FASD, FAS, pFAS, Other FASDs (e.g., ARND, non-syndromal)	Mean/SD	**4 studies** across diagnostic groups
		Mean/SD percentiles	**1 study** across FAS, pFAS and ARND
Postnatal weight	Exposure – light, moderate, heavy, very heavy, any level, confirmed-level unquantifiable	Weight < 10th percentile	**6 studies** across exposure levels
		Mean/SD (kg) (≤ 12 months of age)	**5 studies** across exposure levels
		Mean/SD (kg) (> 12 months of age)	**4 studies** across exposure levels
		Mean/SD percentiles	**1 study** with heavy exposure
	Diagnosed – FASD, FAS, pFAS, Other FASDs (e.g., ARND, non-syndromal)	Weight < 10th percentile	**4 studies** across diagnostic groups
		Mean/SD (kg) (6-9 years of age)	**13 studies** across diagnostic groups
		Mean/SD (kg) (9 – 18 years of age)	**6 studies** across diagnostic groups
		Mean/SD percentiles	**11 studies** across diagnostic groups
Postnatal height	Exposure – light, moderate, heavy, very heavy, any level, confirmed-level unquantifiable	Height < 10th percentile	**6 studies** across exposure levels
		Mean/SD (cm) (≤ 12 months of age)	**4 studies** across light and confirmed unquantifiable exposure levels
		Mean/SD (cm) (> 12 months of age)	**5 studies** across exposure levels
		Mean/SD percentiles	**1 study** with heavy exposure
	Diagnosed – FASD, FAS, pFAS, Other FASDs (e.g., ARND, non-syndromal)	Height < 10th percentile	**4 studies** across diagnostic groups
		Mean/SD (cm) (6-9 years of age)	**13 studies** across diagnostic groups

		Mean/SD (cm) (9 – 18 years of age)	**7 studies** across diagnostic groups
		Mean/SD percentiles	**11 studies** across diagnostic groups

Notes:

SGA = small for gestational age (mostly defined as <10th percentile); LBW = low birth weight (mostly defined as <2500g); ND/AE = Neurobehavioural disorder/alcohol exposed; FASD = fetal alcohol spectrum disorder; FAS = fetal alcohol syndrome; pFAS = partial fetal alcohol syndrome; ARND = alcohol related neurodevelopmental disorder.

- Postnatal weight/height = any measurements taken after birth.
- Postnatal weight/height for diagnosed studies – minimum age is 6 years as this was youngest age of diagnosis for available studies.
- Sub-group analyses done to separate studies with a high risk of bias score.
- Funnel plots only where there are ≥10 studies.

Table 2. GRADE ratings for birth weight

	Certainty assessment					№ of patients		Effect		Certainty
№ of studies	Risk of bias	Inconsistency	Indirectness	Imprecision	Other	PAE	Control	Relative (95% CI)	Absolute (95% CI)[1]	
EXPOSURE STUDIES										
Small for gestational age (defined at <10th percentile)										
Light prenatal alcohol exposure (1-20g/w in at least one trimester)										
8	serious[a]	not serious	not serious	serious[d]	none	18166	1271434	**OR 1.08** (0.99 to 1.18)	**7 more** per 1000 (from 1 fewer to 15 more)	⊕⊕◯◯ Low
Moderate prenatal alcohol exposure (21-100g/w in at least one trimester)										
8	serious[a]	serious[b]	not serious	serious[d]	none	19594	1236494	**OR 1.18** (0.84 to 1.66)	**15 more** per 1000 (from 14 fewer to 53 more)	⊕◯◯◯ Very low
Heavy prenatal alcohol exposure (101-200g/w in at least one trimester)										
8	serious[a]	not serious	not serious	not serious	none	2292	71552	**OR 1.30** (1.03 to 1.63)	**25 more** per 1000 (from 3 more to 51 more)	⊕⊕⊕◯ Moderate
Very heavy prenatal alcohol exposure (201g+/w in at least one trimester)										
5	serious[a]	not serious	not serious	not serious	none	204	66837	**OR 2.83** (1.79 to 4.48)	**133 more** per 1000 (from 63 more to 223 more)	⊕⊕⊕◯ Moderate
Any level prenatal alcohol exposure (Exposure dichotomized yes/no)										
4	serious[a]	serious[b]	not serious	serious[d]	none	20422	1220299	**OR 1.11** (0.85 to 1.44)	**9 more** per 1000 (from 13 fewer to 36 more)	⊕◯◯◯ Very low
Confirmed prenatal alcohol exposure-Level Unquantifiable – no studies										
Small for gestational age (any definition)										
Light prenatal alcohol exposure (1-20g/w in at least one trimester)										
12	serious[a]	serious[b]	not serious	serious[d]	none	56013	1306218	**OR 1.02** (0.91 to 1.14)	**2 more** per 1000 (from 8 fewer to 12 more)	⊕◯◯◯ Very low
Moderate prenatal alcohol exposure (21-100g/w in at least one trimester)										
12	serious[a]	serious[b]	not serious	serious[d]	none	28790	1413949	**OR 1.10** (0.86 to 1.41)	**8 more** per 1000 (12 fewer to 34 more)	⊕◯◯◯ Very low
Heavy prenatal alcohol exposure (101-200g/w in at least one trimester)										

11	serious[a]	not serious	not serious	not serious	none	4005	102426	**OR 1.22** (1.01 to 1.46)	18 **more** per 1000 (1 more to 38 more)	⊕⊕⊕◯ Moderate
Very heavy prenatal alcohol exposure (201g+/w in at least one trimester)										
7	serious[a]	not serious	not serious	not serious	none	352	95156	**OR 2.17** (1.36 to 3.45)	**90 more** per 1000 (30 more to 170 more)	⊕⊕⊕◯ Moderate
Any level prenatal alcohol exposure (exposure dichotomized to yes/no)										
7	serious[a]	serious[b]	not serious	serious[d]	none	51861	1320851	**OR 1.10** (0.96 to 1.26)	**8 more** per 1000 (3 fewer to 22 more)	⊕◯◯◯ Very low
Confirmed prenatal alcohol exposure-Level Unquantifiable – no studies										
Low Birth weight (≤2500g)										
Light prenatal alcohol exposure (1-20g/w in at least one trimester)										
12	serious[a]	not serious	not serious	serious[d]	none	25091	63079	**OR 1.00** (0.88 to 1.13)	**0 fewer** per 1000 (from 7 fewer to 8 more)	⊕⊕◯◯ Low
Moderate prenatal alcohol exposure (21-100g/w in at least one trimester)										
13	serious[a]	serious[b]	not serious	serious[d]	none	22385	72553	**OR 1.08** (0.88 to 1.34)	**5 more** per 1000 (from 7 fewer to 20 more)	⊕◯◯◯ Very low
Heavy prenatal alcohol exposure (101-200g/w in at least one trimester)										
12	serious[a]	serious[b]	not serious	not serious	none	3357	72079	**OR 1.75** (1.30 to 2.36)	**44 more** per 1000 (from 18 more to 77 more)	⊕⊕◯◯ Low
Very heavy prenatal alcohol exposure (201+g/w in at least one trimester)										
6	serious[a]	not serious	not serious	not serious	none	585	60450	**OR 2.06** (1.39 to 3.06)	**61 more** per 1000 (from 23 more to 112 more)	⊕⊕⊕◯ Moderate
Any level prenatal alcohol exposure (exposure dichotomized to yes/no)										
10	serious[a]	not serious	not serious	serious[d]	none	29633	246044	**OR 1.10** (0.99 to 1.21)	**6 more** per 1000 (from 1 fewer to 13 more)	⊕⊕◯◯ Low
Confirmed prenatal alcohol exposure-Level Unquantifiable – no studies										
Birth weight (grams)										
Light prenatal alcohol exposure (1-20g/w in at least one trimester)										
10	serious[a]	serious[b]	not serious	serious[d]	none	7156	33779	-	MD **1.65 higher** (45.18 lower to 48.47 higher)	⊕◯◯◯ Very low

Moderate prenatal alcohol exposure (21-100g/w in at least one trimester)										
14	serious[a]	serious[b]	not serious	serious[d]	none	20104	43678	-	MD **26.14 lower** (59.46 lower to 7.19 higher)	⊕◯◯◯ Very low
Heavy prenatal alcohol exposure (101-200g/w in at least one trimester)										
14	serious[a]	serious[b]	not serious	not serious	none	2632	34240	-	MD **193.36 lower** (267.80 lower to 118.91 lower)	⊕⊕◯◯ Low
Very heavy prenatal alcohol exposure (201g+/w in at least one trimester)										
6	serious[a]	serious[b]	not serious	not serious	none	220	21178	-	MD **272.9 lower** (411.26 lower to 134.55 lower)	⊕⊕◯◯ Low
Any level prenatal alcohol exposure (exposure dichotomized to yes/no)										
4	serious[a]	serious[b]	not serious	serious[d]	none	3867	10841	-	MD **2.44 lower** (68.14 lower to 63.27 higher)	⊕◯◯◯ Very low
Confirmed prenatal alcohol exposure-Level Unquantifiable										
4	serious[a]	serious[b]	not serious	serious[d,e]	none	196	529	-	MD **232.80 lower** (476.64 lower to 11.05 higher)	⊕◯◯◯ Very low
Birth weight Percentiles										
Light prenatal alcohol exposure (1-20g/w in at least one trimester)										
1	serious[a]	not serious	serious[c]	serious[f]	none	96	277	-	MD **6.80 lower** (13.08 lower to 0.52 lower)	⊕◯◯◯ Very low
Moderate prenatal alcohol exposure (21-100g/w in at least one trimester)										
1	serious[a]	not serious	serious[c]	serious[f]	none	23	277	-	MD **18.80 lower** (30.34 lower to 7.26 lower)	⊕◯◯◯ Very low
Heavy prenatal alcohol exposure (101-200g/w in at least one trimester)										
1	serious[a]	not serious	serious[c]	serious[f]	none	33	47	-	MD **6.10 lower** (17.92 lower to 5.72 lower)	⊕◯◯◯ Very low
Very heavy prenatal alcohol exposure (201g+/w in at least one trimester)										
1	serious[a]	not serious	serious[c]	serious[f]	none	24	277	-	MD **20.80 lower** (31.19 lower	⊕◯◯◯ Very low

									to 10.41 lower)	
Any level prenatal alcohol exposure (exposure dichotomized to yes/no) – no studies										
Confirmed prenatal alcohol exposure-Level Unquantifiable – no studies										
DIAGNOSED STUDIES										
Small for Gestational Age (defined as <10th Percentile)										
FASD – no studies										
FAS										
1	serious[a]	not serious	serious[c]	serious[f]	none	96	313	**OR 4.47** (2.76 to 7.24)	**223 more** per 1000 (129 more to 335 more)	⊕◯◯◯ Very low
pFAS (pFAS or pFAS/FAS or dysmorphic)										
1	serious[a]	not serious	serious[c]	serious[f]	none	81	313	**OR 1.94** (1.17 to 3.22)	**74 more** per 1000 (14 more to 156 more)	⊕◯◯◯ Very low
Other FASDs (ARND, ND-AE, SE-AE, Non-syndromal)										
1	serious[a]	not serious	serious[c]	serious[f]	none	78	313	**OR 2.42** (1.45 to 4.03)	**107 more** per 1000 (34 more to 201 more)	⊕◯◯◯ Very low
Low birth weight										
FASD, FAS, pFAS, Other FASDs - no studies										
Birth weight (grams)										
FASD										
6	serious[a]	not serious	not serious	not serious	none	746	810	-	MD **397.16 lower** (502.46 lower to 291.87 lower)	⊕⊕⊕◯ Moderate
FAS										
4	serious[a]	serious[b]	not serious	serious[e]	none	241	2147	-	MD **594.71 lower** (743.06 lower to 446.35 lower)	⊕◯◯◯ Very Low
pFAS (pFAS or pFAS/FAS or dysmorphic)										
5	serious[a]	serious[b]	not serious	serious[e]	none	214	1580	-	MD **384.91 lower** (651.38 lower to 118.45 lower)	⊕◯◯◯ Very Low
Other FASDs (ARND, ND-AE, SE-AE, Non-syndromal)										
4	serious[a]	serious[b]	not serious	serious[d,e]	none	201	1521	-	MD **198.72 lower** (426.95 lower to 29.51 higher)	⊕◯◯◯ Very Low
Birthweight Percentiles										
FASD – no studies										
FAS										
1	serious[a]	not serious	serious[c]	not serious	none	96	313	-	MD **16.00 lower** (22.05 lower to 9.95 lower)	⊕⊕◯◯ Low

pFAS (pFAS or pFAS/FAS or dysmorphic)										
1	serious[a]	not serious	serious[c]	not serious	none	81	313	-	MD **8.50 lower** (14.98 lower to 2.02 lower)	⊕⊕◯◯ Low
Other FASDs (ARND, ND-AE, SE-AE, Non-syndromal)										
1	serious[a]	not serious	serious[c]	not serious	none	78	313	-	MD **13.80 lower** (19.93 lower to 7.67 lower)	⊕⊕◯◯ Low

Notes: CI: confidence interval; **MD:** mean difference; **OR:** odds ratio; 1) **LBW**: Absolute effect calculated based on Australian population average LBW = 6.6% (66 per 1000) (AIHW, 2019); **SGA**: Absolute effect calculated based on Australian population average for SGA = 9.4% (94 per 1000) (AIHW, 2019).

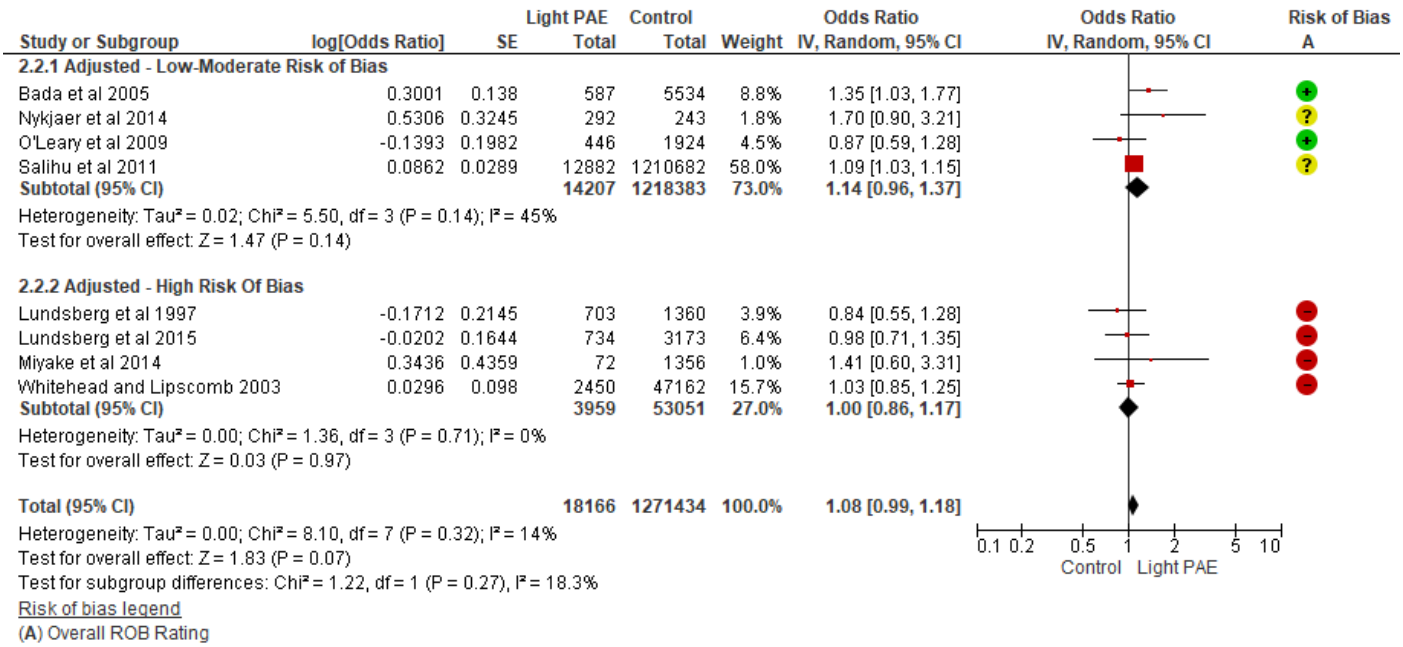
Explanations: a) >50% of studies were rated as moderate or high risk of bias; b) High heterogeneity (I^2 >50% and significant chi-square for heterogeneity); c) >50% of studies had a sample not representative of the Australian populations not representative of Australia; d) 95% CI for overall estimate crossed the line of no effect; e) Wide 95% CI for overall estimate; f) optimal information size not met

Meta-analyses for birth weight

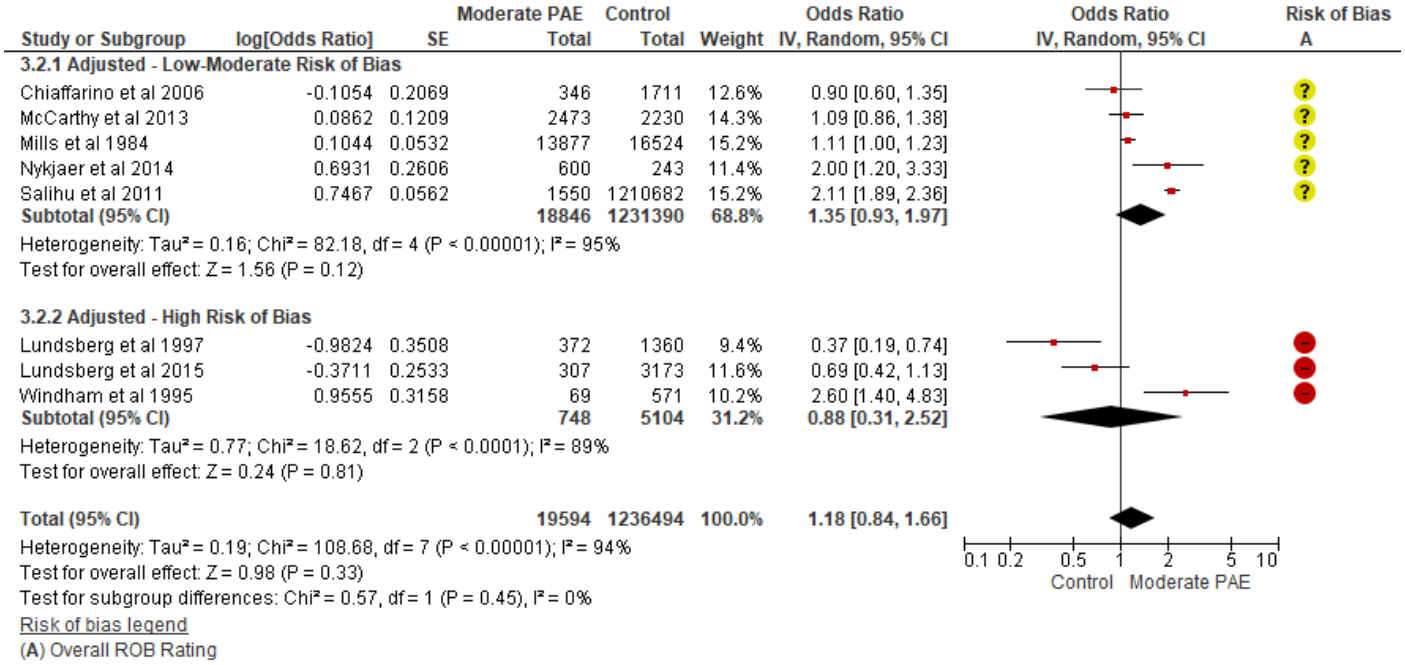
Exposure studies

Small for Gestational Age (<10th percentile)

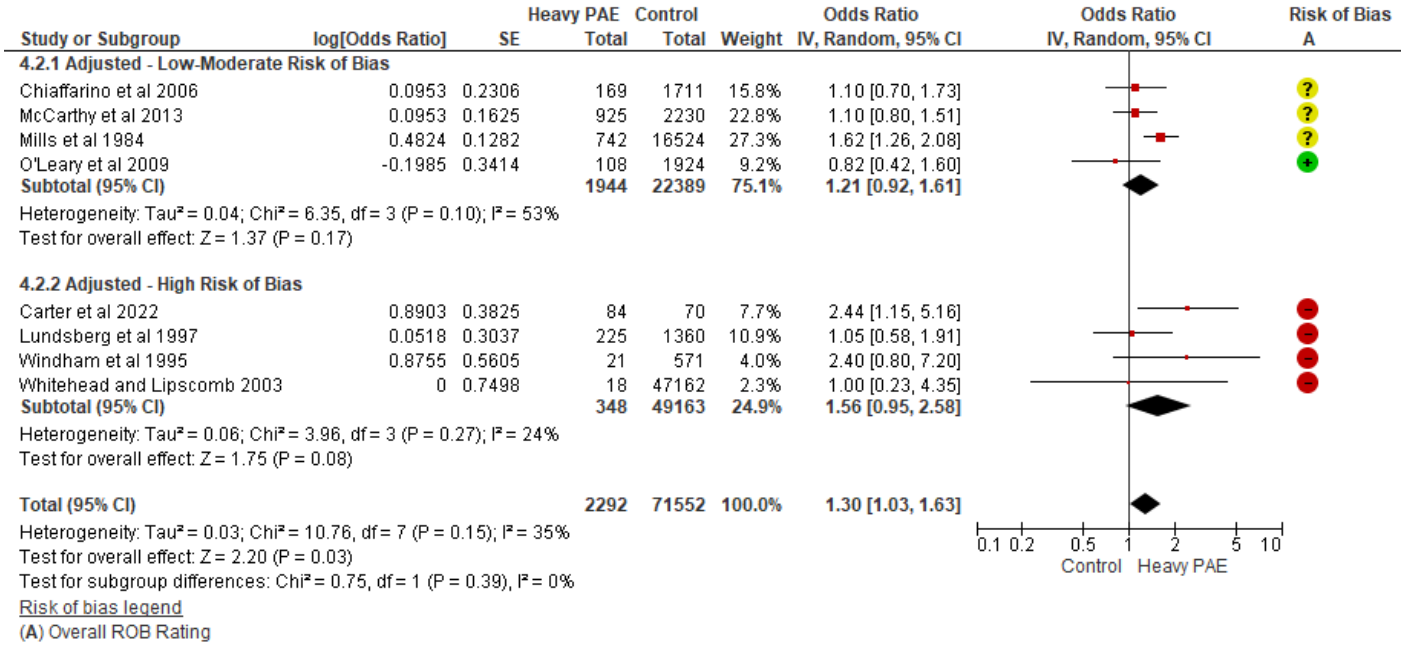
Light PAE and SGA (8 studies)



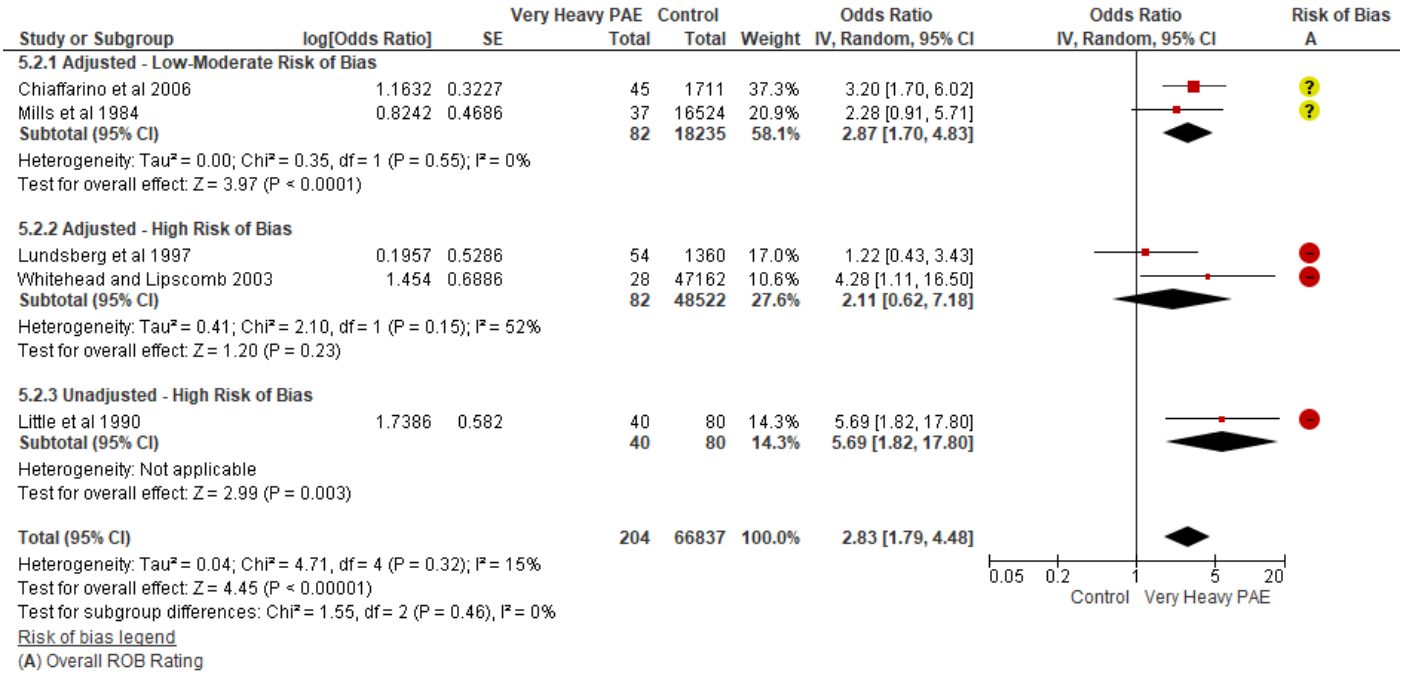
Moderate PAE and SGA (8 studies)



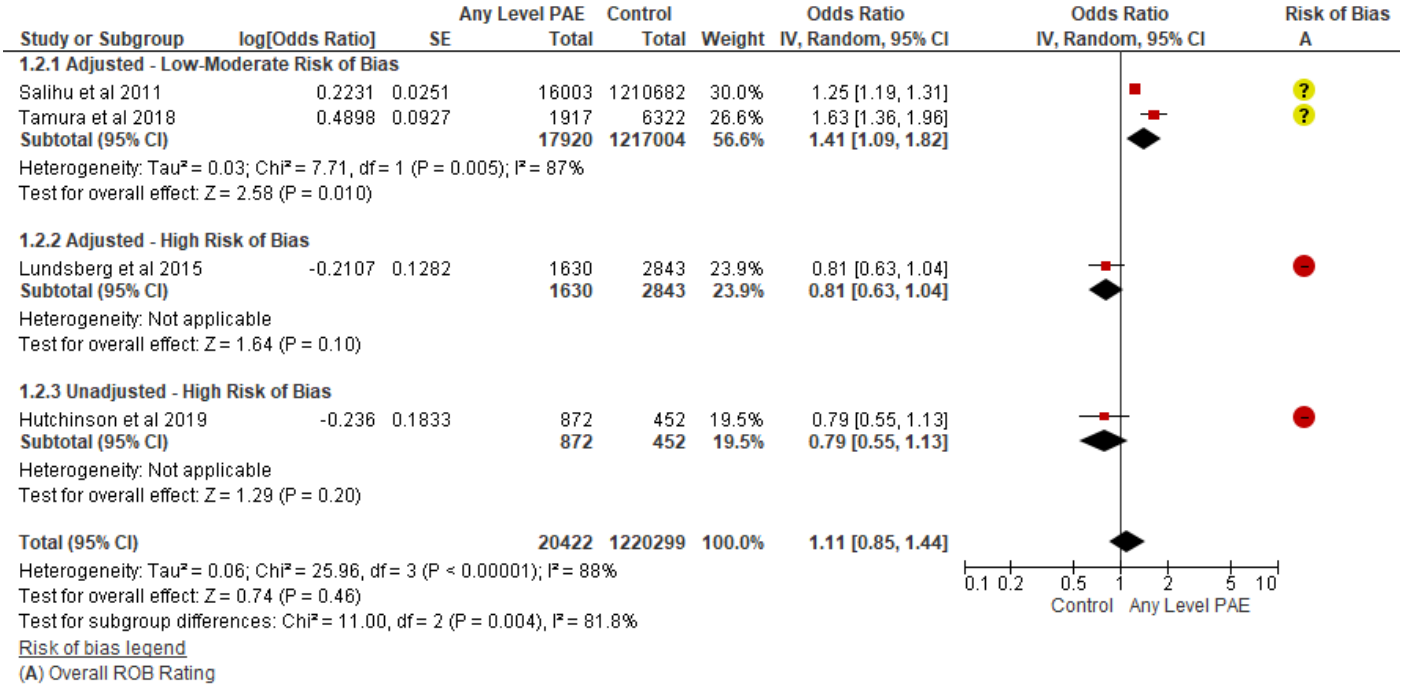
Heavy PAE and SGA (8 studies)



Very Heavy PAE and SGA (5 studies)



Any Level PAE and SGA (4 studies)



Confirmed PAE-Level Unquantifiable and SGA (0 studies)

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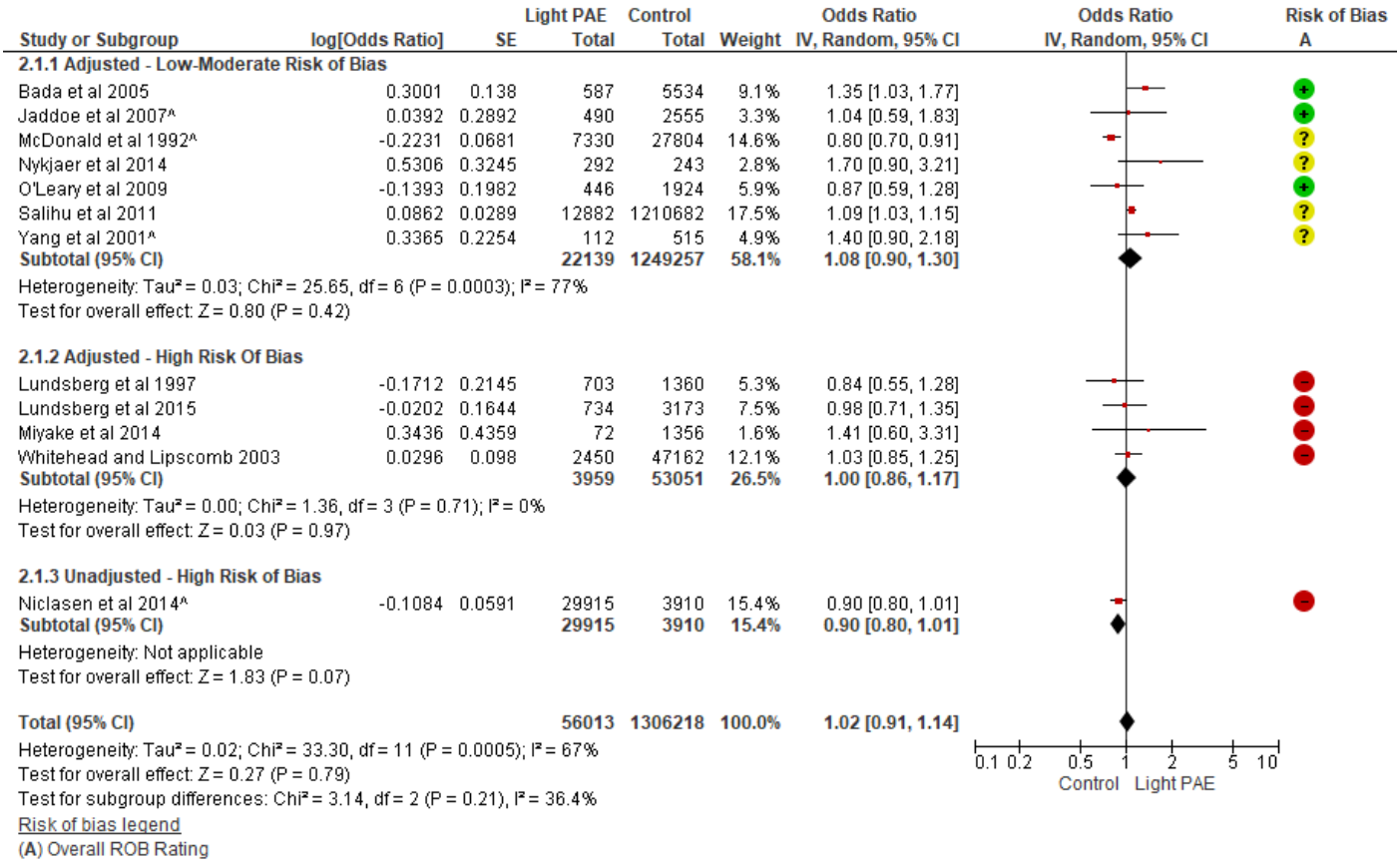
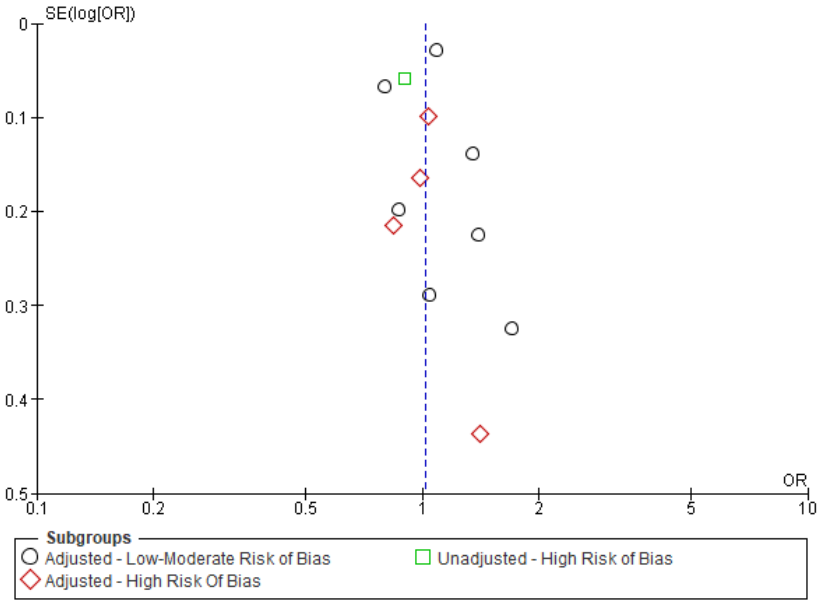
Small for Gestational Age (all definitions)

