

Appendix 1 – MEDLINE Search Strategy

Population:

1. exp infant/ or exp child/ or exp newborn/ or exp child,preschool/ or exp pediatrics/ or (infant* or neonat* or baby* or babies or child*or newborn* or "newborn infant*" or girl* or boy* or toddler* or preschool* or "pre school*" or pre-school* or "preschool child*" or kindergarten* or kindergarden* or "nursery school" or "day care*" NOT adult* or paediatric* or pediatric* or under-five* or "under five*" or "under 5" or under-5 or "5 and under" or "five and under" or "under the age of five" or "under the age of 5").tw,kf

Single or Multiple Micronutrient Supplementation:

2. Micronutrients/ or vitamins/ or minerals/ or exp iron/ or exp iron compounds/ or iron, dietary/ or vitamin A/ or exp iodine/ or exp zinc or exp zinc compounds/ or exp vitamin D/ or (micronutrient* or multivitamin* or multi-nutrient* or "multi*nutrient" or "multimicro-nutrient*" or "multimicronutrient*" or multivitamin* or "multi-vitamin*" or multimicronutrient* or "multi-mineral*" or MMN or "multiple micro nutrient*" or "multiple micronutrient" or micro-nutrient* or "essential vitamins*" or minerals* or "vitamin d" or "hydroxyvitamin d" or vitamin-d or "25 hydroxyvitamin d" or "25 hydroxy-vitamin d" or "25-hydroxyvitamin d" or "25-hydroxy-vitamin d" or "25-hydroxyvitamin d" or 25ohd or "25-oh-vitamin d" or 25-ohd or "vitamin d2" or vitamin-d2 or "25-hydroxyvitamin d2" or "25-hydroxy-vitamin d2" or "vitamin d3" or vitamin-d3 or "25 hydroxyvitamin d3" or "25 hydroxyvitamin d3" or "25-hydroxy-vitamin d3" or calcidiol or calcifediol or "vitamin a" or "vitamin a1" or retinol* or retinal* or Retinaldehyde or retinoid or Retinoids or retinoic or beta-carotene or "beta carotene" or iron or ferr* compounds or "dietary iron" or zinc or "zn" or "zinc acetate" or "zn acetate" or "zn sulfate" or "zn oxide" or iodine or "iod* compounds" or "ferr* compounds" or "dietary iron").tw,kf

3. Dietary supplements/ or tablets/ or ((supplement* or nutraceutical* or nutraceutical* or nutraceutical* or tablet* or syrup* or drop*).tw,kf)

4. 1 AND 2 AND 3

Lipid-Nutrient Supplementation:

5. exp Lipids/ or omega-3/ or (lipid* or soy* or peanut* or whey* or sesame* or cashew* or chickpea* or oils or protein* or butter* or fat* or "alpha-linolenic acid" or "docosahexaenoic acids" or "eicosapentaenoic acid").tw,kf

6. Dietary supplements/ or (("lipid based" or "lipid-based nutri*" or enrich* or emuls* or powder* or spread* or paste* or LNS*1 or iLiNS or supplement* or nutraceutical* or nutraceutical* or Nutraceutical* or Plumpy* or PlumpyNut or "ready to use" or "ready-to-use therapeutic food" or RUSF or RUTF).tw,kf)

7. 1 AND 5 AND 6

Large-Scale Fortification:

8. exp Food/ or "Food Supply"/ or exp "Agricultural Crops"/ or exp Salts/ or exp "Fish Products"/ or exp "Soy Foods" or exp Cereals/ or exp "Dietary Carbohydrates"/ or exp Oryza/ or exp Milk/ or exp Bread/ or exp Beverages/ or exp Yogurt/ or exp Margarine/ or exp Cheese/ or exp "Zea mays"/ or exp Condiments/ or exp Triticum/ or exp Spices/ or exp "Dietary Fats"/ or exp "Dairy Products"/ or (Food* or "staple foods" or crop* or flour* or salt* or sauce* or cereal* or sugar* or rice* or milk* or bread* or oil* or beverage* or yogurt* or margarine* or cheese* or maize* or corn* or wheat* or "durum wheat*" or "sorghum vulgare" or sorghum or condiment* or spices* or "curry powder*" or fat* or dairy*).tw,kf