Light PAE and SGA (all) (12 studies)

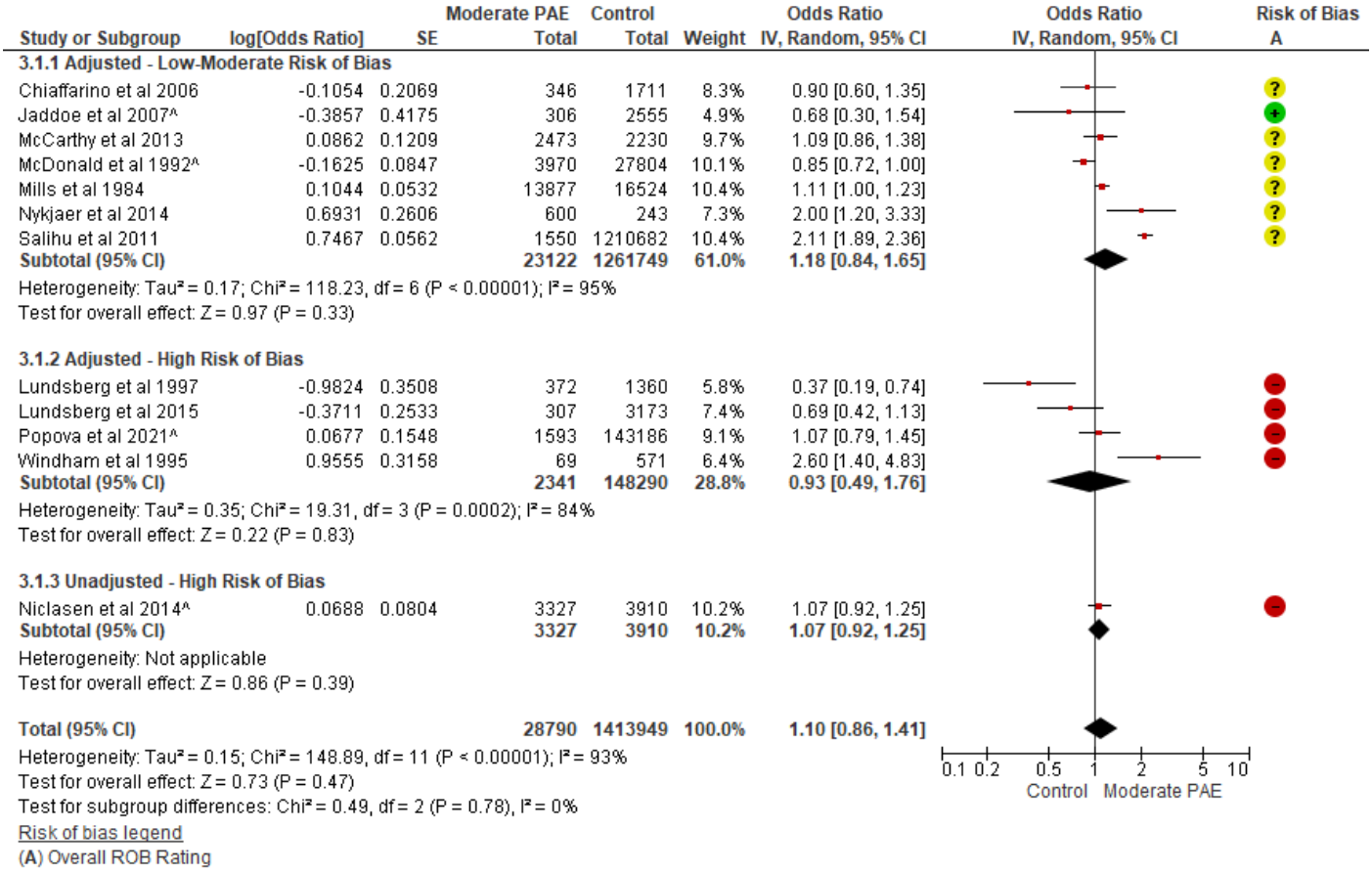


Notes. ^Definition of SGA: Niclasen et al 2014 = SGA not defined; Jaddoe et al. 2007 = SGA < SDs; McDonald et al. 1992 = SGA <5th percentile; Yang et al. 2001 = SGA between 5th and 10th percentile; all other studies = SGA < 10th percentile.

Funnel Plot: **Light PAE and SGA (all definitions)**

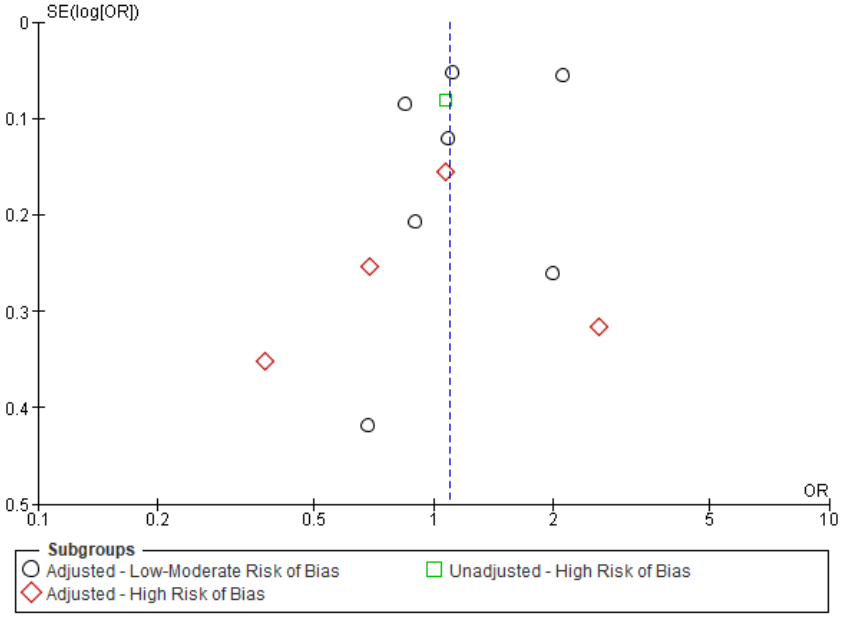


Moderate PAE and SGA (all) (12 studies)

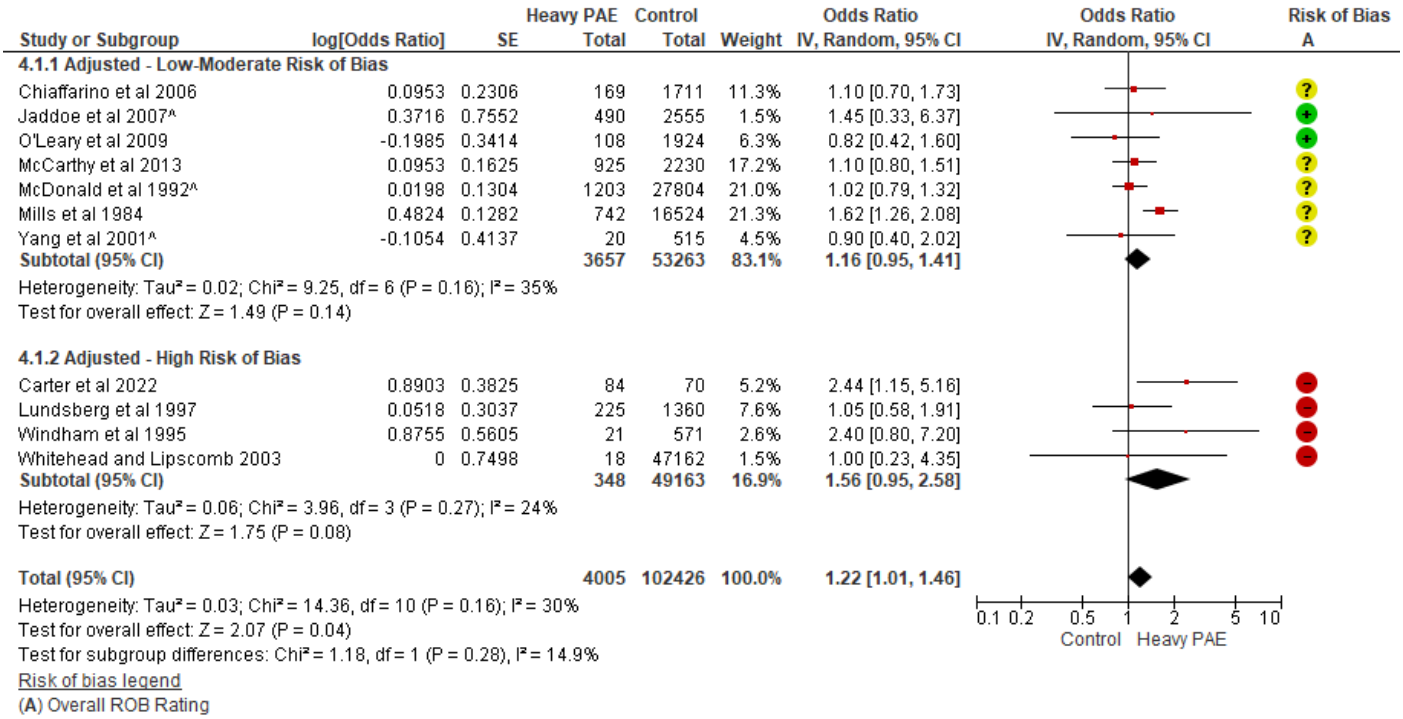


Notes. ^Definition of SGA: Niclasen et al 2014 and Popova et al. 2021 = SGA not defined; Jaddoe et al. 2007 = SGA < SDs; McDonald et al. 1992 = SGA <5th percentile; all other studies = SGA < 10th percentile.

Funnel Plot: **Moderate PAE and SGA (all definitions)**

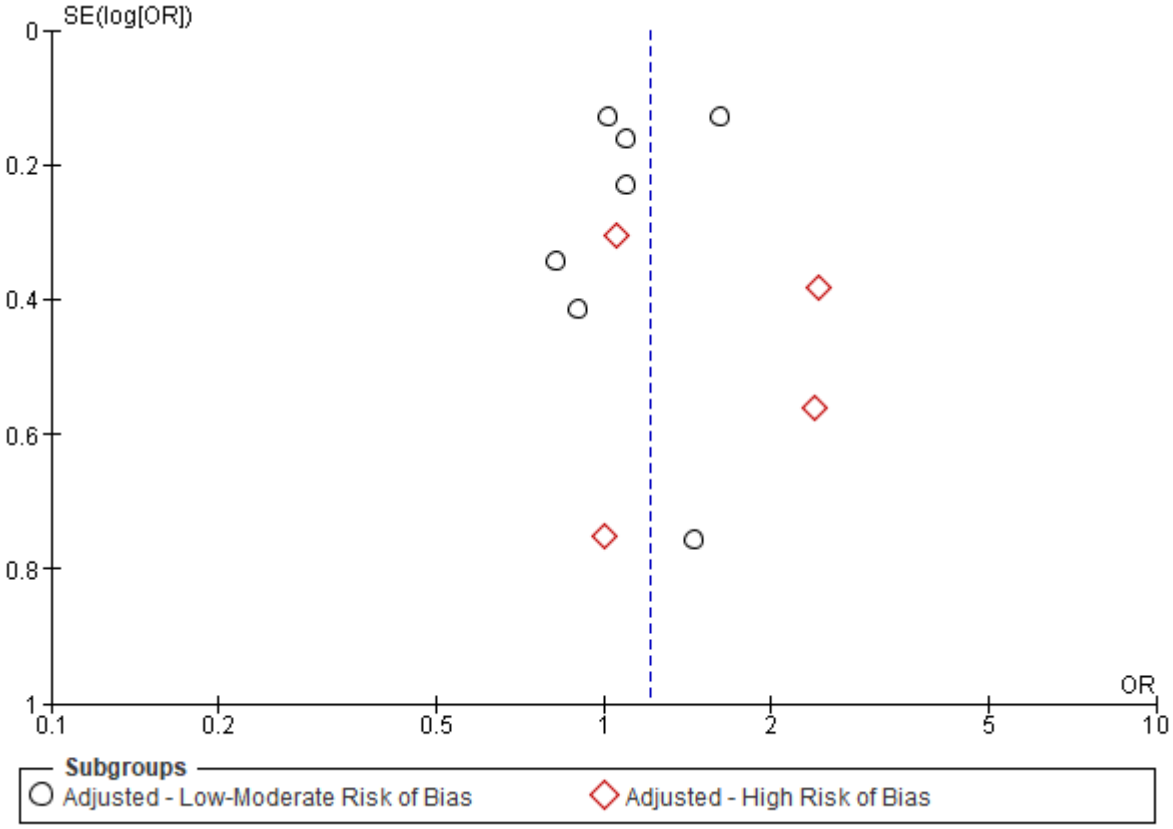


Heavy PAE and SGA (all) (11 studies)

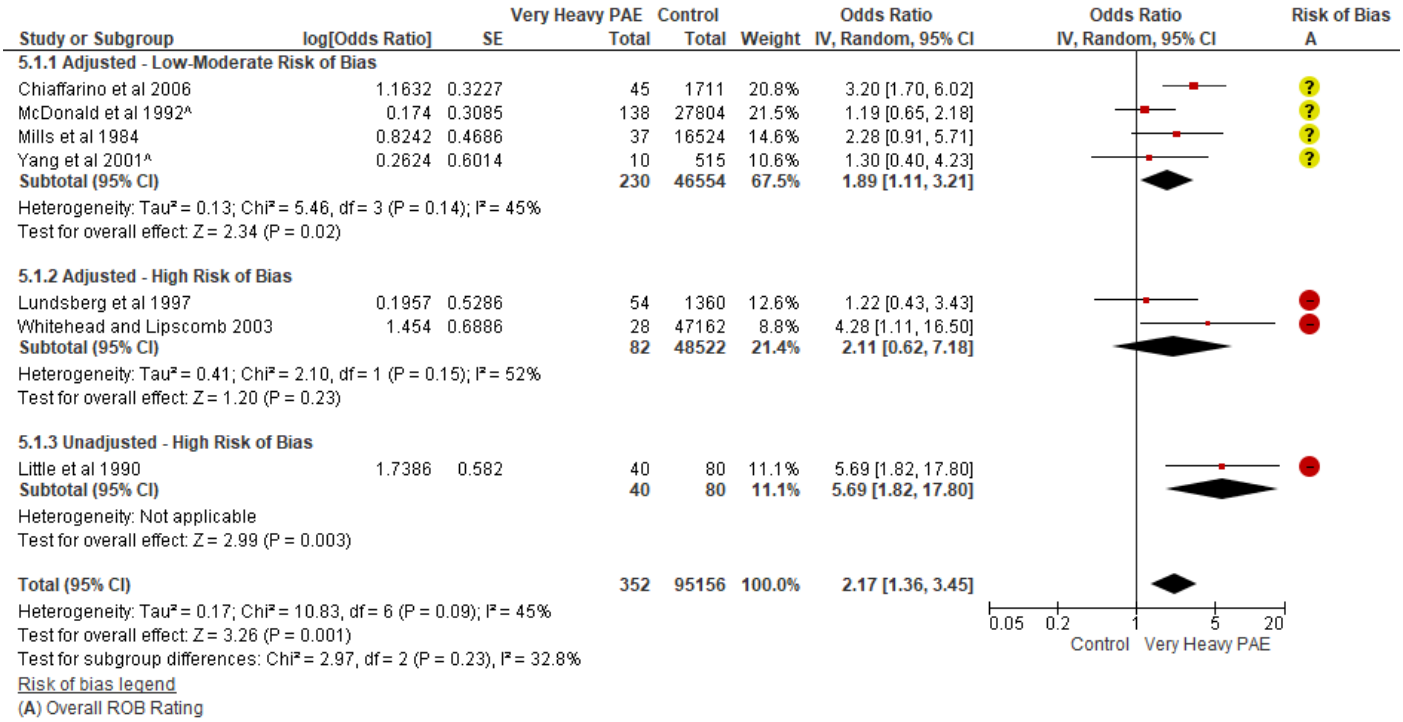


Notes. ^Definition of SGA: Jaddoe et al. 2007 = SGA < SDs; McDonald et al. 1992 = SGA <5th percentile; Yang et al. 2001 = SGA between 5th and 10th percentile; all other studies = SGA < 10th percentile.

Funnel Plot: **Heavy PAE and SGA (all definitions)**

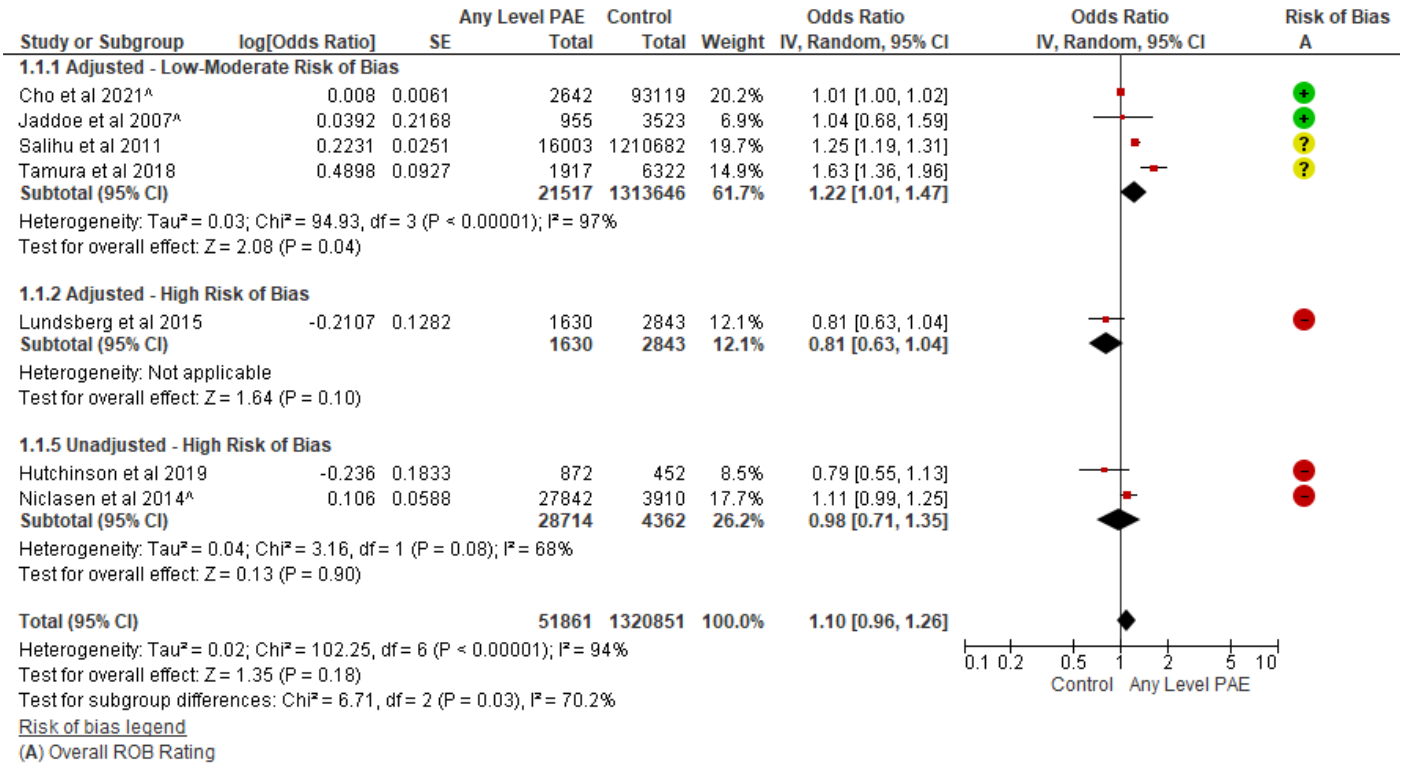


Very Heavy PAE and SGA (all) (7 studies)



Notes. ^Definition of SGA: McDonald et al. 1992 = SGA <5th percentile; Yang et al. 2001 = SGA between 5th and 10th percentile; all other studies = SGA < 10th percentile.

Any Level PAE and SGA (all) (7 studies)



Notes. ^Definition of SGA: Cho et al. 2021, Niclasen et al 2014 = SGA not defined; Jaddoe et al. 2007 = SGA < SDs; all other studies = SGA < 10th percentile.

Confirmed PAE-Level Unknown and SGA (all) (0 studies)

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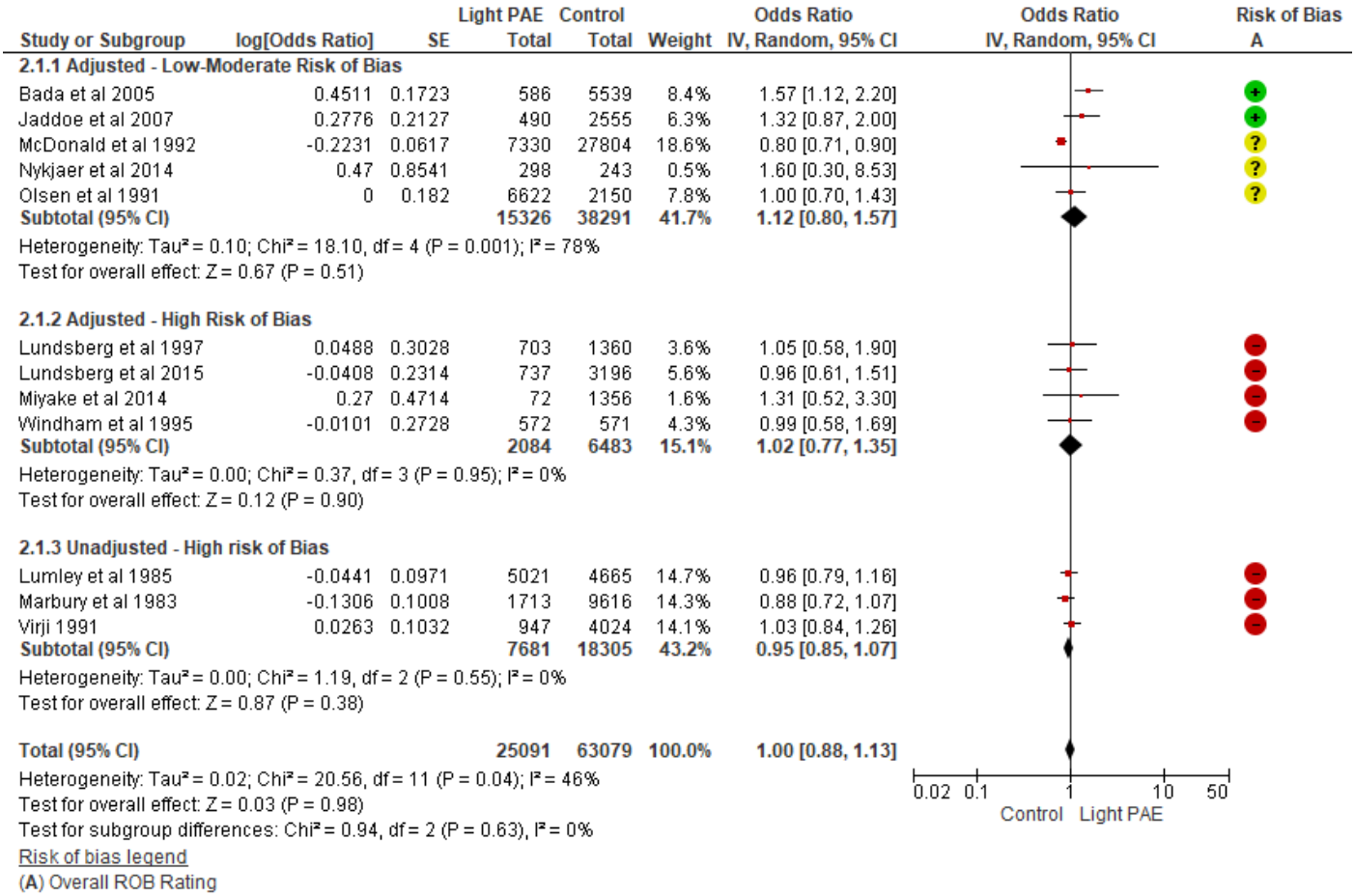
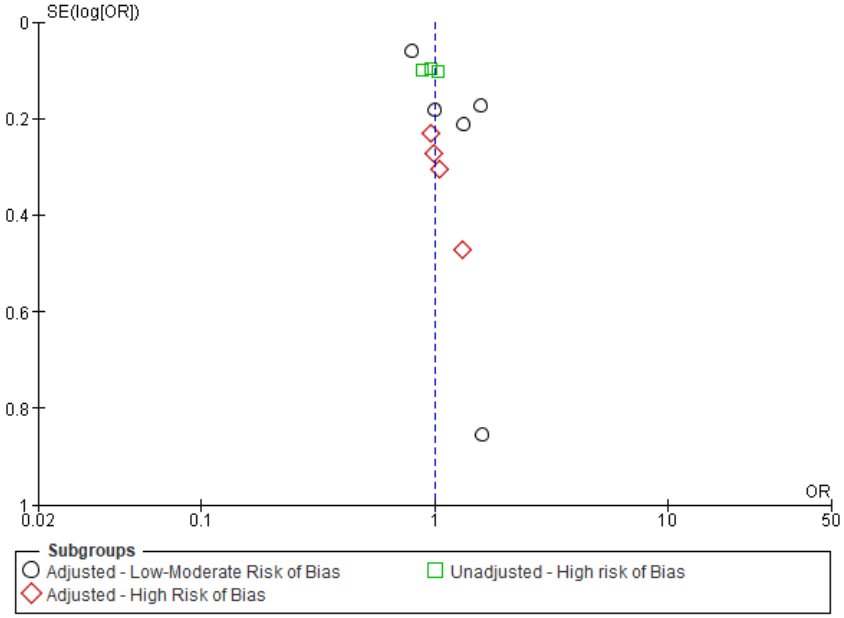
Low Birth weight (<2500g)

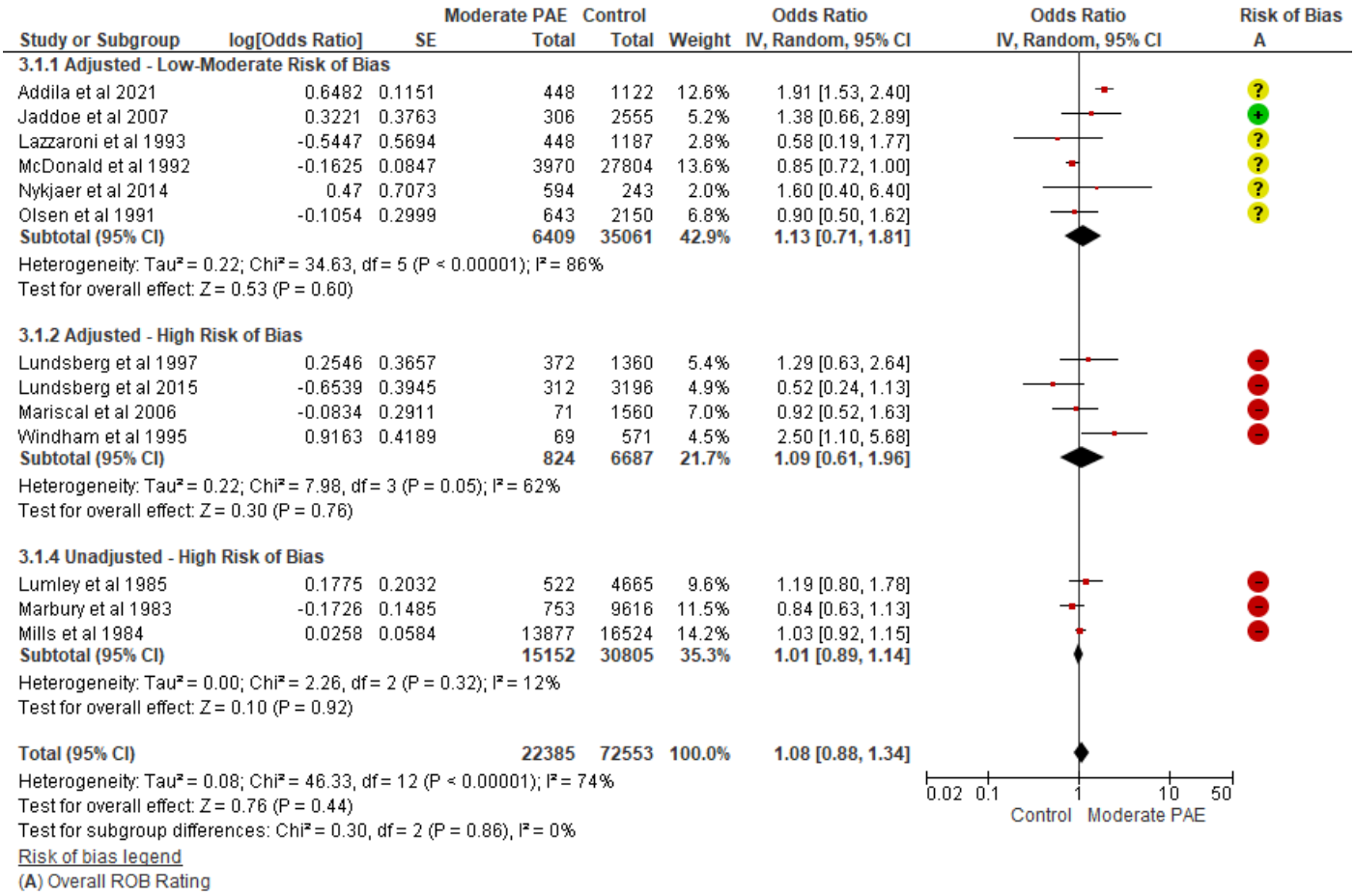
Light PAE and LBW (12 studies)