9. Micronutrients/ or vitamins/ or minerals/ or exp iron/ or exp iron compounds/ or iron, dietary/ or vitamin A/ or exp iodine/ or exp zinc/ or exp zinc compounds/ or exp vitamin D/ or exp folic acid/ or (micronutrient* or multivitamin* or multi-nutrient* or "multi*nutrient" or "multimicro-nutrient*" or "multimicronutrient*" or multivitamin* or "multi-vitamin*" or multimineral* or "multi-mineral*" or MMN or "multiple micro nutrient*" or "multiple micronutrient" or micro-nutrient* or "essential vitamins*" or minerals* or "vitamin d" or "hydroxyvitamin d" or vitamin-d or "25 hydroxyvitamin d" or "25 hydroxy-vitamin d" or "25-hydroxyvitamin d" or "25-hydroxy-vitamin d" or "25-hydroxyvitamin d" or 25ohd or "25-oh-vitamin d" or 25-ohd or "vitamin d2" or vitamin-d2 or "25-hydroxyvitamin d2" or "25 hydroxy-vitamin d2" or "vitamin d3" or vitamind3 or "25 hydroxyvitamin d3" or "25 hydroxyvitamin d3" or "25-hydroxy-vitamin d3" or calcidiol or calcifediol or "vitamin a" or "vitamin a1" or retinol* or retinal* or Retinaldehyde or retinoid or Retinoids or retinoic or beta-carotene or "beta carotene" or iron or ferr* compounds or "dietary iron" or zinc or "zn" or "zinc acetate" or "zn acetate" or "zn sulfate" or "zn oxide" or iodine or "iod* compounds" or "ferr* compounds" or "dietary iron" or "folic acid" or folate*).tw,kf.

10. ("supplemented food*" or "large scale fortif*" or enrich* or fortif*).tw,kf.

11. 1 AND 8 AND 9 AND 10

Targeted Fortification for Infants and Young Children:

12. exp "infant food"/ or milk substitutes/ or infant formula/ or soy milk/ or ("baby formula" or "artificial milk" or "complementary food*" or "blended food*" or "infant cereal" or "baby food*" or milk* or cereal* or porridge* or paste*).tw,kf

13. ("targeted fortification" or enrich* or fortif* or "supplemented food*").tw,kf

14. 1 AND 12 AND 13

Point-Of-Use Fortification with Micronutrient Powders:

15. Powders/ or vitamins/ or minerals/ or micronutrients/ or ("sprinkles powder" or Sprinkle* or powder* or foodlet* or "foodlet-based" or "crushable nutritabs" or "micronutrient powder" or "multiple micronutrient powder" or mnp).tw,kf

16. ("Point-of-use" or "home fortification" or "food fortif*" or enrich* or fortif*).tw,kf

17. 1 AND 15 AND 16

18. Developing Countries/ or ("developing country" or "developing countries" or "developing nation" or "developing nations" or "developing population" or "developing populations" or "developing world" or "less developed country" or "less developed countries" or "less developed nation" or "less developed nations" or "less developed population" or "less developed populations" or "less developed world" or "lesser developed country" or "lesser developed countries" or "lesser developed nation" or "lesser developed nations" or "lesser developed population" or "lesser developed populations" or "lesser developed world" or "under developed country" or "under developed countries" or "under developed nation" or "under developed nations" or "under developed population" or "under developed populations" or "under developed world" or "underdeveloped country" or "underdeveloped countries" or "underdeveloped nation" or "underdeveloped nations" or "underdeveloped population" or "underdeveloped populations" or "underdeveloped world" or "middle income country" or "middle income countries" or "middle income nation" or "middle income nations" or "middle income population" or "middle income populations" or "low income country" or "low income countries" or "low income nation" or "low income nations" or "low income population" or "low income populations" or "lower income country" or "lower income countries" or "lower income nation" or "lower income nations" or "lower income population" or "lower income populations" or "underserved country" or "underserved countries" or "underserved nation" or "underserved nations" or "underserved population" or "underserved populations" or "underserved world" or "under served country" or "under served countries" or "under served nation" or "under served nations" or "under served population" or "under served populations" or "under served world" or "deprived country" or "deprived countries" or "deprived nation" or "deprived nations" or "deprived population" or "deprived populations" or "deprived world" or "poor country" or "poor countries" or "poor nation" or "poor nations" or "poor population" or "poor populations" or "poor world" or "poorer country" or "poorer countries" or "poorer nation" or "poorer nations" or "poorer population" or "poorer populations" or "poorer world" or "developing economy" or "developing economies" or "less developed economy" or "less developed economies" or "lesser developed economy" or "lesser developed economies" or "under developed economy" or "under developed economies" or "underdeveloped economy" or "underdeveloped economies" or "middle income economy" or "middle income economies" or "low income economy" or "low income economies" or "lower income economy" or "lower income economies" or "low gdp" or "low gnp" or "low gross domestic" or "low gross national" or "lower gdp" or "lower gnp" or "lower gross domestic" or "lower gross national" or lmic or lmics or "third world" or "lami country" or "lami countries" or "transitional country" or "transitional countries" or Africa or Asia or "Caribbean Region" or