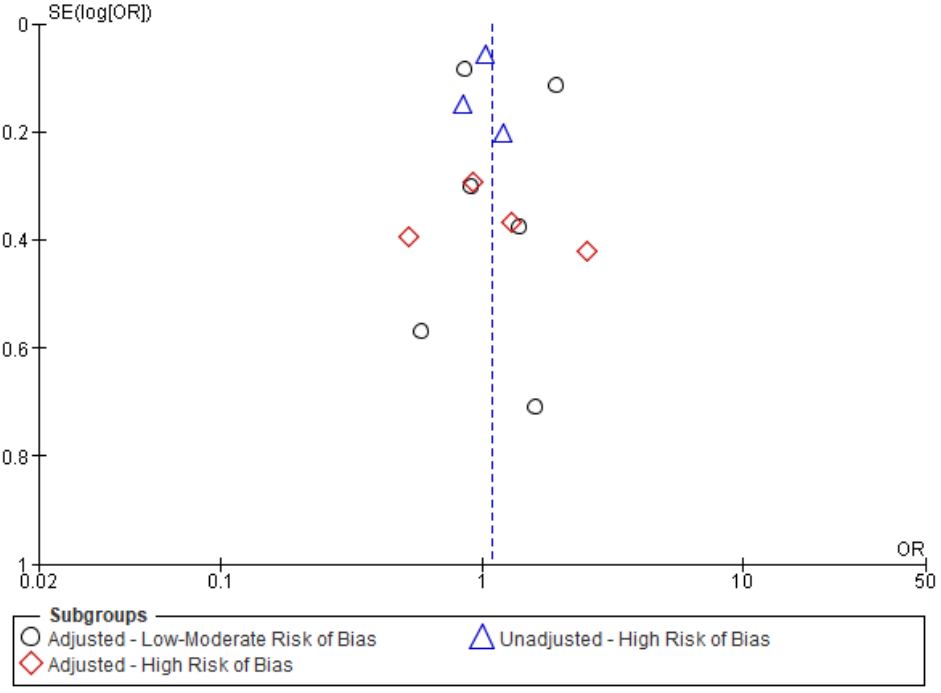
Funnel Plot: **Light PAE and LBW**



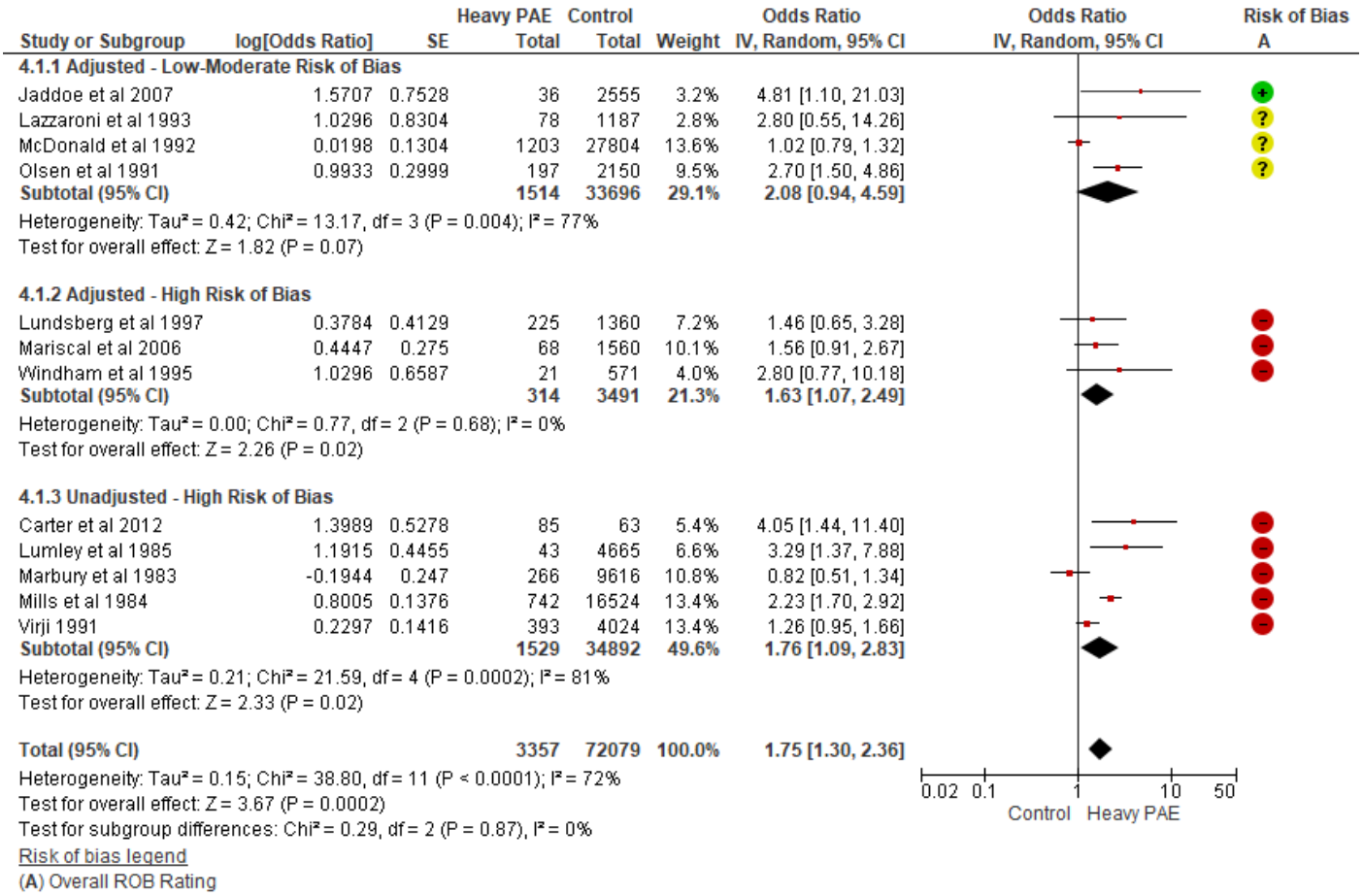
Moderate PAE and LBW (13 studies)



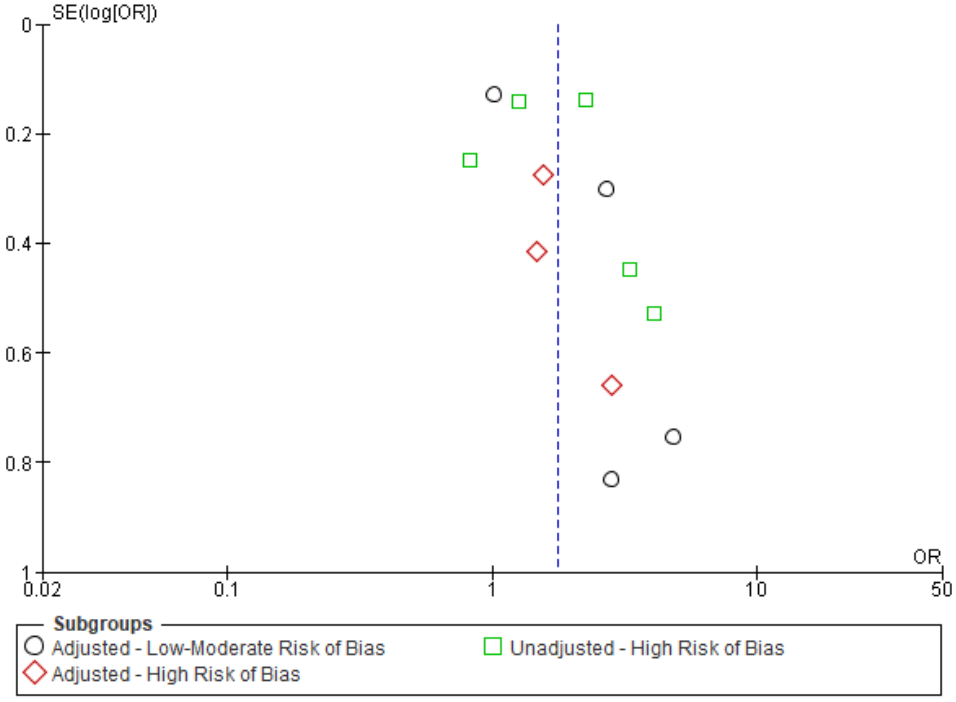
Funnel Plot: **Moderate PAE and LBW**



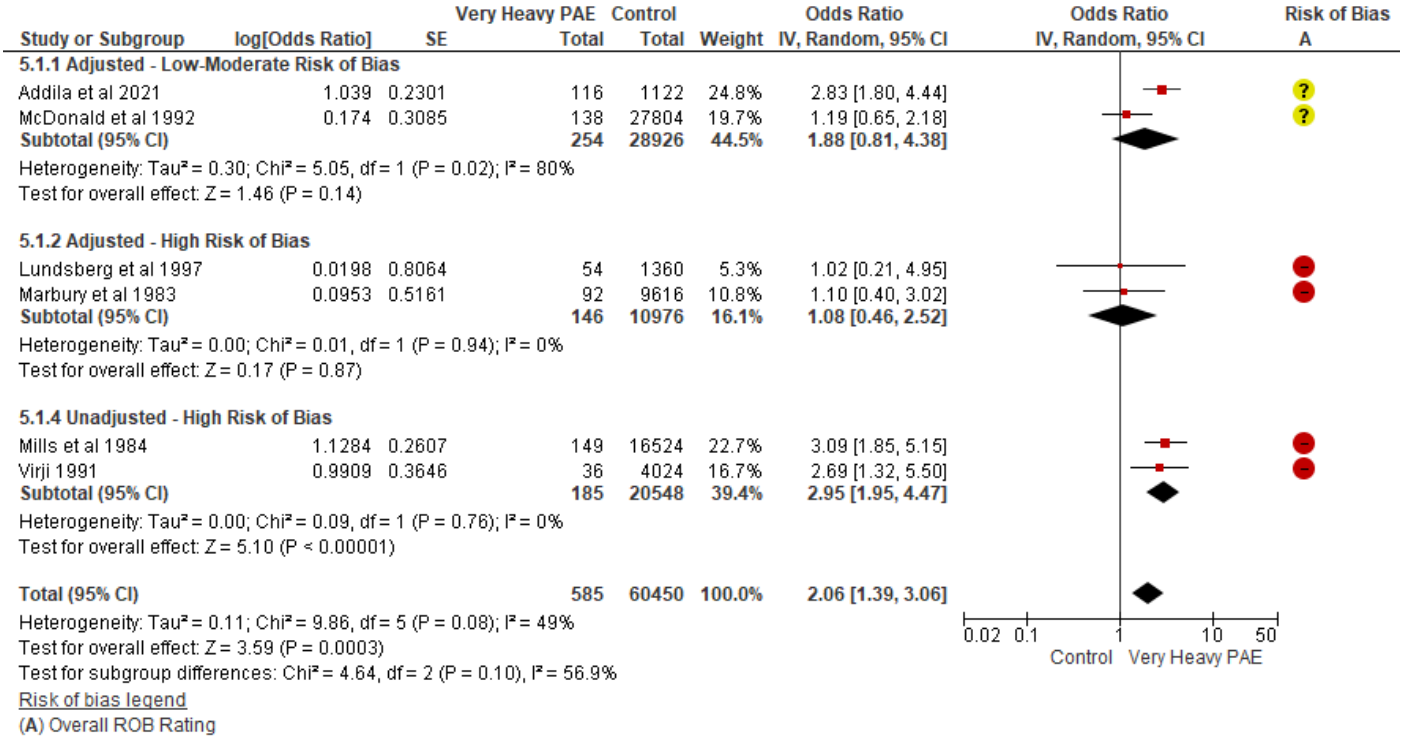
Heavy PAE and LBW (12 studies)



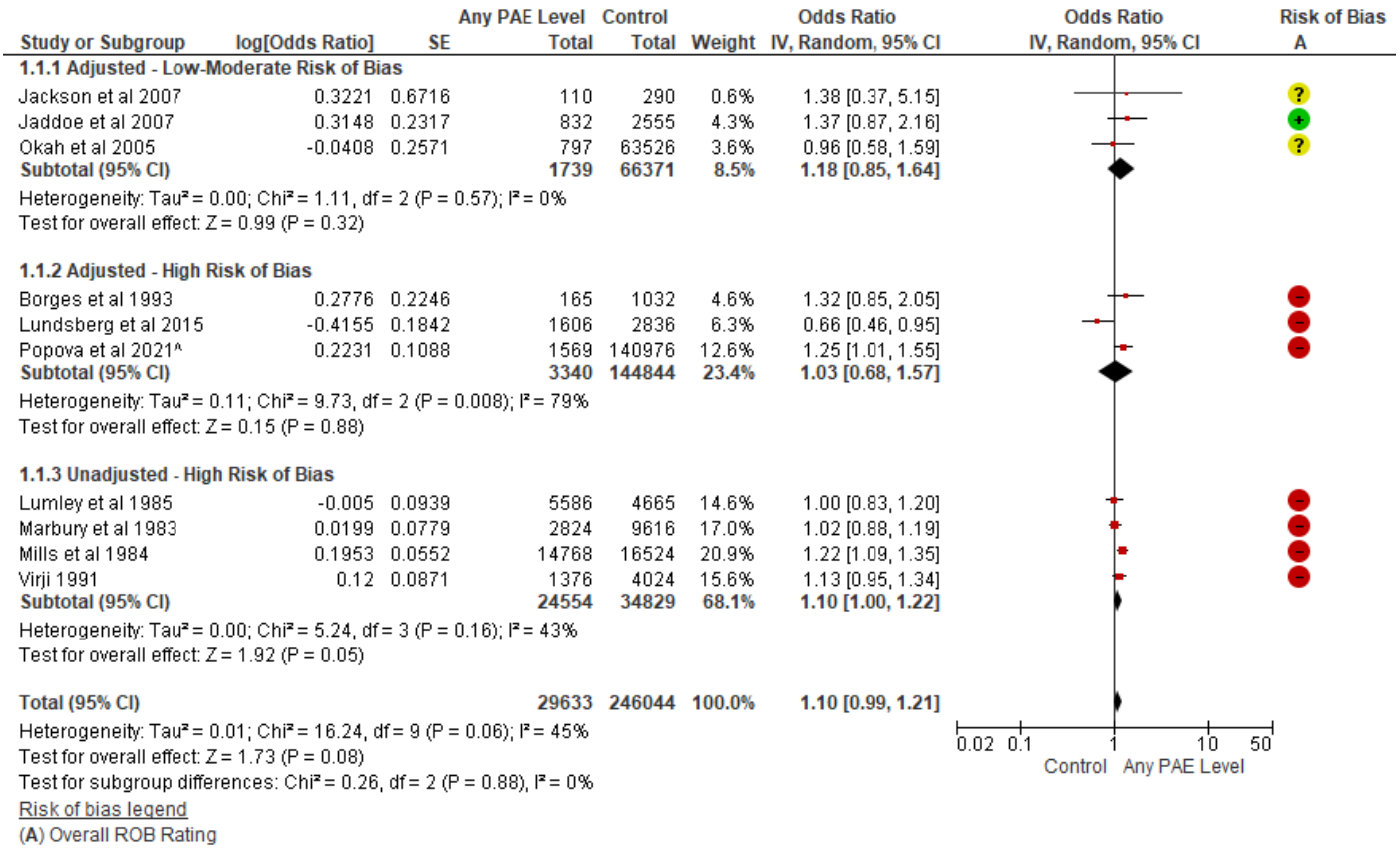
Funnel Plot: **Heavy PAE and LBW**



Very Heavy PAE and LBW (6 studies)

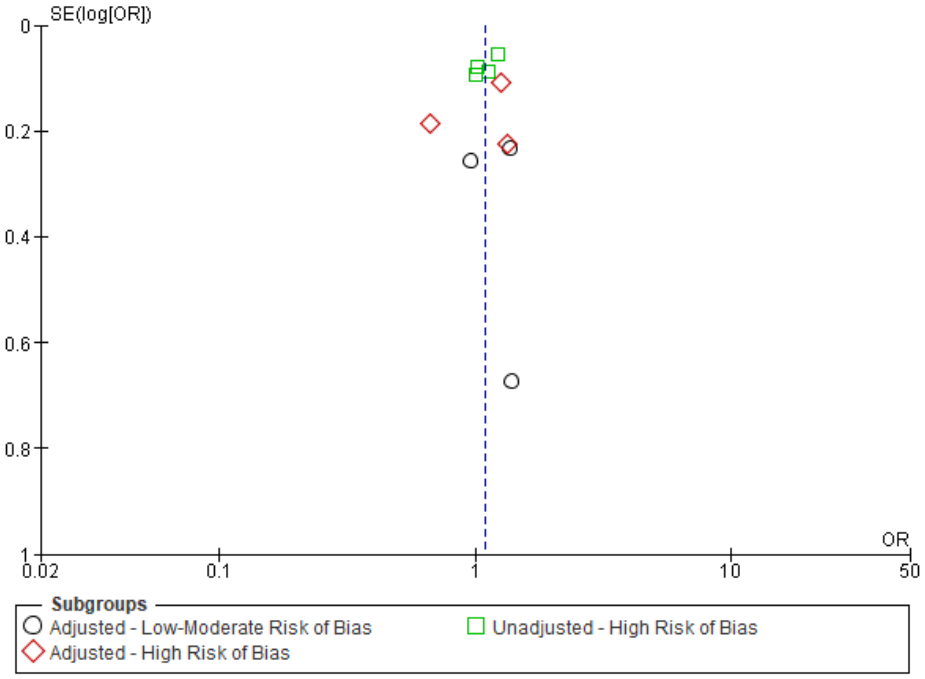


Any Level PAE and LBW (10 studies)



Note. ^Popova et al. 2021 = LBW not defined.

Funnel Plot: **Any Level PAE and LBW**



Confirmed PAE-Level Unknown and LBW (0 studies)

-

Birth weight (grams)

Light PAE and Birthweight (10 studies)

Study or Subgroup	Light PAE Mean [g]	Light PAE SD [g]	Light PAE Total	Control Mean [g]	Control SD [g]	Control Total	Weight	Mean Difference IV, Random, 95% CI	Risk of Bias A
1.1.1 Low-Moderate Risk of Bias									
Faden et al 1997	3,389.1	639.1	124	3,351	588	8245	7.4%	38.10 [-75.10, 151.30]	?
Subtotal (95% CI)			**124**			**8245**	**7.4%**	**38.10 [-75.10, 151.30]**	
Heterogeneity: Not applicable									
Test for overall effect: Z = 0.66 (P = 0.51)									
1.1.2 High Risk of Bias									
Falgreen et al 2012	3,618.8	511.3	675	3,601.6	525.2	758	11.2%	17.20 [-36.52, 70.92]	-
Kelly et al 2009	3,454	605.8515	2549	3,420	627.9873	6162	12.5%	34.00 [5.73, 62.27]	-
Lees et al 2020	3,129.79	725.748	93	2,948.35	680.39	6669	5.7%	181.44 [33.04, 329.84]	-
Virji et al 1991	3,299.59	680.9	948	3,301.14	698	4024	11.5%	-1.55 [-49.96, 46.86]	-
Sayal et al 2013	3,410	550	1963	3,420	560	5547	12.5%	-10.00 [-38.45, 18.45]	-
Subtotal (95% CI)			**6228**			**23160**	**53.3%**	**17.06 [-14.41, 48.53]**	
Heterogeneity: Tau² = 679.91; Chi² = 9.95, df = 4 (P = 0.04); I² = 60%									
Test for overall effect: Z = 1.06 (P = 0.29)									
1.1.3 Mean and/or SD estimated - Low-Moderate Risk of Bias*									
Shu et al 1995	3,434	420.987	48	3,404	420.987	350	6.7%	30.00 [-97.00, 157.00]	?
Subtotal (95% CI)			**48**			**350**	**6.7%**	**30.00 [-97.00, 157.00]**	
Heterogeneity: Not applicable									
Test for overall effect: Z = 0.46 (P = 0.64)									
1.1.4 Mean and/or SD estimated - High Risk of Bias*									
Marianian et al 2020	3,200	74	112	3,300	59.2	97	12.9%	-100.00 [-118.07, -81.93]	-
Miyake et al 2014	2,952	320.8668	72	3,008.7	320.9887	1356	9.7%	-56.70 [-132.76, 19.36]	-
Windham 1995	3,311.9	623.5671	572	3,310.1	623.5671	571	10.0%	1.80 [-70.50, 74.10]	-
Subtotal (95% CI)			**756**			**2024**	**32.6%**	**-58.85 [-122.78, 5.07]**	
Heterogeneity: Tau² = 2348.24; Chi² = 8.05, df = 2 (P = 0.02); I² = 75%									
Test for overall effect: Z = 1.80 (P = 0.07)									
Total (95% CI)			**7156**			**33779**	**100.0%**	**1.65 [-45.18, 48.47]**	
Heterogeneity: Tau² = 4355.97; Chi² = 92.70, df = 9 (P < 0.00001); I² = 90%									
Test for overall effect: Z = 0.07 (P = 0.95)									
Test for subgroup differences: Chi² = 4.87, df = 3 (P = 0.18), I² = 38.4%									

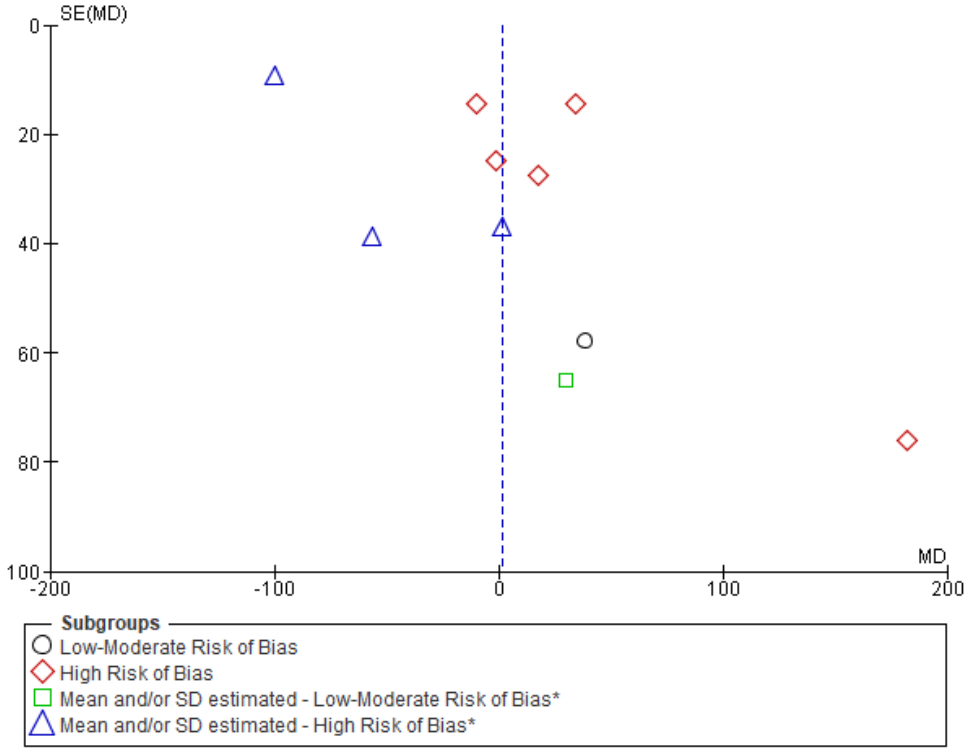
Mean Difference IV, Random, 95% CI: -200, -100, 0, 100, 200 (Light PAE, Control)

Risk of bias legend

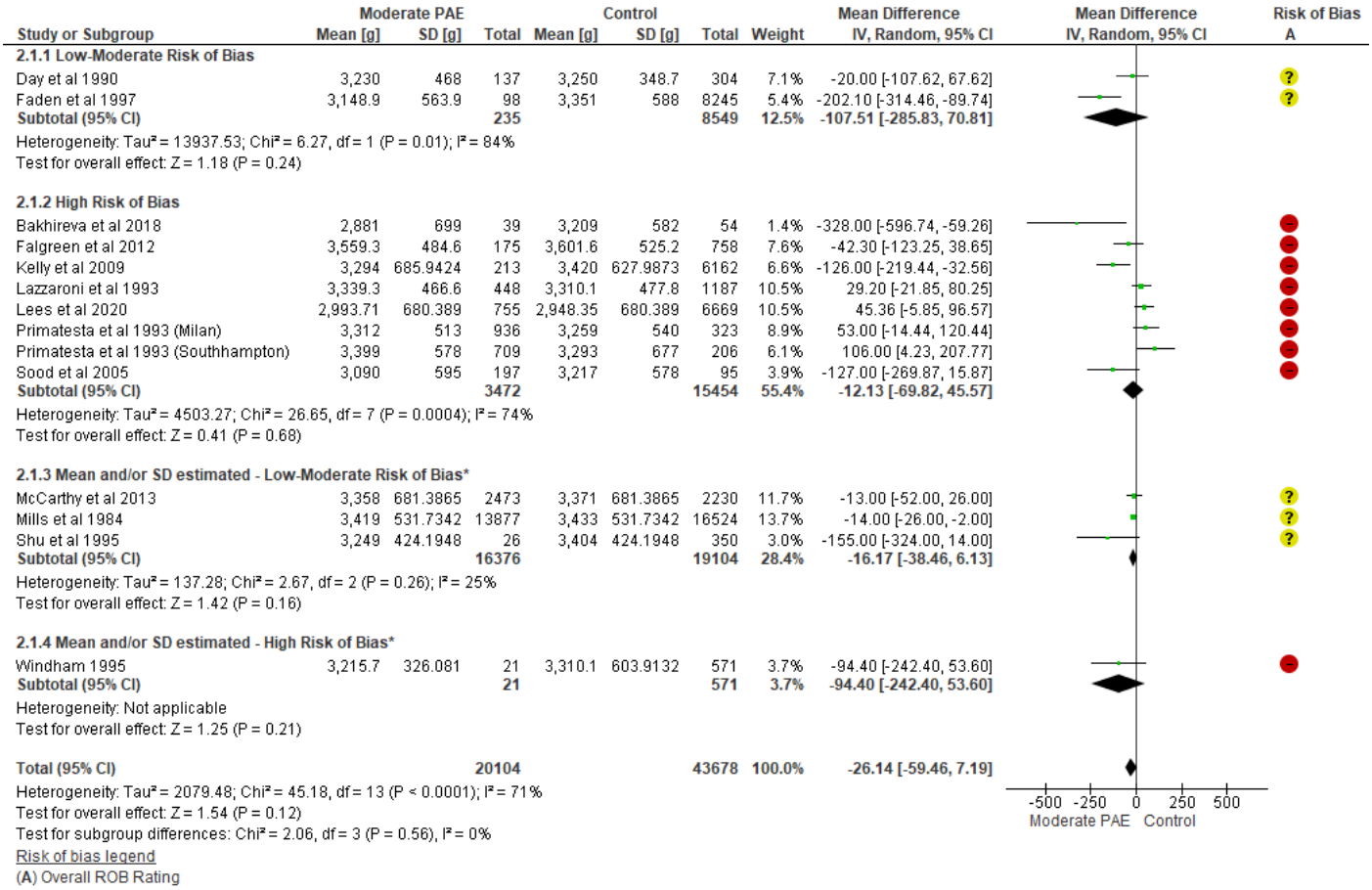
(A) Overall ROB Rating

Notes: *mean and/or SD estimated: Marianian et al 2020 from median and IQR; Miyake et al 2014 from adjusted mean and 95% CI; Shu et al 1995 and Windham et al 1995 from adjusted mean difference and 95% CI

Funnel Plot: **Light PAE and Birth weight**

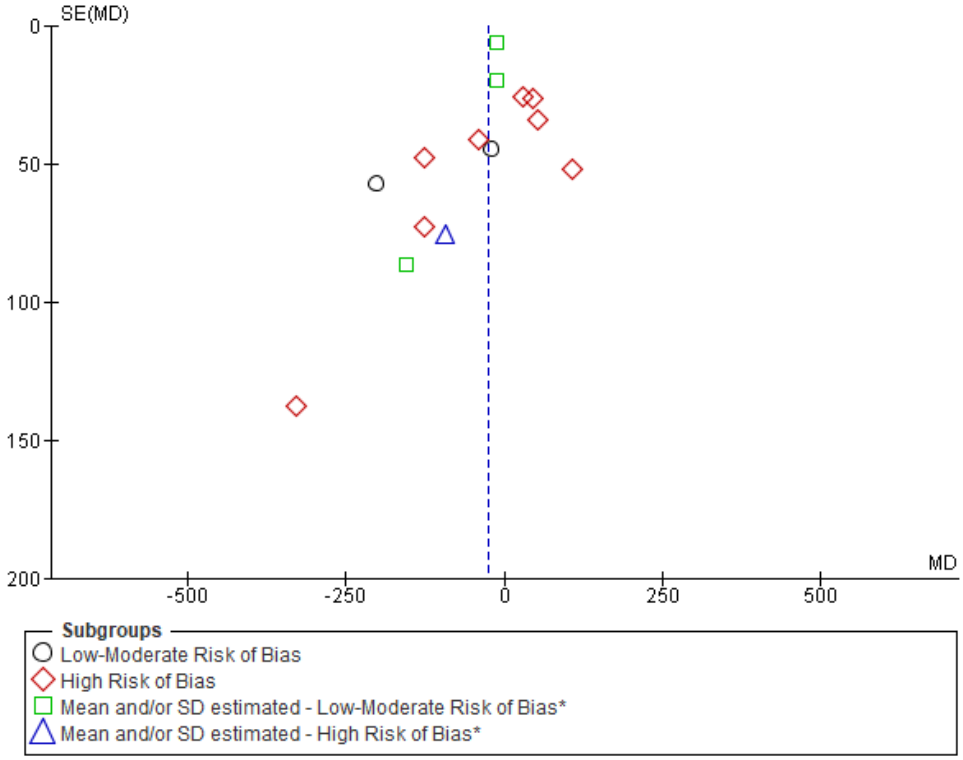


Moderate PAE and Birthweight (14 studies)



Notes: *McCarthy et al 2013 and Mills et al 1984 from adjusted mean and 95% CI; Shu et al 1995 and Windham et al 1995 from adjusted mean difference and 95% CI

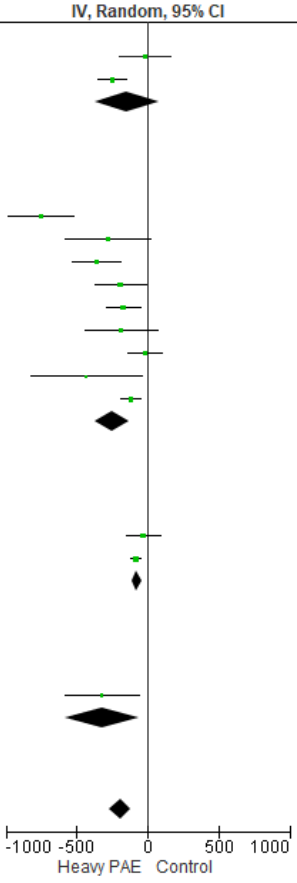
Funnel Plot: **Moderate PAE and Birth weight**



Heavy PAE and Birth weight (14 studies)