"West Indies" or "South America" or "Latin America" or "Central America" or Afghanistan or Albania or Algeria or Angola or Argentina or Armenia or Armenian or Azerbaijan or Bangladesh or Benin or Byelarus or Byelorussian or Belarus or Belorussian or Belorussia or Belize or Bhutan or Bolivia or Bosnia or Herzegovina or Hercegovina or Botswana or Brazil or Bulgaria or "Burkina Faso" or "Burkina Fasso" or Burundi or Urundi or Cambodia or "Khmer Republic" or Kampuchea or Cameroon or Cameroons or Cameron or Camerons or "Cape Verde" or "Central African Republic" or Chad or China or Colombia or Comoros or "Comoro Islands" or Comores or Mayotte or Congo or Zaire or "Costa Rica" or "Cote d'Ivoire" or "Ivory Coast" or Cuba or Djibouti or "French Somaliland" or Dominica or "Dominican Republic" or "East Timor" or "East Timur" or "Timor Leste" or Ecuador or Egypt or "El Salvador" or Eritrea or Ethiopia or Fiji or Gabon or "Gabonese Republic" or Gambia or Gaza or "Georgia Republic" or "Georgian Republic" or Ghana or "Gold Coast" or Grenada or Guatemala or Guinea or Guiana or Guyana or Haiti or Honduras or India or Maldives or Indonesia or Iran or Iraq or "Isle of Man" or Jamaica or Jordan or Kazakhstan or Kazakh or Kenya or Kiribati or Korea or Kosovo or Kyrgyzstan or Kirghizia or "Kyrgyz Republic" or Kirghiz or Kirgizstan or "Lao PDR" or Laos or Lebanon or Lesotho or Basutoland or Liberia or Libya or Macedonia or Madagascar or "Malagasy Republic" or Malaysia or Malaya or Malay or Sabah or Sarawak or Malawi or Nyasaland or Mali or "Marshall Islands" or Mauritania or Mauritius or Mexico or Micronesia or "Middle East" or Moldova or Moldovia or Moldovian or Mongolia or Montenegro or Morocco or Mozambique or Myanmar or Myanma or Burma or Namibia or Nepal or Nicaragua or Niger or Nigeria or Pakistan or Palau or Palestine or Panama or Paraguay or Peru or Philippines or Philipines or Phillipines or Phillippines or Romania or Rumania or Roumania or Russia or Russian or Rwanda or Ruanda or "Saint Lucia" or "St Lucia" or "Saint Vincent" or "St Vincent" or Grenadines or Samoa or "Samoan Islands" or "Navigator Island" or "Navigator Islands" or "Sao Tome" or Senegal or Serbia or Montenegro or Seychelles or "Sierra Leone" or "Sri Lanka" or Ceylon or "Solomon Islands" or Somalia or Sudan or Suriname or Surinam or Swaziland or Syria or Tajikistan or Tadjhikistan or Tadjikistan or Tadzhih or Tanzania or Thailand or Togo or "Togolese Republic" or Tonga or Tunisia or Turkey or Turkmenistan or Turkmen or Uganda or Ukraine or USSR or "Soviet Union" or "Union of Soviet Socialist Republics" or Uzbekistan or Uzbek or Vanuatu or Venezuela or Vietnam or "Viet Nam" or "West Bank" or Yemen or Yugoslavia or Zambia or Zimbabwe or Rhodesia).tw,kf

19. 4 OR 7 OR 11 OR 14 OR 17

20. 19 AND 18

21. Limit 20 to yr="1995-2017"

Appendix 2 – Eligible Studies Excluded from Meta-Analyses

First author, year	Study design	Country	Age range enrolled	Total study population	Intervention	Intervention dose and formulation	Intervention duration and frequency	Control	Control dose and formulation
Abdelrazik, 2007	Non-RCT	Egypt	4-6 months	248	MMN (with iron) supplementation	5mL of syrup: vitamin A (1200IU), vitamin D3 (100IU), thiamin (1mg), riboflavin (1mg), pyridoxine (0.5mg), vitamin C (50mg), vitamin E (1mg), nicotinamide (5mg), panthenol (2mg), calcium gluconate and phosphate (50mg), ferrous gluconate (43mg eq to elemental iron 5mg), 1 mg/kg iron - adjusted monthly according to infant weight	Daily for 12 months	MMN (without iron) supplementation	5ml of syrup: vitamin A (1200IU), D3 (100IU), thiamin (1mg), riboflavin (1mg), pyridoxine (0.5mg), vitamin C (50mg), vitamin E (1mg), nicotinamide (5mg), panthenol (2mg), calcium gluconate and phosphate (50mg)
Abdollahi, 2014	cRCT	Iran	6-24 months	838 (17 clusters)	Zinc supplementation	5 mL of syrup: zinc (5mg)	Daily for 3 months	No intervention	
Aburto, 2010	cRCT	Mexico	4-12 months	187	MNP, MMN supplementation or fortified food group	MNP and MMN (syrup): iron (10mg), zinc (10mg), vitamin A (400mcg), vitamin E (6mg), vitamin C (50mg), vit B2 (0.8mg), vitamin B12 (0.7mcg), folic acid (50mcg) Fortified food: also contained energy (194kcal), protein (5.8g), fat (6.6g), carbohydrate (27.9g), sodium (24.5mg).	Daily for 4 months	No intervention	
Acharya, 2018	Natural experiment	Nepal	6-60 months		Vitamin A supplementation	High-dose capsule	Bi-annually	No intervention	
Adom, 2010	RCT	Ghana	6-18 months	56	Iron fortified maize-cowpea flour	184mg/kg dry weight	Daily (3 times a day) for 6 months	Unfortified maize-cowpea flour	
Akrour-Aissou, 2019	Non-RCT	Algeria	1-23 months	150	Vitamin D supplementation	Syrup: 200 000 IU at 1 month of age and 200 000 IU at 6 months of age	2 doses (one at 1 month of age and another at 6 months of age)	No intervention	
Alderman, 2009 Associated refs:	cRCT	Senegal	6-59 months	200,000 households (220 clusters)	Vitamin A supplementation	Syrup: children 6-11 months of age received 100,000IU and children 12-59 months of age received 200,000IU	Bi-annually for 2 years	No intervention	

Linnemayr, 2011									
Almeida, 2014	cRCT	Brazil	12-59 months	184	MNP (with iron only) fortified drinking water	10mg of iron and 100mg of ascorbic acid per liter water (the pre-mix contained 1000 mg of FeSO4-7H2O and 2000 mg of ascorbic acid diluted in 20 ml of water)	Daily for 3 months	Unfortified drinking water	
Asibey-Berko, 2007	RCT	Ghana	1-5 years	157	Iodine and iron fortified salt	1000ppm iron (1g/kg) and 50ppm (50mg/kg) iodine; average daily intake is 70mg/week	Daily for 8 months	No intervention	
Assis, 2000	Non-RCT	Brazil	6-59 months	871	Vitamin A supplementation	Children 6-12 months of age: vitamin A (100,000IU); children >1year of age: 200,000IU	1 dose	No intervention	
Baqui, 1995	RCT	Bangladesh	6-7 weeks	185	Vitamin A supplementation	Liquid: 25,000IU	3 doses at DPT immunization	Placebo	
Barth-Jaeggi, 2015	RCT	Kenya	6 months	379	MNP (with iron only)	1 sachet: vitamin A (100ug), iron (2.5mg), vitamin D (5ug), copper (0.34mg), tocopherol equivalent (5mg), iodine (30ug), vitamin K1 (30ug), selenium (17ug), thiamine (0.5mg), zinc (2.5mg), riboflavin (0.5mg), pyridoxine (0.5mg), folic acid anhydrous (90ug), niacinamide (6mg), vitamin B12 (0.9ug), vitamin C (60mg)	Daily for 12 months	MNP (without iron)	1 sachet: vitamin A (100ug), vitamin D (5ug), copper (0.34mg), tocopherol equivalent (5mg), iodine (30ug), vitamin K1 (30ug), selenium (17ug), thiamine (0.5mg), zinc (2.5mg), riboflavin (0.5mg), pyridoxine (0.5mg), folic acid anhydrous (90ug), niacinamide (6mg), vitamin B12 (0.9ug), vitamin C (60mg)
Bisimwa, 2012	RCT	Democratic Republic of Congo	4-5 months	1383	LNS (RUCF)	50g: vitamin A (412IU), vitamin D (307IU), vitamin C (75mg), thiamine (0.7mg), riboflavin (1.0mg), vitamin B12 (1ug), pyridoxine (0.24mg), niacin (10.3mg), pantothenic acid (3.8mg), folic acid (0.07mg), vitamin K (0.01mg), calcium (514mg), phosphorus (265mg), iron (9.5mg), zinc (8.3mg), copper (0.3mg), iodine (0.07mg), selenium (0.003mg), magnesium (23.4mg), phytic acid (2.1mg)	Daily for 6 months	MMN fortified corn soy blend flour	70g: Vitamin A (537IU), vitamin D (140IU), vitamin C (42mg), thiamine (0.2mg), riboflavin (0.6mg), vitamin B12 (0.9ug), pyridoxine (0.11mg), niacin (3.5mg), pantothenic acid (2.0mg), folic acid (0.14mg), vitamin E (5.3IU), calcium (182mg), iron (5.6mg), zinc (8.4mg), copper (0.5mg), iodine (0.03mg), phytic acid (0.650mg)