Study or Subgroup	Heavy PAE Mean [g]	Heavy PAE SD [g]	Heavy PAE Total	Control Mean [g]	Control SD [g]	Control Total	Weight	Mean Difference IV, Random, 95% CI	Risk of Bias A
3.1.1 Low-Moderate Risk of Bias									
Day et al 1990	3,230	412	21	3,250	348.7	304	6.8%	-20.00 [-200.52, 160.52]	?
Faden et al 1997	3,101.8	506.3	102	3,351	588	8245	9.5%	-249.20 [-348.27, -150.13]	?
Subtotal (95% CI)			**123**			**8549**	**16.4%**	**-147.53 [-370.71, 75.65]**	
Heterogeneity: Tau² = 20747.28; Chi² = 4.76, df = 1 (P = 0.03); I² = 79%									
Test for overall effect: Z = 1.30 (P = 0.20)									
3.1.2 High Risk of Bias									
Autti-Ramo et al 1991a	2,704	406.9	13	3,458	307.2	56	5.3%	-754.00 [-989.37, -518.63]	−
Berger et al 2019	2,775.3	380.1	16	3,056.3	478.7	16	4.0%	-281.00 [-580.51, 18.51]	−
Carter et al 2012	2,731.9	592.8	85	3,094	466.6	63	7.1%	-362.10 [-532.85, -191.35]	−
Carter et al 2022	2,885.4	609.5	87	3,078.8	534.5	70	6.9%	-193.40 [-372.51, -14.29]	−
Coles et al 2021	3,225.29	560.67	113	3,398.14	438.42	178	8.8%	-172.85 [-294.65, -51.05]	−
Falgreen et al 2012	3,416.3	572.5	20	3,601.6	525.2	758	4.9%	-185.30 [-438.98, 68.38]	−
Lazzaroni et al 1993	3,290.7	532.7	78	3,310.1	477.8	1187	8.8%	-19.40 [-140.70, 101.90]	−
Oberlander et al 2010	2,884.6	600.2	14	3,320.7	444.5	14	2.8%	-436.10 [-827.33, -44.87]	−
Virji et al 1991	3,181.3	715	395	3,301.14	698	4024	10.3%	-119.84 [-193.58, -46.10]	−
Subtotal (95% CI)			**821**			**6366**	**58.9%**	**-252.81 [-374.21, -131.41]**	
Heterogeneity: Tau² = 24052.81; Chi² = 38.57, df = 8 (P < 0.00001); I² = 79%									
Test for overall effect: Z = 4.08 (P < 0.0001)									
3.1.3 Mean and/or SD estimated - Low-Moderate Risk of Bias*									
McCarthy et al 2013	3,340	1,539.4214	925	3,371	1,539.4214	2230	8.9%	-31.00 [-149.00, 87.00]	?
Mills et al 1984	3,350	489.461	742	3,433	489.461	16524	11.2%	-83.00 [-119.00, -47.00]	?
Subtotal (95% CI)			**1667**			**18754**	**20.0%**	**-78.57 [-113.01, -44.14]**	
Heterogeneity: Tau² = 0.00; Chi² = 0.68, df = 1 (P = 0.41); I² = 0%									
Test for overall effect: Z = 4.47 (P < 0.00001)									
3.1.4 Mean and/or SD estimated - High Risk of Bias*									
Windham 1995	2,986.6	603.9132	21	3,310.1	603.9132	571	4.7%	-323.50 [-586.50, -60.50]	−
Subtotal (95% CI)			**21**			**571**	**4.7%**	**-323.50 [-586.50, -60.50]**	
Heterogeneity: Not applicable									
Test for overall effect: Z = 2.41 (P = 0.02)									
Total (95% CI)			**2632**			**34240**	**100.0%**	**-193.36 [-267.80, -118.91]**	
Heterogeneity: Tau² = 12601.07; Chi² = 59.72, df = 13 (P < 0.00001); I² = 78%									
Test for overall effect: Z = 5.09 (P < 0.00001)									
Test for subgroup differences: Chi² = 10.47, df = 3 (P = 0.01), I² = 71.4%									

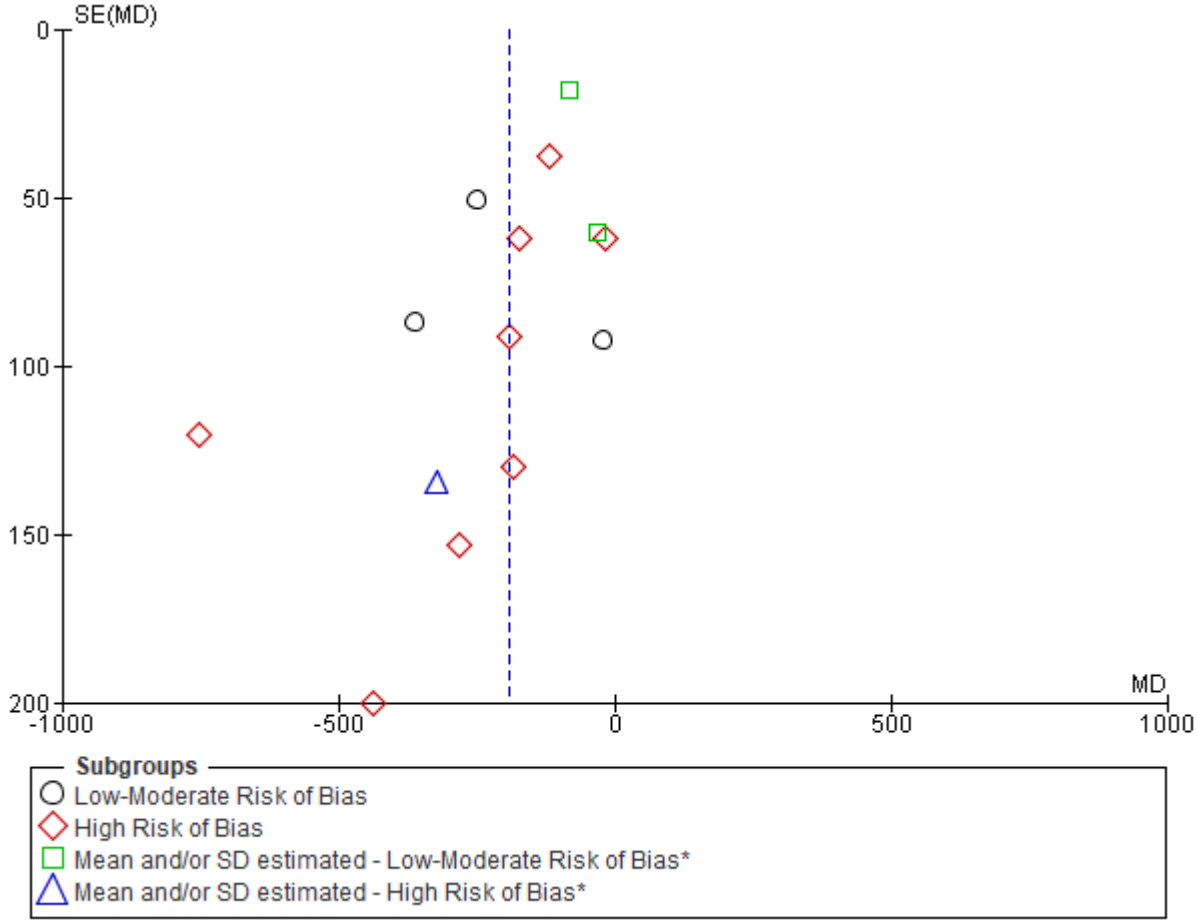
Mean Difference IV, Random, 95% CI



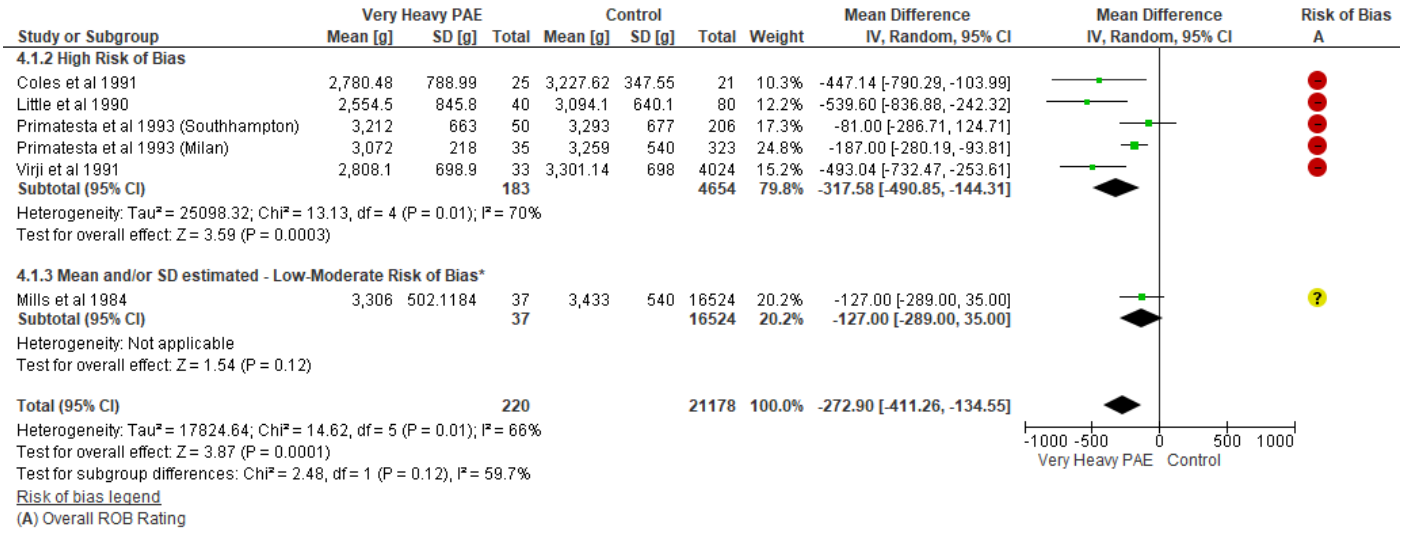
Risk of bias legend
(A) Overall ROB Rating

Notes: *McCarthy et al 2013 and Mills et al 1984 from adjusted mean and 95% CI; Windham et al 1995 from adjusted mean difference and 95% CI

Funnel Plot: **Heavy PAE and Birth weight**



Very Heavy PAE and Birth weight (6 studies)

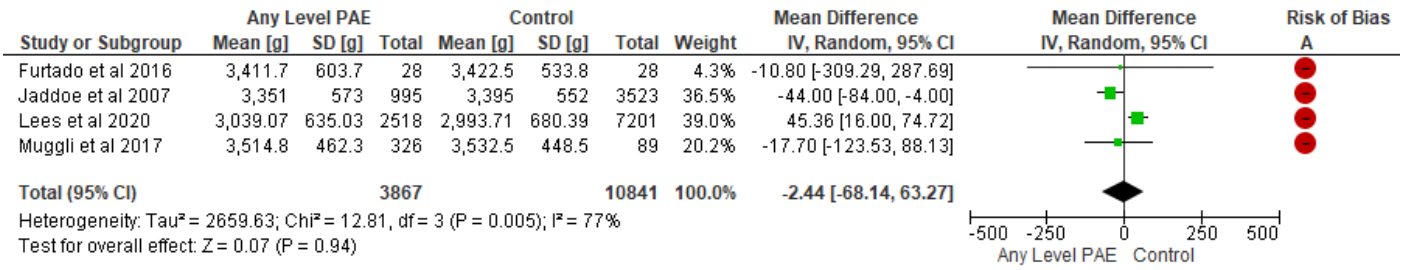


Study or Subgroup	Very Heavy PAE Mean [g]	SD [g]	Total	Control Mean [g]	SD [g]	Total	Weight	Mean Difference IV, Random, 95% CI	Risk of Bias A
4.1.2 High Risk of Bias									
Coles et al 1991	2,780.48	788.99	25	3,227.62	347.55	21	10.3%	-447.14 [-790.29, -103.99]	
Little et al 1990	2,554.5	845.8	40	3,094.1	640.1	80	12.2%	-539.60 [-836.88, -242.32]	
Primatesta et al 1993 (Southhampton)	3,212	663	50	3,293	677	206	17.3%	-81.00 [-286.71, 124.71]	
Primatesta et al 1993 (Milan)	3,072	218	35	3,259	540	323	24.8%	-187.00 [-280.19, -93.81]	
Virji et al 1991	2,808.1	698.9	33	3,301.14	698	4024	15.2%	-493.04 [-732.47, -253.61]	
Subtotal (95% CI)			**183**			**4654**	**79.8%**	**-317.58 [-490.85, -144.31]**	
Heterogeneity: Tau² = 25098.32; Chi² = 13.13, df = 4 (P = 0.01); I² = 70%									
Test for overall effect: Z = 3.59 (P = 0.0003)									
4.1.3 Mean and/or SD estimated - Low-Moderate Risk of Bias*									
Mills et al 1984	3,306	502.1184	37	3,433	540	16524	20.2%	-127.00 [-289.00, 35.00]	?
Subtotal (95% CI)			**37**			**16524**	**20.2%**	**-127.00 [-289.00, 35.00]**	
Heterogeneity: Not applicable									
Test for overall effect: Z = 1.54 (P = 0.12)									
Total (95% CI)			**220**			**21178**	**100.0%**	**-272.90 [-411.26, -134.55]**	
Heterogeneity: Tau² = 17824.64; Chi² = 14.62, df = 5 (P = 0.01); I² = 66%									
Test for overall effect: Z = 3.87 (P = 0.0001)									
Test for subgroup differences: Chi² = 2.48, df = 1 (P = 0.12), I² = 59.7%									

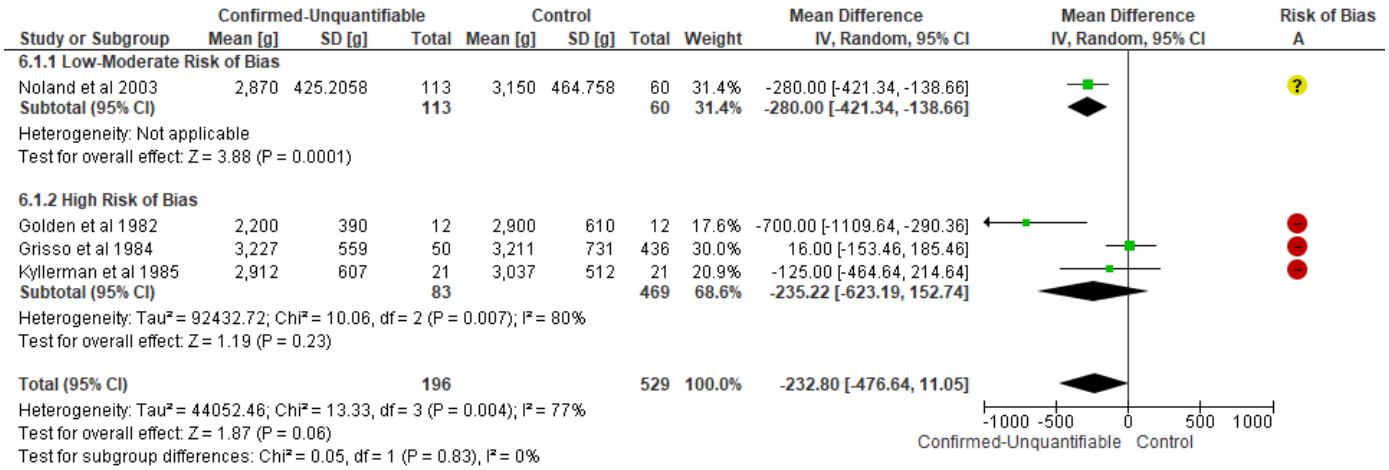
Risk of bias legend
(A) Overall ROB Rating

Notes: *Mills et al 1984 from adjusted mean and 95% CI.

Any Level PAE and Birth weight (4 studies)

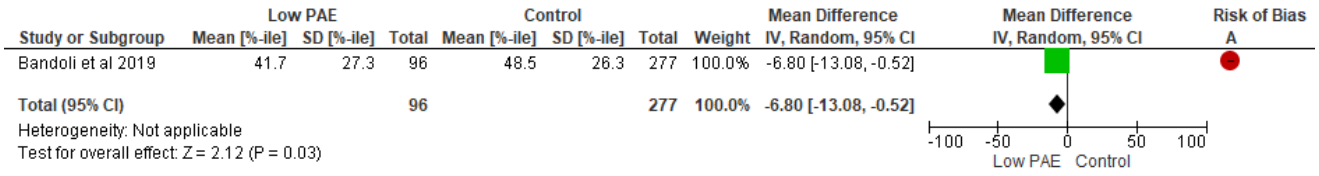


Confirmed PAE-Level Unquantifiable and Birth weight (4 studies)

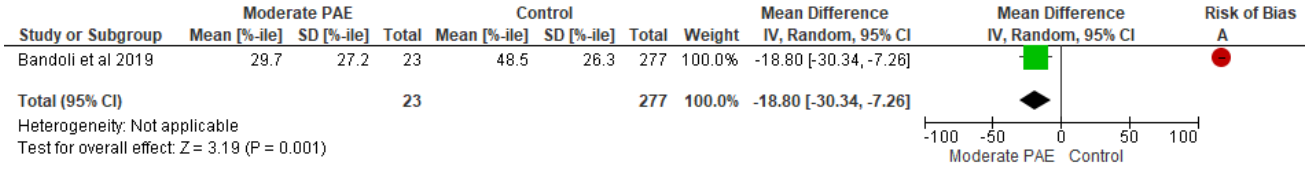


Birth weight Percentiles

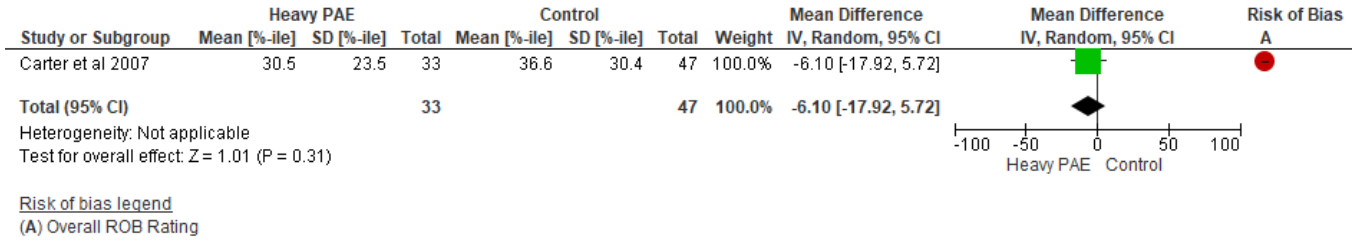
Light PAE and Birth weight Percentiles (1 study)



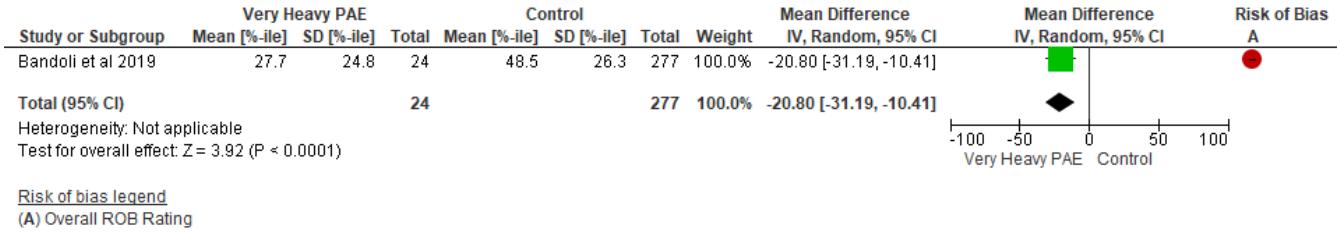
Moderate PAE and Birth weight Percentiles (1 study)



Heavy PAE and Birth weight Percentiles (1 study)



Very Heavy PAE and Birth weight Percentiles (1 study)



Any Level PAE and Birth weight Percentiles (0 studies)

-

Confirmed PAE-Level Unquantifiable and Birth weight Percentiles (0 studies)

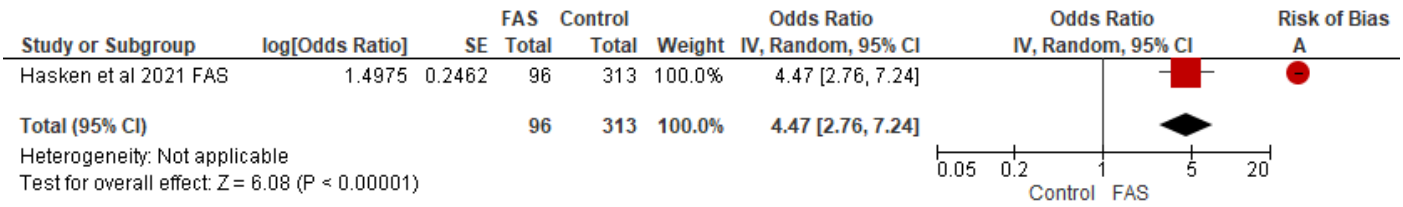
Diagnosed studies

Small for Gestational Age (Birthweight <10th Percentile)

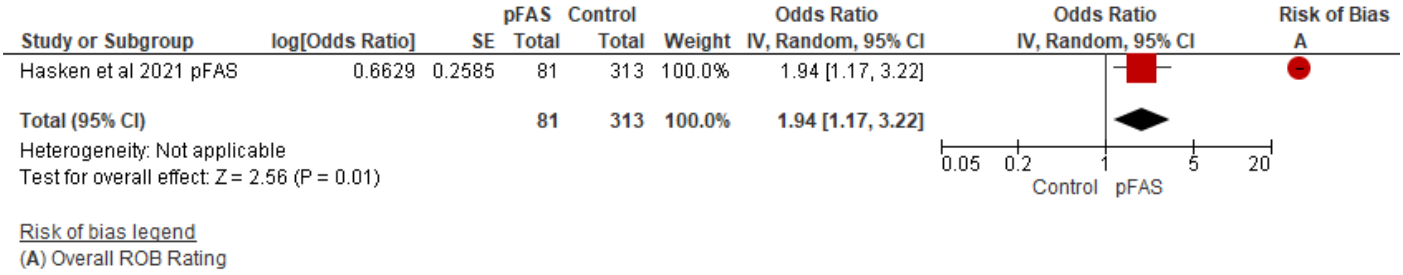
FASD and SGA (0 studies)

-

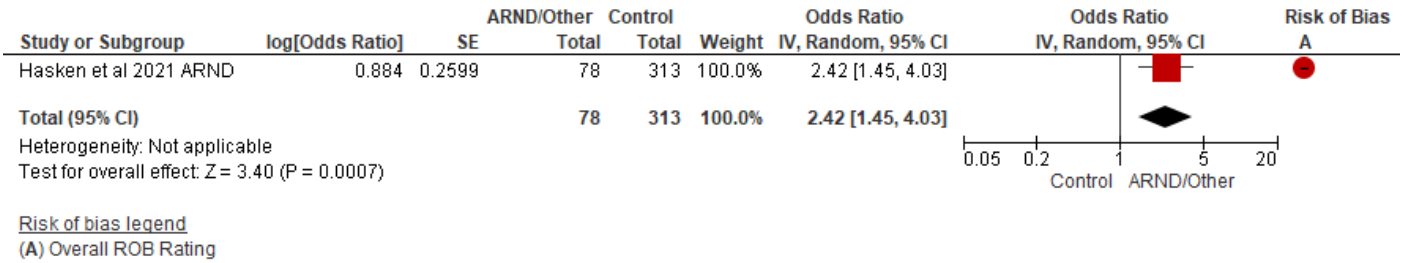
FAS and SGA (1 study)



pFAS and SGA (1 study)



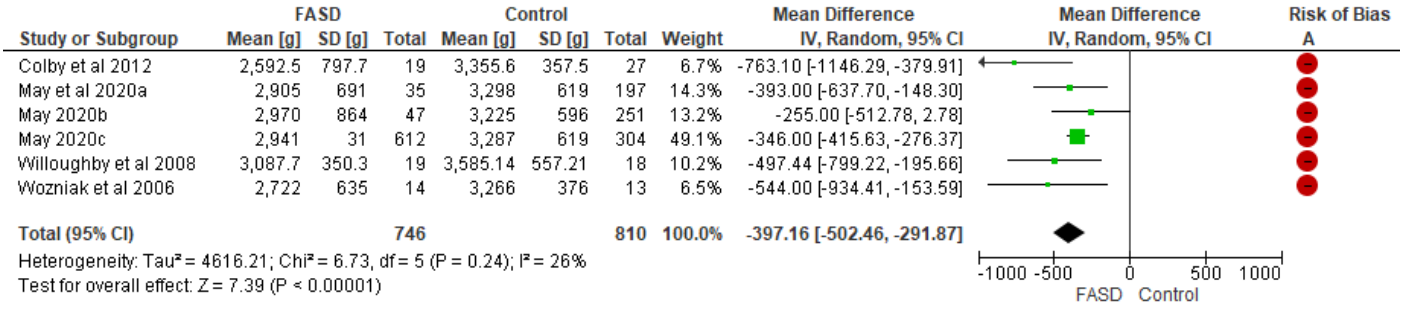
Other FASDs and SGA (1 study)



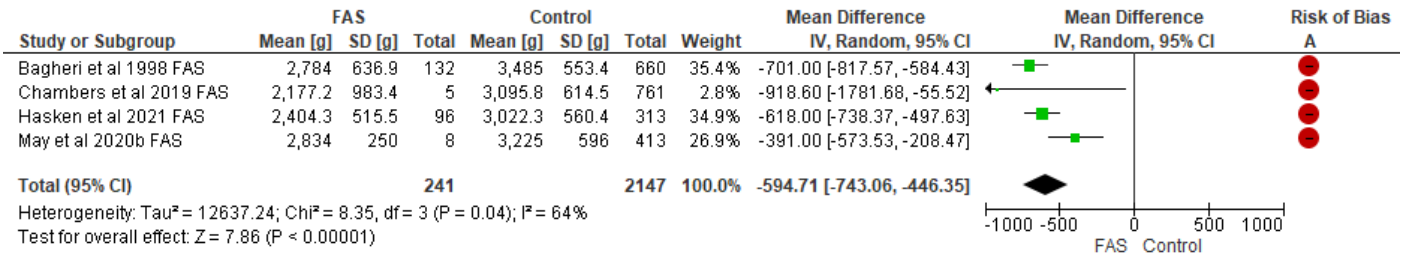
Low birth weight – no studies

Birth weight (in grams)

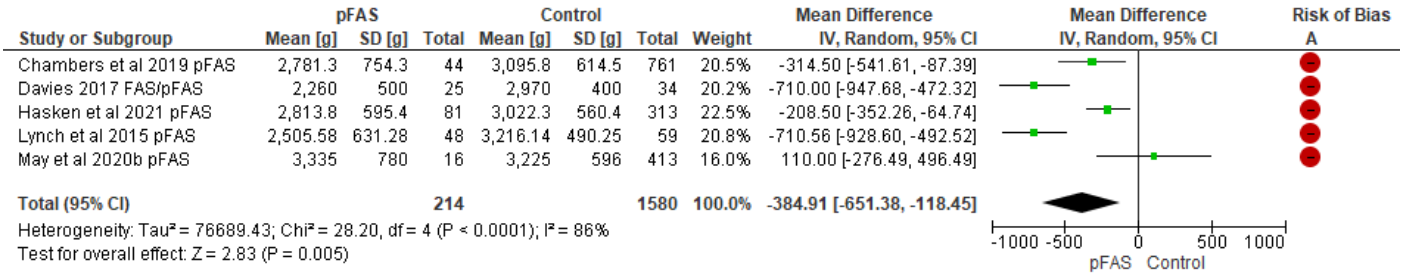
FASD and Birthweight (6 studies)



FAS and Birth weight (4 studies)

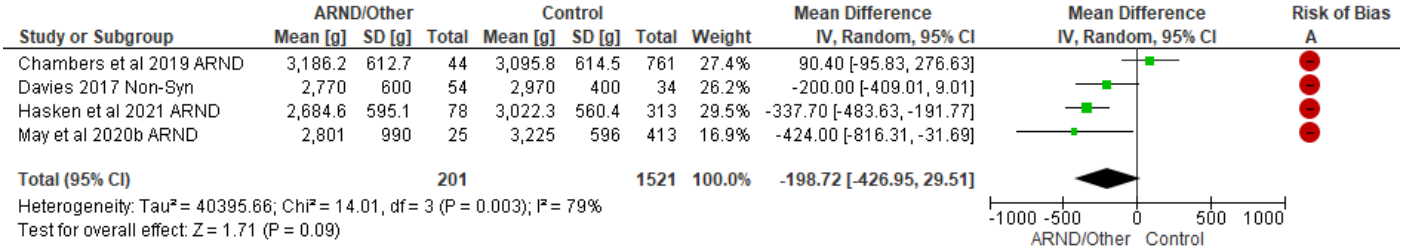


pFAS and Birth weight (5 studies)



Risk of bias legend
(A) Overall ROB Rating

Other FASDs and Birth weight (4 studies)



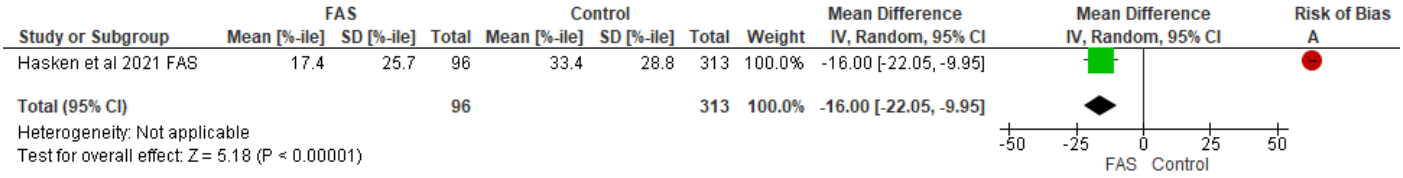
Risk of bias legend
(A) Overall ROB Rating

Birth weight Percentiles

FASD and Birth weight Percentile (0 studies)

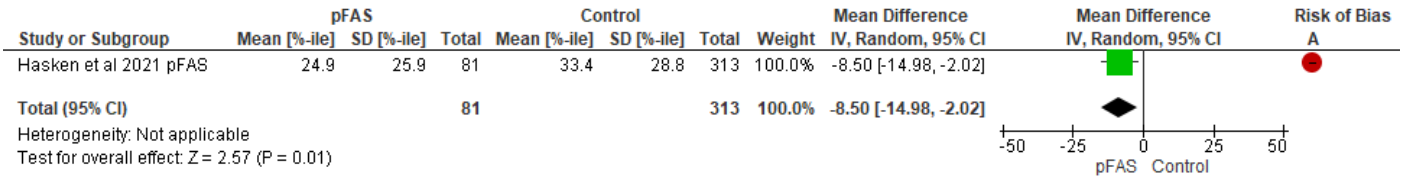
-

FAS and Birth weight Percentile (1 study)



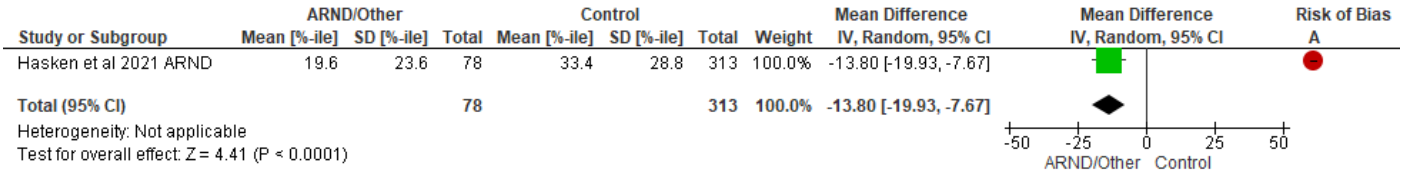
Risk of bias legend
(A) Overall ROB Rating

pFAS and Birth weight Percentile (1 study)



Risk of bias legend
(A) Overall ROB Rating

Other FASDs and Birth weight Percentile (1 study)



Risk of bias legend
(**A**) Overall ROB Rating

Table 3. GRADE ratings for birth length

	Certainty assessment					№ of patients		Effect		Certainty
№ of studies	Risk of bias	Inconsistency	Indirectness	Imprecision	Other	PAE	Control	Relative (95% CI)	Absolute (95% CI)	
EXPOSURE STUDIES										
Birth Length (cm)										
Light prenatal alcohol exposure (1-20g/w in at least one trimester)										
1	serious[a]	not serious	serious[c]	serious[d,f]	none	112	97	-	MD **0.50 lower** (1.31 lower to 0.31 higher)	⊕◯◯◯ Very low
Moderate prenatal alcohol exposure (21-100g/w in at least one trimester)										
3	serious[a]	serious[b]	not serious	serious[d]	none	2062	144410	-	MD **0.15 lower** (0.45 lower to 0.15 higher)	⊕◯◯◯ Very low
Heavy prenatal alcohol exposure (101-200g/w in at least one trimester)										
5	serious[a]	serious[b]	serious[c]	not serious	none	234	1451	-	MD **0.99 lower** (1.92 lower to 0.06 lower)	⊕◯◯◯ Very low
Very heavy prenatal alcohol exposure (201g+/w in at least one trimester)										
2	serious[a]	not serious	not serious	serious[e,f]	none	57	101	-	MD **2.67 lower** (3.92 lower to 1.43 lower)	⊕⊕◯◯ Low
Any level prenatal alcohol exposure (exposure dichotomized as yes/no)										
1	serious[a]	not serious	not serious	serious[d,f]	none	28	28	-	MD **0.12 lower** (0.97 lower to 0.73 higher)	⊕⊕◯◯ Low
Confirmed prenatal alcohol exposure-Level Unquantifiable										
3	serious[a]	serious[b]	not serious	serious[e,f]	none	146	96	-	MD **1.27 lower** (2.45 lower to 0.10 lower)	⊕◯◯◯ Very low
Birth Length Percentiles										
Light prenatal alcohol exposure (1-20g/w in at least one trimester)										
1	serious[a]	not serious	serious[c]	serious[f]	none	96	277	-	MD **7.70 lower** (13.49 lower to 1.91 lower)	⊕◯◯◯ Very low
Moderate prenatal alcohol exposure (21-100g/w in at least one trimester)										
1	serious[a]	not serious	serious[c]	serious[e,f]	none	23	277	-	MD **22.70 lower** (35.63 lower to 9.77 lower)	⊕◯◯◯ Very low
Heavy prenatal alcohol exposure (101-200g/w in at least one trimester) - no studies										
Very heavy prenatal alcohol exposure (201g+/w in at least one trimester)										
1	serious[a]	not serious	serious[c]	serious[e,f]	none	24	277	-	MD **18.50 lower** (31.44 lower to 5.56 lower)	⊕◯◯◯ Very low
Any level prenatal alcohol exposure – no studies										

Confirmed prenatal alcohol exposure-Level Unquantifiable – no studies										
DIAGNOSED STUDIES										
Birth Length (cm)										
FASD										
1	serious[a]	not serious	not serious	very serious[d,e,f]	none	14	13	-	MD **5.30 lower** (11.77 lower to 1.17 higher)	⊕◯◯◯ Very low
FAS										
1	serious[a]	not serious	serious[c]	serious[e]	not	96	313	-	MD **3.80 lower** (4.80 lower to 2.80 lower)	⊕◯◯◯ Very low
pFAS or pFAS/FAS										
3	serious[a]	serious[b]	serious[c]	serious[e]	none	160	379	-	MD **1.81 lower** (3.24 lower to 0.38 lower)	⊕◯◯◯ Very low
Other FASDs (ARND, ND-AE, SE-AE, Non-syndromal)										
3	serious[a]	serious[b]	serious[c]	serious[e]	none	163	379	-	MD **1.86 lower** (3.29 lower to 0.43 lower)	⊕◯◯◯ Very low
Birth Length Percentiles										
FASD – no studies										
FAS										
1	serious[a]	not serious	serious[c]	not serious	none	96	313	-	MD **21.70 lower** (29.35 lower to 14.05 lower)	⊕⊕◯◯ Low
pFAS or pFAS/FAS										
1	serious[a]	not serious	serious[c]	not serious	none	81	313	-	MD **12.70 lower** (21.23 lower to 4.07 lower)	⊕⊕◯◯ Low
Other FASDs (ARND, ND-AE, SE-AE, Non-syndromal)										
1	serious[a]	not serious	serious[c]	not serious	none	78	313	-	MD **11.20 lower** (19.66 lower to 2.74 lower)	⊕⊕◯◯ Low

Notes: CI = confidence interval; **MD =** mean difference; **OR** = odds ratio

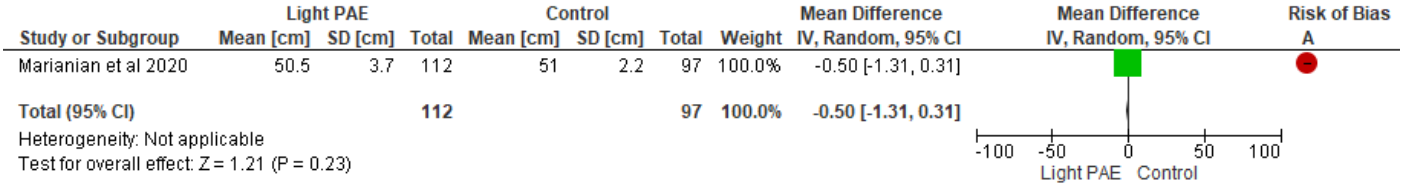
Explanations: a) >50% of studies were rated as moderate or high risk of bias; b) High heterogeneity (I^2 >50% and significant chi-square for heterogeneity); c) >50% of studies had a sample not representative of the Australian populations not representative of Australia; d) 95% CI for overall estimate crossed the line of no effect; e) Wide 95% CIs for overall estimate; f) Optimal information size not met.

Meta-analyses for birth length

Exposure studies

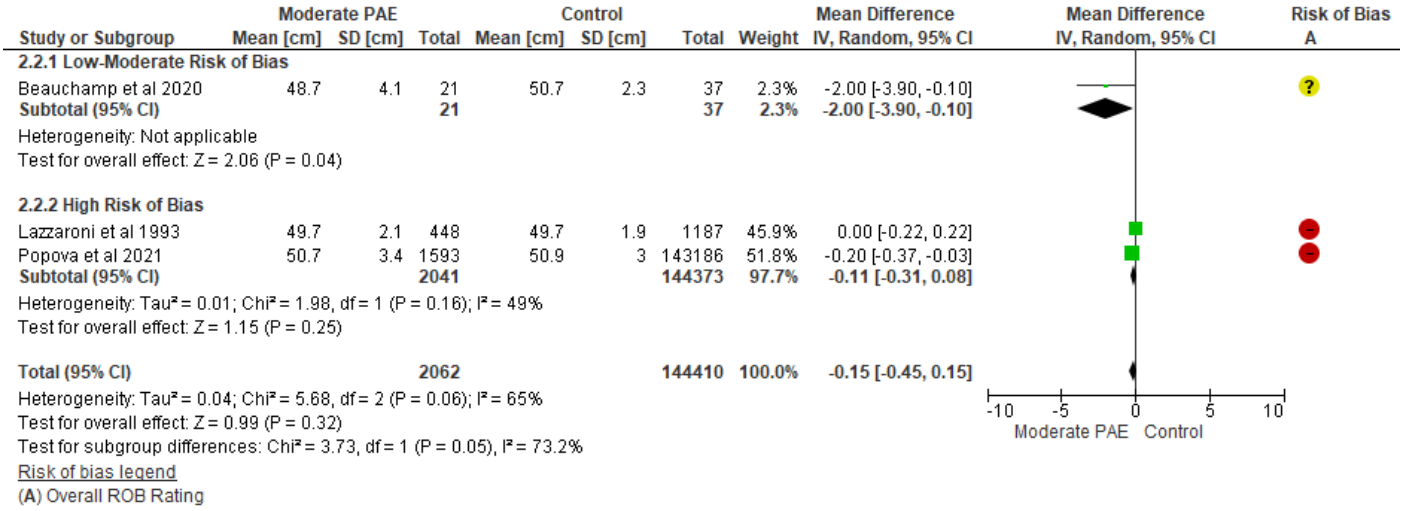
Birth Length (cms)

Light PAE and Birth Length (1 study)

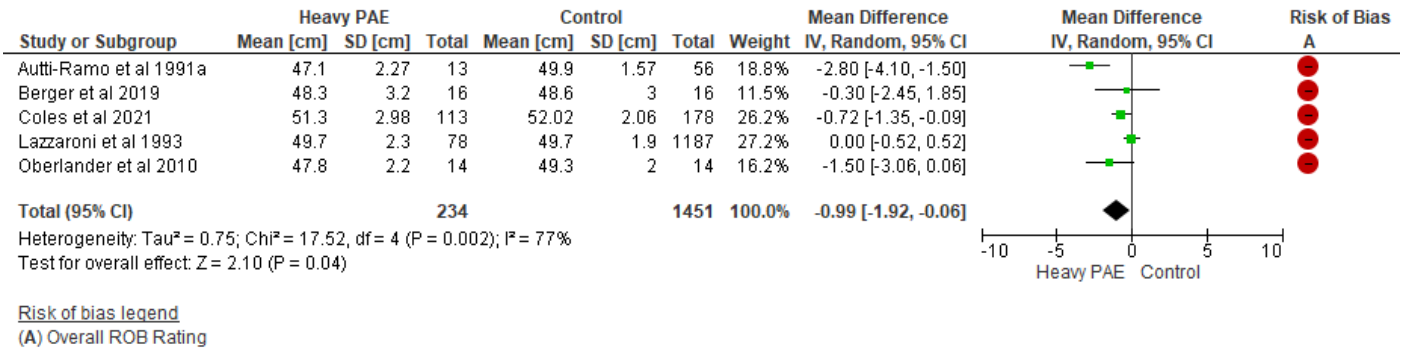


Note. Marianian et al 2020: mean and SD estimated from median and inter-quartile range.

Moderate PAE and Birth Length (3 studies)



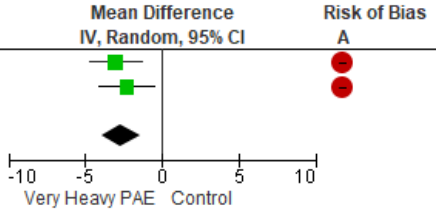
Heavy PAE and Birth Length (5 studies)



Very Heavy PAE and Birth Length (2 studies)

Study or Subgroup	Very Heavy PAE Mean [cm]	SD [cm]	Total	Control Mean [cm]	SD [cm]	Total	Weight	Mean Difference IV, Random, 95% CI
Coles et al 1991	46.38	3.65	25	49.42	2.23	21	52.4%	-3.04 [-4.76, -1.32]
Little et al 1990	46.8	5	32	49.07	2.3	80	47.6%	-2.27 [-4.07, -0.47]
Total (95% CI)			**57**			**101**	**100.0%**	**-2.67 [-3.92, -1.43]**

Heterogeneity: Tau² = 0.00; Chi² = 0.37, df = 1 (P = 0.54); I² = 0%
Test for overall effect: Z = 4.21 (P < 0.0001)

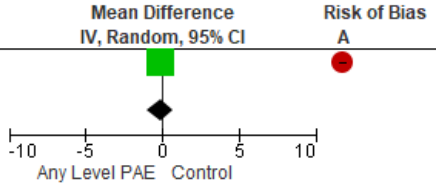


Risk of bias legend
(A) Overall ROB Rating

Any Level PAE and Birth Length (1 study)

Study or Subgroup	Any Level PAE Mean [cm]	SD [cm]	Total	Control Mean [cm]	SD [cm]	Total	Weight	Mean Difference IV, Random, 95% CI
Furtado et al 2016	49.07	1.53	28	49.19	1.72	28	100.0%	-0.12 [-0.97, 0.73]
Total (95% CI)			**28**			**28**	**100.0%**	**-0.12 [-0.97, 0.73]**

Heterogeneity: Not applicable
Test for overall effect: Z = 0.28 (P = 0.78)

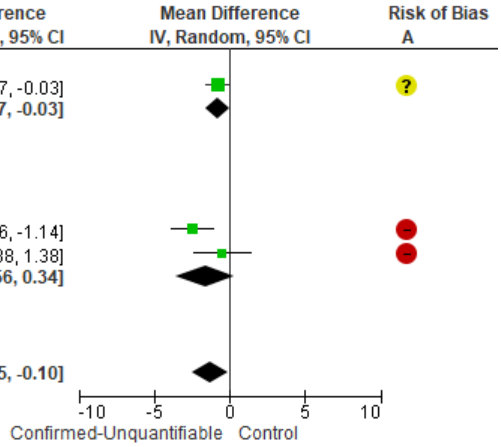


Risk of bias legend
(A) Overall ROB Rating

Confirmed PAE-Level Unknown and Birth Length (3 studies)

Study or Subgroup	Confirmed-Unquantifiable Mean [cm]	SD [cm]	Total	Control Mean [cm]	SD [cm]	Total	Weight	Mean Difference IV, Random, 95% CI
6.3.1 Low-Moderate Risk of Bias								
Noland et al 2003	48.3	2.4449	113	49.1	2.4787	60	45.1%	-0.80 [-1.57, -0.03]
Subtotal (95% CI)			**113**			**60**	**45.1%**	**-0.80 [-1.57, -0.03]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.03 (P = 0.04)								
6.3.2 High Risk of Bias								
Golden et al 1982	45.5	1.8	12	48	1.6	12	31.9%	-2.50 [-3.86, -1.14]
Kyllerman et al 1985	47.9	3.3	21	48.4	2.9	21	23.0%	-0.50 [-2.38, 1.38]
Subtotal (95% CI)			**33**			**33**	**54.9%**	**-1.61 [-3.56, 0.34]**
Heterogeneity: Tau² = 1.30; Chi² = 2.85, df = 1 (P = 0.09); I² = 65%								
Test for overall effect: Z = 1.62 (P = 0.11)								
Total (95% CI)			**146**			**93**	**100.0%**	**-1.27 [-2.45, -0.10]**

Heterogeneity: Tau² = 0.64; Chi² = 5.02, df = 2 (P = 0.08); I² = 60%
Test for overall effect: Z = 2.13 (P = 0.03)
Test for subgroup differences: Chi² = 0.57, df = 1 (P = 0.45), I² = 0%



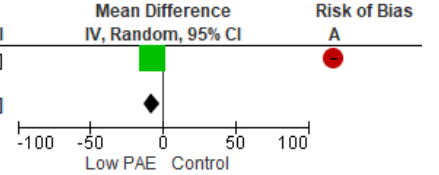
Risk of bias legend
(A) Overall ROB Rating

Birth Length Percentiles

Light PAE and Birth Length Percentiles (1 study)

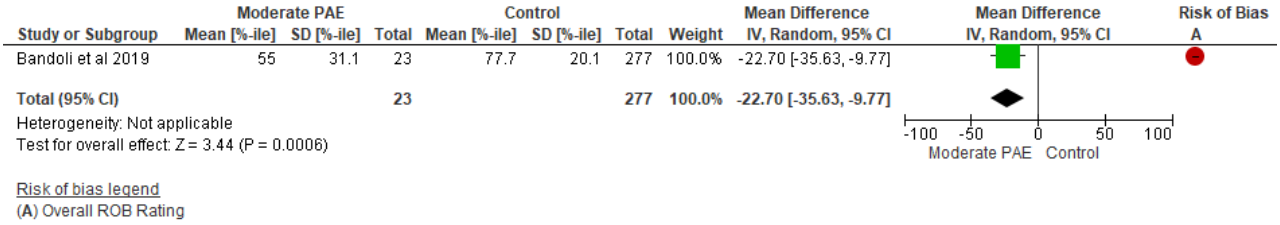
Study or Subgroup	Low PAE Mean [%-ile]	SD [%-ile]	Total	Control Mean [%-ile]	SD [%-ile]	Total	Weight	Mean Difference IV, Random, 95% CI
Bandoli et al 2019	70	26.4	96	77.7	20.1	277	100.0%	-7.70 [-13.49, -1.91]
Total (95% CI)			**96**			**277**	**100.0%**	**-7.70 [-13.49, -1.91]**

Heterogeneity: Not applicable
Test for overall effect: Z = 2.61 (P = 0.009)



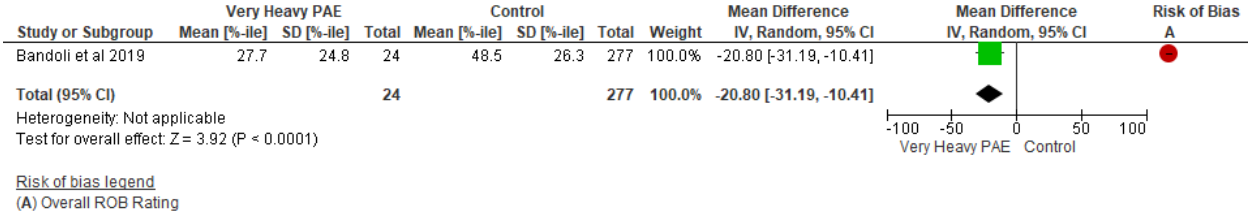
Risk of bias legend
(A) Overall ROB Rating

Moderate PAE and Birth Length Percentiles (1 study)



Heavy PAE and Birth Length Percentiles (0 studies)

Very Heavy PAE and Birth Length Percentiles (1 study)



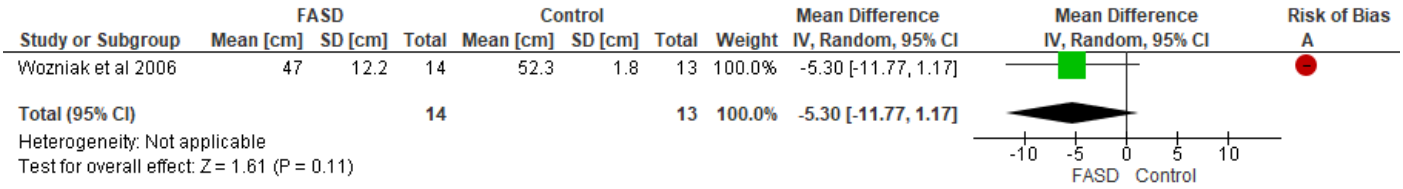
Any Level PAE and Birth Length Percentiles (0 studies)

Confirmed PAE-Unquantifiable and Birth Length Percentiles (0 studies)

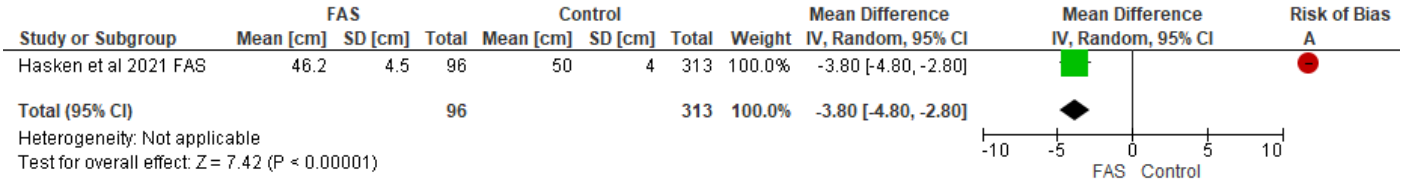
Diagnosed studies

Birth Length (in cms)

FASD and Birth Length (1 study)



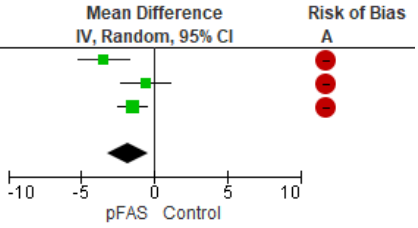
FAS and Birth Length (1 study)



pFAS and Birth Length (3 studies)

Study or Subgroup	pFAS Mean [cm]	pFAS SD [cm]	pFAS Total	Control Mean [cm]	Control SD [cm]	Control Total	Weight	Mean Difference IV, Random, 95% CI	Risk of Bias A
Coles et al 1997 FAS/FAE	45.98	3.92	25	49.46	2.38	35	29.1%	-3.48 [-5.21, -1.75]	
Davies et al 2017 FAS/pFAS	49.2	4.1	54	49.8	3.6	31	29.9%	-0.60 [-2.27, 1.07]	
Hasken et al 2021 pFAS	48.5	4	81	50	4	313	41.0%	-1.50 [-2.48, -0.52]	
Total (95% CI)			**160**			**379**	**100.0%**	**-1.81 [-3.24, -0.38]**	

Heterogeneity: Tau² = 1.05; Chi² = 5.90, df = 2 (P = 0.05); I² = 66%
Test for overall effect: Z = 2.48 (P = 0.01)

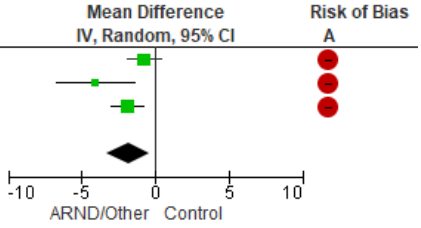


Risk of bias legend
(A) Overall ROB Rating

Other FASD and Birth Length (3 studies)

Study or Subgroup	ARND/Other Mean [cm]	ARND/Other SD [cm]	ARND/Other Total	Control Mean [cm]	Control SD [cm]	Control Total	Weight	Mean Difference IV, Random, 95% CI	Risk of Bias A
Coles et al 1997 Non-Syn	48.69	3.22	62	49.46	2.38	35	40.4%	-0.77 [-1.89, 0.35]	
Davies et al 2017 Non-Syn	45.7	5.7	23	49.8	3.6	31	18.9%	-4.10 [-6.75, -1.45]	
Hasken et al 2021 ARND	48.1	4.6	78	50	4	313	40.7%	-1.90 [-3.01, -0.79]	
Total (95% CI)			**163**			**379**	**100.0%**	**-1.86 [-3.29, -0.43]**	

Heterogeneity: Tau² = 0.99; Chi² = 5.78, df = 2 (P = 0.06); I² = 65%
Test for overall effect: Z = 2.55 (P = 0.01)



Risk of bias legend
(A) Overall ROB Rating

Birth Length Percentile

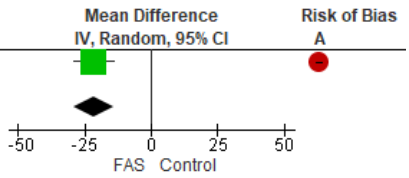
FASD and Birth Length Percentile (0 studies)

-

FAS and Birth Length Percentile (1 study)

Study or Subgroup	FAS Mean [%-ile]	FAS SD [%-ile]	FAS Total	Control Mean [%-ile]	Control SD [%-ile]	Control Total	Weight	Mean Difference IV, Random, 95% CI	Risk of Bias A
Hasken et al 2021 FAS	30.8	33.2	96	52.5	34.2	313	100.0%	-21.70 [-29.35, -14.05]	
Total (95% CI)			**96**			**313**	**100.0%**	**-21.70 [-29.35, -14.05]**	

Heterogeneity: Not applicable
Test for overall effect: Z = 5.56 (P < 0.00001)

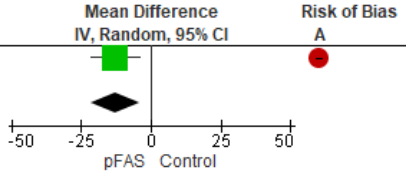


Risk of bias legend
(A) Overall ROB Rating

pFAS and Birth Length Percentile (1 study)

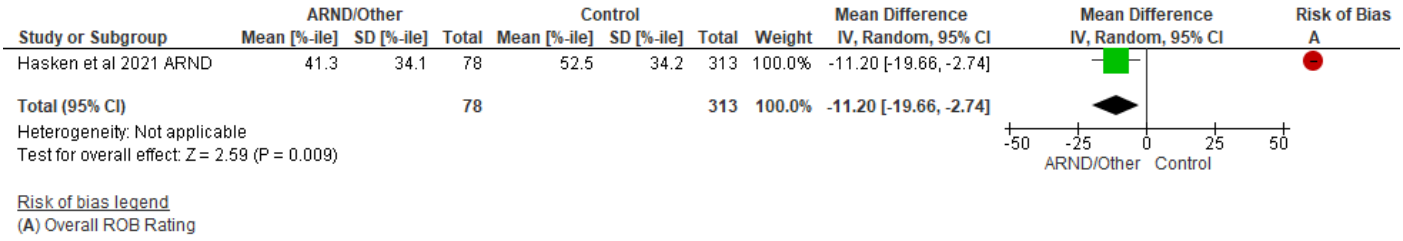
Study or Subgroup	pFAS Mean [%-ile]	pFAS SD [%-ile]	pFAS Total	Control Mean [%-ile]	Control SD [%-ile]	Control Total	Weight	Mean Difference IV, Random, 95% CI	Risk of Bias A
Hasken et al 2021 pFAS	39.8	35.6	81	52.5	34.2	313	100.0%	-12.70 [-21.33, -4.07]	
Total (95% CI)			**81**			**313**	**100.0%**	**-12.70 [-21.33, -4.07]**	

Heterogeneity: Not applicable
Test for overall effect: Z = 2.88 (P = 0.004)



Risk of bias legend
(A) Overall ROB Rating

Other FASDs and Birth Length Percentile (1 study)



Risk of bias legend
(**A**) Overall ROB Rating

Table 4. GRADE ratings for postnatal weight

	Certainty assessment					№ of patients		Effect		Certainty
№ of studies	Risk of bias	Inconsistency	Indirectness	Imprecision	Other	PAE	Control	Relative (95% CI)	Absolute (95% CI)	
EXPOSURE STUDIES										
Weight <10th Percentile										
Light prenatal alcohol exposure (1-20g/w in at least one trimester) - no studies										
Moderate prenatal alcohol exposure (101-200g/w in at least one trimester)										
2	serious[a]	not serious	not serious	very serious[d,e,f]	none	79	319	**OR 2.12** (0.91 to 4.89)	-	⨁◯◯◯ Very Low
Heavy prenatal alcohol exposure (101-200g/w in at least one trimester)										
1	serious[a]	not serious	not serious	very serious[d,e,f]	none	20	66	**OR 1.72** (0.29 to 10.18)	-	⨁◯◯◯ Very Low
Very Heavy prenatal alcohol exposure (201g+/w in at least one trimester)										
3	serious[a]	not serious	not serious	serious[e,f]	none	47	338	**OR 13.60** (4.65 to 39.77)	-	⨁⨁◯◯ Low
Any level prenatal alcohol exposure (exposure dichotomised to yes/no) - no studies										
Confirmed prenatal alcohol exposure-Level Unquantifiable										
3	serious[a]	not serious	not serious	serious[e,f]	none	357	347	**OR 6.66** (4.24 to 10.48)	-	⨁⨁◯◯ Low
Weight (≤12months of age) (kg)										
Light prenatal alcohol exposure (1-20g/w in at least one trimester)										
1	serious[a]	not serious	serious[c]	serious[f]	none	112	97	-	MD **2.70 lower** (3.00 lower to 2.40 lower)	⨁◯◯◯ Very Low
Moderate prenatal alcohol exposure (101-200g/w in at least one trimester)										
1	serious[a]	not serious	not serious	serious[d]	none	137	304	-	MD **0.11 lower** (0.31 lower to 0.09 higher)	⨁⨁◯◯ Low
Heavy prenatal alcohol exposure (101-200g/w in at least one trimester)										
2	serious[a]	not serious	not serious	not serious	none	51	348	-	MD **0.46 lower** (0.80 lower to 0.12 lower)	⨁⨁⨁◯ Moderate
Very Heavy and Any Level – no studies										
Confirmed prenatal alcohol exposure-Level Unquantifiable										

2	serious[a]	serious[b]	not serious	very serious[d,e,f]	none	40	57	-	MD **2.26 lower** (6.47 lower to 1.95 higher)	⊕◯◯◯ Very Low
Weight (>12 months of age) (kg)										
Light, Moderate, Heavy, Any Level - no studies										
Very heavy prenatal alcohol exposure (201g+/w in at least one trimester)										
1	serious[a]	not serious	not serious	serious[d,f]	none	25	21	-	MD **1.40 lower** (4.23 lower to 1.43 higher)	⊕⊕◯◯ Low
Confirmed prenatal alcohol exposure-Level Unquantifiable										
3	serious[a]	serious[b]	not serious	serious[d,f]	none	74	109	-	MD **0.77 lower** (1.65 lower to 0.11 higher)	⊕◯◯◯ Very Low
Weight Percentiles										
Light, Moderate, Very Heavy, Any Level, Confirmed-Level Unquantifiable – no studies										
Heavy prenatal alcohol exposure (101-200g/w in at least one trimester)										
1	serious[a]	not serious	serious[c]	serious[d,f]	none	30	44	-	MD **7.40 lower** (20.28 lower to 5.48 higher)	⊕◯◯◯ Very Low
DIAGNOSED STUDIES										
Weight <10th Percentile										
FASD										
2	serious[a]	not serious	not serious	very serious[d,e,f]	none	62	126	**OR 1.55** (0.44 to 5.43)	-	⊕◯◯◯ Very Low
FAS										
2	serious[a]	not serious	not serious	serious[e,f]	none	120	231	**OR 17.92** (3.29 to 97.45)	-	⊕⊕◯◯ Low
pFAS (pFAS or pFAS/FAS or dysmorphic) - no studies										
Other (ARND, ND-AE, SE-AE, Non-syndromal)										
1	serious[a]	not serious	not serious	serious[e,f]	none	117	185	**OR 4.40** (2.48 to 7.82)	-	⊕⊕◯◯ Low
Weight (kg) (6-9 years)										
FASD										
3	serious[a]	not serious	not serious	serious[f]	none	70	169	-	MD 1.60 **lower** (4.10 lower to 0.90 higher)	⊕⊕◯◯ Low

FAS										
7	serious[a]	serious[b]	serious[c]	not serious	none	383	956	-	MD **4.13 lower** (5.41 lower to 2.86 lower)	⊕◯◯◯ Very low
pFAS (pFAS or pFAS/FAS or dysmorphic)										
6	serious[a]	serious[b]	serious[c]	serious[f]	none	195	775	-	MD **4.12 lower** (5.96 lower to 2.28 lower)	⊕◯◯◯ Very low
Other (ARND, ND-AE, SE-AE, Non-syndromal)										
3	serious[a]	not serious	serious[c]	not serious	none	197	383	-	MD **1.59 lower** (2.20 lower to 0.97 lower)	⊕⊕◯◯ Low
Weight (kg) (9-18 yrs)										
FASD										
2	serious[a]	not serious	not serious	serious[e,f]	none	37	43	-	MD **5.37 lower** (10.47 lower to 0.28 lower)	⊕⊕◯◯ Low
FAS										
2	serious[a]	not serious	serious[c]	serious[f]	none	13	45	-	MD **9.32 lower** (12.36 lower to 6.28 lower)	⊕◯◯◯ Very low
pFAS (pFAS or pFAS/FAS or dysmorphic)										
2	serious[a]	not serious	not serious	serious[f]	none	64	69	-	MD **3.17 lower** (6.33 lower to 0.02 lower)	⊕⊕◯◯ Low
Other (ARND, ND-AE, SE-AE, Non-syndromal)										
3	serious[a]	serious[b]	serious[c]	very serious[d,e,f]	none	124	98	-	MD **0.77 higher** (5.40 lower to 6.93 higher)	⊕◯◯◯ Very low
Weight Percentiles										
FASD										
1	serious[a]	not serious	not serious	serious[f]	none	14	13	-	MD 15.70 **lower** (34.55 lower to 3.15 lower)	⊕⊕◯◯ Low
FAS										
7	serious[a]	serious[b]	not serious	not serious	none	200	2475	-	MD **42.32 lower** (52.19 lower to 36.46 lower)	⊕⊕◯◯ Low
pFAS (pFAS or pFAS/FAS or dysmorphic)										
9	serious[a]	not serious	not serious	not serious	none	264	2583	-	MD **18.27 lower** (22.25 lower to 14.29 lower)	⊕⊕⊕◯ Moderate
Other (ARND, ND-AE, SE-AE, Non-syndromal)										

7	serious[a]	serious[b]	not serious	serious[d]	none	209	2372	-	MD **7.24 lower** (17.09 lower to 2.61 higher)	⊕◯◯◯ Very Low

CI: confidence interval; **MD:** mean difference; **OR:** odds ratio

Explanations: a) >50% of studies were rated as moderate or high risk of bias; b) High heterogeneity (I^2 >50% and significant chi-square for heterogeneity); c) >50% of studies had a sample not representative of the Australian populations not representative of Australia; d) 95% CI for overall estimate crossed the line of no effect; e) Wide CI for overall estimate; f) Optimal information size criteria not met.