Bloem, 1995	Interrupted time-series study	Bangladesh	12-59 months	~124,606	Vitamin A supplementation	1 capsule: 200,000IU	Every 6 months	No intervention	
Bougma, 2018	cRCT	Ethiopia	5-11 months	2136 (60 clusters)	Iodine fortified salt		Usual use for 8-10 months	Iodine (iodised salt gradually made available through regular market channels once production was sufficient and legislation was enforced in Oct 2012)	Usual use for 4-6 months
Caufield, 2013 Associated refs: Colombo, 2014	RCT	Peru	6 months	251	MMN (iron, copper, zinc) supplementation	Liquid: iron (10mg), copper (0.5mg), zinc (10mg)	Daily for 12 months	Iron and copper	Liquid: iron (10mg) and copper (0.5mg)
Chen, 2010	RCT	China	4-12 months	1478 in main trial; 475 in this follow up study	MNP fortified whole soybean flour	10g sachet: iron (6mg), zinc (4.1mg), calcium (385mg), vitamin B2 (0.2mg), vitamin D (7.0ug), protein (3.8g), energy (167kJ)	Daily for 12-20 months	No intervention	
Chen, 2012	cRCT	China	36-72 months	361	1) vitamin A and zinc supplementation 2) MMN supplementation	1) 1 capsule: vitamin A (25000IU), 1 tablet: zinc (10mg) 2) 1 tablet: vitamin A (5000IU), vitamin B1 (1.5mg), vitamin B2 (1.7mg), vitamin B6 (2mg), vitamin B12 (4ug), vitamin C (50mg), vitamin D (400IU), folic acid (100ug), niacinamide (20mg), calcium (162mg)	1) vitamin A once every 14 days and zinc 5 times a week for 6 months 2) 5 times every 14 days for 6 months	Vitamin A	1 capsule: 25,000IU Frequency/duration: once every 14 days for 6 months
Cobra, 1997	RCT	Indonesia	6-10 weeks	617	Iodine supplementation	1 capsule: 100mg		Placebo	
de Almeida, 2005	cRCT	Brazil	12-75 months	150 (6 clusters)	MNP (with iron and vitamin C) in drinking water	10 mg of iron and 100 mg of ascorbic acid per liter water (the pre-mix contained 1000 mg of FeSO4-7H2O and 2000 mg of ascorbic acid diluted in 20 ml of water)	Usual use for 6 months	MNP (with vitamin C only) in drinking water	Water with 10mg of iron and 100mg of ascorbic acid per liter (the pre-mix contained 1000 mg of FeSO4-7H2O and 2000 mg of ascorbic acid diluted in 20 ml of water)

DeLong, 1997	Controlled before-after study	China			Iodine fortified irrigation water	Long Ru: 1992 - 30kg given to an area of 4 villages, 1993 - 80kg given to same areas; Bakechi: 80kg given to an area of 8 villages Tusala: 80kg given to an area of 15 villages	Long Ru: 1992, 1993 Bakechi: 1993 Tusala: 1994	No intervention	
Dutra-de-Oliveira, 2002	RCT	Brazil	1-6 years	21 families (88 members)	MNP (with iron and vitamin C) in drinking water	10mL iron solution to 10L of water: elemental iron (10mg) and ascorbic acid (60mg) per L of drinking water	Daily for 4 months	Placebo	
Fawzi, 1998	RCT	Sudan	9-72 months	28,753	Vitamin A supplementation	1 capsule: 200,000IU	Bi-annually for 18 months	Placebo	
Galasso, 2019	cRCT	Madagascar	6-18 months	3738 households (125 clusters)	LNS	20g	Children in cohorts A and B (–6 months to <6 months at baseline) received the full 12 months of supplementation daily. Children in cohort C (6 months to <12 months) received daily LNS for 12 months or less.	No intervention	
Gebremedin, 2014	Propensity score matched retrospective cohort study	Ethiopia	6-59 months	4794	Vitamin A supplementation	Children aged 6–11 and 12–59 months are given 100,000 and 200,000 IU of VA (i.e. 30 and 60 mg of retinol), respectively in the form of a capsule	1 dose (within the preceding 6 months of the survey)	No intervention	
Hadler, 2008 Associated refs: Medeiros, 2015	cRCT	Brazil	6-24 months	192 (25 clusters)	IFA supplementation	Drops: iron (1.4mg/kg/day), folic acid (50ug)	5 days a week for ~3 months	Iron and folic acid placebo	Iron (1.4mg/kg/day)
Hettiarachchi, 2010	cRCT	Sri Lanka	3-5 years	267	LNS food supplement Thripasha	Per 100g: energy (401.8 cal), fat (7.8g), minerals (4.0g), protein (20g), carbohydrates (61.9g), vitamin A (1700IU), vitamin D (200IU), vitamin E (6IU), vitamin C (40mg), vitamin B6 (6mg), vitamin B12 (4mcg), thiamine	Daily for 9 months	Unfortified Thripasha (corn-soya blend)	50g

						(760mcg), riboflavin (560mcg), niacin (8mg), folic acid (200mcg), pantothenic acid (3mg), calcium (900mg), phosphorus (670mg), magnesium (96mg), iron (18mg), zinc (3mg), iodine (44mcg). Children were given 50g/day			
Iannotti, 2014	RCT	Haiti	6-11 months	589	LNS	20g: protein (2.56g), fat (7.08g), linoleic acid (1.29g), alpha linoleic acid (0.29g), vitamin A (400ug), thiamin (0.3mg), riboflavin (0.4mg), niacin (4mg), pantothenic acid (1.8mg), vitamin B6 (0.3mg), vitamin B12 (0.5mg), folic acid (80ug), vitamin C (30mg), calcium (100mg), copper (0.2mg), iodine (90ug), iron (9mg), magnesium (16mg), manganese (0.08mg), phosphorus (82.2mg), potassium (152mg), selenium (10ug), zinc (4mg)	Daily for 6 months	No intervention	
Isanaka, 2009	cRCT	Niger	6-60 months	3533 (12 clusters)	LNS	92g (500 kcal/day)	Daily for 3 months	No intervention	
Kapur, 2003	RCT	India	9-36 months	451	Iron	20mg	Weekly for 8 weeks	Placebo	
Kartasasmita, 1995	RCT	Indonesia	12-54 months	269	Vitamin A supplementation	200,000IU	2 doses (one at baseline and one at 6 months)	Placebo	
Kujinga 2018	RCT	Kenya	2-6 years	184	Zinc fortified filtered water	8mg/L water	Usual use for 25 weeks	Placebo (filtered water)	
Lopez, 2006	Non-RCT	Peru	6 months-4 years	866	MMN supplementation	1 foodlet: vitamin A as acetate (750ug), vitamin D (10ug), vitamin E (12IU), vitamin C (70mg), niacin (12mg), thiamine (1mg), riboflavin (1mg), pyridoxine (1mg), vitamin B12 (1.8mg), folic acid (300ug), iron as ferrous fumarate (20mg), zinc as zinc gluconate (20mg), copper as cupric gluconate (1.2mg), iodine as potassium iodide (100ug)	Weekly for 8 weeks	No intervention	

Luabeya, 2007 Associated refs: Chhagan, 2009; Chhagan, 2010	RCT	South Africa	4-6 months	373	1) Vitamin A and zinc supplementation 2) MMN supplementation	1) 1 tablet: zinc (10mg), vitamin A (1250IU) 2) 1 tablet: zinc (10mg), vitamin A (1250IU), vitamin B1 (0.5mg), vitamin B2 (0.5mg), vitamin B6 (0.5mg), vitamin B12 (0.9ug), vitamin C (35mg), vitamin D (5ug), vitamin E (6mg), vitamin K (10ug), copper (0.6mg), folate (150ug), iodine (50ug), iron (10mg), niacin (6mg)	Daily for 18 months	Vitamin A supplementation	1 tablet: 1250IU
Lutter, 2008	Non-RCT	Ecuador	9-14 months	634	MMN fortified cereal and legume flour	65g	Daily for 11 months	No intervention	
Manaseki-Holland, 2012 Associated refs: Aluisio, 2013	RCT	Afghanistan	1-11 months	3046	Vitamin D supplementation	0.5mL of syrup: vitamin D (100,000IU/2.5mg)	Every 3 months for 18 months	Placebo	
Martinez-Estevez, 2016	RCT	Colombia	6-12 months	355	MMN supplementation	3.5mm of syrup: zinc oxide (5mg), calcium carbonate (525mg), vitamin D3 (70IU)	Daily for 12 months	Calcium and vitamin D supplementation	3.5mm of syrup: Calcium carbonate (525mg), vitamin D3 (70IU)
Matias, 2017	RCT	Peru	6-11 months	422	LNS	20g LNS: energy (110kcal/460.24kJ), protein (2.6g), fat (7g), linoleic acid (1.29g), α -Linolenic acid (0.29g), folic acid (80ug), niacin (4mg), pantothenic acid (1.8mg), riboflavin (0.4mg), thiamin (0.3mg), vitamin A (400ug), vitamin B12 (0.5ug), vitamin B6 (0.3mg), vitamin C (30mg), calcium (100mg), copper (0.2mg), iodine (90ug), iron (9mg), magnesium (16mg), manganese (0.08mg), phosphorus (82mg), potassium (152mg), selenium (10ug), zinc (4mg)	Daily for 6 months	MNP	1 sachet: folic acid (160ug), vitamin A (300ug), vitamin C (30mg), iron (12.5mg), zinc (5mg)
Mitra, 1997	RCT	Bangladesh	2-48 months	349	MMN (with iron) supplementation	5mL of syrup: 125 mg of ferrous gluconate (15mg elemental iron), vitamin A (80,000 RE/L), vitamin D as cholecalciferol (2000ug/L), vitamin C (10,000mg/L)	Daily for 15 months	MMN (without iron) supplementation	5 mL of syrup: vitamin A (80,000 RE/L), vitamin D as cholecalciferol (2000ug/L), vitamin C (10,000mg/L)