Meta-analyses for postnatal weight

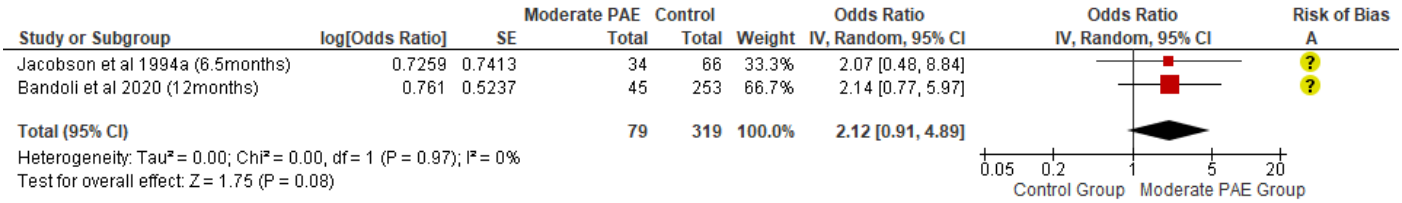
Exposure studies

Weight <10th Percentile

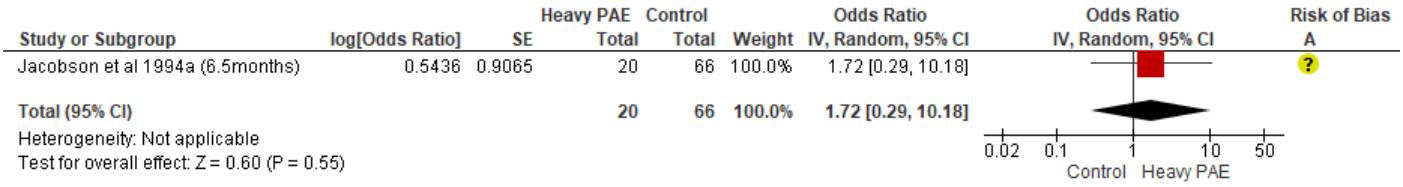
Light and PAE and Weight <10th percentile (0 studies)

-

Moderate PAE and Weight <10th percentile (2 studies)

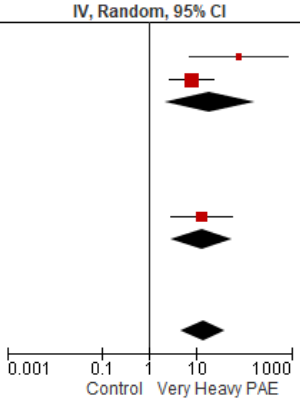


Heavy PAE and Weight <10th percentile (1 study)



Very Heavy PAE and Weight <10th percentile (3 studies)

Study or Subgroup	log[Odds Ratio]	SE	Very Heavy PAE Total	Control Total	Weight	Odds Ratio IV, Random, 95% CI	Risk of Bias A
7.5.1 Low-Moderate Risk of Bias							
Jacobson et al 1994a (6.5months)	4.3503	1.2108	6	66	16.9%	77.50 [7.22, 831.66]	?
Bandoli et al 2020 (12months)	2.0571	0.5499	19	253	49.2%	7.82 [2.66, 22.99]	?
Subtotal (95% CI)			**25**	**319**	**66.1%**	**19.11 [2.13, 170.98]**	
Heterogeneity: Tau² = 1.75; Chi² = 2.97, df = 1 (P = 0.08); I² = 66%							
Test for overall effect: Z = 2.64 (P = 0.008)							
7.5.2 High Risk of Bias							
Little et al 1990 (4yrs)	2.5455	0.7586	22	19	33.9%	12.75 [2.88, 56.39]	
Subtotal (95% CI)			**22**	**19**	**33.9%**	**12.75 [2.88, 56.39]**	
Heterogeneity: Not applicable							
Test for overall effect: Z = 3.36 (P = 0.0008)							
Total (95% CI)			**47**	**338**	**100.0%**	**13.60 [4.65, 39.77]**	
Heterogeneity: Tau² = 0.31; Chi² = 2.98, df = 2 (P = 0.22); I² = 33%							
Test for overall effect: Z = 4.77 (P < 0.00001)							
Test for subgroup differences: Chi² = 0.09, df = 1 (P = 0.76), I² = 0%							



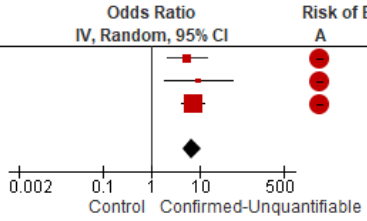
Risk of bias legend
(A) Overall ROB Rating

Any Level PAE and Weight <10th percentile (0 studies)

-

Confirmed PAE-Level Unquantifiable and Weight <10th percentile (3 studies)

Study or Subgroup	log[Odds Ratio]	SE	Confirmed-Unquantifiable Total	Control Total	Weight	Odds Ratio IV, Random, 95% CI	Risk of Bias A
Graham et al 2013 (8-16yrs)	1.6496	0.4756	110	102	23.6%	5.20 [2.05, 13.22]	-
Mattson et al 2010 (7-21yrs)	2.1972	0.8141	38	60	8.0%	9.00 [1.83, 44.38]	-
Mattson et al 2013 (8-17 yrs)	1.9466	0.2793	209	185	68.4%	7.00 [4.05, 12.11]	-
Total (95% CI)			**357**	**347**	**100.0%**	**6.66 [4.24, 10.48]**	
Heterogeneity: Tau² = 0.00; Chi² = 0.44, df = 2 (P = 0.80); I² = 0%							
Test for overall effect: Z = 8.21 (P < 0.00001)							

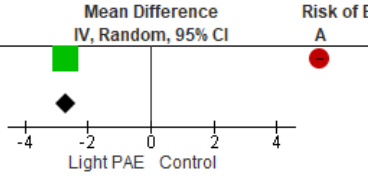


Risk of bias legend
(A) Overall ROB Rating

Weight (kg) (≤12 months)

Light PAE and Weight (kg) (≤12 months) (1 study)

Study or Subgroup	Light PAE Mean [kg]	SD [kg]	Total	Control Mean [kg]	SD [kg]	Total	Weight	Mean Difference IV, Random, 95% CI	Risk of Bias A
Marianian et al 2020 (12months)*	10	1.48	112	12.7	0.67	97	100.0%	-2.70 [-3.00, -2.40]	-
Total (95% CI)			**112**			**97**	**100.0%**	**-2.70 [-3.00, -2.40]**	
Heterogeneity: Not applicable									
Test for overall effect: Z = 17.36 (P < 0.00001)									

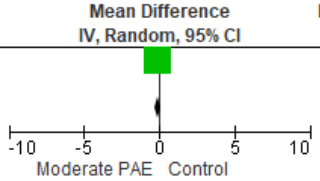


Risk of bias legend
(A) Overall ROB Rating

Notes. *Mean and SD estimated from Median and IQR.

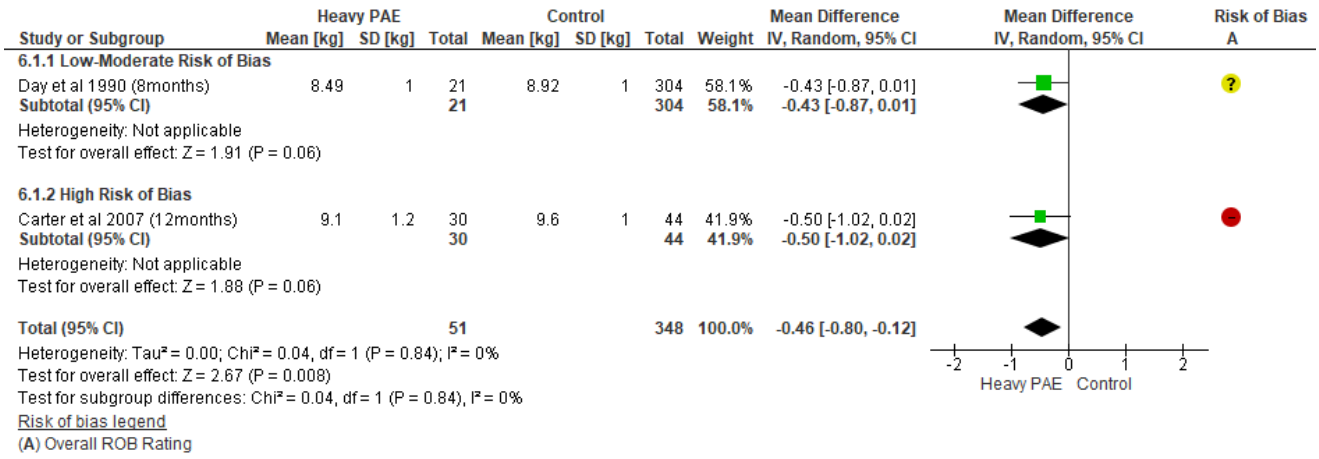
Moderate PAE and Weight (kg) (≤12 months) (1 study)

Study or Subgroup	Moderate PAE Mean [kg]	SD [kg]	Total	Control Mean [kg]	SD [kg]	Total	Weight	Mean Difference IV, Random, 95% CI	Risk of Bias A
Day et al 1990 (8months)	8.81	1	137	8.92	1	304	100.0%	-0.11 [-0.31, 0.09]	?
Total (95% CI)			**137**			**304**	**100.0%**	**-0.11 [-0.31, 0.09]**	
Heterogeneity: Not applicable									
Test for overall effect: Z = 1.07 (P = 0.29)									



Risk of bias legend
(A) Overall ROB Rating

Heavy PAE and Weight (kg) (≤12months) (2 studies)



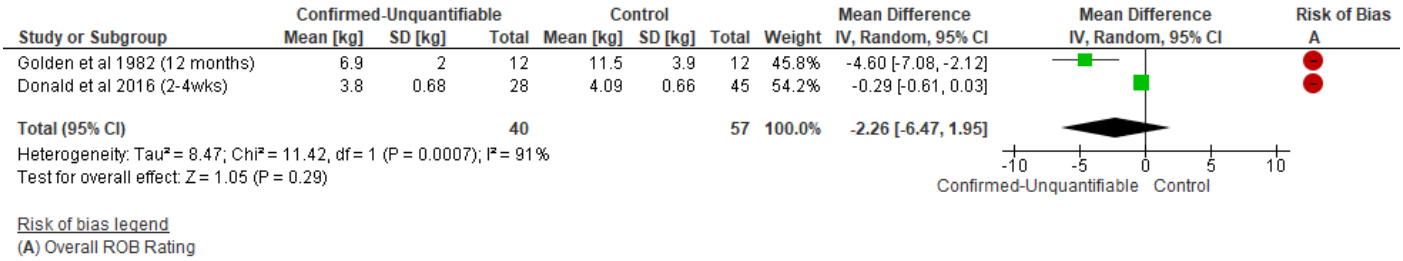
Very Heavy PAE and Weight (kg) (≤12 months) (0 studies)

-

Any Level PAE and Weight (kg) (≤12 months) (0 studies)

-

Confirmed PAE-Level Unquantifiable (≤12 months) (2 studies)



Weight (kg) (>12 months)

Light PAE and Weight (kg) (>12 months) (0 studies)

-

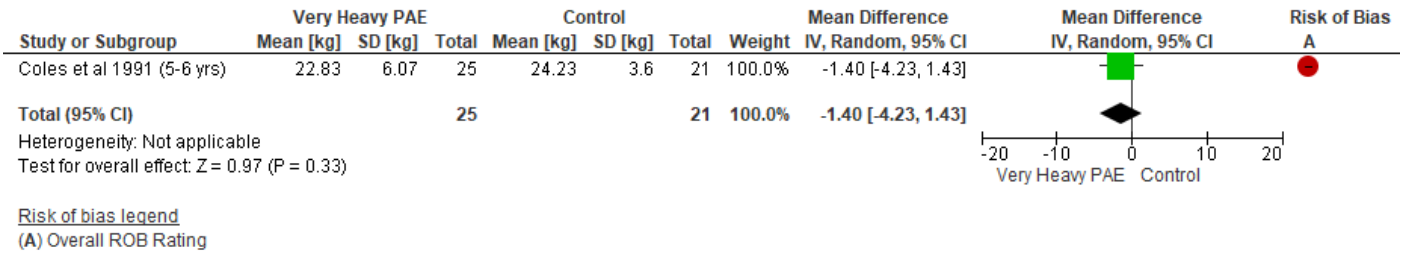
Moderate PAE and Weight (kg) (>12 months) (0 studies)

-

Heavy PAE and Weight (kg) (>12 months) (0 studies)

-

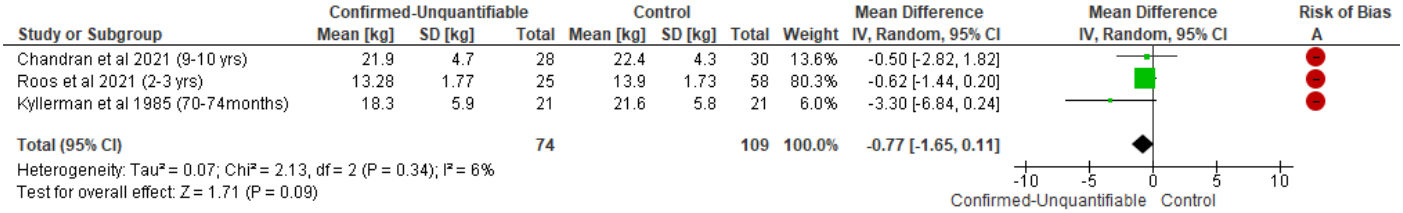
Very Heavy PAE and Weight (kg) (>12 months) (1 study)



Any Level PAE and Weight (kg) (>12 months) (0 studies)

-

Confirmed PAE-Level Unquantifiable (kg) (>12 months) (3 studies)



Weight Percentiles

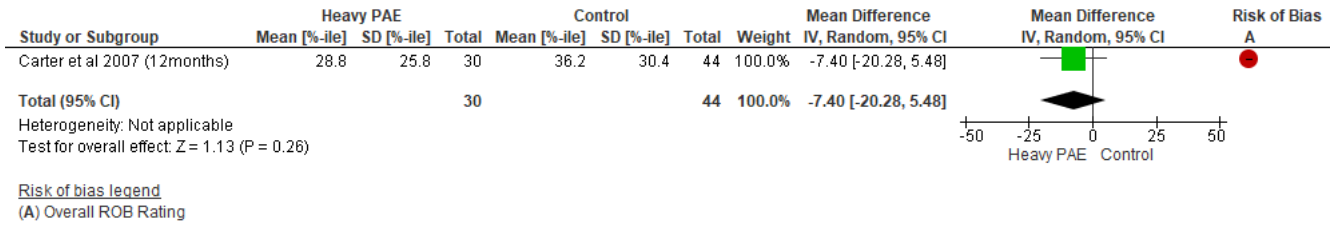
Light PAE and Weight Percentiles (0 studies)

-

Moderate PAE and Weight Percentiles (0 studies)

-

Heavy PAE and Weight Percentiles (1 study)



Very Heavy PAE and Weight Percentiles (0 studies)

-

Any Level PAE and Weight Percentiles (0 studies)

-

Confirmed PAE-Level Unquantifiable and Weight Percentiles (0 studies)

-

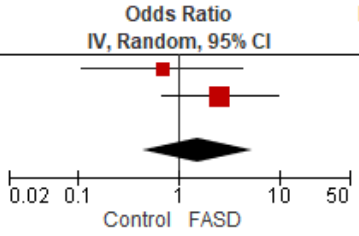
Diagnosed studies

Weight <10th percentile

FASD and Weight <10th Percentile (2 studies)

Study or Subgroup	log[Odds Ratio]	SE	FASD Total	Control Total	Weight	Odds Ratio IV, Random, 95% CI	Risk of Bias A
de Water et al 2021	-0.3801	0.9402	41	43	37.9%	0.68 [0.11, 4.32]	
Popova et al 2019	0.9379	0.6818	21	83	62.1%	2.55 [0.67, 9.72]	
Total (95% CI)			**62**	**126**	**100.0%**	**1.55 [0.44, 5.43]**	

Heterogeneity: Tau² = 0.19; Chi² = 1.29, df = 1 (P = 0.26); I² = 22%
Test for overall effect: Z = 0.68 (P = 0.49)

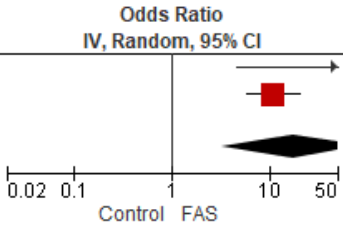


Risk of bias legend
(A) Overall ROB Rating

FAS and Weight <10th Percentile (2 studies)

Study or Subgroup	log[Odds Ratio]	SE	FAS Total	Control Total	Weight	Odds Ratio IV, Random, 95% CI	Risk of Bias A
Mattson et al 2010 FAS	4.3895	1.4551	41	46	24.8%	80.60 [4.65, 1396.11]	
Mattson et al 2013 FAS	2.3893	0.3205	79	185	75.2%	10.91 [5.82, 20.44]	
Total (95% CI)			**120**	**231**	**100.0%**	**17.92 [3.29, 97.45]**	

Heterogeneity: Tau² = 0.89; Chi² = 1.80, df = 1 (P = 0.18); I² = 45%
Test for overall effect: Z = 3.34 (P = 0.0008)



Risk of bias legend
(A) Overall ROB Rating

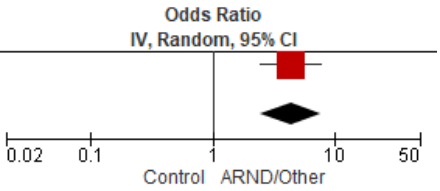
pFAS and Weight <10th Percentile (0 studies)

-

Other FASDs and Weight <10th Percentile (1 study)

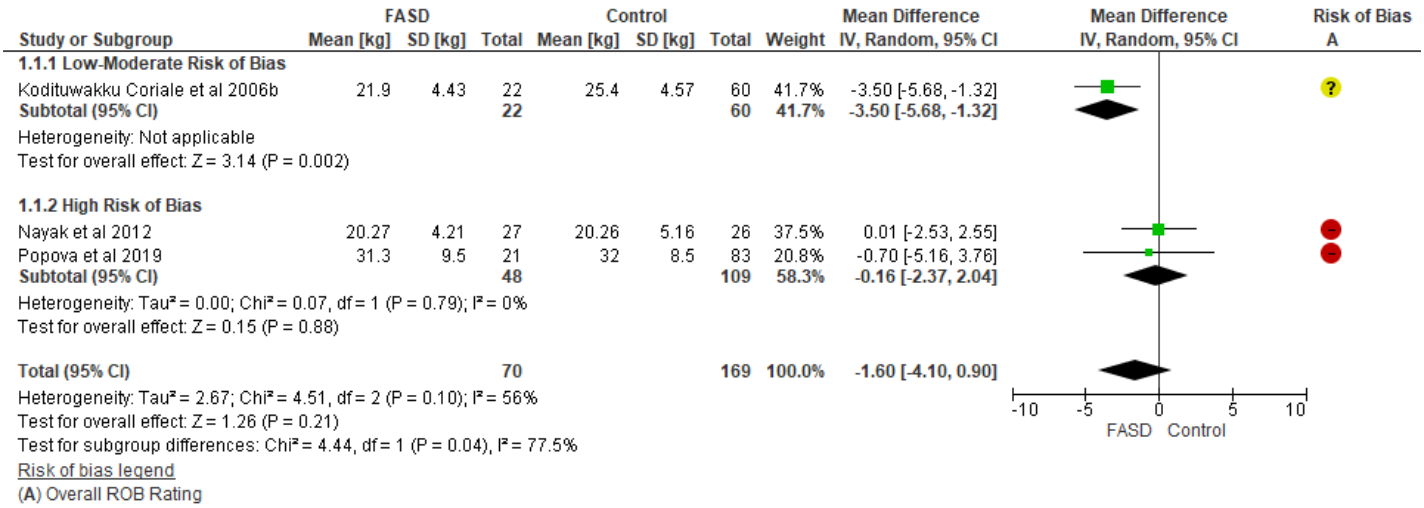
Study or Subgroup	log[Odds Ratio]	SE	ARND/Other Total	Control Total	Weight	Odds Ratio IV, Random, 95% CI
Mattson et al 2013 Non-syn	1.4821	0.2929	117	185	100.0%	4.40 [2.48, 7.82]
Total (95% CI)			**117**	**185**	**100.0%**	**4.40 [2.48, 7.82]**

Heterogeneity: Not applicable
Test for overall effect: Z = 5.06 (P < 0.00001)

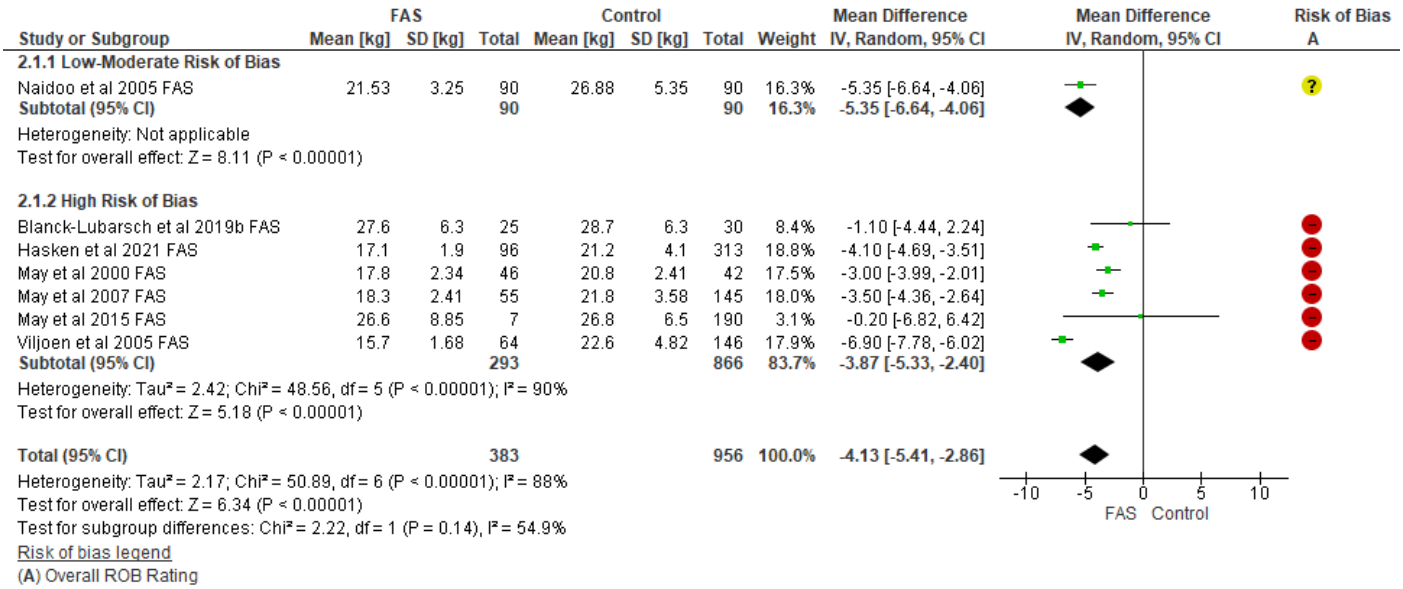


Weight (in kgs) (6-9 yrs)

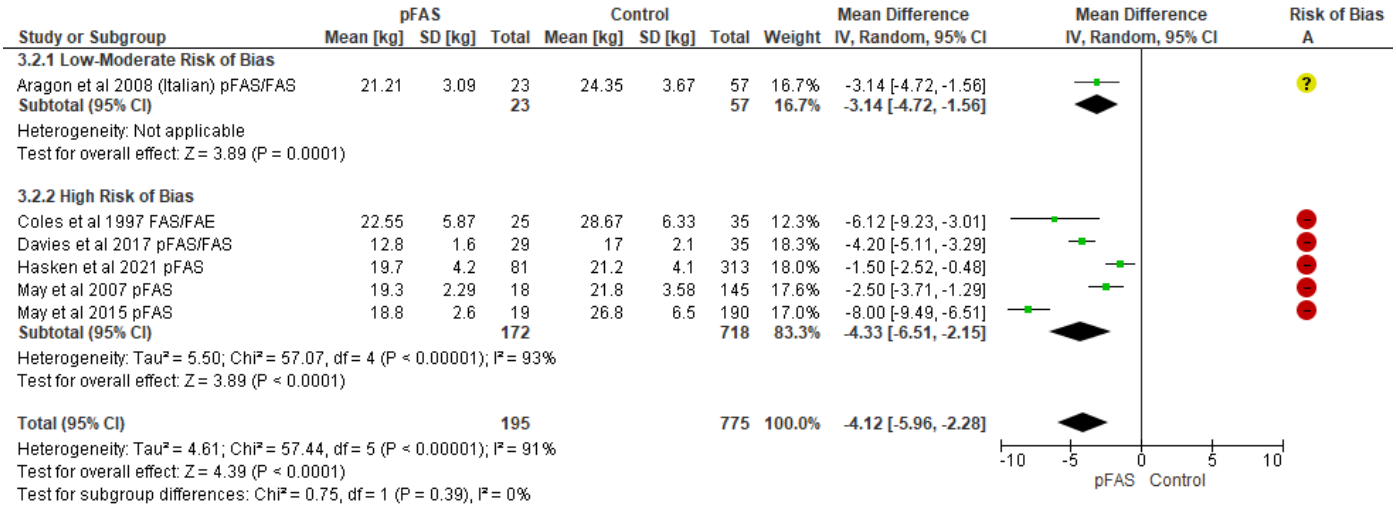
FASD and Weight (6-9yrs) (3 studies)



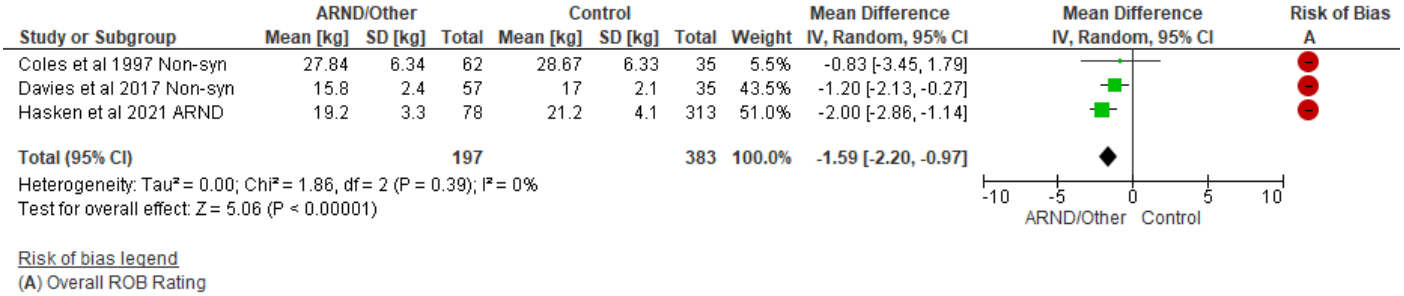
FAS and Weight (6-9 yrs) (7 studies)



pFAS and Weight (6-9 yrs) (6 studies)

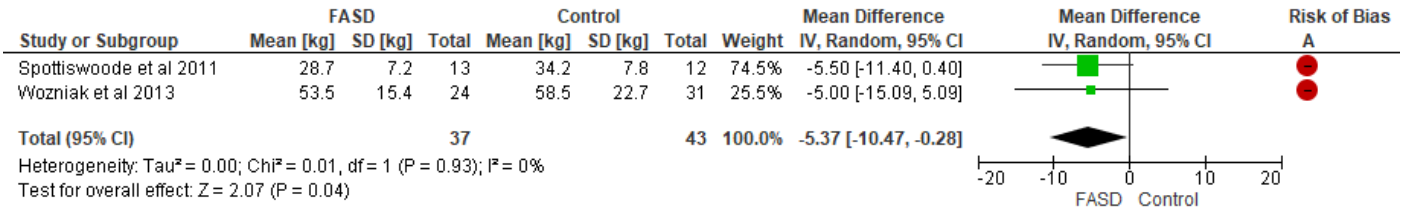


Other FASD and Weight (6-9 yrs) (3 studies)

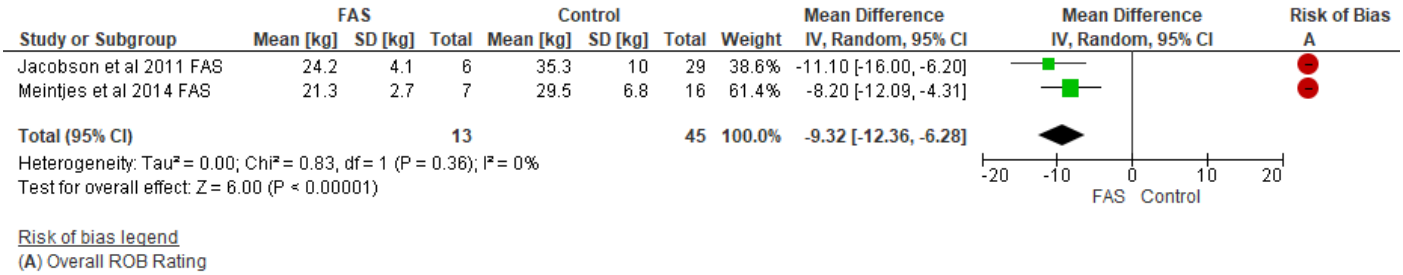


Weight (in kgs) (9-18 yrs)

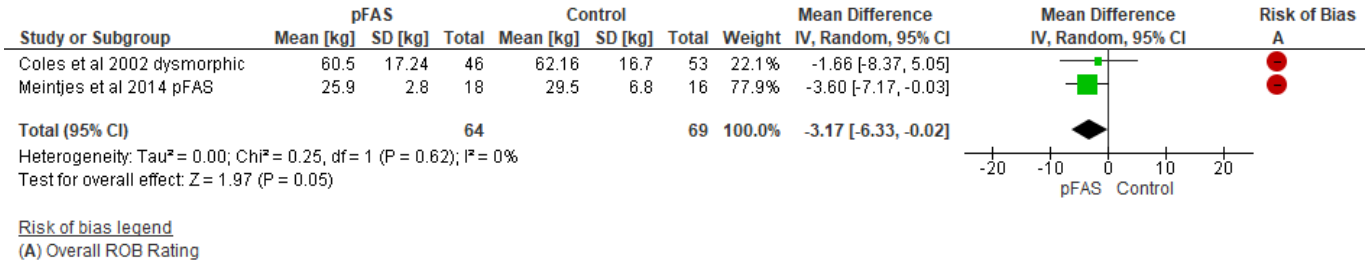
FASD and Weight (9-18 yrs) (2 studies)



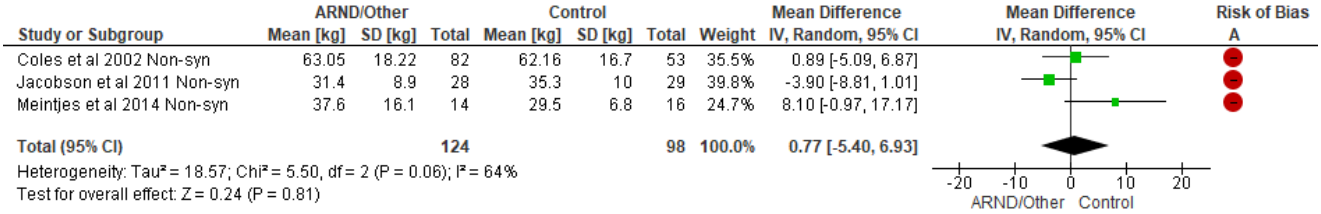
FAS and Weight (9-18 yrs) (2 studies)



pFAS and Weight (9-18 yrs) (2 studies)

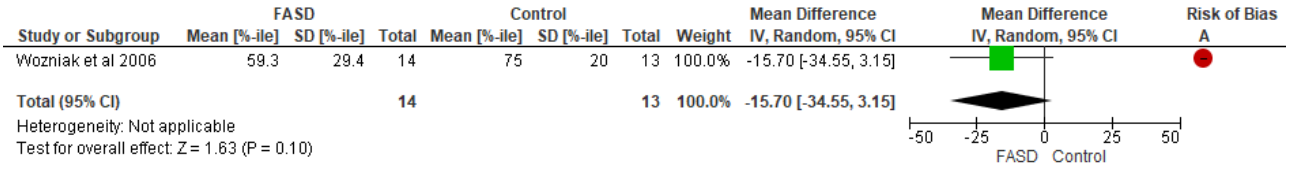


Other FASD and Weight (9-18 yrs) (3 studies)

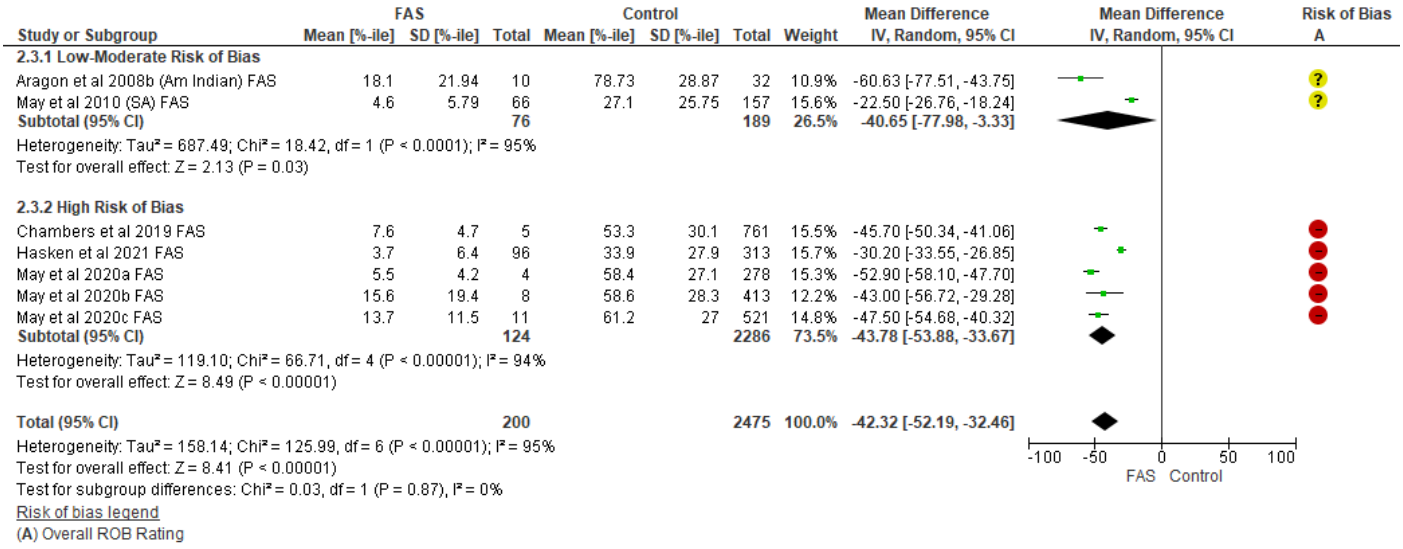


Weight Percentiles

FASD and Weight Percentiles (1 study)



FAS and Weight Percentiles (7 studies)



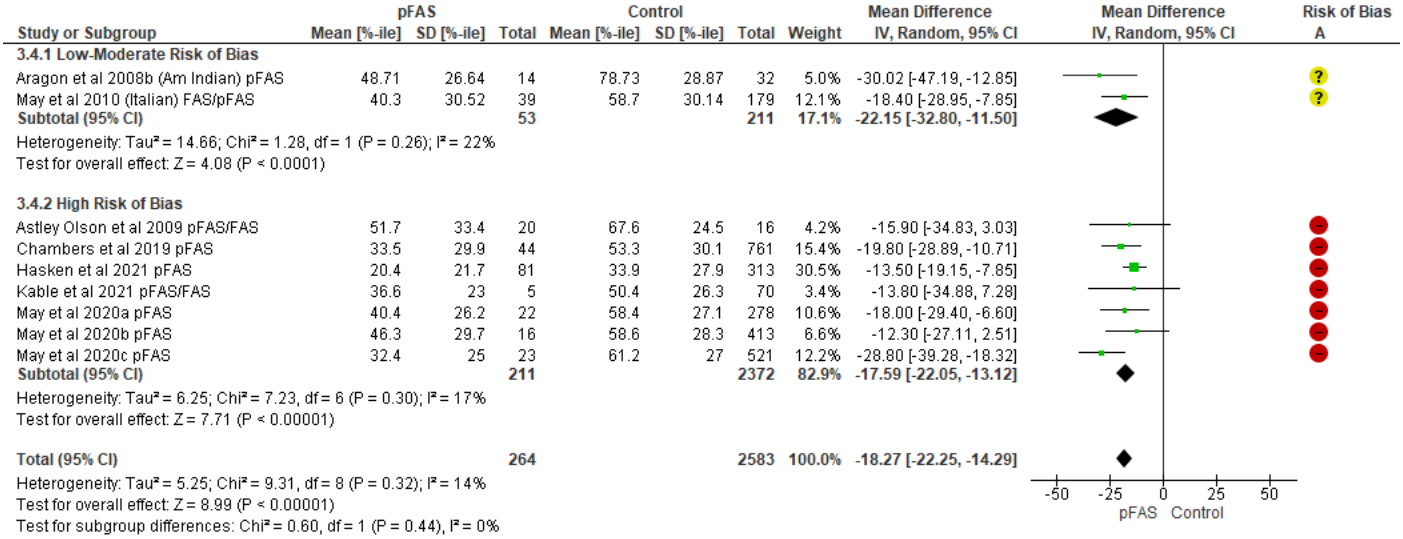
Study or Subgroup	FAS Mean [%-ile]	FAS SD [%-ile]	FAS Total	Control Mean [%-ile]	Control SD [%-ile]	Control Total	Weight	Mean Difference IV, Random, 95% CI	Risk of Bias A
2.3.1 Low-Moderate Risk of Bias									
Aragon et al 2008b (Am Indian) FAS	18.1	21.94	10	78.73	28.87	32	10.9%	-60.63 [-77.51, -43.75]	?
May et al 2010 (SA) FAS	4.6	5.79	66	27.1	25.75	157	15.6%	-22.50 [-26.76, -18.24]	?
Subtotal (95% CI)			**76**			**189**	**26.5%**	**-40.65 [-77.98, -3.33]**	
Heterogeneity: Tau² = 687.49; Chi² = 18.42, df = 1 (P < 0.0001); I² = 95%									
Test for overall effect: Z = 2.13 (P = 0.03)									
2.3.2 High Risk of Bias									
Chambers et al 2019 FAS	7.6	4.7	5	53.3	30.1	761	15.5%	-45.70 [-50.34, -41.06]	–
Hasken et al 2021 FAS	3.7	6.4	96	33.9	27.9	313	15.7%	-30.20 [-33.55, -26.85]	–
May et al 2020a FAS	5.5	4.2	4	58.4	27.1	278	15.3%	-52.90 [-58.10, -47.70]	–
May et al 2020b FAS	15.6	19.4	8	58.6	28.3	413	12.2%	-43.00 [-56.72, -29.28]	–
May et al 2020c FAS	13.7	11.5	11	61.2	27	521	14.8%	-47.50 [-54.68, -40.32]	–
Subtotal (95% CI)			**124**			**2286**	**73.5%**	**-43.78 [-53.88, -33.67]**	
Heterogeneity: Tau² = 119.10; Chi² = 66.71, df = 4 (P < 0.00001); I² = 94%									
Test for overall effect: Z = 8.49 (P < 0.00001)									
Total (95% CI)			**200**			**2475**	**100.0%**	**-42.32 [-52.19, -32.46]**	
Heterogeneity: Tau² = 158.14; Chi² = 125.99, df = 6 (P < 0.00001); I² = 95%									
Test for overall effect: Z = 8.41 (P < 0.00001)									
Test for subgroup differences: Chi² = 0.03, df = 1 (P = 0.87), I² = 0%									

Mean Difference IV, Random, 95% CI: -100, -50, 0, 50, 100 — FAS, Control

Risk of bias legend

(A) Overall ROB Rating

pFAS and Weight Percentiles (9 studies)



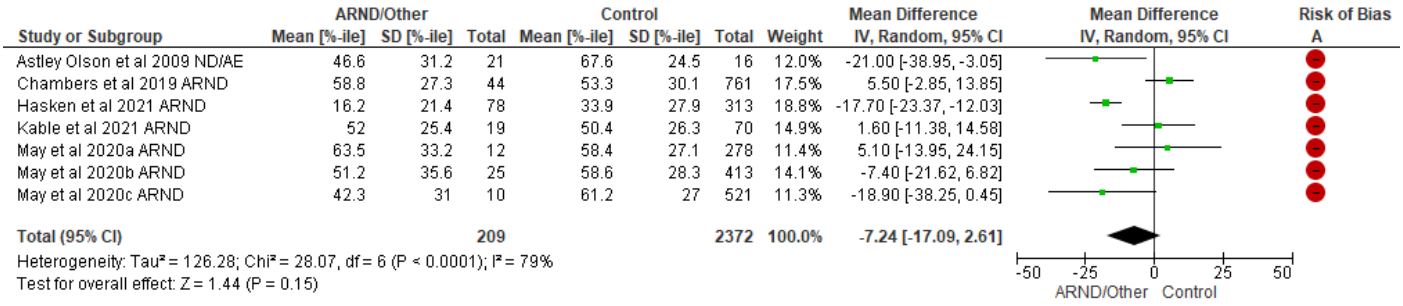
Study or Subgroup	pFAS Mean [%-ile]	pFAS SD [%-ile]	pFAS Total	Control Mean [%-ile]	Control SD [%-ile]	Control Total	Weight	Mean Difference IV, Random, 95% CI	Risk of Bias A
3.4.1 Low-Moderate Risk of Bias									
Aragon et al 2008b (Am Indian) pFAS	48.71	26.64	14	78.73	28.87	32	5.0%	-30.02 [-47.19, -12.85]	?
May et al 2010 (Italian) FAS/pFAS	40.3	30.52	39	58.7	30.14	179	12.1%	-18.40 [-28.95, -7.85]	?
Subtotal (95% CI)			**53**			**211**	**17.1%**	**-22.15 [-32.80, -11.50]**	
Heterogeneity: Tau² = 14.66; Chi² = 1.28, df = 1 (P = 0.26); I² = 22%									
Test for overall effect: Z = 4.08 (P < 0.0001)									
3.4.2 High Risk of Bias									
Astley Olson et al 2009 pFAS/FAS	51.7	33.4	20	67.6	24.5	16	4.2%	-15.90 [-34.83, 3.03]	–
Chambers et al 2019 pFAS	33.5	29.9	44	53.3	30.1	761	15.4%	-19.80 [-28.89, -10.71]	–
Hasken et al 2021 pFAS	20.4	21.7	81	33.9	27.9	313	30.5%	-13.50 [-19.15, -7.85]	–
Kable et al 2021 pFAS/FAS	36.6	23	5	50.4	26.3	70	3.4%	-13.80 [-34.88, 7.28]	–
May et al 2020a pFAS	40.4	26.2	22	58.4	27.1	278	10.6%	-18.00 [-29.40, -6.60]	–
May et al 2020b pFAS	46.3	29.7	16	58.6	28.3	413	6.6%	-12.30 [-27.11, 2.51]	–
May et al 2020c pFAS	32.4	25	23	61.2	27	521	12.2%	-28.80 [-39.28, -18.32]	–
Subtotal (95% CI)			**211**			**2372**	**82.9%**	**-17.59 [-22.05, -13.12]**	
Heterogeneity: Tau² = 6.25; Chi² = 7.23, df = 6 (P = 0.30); I² = 17%									
Test for overall effect: Z = 7.71 (P < 0.00001)									
Total (95% CI)			**264**			**2583**	**100.0%**	**-18.27 [-22.25, -14.29]**	
Heterogeneity: Tau² = 5.25; Chi² = 9.31, df = 8 (P = 0.32); I² = 14%									
Test for overall effect: Z = 8.99 (P < 0.00001)									
Test for subgroup differences: Chi² = 0.60, df = 1 (P = 0.44), I² = 0%									

Mean Difference IV, Random, 95% CI: -50, -25, 0, 25, 50 — pFAS, Control

Risk of bias legend

(A) Overall ROB Rating

Other FASD and Weight Percentiles (7 studies)



Heterogeneity: $Tau^2 = 126.28$; $Chi^2 = 28.07$, $df = 6$ ($P < 0.0001$); $I^2 = 79\%$

Test for overall effect: $Z = 1.44$ ($P = 0.15$)

Risk of bias legend

(**A**) Overall ROB Rating

Table 5. GRADE ratings for postnatal height

	Certainty assessment					№ of patients		Effect		Certainty
№ of studies	Risk of bias	Inconsistency	Indirectness	Imprecision	Other	PAE	Control	Relative (95% CI)	Absolute (95% CI)	
EXPOSURE STUDIES										
Height <10th Percentile										
Light prenatal alcohol exposure (1-20g/w in at least one trimester) - 0 studies										
Moderate prenatal alcohol exposure (101-200g/w in at least one trimester)										
2	serious[a]	serious[b]	not serious	very serious[d,e,f]	none	78	319	**OR 2.79** (0.54 to 14.38)	-	⊕◯◯◯ Very low
Heavy prenatal alcohol exposure (101-200g/w in at least one trimester)										
1	serious[a]	not serious	not serious	very serious[d,e,f]	none	20	66	**OR 2.74** (0.56 to 13.41)	-	⊕◯◯◯ Very low
Very Heavy prenatal alcohol exposure (201g+/w in at least one trimester)										
3	serious[a]	not serious	not serious	serious[e,f]	none	47	338	**OR 8.31** (3.68 to 18.76)	-	⊕⊕◯◯ Low
Any level prenatal alcohol exposure (exposure dichotomised to yes/no) - no studies										
Confirmed prenatal alcohol exposure-Level Unquantifiable										
3	serious[a]	not serious	not serious	serious[e,f]	none	357	347	**OR 4.75** (2.81 to 8.02)	-	⊕⊕◯◯ Low
Height (≤12 months of age) (cm)										
Moderate, Very Heavy, Any Level – no studies										
Light prenatal alcohol exposure (1-20g/w in at least one trimester)										
1	serious[a]	not serious	serious[c]	serious[f]	none	112	97	-	**MD 4.00 lower** (4.60 lower to 3.40 lower)	⊕◯◯◯ Very low
Heavy prenatal alcohol exposure (201g+/w in at least one trimester)										
1	serious[a]	not serious	serious[c]	serious[d,f]	-	30	44	-	**MD 0.70 lower** (1.81 lower to 0.41 higher)	⊕◯◯◯ Very low
Confirmed prenatal alcohol exposure-Level Unquantifiable										
2	serious[a]	serious[b]	not serious	very serious[d,e,f]	none	40	57	-	MD **3.02 lower** (10.55 lower to 4.51 higher)	⊕◯◯◯ Very low
Height (>12 months of age) (cm)										
Light, Any Level – no studies										
Moderate prenatal alcohol exposure (101-200g/w in at least one trimester)										

1	serious[a]	not serious	not serious	serious[f]	-	26	49	-	MD 0.30 lower (0.54 lower to 0.06 lower)	⊕⊕◯◯ Low
Heavy prenatal alcohol exposure (201g+/w in at least one trimester)										
1	serious[a]	not serious	not serious	serious[d,f]	-	20	49	-	MD 0.20 higher (0.05 lower to 0.45 higher)	⊕⊕◯◯ Low
Very heavy prenatal alcohol exposure (201g+/w in at least one trimester)										
2	serious[a]	not serious	not serious	serious[f]	-	37	70	-	MD 3**.22 lower** (3.57 lower to 2.86 lower)	⊕⊕◯◯ Low
Confirmed prenatal alcohol exposure-Level Unquantifiable										
3	serious[a]	not serious	not serious	serious[d,f]	none	74	109	-	MD **0.32 lower** (1.91 lower to 1.27 higher)	⊕⊕◯◯ Low
Height Percentiles										
Light, Moderate, Very Heavy, Any Level, Confirmed-Level Unquantifiable – 0 studies										
Heavy prenatal alcohol exposure (101-200g/w in at least one trimester)										
1	serious[a]	not serious	serious[c]	serious[d,f]	none	30	44	-	MD **7.60 lower** (20.29 lower to 5.09 higher)	⊕◯◯◯ Very low
DIAGNOSED STUDIES										
Height <10th Percentile										
FASD										
2	serious[a]	not serious	not serious	serious[e,f]	none	62	126	**OR 12.77** (2.89 to 56.47)	-	⊕⊕◯◯ Low
FAS										
2	serious[a]	not serious	not serious	serious[e,f]	none	120	231	**OR 9.59** (5.48 to 16.79)	-	⊕⊕◯◯ Low
pFAS (pFAS or pFAS/FAS or dysmorphic) - no studies										
Other (ARND, ND-AE, SE-AE, Non-syndromal)										
1	serious[a]	not serious	not serious	serious[e,f]	none	117	185	**OR 4.19** (2.38 to 7.40)	-	⊕⊕◯◯ Low
Height (cm) (6-9 years)										
FASD										
3	serious[a]	serious[b]	not serious	serious[d,f]	none	70	169	-	MD 1.93 **lower** (6.27 lower to 2.40 higher)	⊕◯◯◯ Very low

FAS										
7	serious[a]	serious[b]	serious[c]	not serious	none	383	956	-	MD 5**.99 lower** (7.79 lower to 4.18 lower)	⊕◯◯◯ Very low
pFAS (or pFAS/FAS or dysmorphic)										
6	serious[a]	serious[b]	serious[c]	serious[e]	none	195	775	-	MD **6.39 lower** (9.53 lower to 3.26 lower)	⊕◯◯◯ Very low
Other (ARND, ND-AE, SE-AE, Non-syndromal)										
3	serious[a]	not serious	serious[c]	not serious	none	197	383	-	MD **2.75 lower** (3.99 lower to 1.5 lower)	⊕⊕◯◯ Low
Height (cm) (9-18 yrs)										
FASD										
3	serious[a]	not serious	not serious	very serious[d,e,f]	none	55	69	-	MD **4.68 lower** (9.54 lower to 0.19 higher)	⊕◯◯◯ Very low
FAS										
2	serious[a]	not serious	serious[c]	serious[e,f]	none	13	45	-	MD **9.70 lower** (13.23 lower to 6.16 lower)	⊕◯◯◯ Very low
pFAS (pFAS or pFAS/FAS or dysmorphic)										
2	serious[a]	not serious	not serious	serious[d,f]	none	64	69	-	MD **0.37 lower** (3.18 lower to 2.44 higher)	⊕⊕◯◯ Low
Other (ARND, ND-AE, SE-AE, Non-syndromal)										
3	serious[a]	serious[b]	serious[c]	serious[d,f]	none	124	98	-	MD **2.00 higher** (2.48 lower to 6.47 higher)	⊕◯◯◯ Very low
Height Percentiles										
FASD										
1	serious[a]	not serious	not serious	serious[e,f]	none	14	13	-	MD **23.64 lower** (47.72 lower to 0.44 lower)	⊕⊕◯◯ Low
FAS										
7	serious[a]	serious[b]	not serious	not serious	none	200	2475	-	MD 41.16 **lower** (53.20 lower to 29.12 lower)	⊕⊕◯◯ Low
pFAS (pFAS or pFAS/FAS or dysmorphic)										
9	serious[a]	serious[b]	not serious	not serious	none	264	2583	-	MD 19.46 lower (25.60 lower to 13.31 lower)	⊕⊕◯◯ Low
Other (ARND, ND-AE, SE-AE, Non-syndromal)										

7	serious[a]	serious[b]	not serious	serious[d]	none	209	2372	-	MD **5.18 lower** (15.11 lower to 4.76 higher)	⊕◯◯◯ Very Low

CI: confidence interval; **MD:** mean difference; **OR:** odds ratio

Explanations: Explanations: a) >50% of studies were rated as moderate or high risk of bias; b) High heterogeneity (I^2 >50% and significant chi-square for heterogeneity); c) >50% of studies had a sample not representative of the Australian populations not representative of Australia, d) 95% CI for overall estimate crossed the line of no effect; e) Wide CI for overall estimate; f) Optimal information size not met.

Meta-analyses for postnatal height

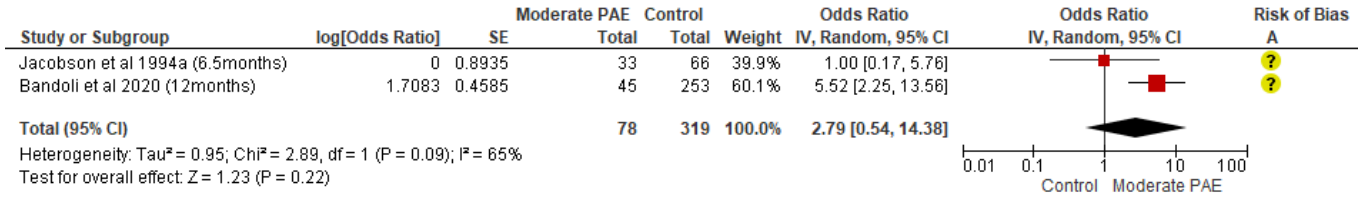
Exposure studies

Height <10th Percentile

Light PAE and Height <10th Percentile (0 studies)

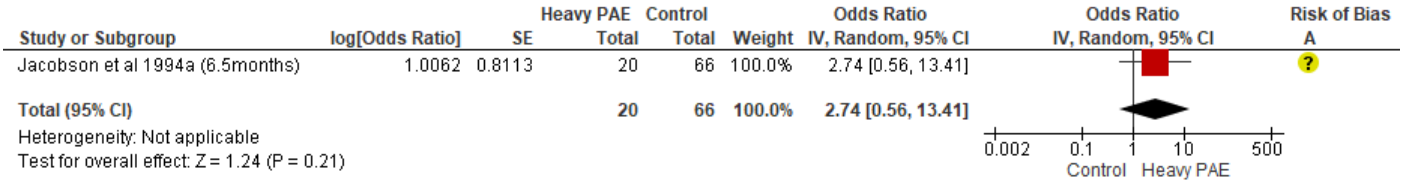
-

Moderate PAE and Height <10th Percentile (2 studies)



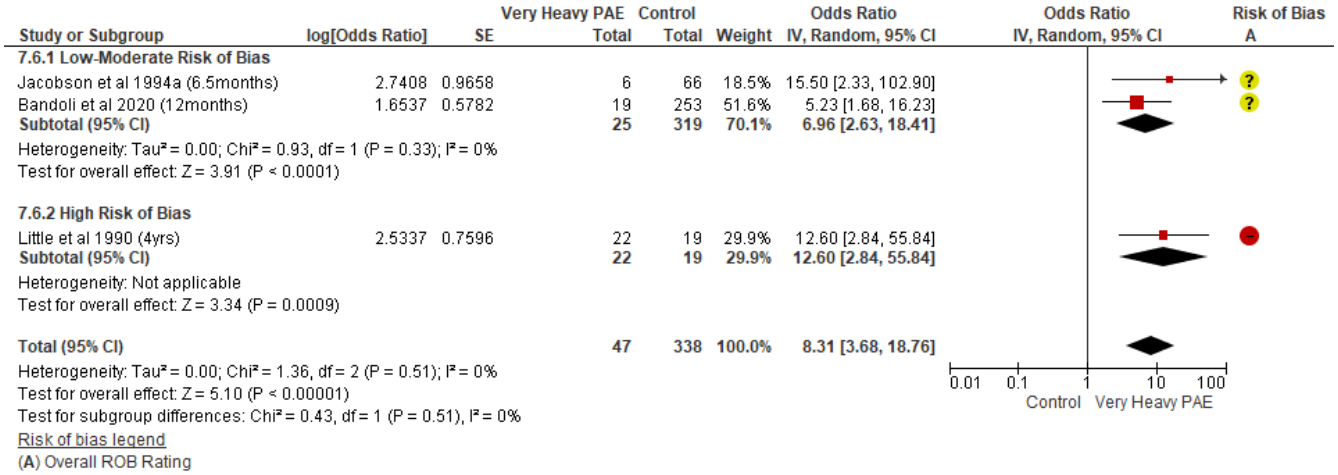
Risk of bias legend
(A) Overall ROB Rating

Heavy PAE and Height <10th Percentile (1 study)



Risk of bias legend
(A) Overall ROB Rating

Very Heavy PAE and Height <10th Percentile (3 studies)

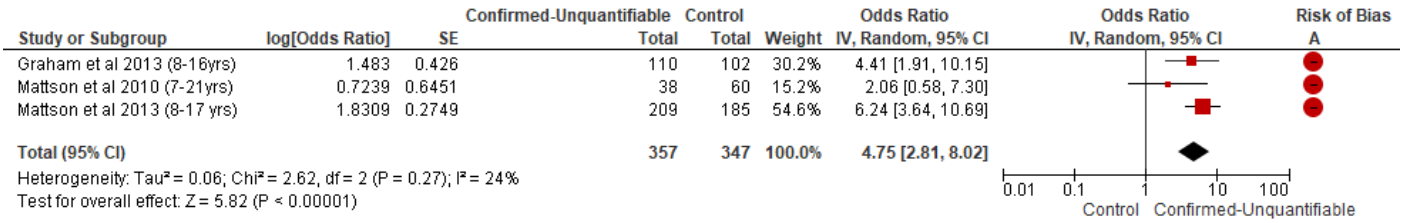


Risk of bias legend
(A) Overall ROB Rating

Any Level PAE and Height <10th Percentile (0 studies)

-

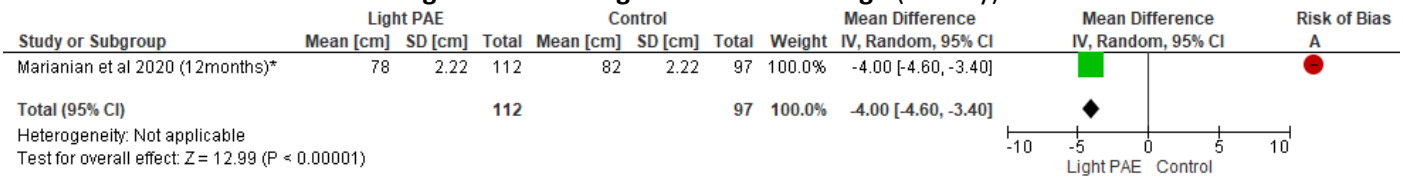
Confirmed PAE-Level Unquantifiable and Height <10th Percentile (3 studies)



Risk of bias legend
(A) Overall ROB Rating

Height (≤12 months of age)

Light PAE and Height ≤12 months of age (1 study)



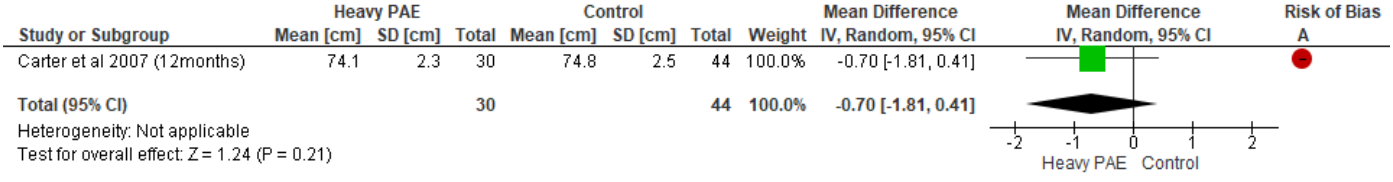
Risk of bias legend
(A) Overall ROB Rating

Notes. *Mean and SD estimated from Median and IQR.

Moderate PAE and Height ≤12 months of age (0 studies)

-

Heavy PAE and Height ≤12 months of age (1 study)



Risk of bias legend
(A) Overall ROB Rating

-

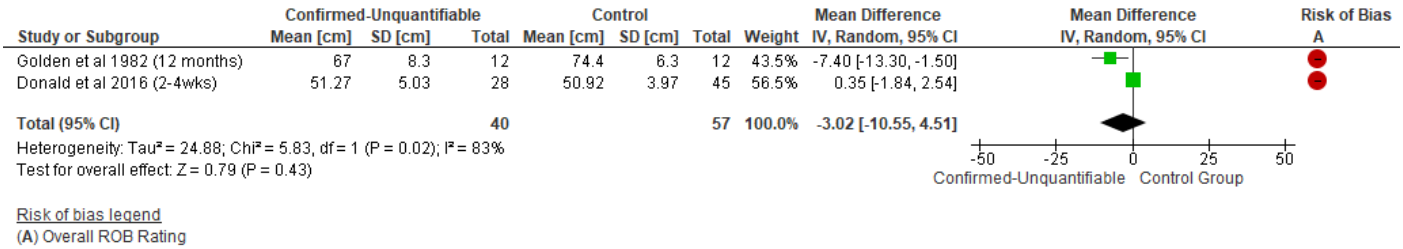
Very Heavy PAE and Height ≤12 months of age (0 studies)

-

Any Level PAE and Height ≤12 months of age (0 studies)

-

Confirmed PAE-Level Unquantifiable and Height ≤12 months of age (2 studies)

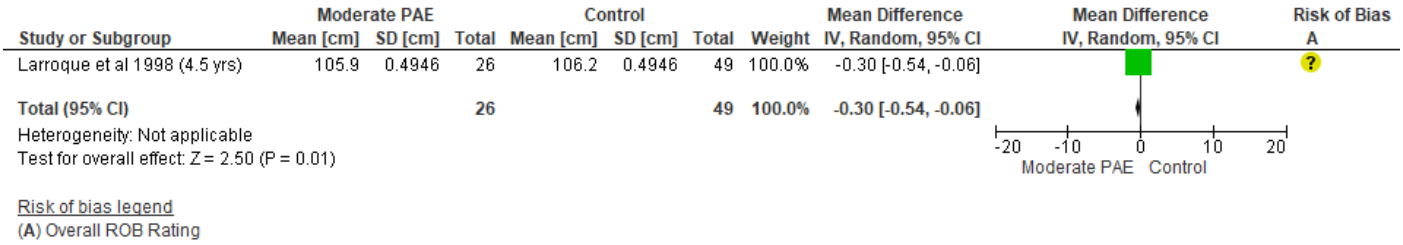


Height (cms) (>12 months of age)

Light PAE and Height >12months of age (0 studies)

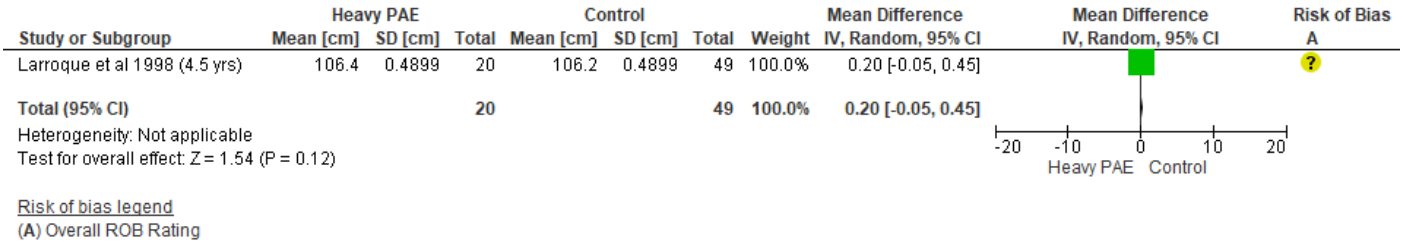
-

Moderate PAE and Height >12months of age (1 study)



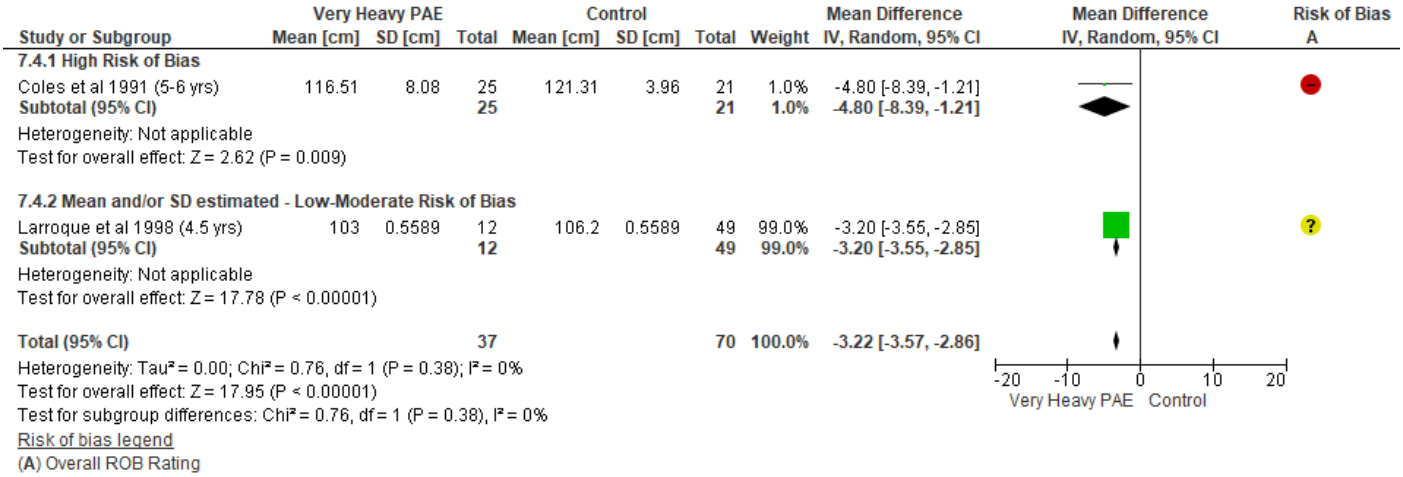
Note. Larroque et al. 1998 – mean and standard deviation estimates from adjusted mean difference.