Muslihah, 2016	Non-RCT	Indonesia	6-12 months	269	LNS	20g LNS: energy (118kcal), protein (2.6g), lipids (9.9g), linoleic acid (2.8g), a-linolenic acid (0.58g), vitamin A (400ug), vitamin B1 (0.5mg), vitamin B2 (0.5mg), vitamin B3 (6.0mg), vitamin B5 (2.0mg), vitamin B6 (0.5mg), vitamin B12 (0.9ug), folic acid (150ug), vitamin C (30mg), vitamin D (10ug), vitamin E (6mg), vitamin K (30ug), calcium (280mg), copper (0.34mg), iodine (90ug), iron (6mg), magnesium (40mg), manganese (1.2mg), phosphorus (190mg), potassium (200mg), selenium (20ug), zinc (8mg)	Daily for 6 months	No intervention	
Nair, 2017	Non-RCT	India	4-6 months	44	Iron and vitamin D supplementation	Iron (2mg/kg)	Daily for 6-8 months (enrollment until 1 year of age)	Vitamin D	
Newton, 2016	RCT	Ghana	7-9 months	93	MNP (with vitamin A)	1 sachet: elemental iron (12.5mg) as microencapsulated ferrous fumarate, ascorbic acid (30mg), retinyl palmitate (400ug RE), zinc (5mg)	Daily for 5 months	MNP (without vitamin A)	1 sachet: elemental iron (12.5mg) as microencapsulated ferrous fumarate, ascorbic acid (30mg), zinc (5mg)
Nogueira, 2012	cRCT	Brazil	10-23 months	216 (2 clusters)	Iron fortified rice	50g portion: elemental iron (56.4mg) as micronized ferric pyrophosphate (MFPP)	Weekly for 18 weeks	Unfortified rice	
Noor, 2018	RCT	Pakistan	6-11 months	120	Zinc supplementation	20mg	Daily for 14 days	Placebo	
Oliveira, 2016	Non-RCT	Brazil	6-14 months	326	MNP	10 mg Fe (encapsulated ferrous fumarate), 4·1 mg Zn (zinc gluconate), 150 µg folic acid, 400 µg vitamin A (retinol equivalents), 30 mg vitamin C (ascorbic acid), 5 µg cholecalciferol, 5 mg vitamin E (tocopherol equivalents), 0·5 mg thiamin, 0·5 mg riboflavin, 0·5 mg vitamin B6, 0·9 µg vitamin B12, 6 mg niacin, 0·56 mg Cu, 90 µg iodine and 17 µg Se	Daily for 60 days	No intervention	