Heavy PAE and Height >12months of age (1 study)



Note. Larroque et al. 1998 – mean and standard deviation estimates from adjusted mean difference.

Very Heavy PAE and Height >12months of age (2 studies)

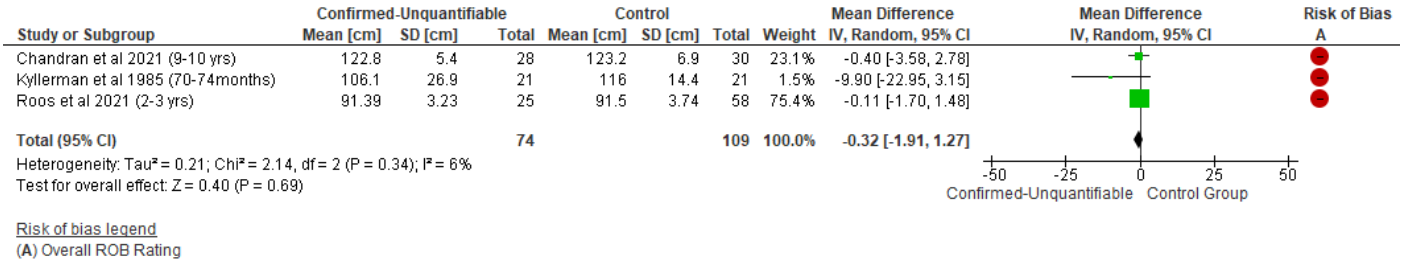


Note. Larroque et al. 1998 – mean and standard deviation estimates from adjusted mean difference.

Any Level PAE and Height >12months of age (0 studies)

-

Confirmed PAE-Level Unquantifiable and Height >12months of age (3 studies)



Height Percentiles

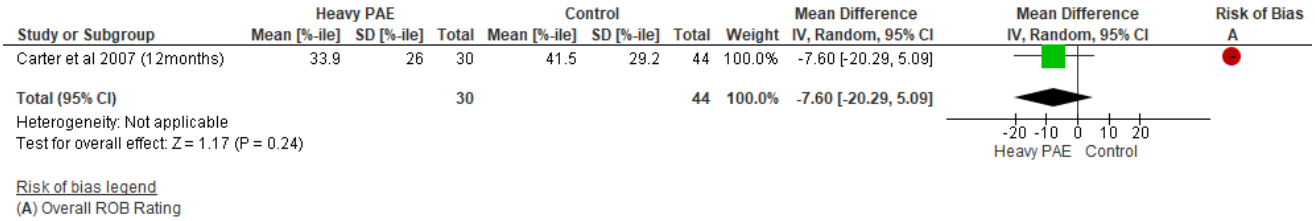
Light PAE and Height Percentiles (0 studies)

-

Moderate PAE and Height Percentiles (0 studies)

-

Heavy PAE and Height Percentiles (1 study)



Very Heavy PAE and Height Percentiles (0 studies)

-

Any Level PAE and Height Percentiles (0 studies)

-

Confirmed PAE-Level Unquantifiable and Height Percentiles (0 studies)

-

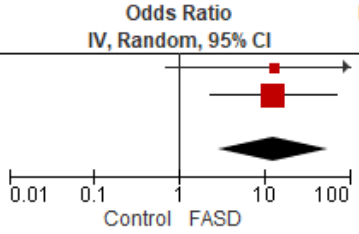
Diagnosed studies

Height <10th percentile

FASD and Height <10th percentile (2 studies)

Study or Subgroup	log[Odds Ratio]	SE	FASD Total	Control Total	Weight	Odds Ratio IV, Random, 95% CI	Risk of Bias A
de Water et al 2021	2.5733	1.4941	41	43	25.8%	13.11 [0.70, 245.10]	
Popova et al 2019	2.5382	0.8803	21	83	74.2%	12.66 [2.25, 71.06]	
Total (95% CI)			**62**	**126**	**100.0%**	**12.77 [2.89, 56.47]**	

Heterogeneity: Tau² = 0.00; Chi² = 0.00, df = 1 (P = 0.98); I² = 0%
Test for overall effect: Z = 3.36 (P = 0.0008)

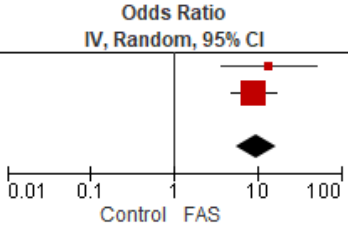


Risk of bias legend
(A) Overall ROB Rating

FAS and Height <10th Percentile (2 studies)

Study or Subgroup	log[Odds Ratio]	SE	FAS Total	Control Total	Weight	Odds Ratio IV, Random, 95% CI	Risk of Bias A
Mattson et al 2010 FAS	2.6138	0.6739	41	46	18.0%	13.65 [3.64, 51.14]	
Mattson et al 2013 FAS	2.1837	0.3155	79	185	82.0%	8.88 [4.78, 16.48]	
Total (95% CI)			**120**	**231**	**100.0%**	**9.59 [5.48, 16.79]**	

Heterogeneity: Tau² = 0.00; Chi² = 0.33, df = 1 (P = 0.56); I² = 0%
Test for overall effect: Z = 7.91 (P < 0.00001)



Risk of bias legend
(A) Overall ROB Rating

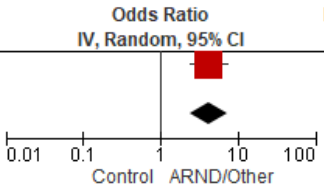
pFAS and Height <10th Percentile (0 studies)

-

Other FASDs and Height <10th Percentile (1 study)

Study or Subgroup	log[Odds Ratio]	SE	ARND/Other Total	Control Total	Weight	Odds Ratio IV, Random, 95% CI	Risk of Bias A
Mattson et al 2013 Non-syn	1.4333	0.2898	117	185	100.0%	4.19 [2.38, 7.40]	
Total (95% CI)			**117**	**185**	**100.0%**	**4.19 [2.38, 7.40]**	

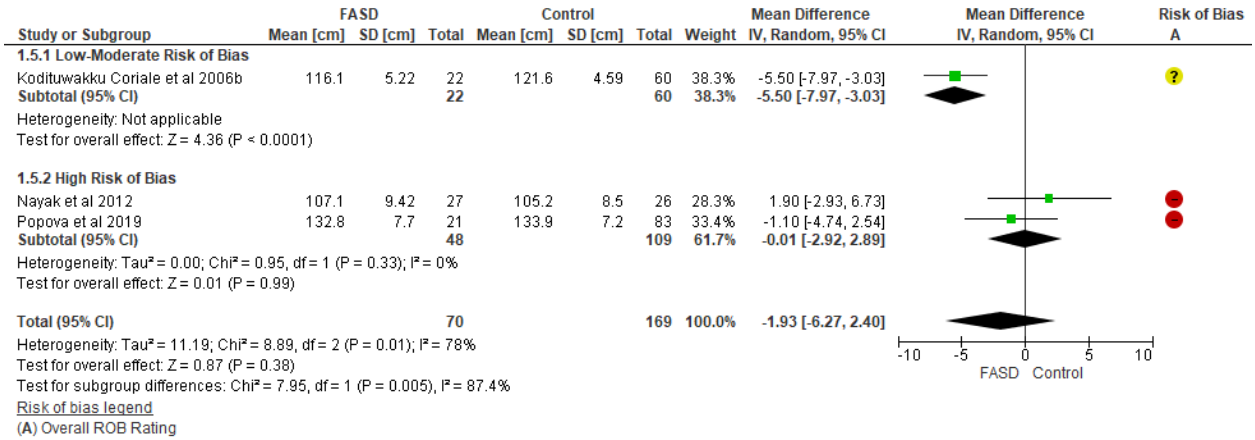
Heterogeneity: Not applicable
Test for overall effect: Z = 4.95 (P < 0.00001)



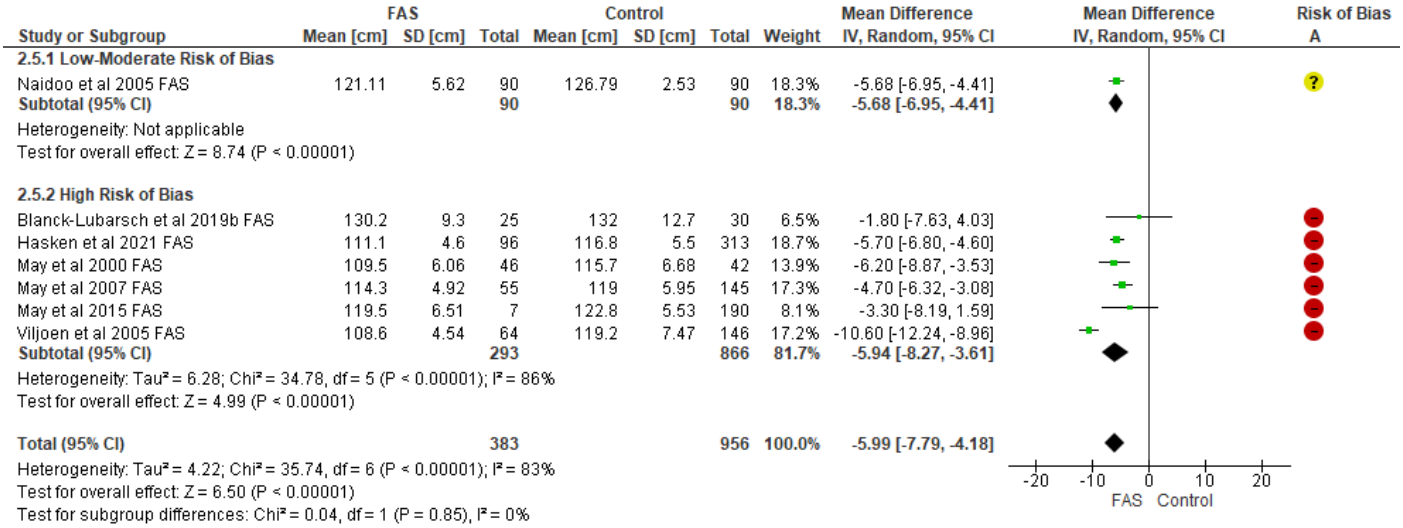
Risk of bias legend
(A) Overall ROB Rating

Height (in cms) (6-9yrs)

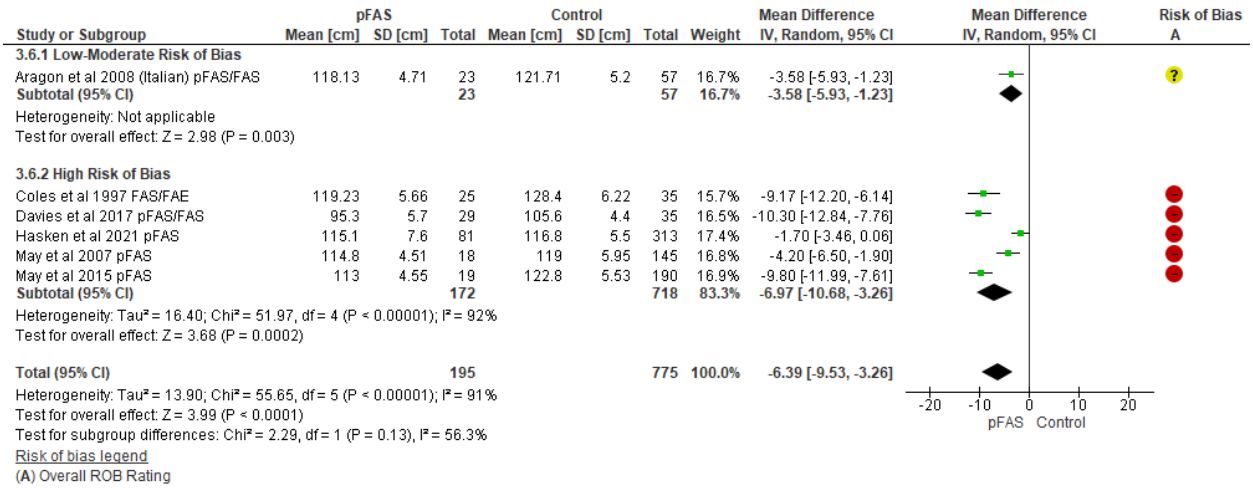
FASD and Height (6-9 yrs) (3 studies)



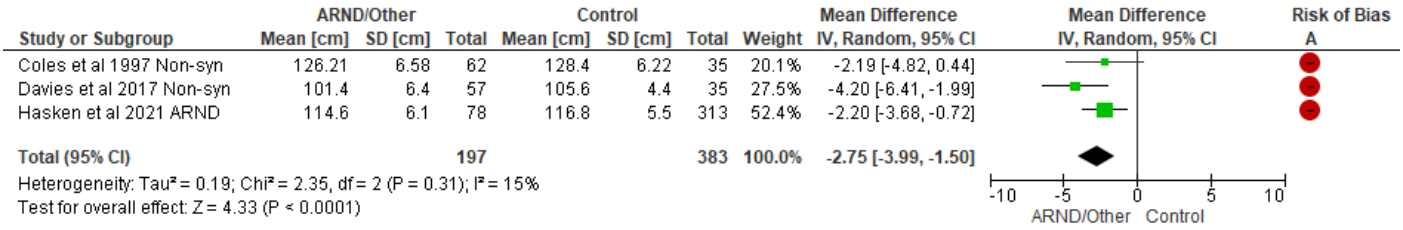
FAS and Height (6-9 yrs) (7 studies)



pFAS and Height (6-9 yrs) (6 studies)



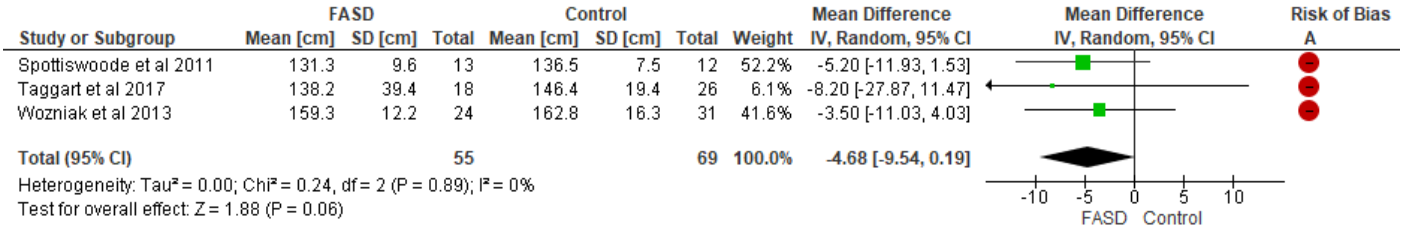
Other FASD and Height (6-9 yrs) (3 studies)



Risk of bias legend
(A) Overall ROB Rating

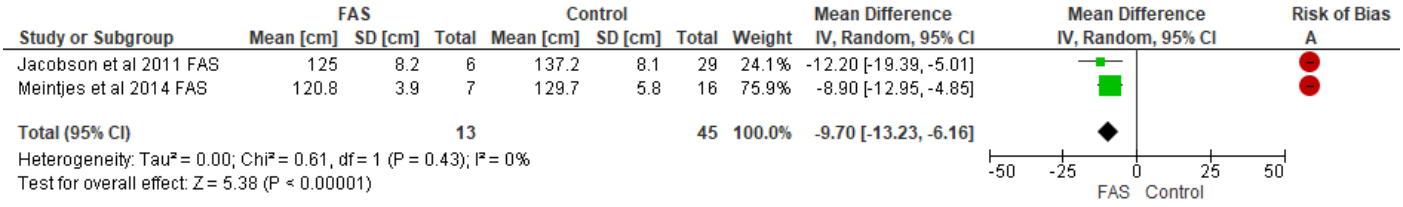
Height (in cms) (9-18 yrs)

FASD and Height (9-18 yrs) (3 studies)



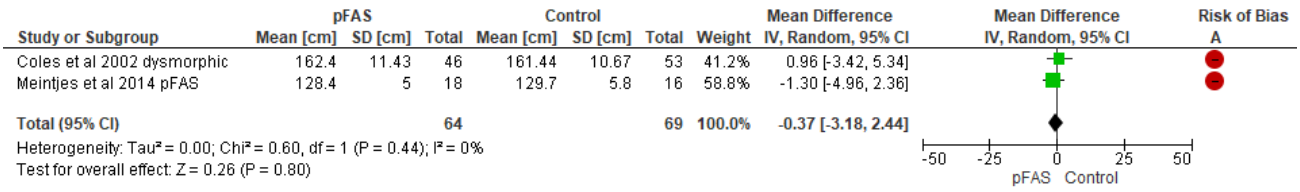
Risk of bias legend
(A) Overall ROB Rating

FAS and Height (9-18 yrs) (2 studies)



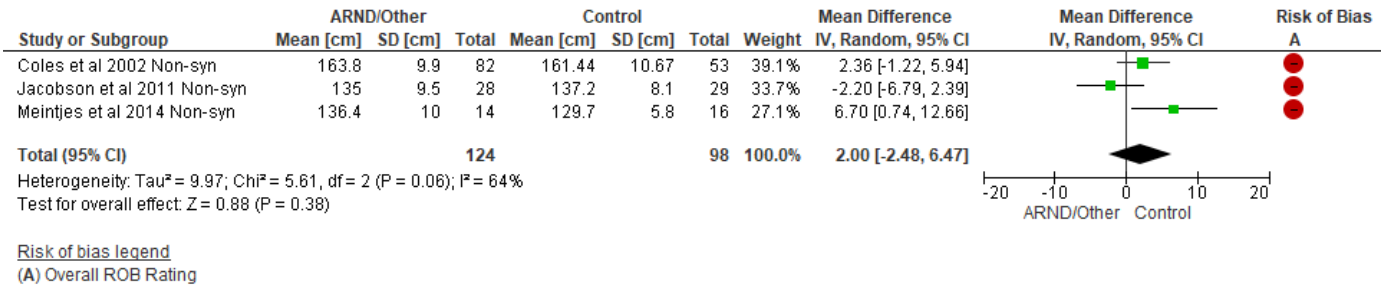
Risk of bias legend
(A) Overall ROB Rating

pFAS and Height (9-18 yrs) (2 studies)



Risk of bias legend
(A) Overall ROB Rating

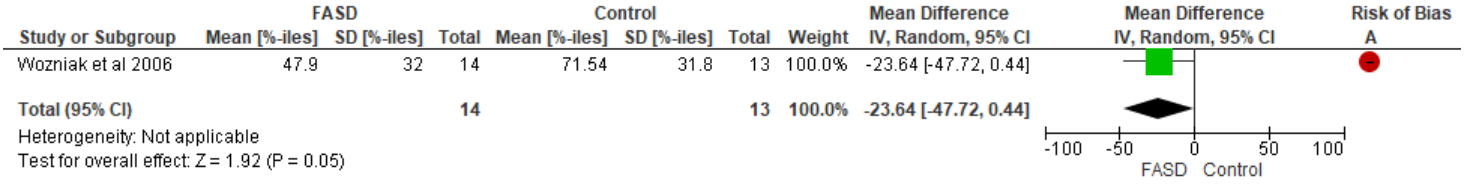
Other FASD and Height (9-18 yrs) (3 studies)



Risk of bias legend
(A) Overall ROB Rating

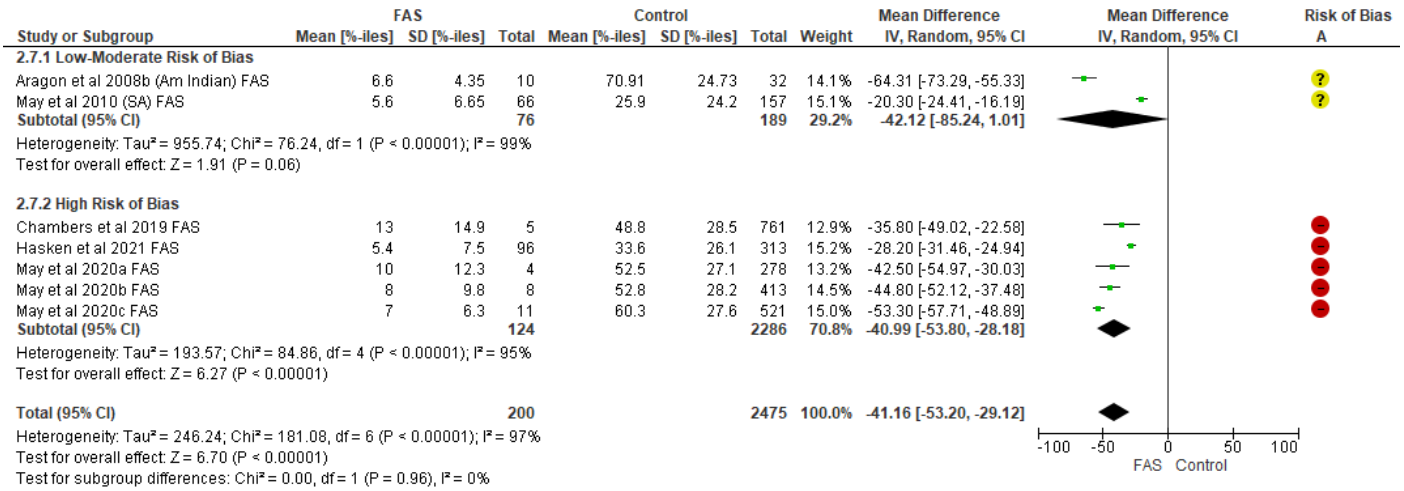
Height Percentiles

FASD and Height Percentiles (1 study)



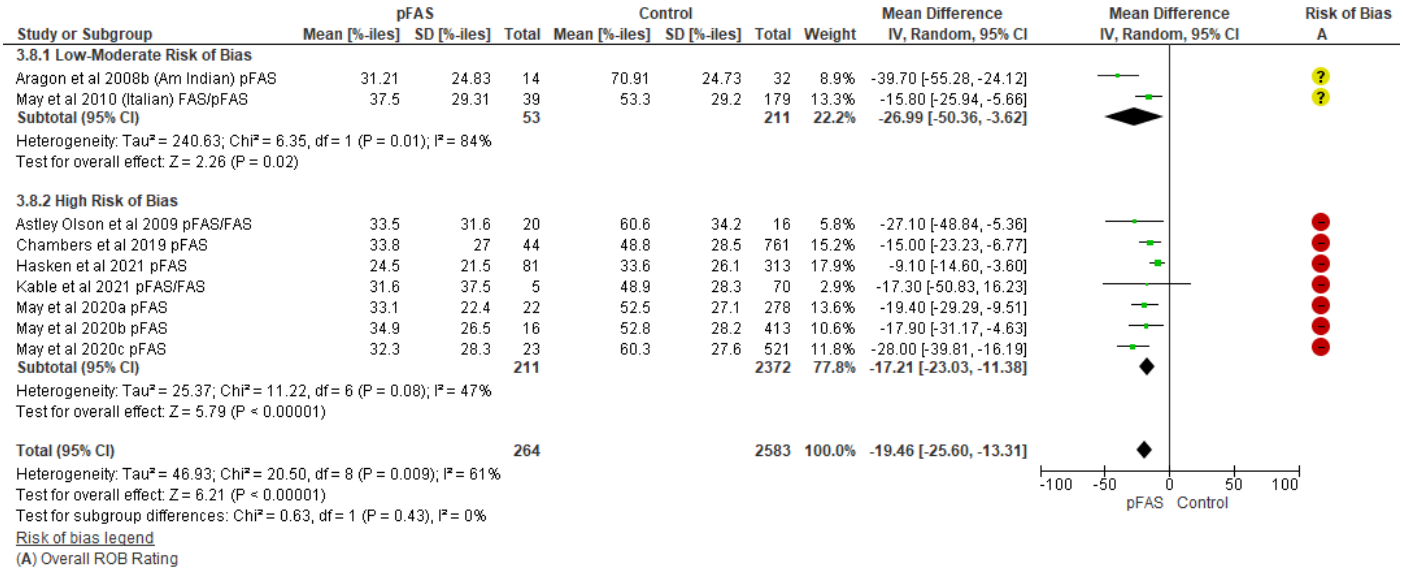
Risk of bias legend
(A) Overall ROB Rating

FAS and Height Percentiles (7 studies)



Risk of bias legend
(A) Overall ROB Rating

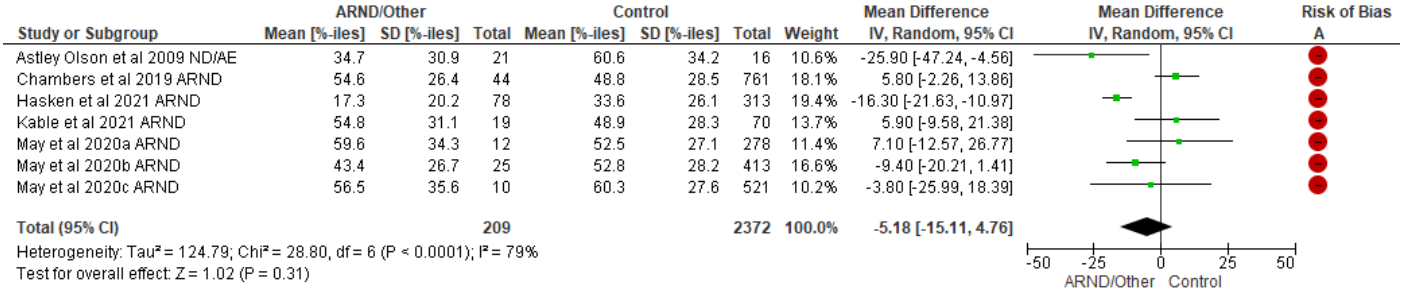
pFAS and Height Percentiles (9 studies)



Study or Subgroup	pFAS Mean [%-iles]	pFAS SD [%-iles]	pFAS Total	Control Mean [%-iles]	Control SD [%-iles]	Control Total	Weight	Mean Difference IV, Random, 95% CI	Risk of Bias A
3.8.1 Low-Moderate Risk of Bias									
Aragon et al 2008b (Am Indian) pFAS	31.21	24.83	14	70.91	24.73	32	8.9%	-39.70 [-55.28, -24.12]	?
May et al 2010 (Italian) FAS/pFAS	37.5	29.31	39	53.3	29.2	179	13.3%	-15.80 [-25.94, -5.66]	?
Subtotal (95% CI)			**53**			**211**	**22.2%**	**-26.99 [-50.36, -3.62]**	
Heterogeneity: Tau² = 240.63; Chi² = 6.35, df = 1 (P = 0.01); I² = 84%									
Test for overall effect: Z = 2.26 (P = 0.02)									
3.8.2 High Risk of Bias									
Astley Olson et al 2009 pFAS/FAS	33.5	31.6	20	60.6	34.2	16	5.8%	-27.10 [-48.84, -5.36]	−
Chambers et al 2019 pFAS	33.8	27	44	48.8	28.5	761	15.2%	-15.00 [-23.23, -6.77]	−
Hasken et al 2021 pFAS	24.5	21.5	81	33.6	26.1	313	17.9%	-9.10 [-14.60, -3.60]	−
Kable et al 2021 pFAS/FAS	31.6	37.5	5	48.9	28.3	70	2.9%	-17.30 [-50.83, 16.23]	−
May et al 2020a pFAS	33.1	22.4	22	52.5	27.1	278	13.6%	-19.40 [-29.29, -9.51]	−
May et al 2020b pFAS	34.9	26.5	16	52.8	28.2	413	10.6%	-17.90 [-31.17, -4.63]	−
May et al 2020c pFAS	32.3	28.3	23	60.3	27.6	521	11.8%	-28.00 [-39.81, -16.19]	−
Subtotal (95% CI)			**211**			**2372**	**77.8%**	**-17.21 [-23.03, -11.38]**	
Heterogeneity: Tau² = 25.37; Chi² = 11.22, df = 6 (P = 0.08); I² = 47%									
Test for overall effect: Z = 5.79 (P < 0.00001)									
Total (95% CI)			**264**			**2583**	**100.0%**	**-19.46 [-25.60, -13.31]**	
Heterogeneity: Tau² = 46.93; Chi² = 20.50, df = 8 (P = 0.009); I² = 61%									
Test for overall effect: Z = 6.21 (P < 0.00001)									
Test for subgroup differences: Chi² = 0.63, df = 1 (P = 0.43), I² = 0%									

Risk of bias legend
(A) Overall ROB Rating

Other FASD and Height Percentiles (7 studies)



Study or Subgroup	ARND/Other Mean [%-iles]	ARND/Other SD [%-iles]	ARND/Other Total	Control Mean [%-iles]	Control SD [%-iles]	Control Total	Weight	Mean Difference IV, Random, 95% CI	Risk of Bias A
Astley Olson et al 2009 ND/AE	34.7	30.9	21	60.6	34.2	16	10.6%	-25.90 [-47.24, -4.56]	−
Chambers et al 2019 ARND	54.6	26.4	44	48.8	28.5	761	18.1%	5.80 [-2.26, 13.86]	−
Hasken et al 2021 ARND	17.3	20.2	78	33.6	26.1	313	19.4%	-16.30 [-21.63, -10.97]	−
Kable et al 2021 ARND	54.8	31.1	19	48.9	28.3	70	13.7%	5.90 [-9.58, 21.38]	−
May et al 2020a ARND	59.6	34.3	12	52.5	27.1	278	11.4%	7.10 [-12.57, 26.77]	−
May et al 2020b ARND	43.4	26.7	25	52.8	28.2	413	16.6%	-9.40 [-20.21, 1.41]	−
May et al 2020c ARND	56.5	35.6	10	60.3	27.6	521	10.2%	-3.80 [-25.99, 18.39]	−
Total (95% CI)			**209**			**2372**	**100.0%**	**-5.18 [-15.11, 4.76]**	
Heterogeneity: Tau² = 124.79; Chi² = 28.80, df = 6 (P < 0.0001); I² = 79%									
Test for overall effect: Z = 1.02 (P = 0.31)									

Risk of bias legend
(A) Overall ROB Rating