Olney, 2018	cRCT	Guatemala	Supplementation given at 6 months	~39,000 mother/child pairs	LNS	2 x 10 g sachets: 118 kcal, protein 2.6g, fat 9.6g, linoleic acid 4.5g, alpha-linoleic acid 0.6g, Vit A 400ug, Vit C 30mg, vit D 5mg, Vit E 6mg, Vit K 30mg, Vit B1 (thiamin) 0.5mg, Vitamin B2 (riboflavin) 0.5 mg, niacin mg, pantothenic acid 2 mg, vitamin B6, 0.5mg, folic acid 150 ug, vit B12 0.9 ug, iron 9mg, zinc 8mg, copper 0.3mg, selenium 20ug, iodine 90ug, calcium 280mg, magnesium 40mg, manganese 1.2mg, phosphorus 190 mg, potassium 200 mg. Intervention Arm 3: MNP (micronutrient powder) (4g or 2 x2g sachets), each containing Vit A 400ug, Vit C 30mg, vit D 5mg, Vit E 6mg, Vit K 30mg, Vit B1 (thiamin) 0.5mg, Vitamin B2 (riboflavin) 0.5 mg, niacin mg, pantothenic acid 2 mg, vitamin B6, 0.5mg, folic acid 150 ug, vit B12 0.9 ug, iron 9mg, zinc 8mg, copper 0.3mg, selenium 20ug, iodine 90ug, calcium 280mg, magnesium 40mg, manganese 1.2mg, phosphorus 190 mg, potassium 200 mg.	Daily for 18 months	Placebo	
Ouedraogo, 2010	RCT	Burkina Faso	6-23 months	131	MMN fortified gruel	8 mg elemental iron (as ferrous fumarate), 5 mg zinc (as zinc gluconate), 300mg vitamin A (as retinyl acetate), 30 mg ascorbic acid and 60 mg iodine (as potassium iodate)	MMN once daily (6 days a week) and gruel twice daily for 6 months	Unfortified gruel	
Owusu-Agyei, 2013	RCT	Ghana	6-24 months	200	Vitamin A and zinc supplementation	Vitamin A: 100,000 IU for <12mo of age or 200 000 IU for older children, and 10mg zinc capsule	Daily for 6 months	Vitamin A and zinc placebo	100,000IU for <12 mos of age or 200,000IU for older children and placebo capsule

Paganini, 2017	RCT	Kenya	6.5-9.5 months	155	MNP (with iron)	1 sachet: vitamin A(400ug), vitamin D(5ug), tocopherol equivalents(5mg), thiamine (0.5mg), riboflavin(0.5mg), vitaminB6(0.5mg), folic acid(90ug), vitamin C,(30mg), copper(0.56mg), iodine(90ug), selenium(17ug), zinc(4.1mg), phytase(190 FTU), Iron(as ferrous fumarate)(2.5mg), iron(as NaFeEDTA)(2.5mg)+ maltodextrin(add to 11g)	Daily for 4 months	MNP (without iron)	1 sachet: vitamin A(400ug), vitamin D(5ug), tocopherol equivalents(5mg), thiamine (0.5mg), riboflavin(0.5mg), vitamin B6 (0.5mg), folic acid (90ug), vitamin C (30mg), copper(0.56mg), iodine(90ug), selenium (17ug), zinc(4.1mg), phytase(190 FTU), Iron (as ferrous fumarate) (2.5mg), Maltodextrin(add to 11g)
Phuka, 2008 Associated refs: Phuka, 2009; Phuka, 2012	RCT	Malawi	5.5 to 6.99 months	182	LNS	50g: energy (256 kcal), protein (7.0g), carbohydrates (13.8g), fat (16.9g), retinol (400ug RE), folate (160ug), niacin (6mg), pantothenic acid (2mg), riboflavin (0.5mg), thiamin (0.5mg), vitamin B6 (0.5mg), vitamin B12 (0.9ug), vitamin C (30mg), vitamin D (5ug), calcium (366mg), copper (0.4mg), iodine (135ug), iron (8mg), magnesium (60mg), selenium (17ug), zinc (8.4mg)	Daily for 1 year	MMN fortified maize flour	71g: energy (282kcal), protein (10.3g), fat (3.1g), retinol (138ug RE), folate (43ug), niacin (3mg), riboflavin (0.3mg), thiamin (0.1mg), vitamin B6 (0.3mg), vitamin B12 (0.9ug), vitamin C (48mg), calcium (71mg), iron (5mg), zinc (3.6mg)
Rahman, 1999	RCT	Bangladesh	6-71 months	250	MMN (with iron) supplementation	5mL of syrup: 125 mg of ferrous gluconate (15 mg elemental iron), vitamin A [80,000 retinol equivalents (RE)/L], vitamin D (2mg cholecalciferol/L) and vitamin C (10g/L)	Daily for 12 months	MMN (without iron) supplementation	5mL of syrup: vitamin A [80,000 retinol equivalents (RE)/L], vitamin D (2mg cholecalciferol/L) and vitamin C (10g/L)
Rooze, 2016	Non-RCT	China (Tibet Autonomous Region)	0-5 years	207	Vitamin D supplementation	625ug	Monthly for 3 years	No intervention	
Sampaio, 2013	RCT	Brazil	6-48 months	143	MNP (with zinc)	1 sachet: vitamin A (vitamin A acetate) (375mcg), vitamin B1 (thiamine mononitrate) (0.5mg), vitamin B2 (riboflavin) (0.5 mg), vitamin B6 (pyridoxine) (0.5 mg), vitamin B12 (cyanocobalamin) (0.9 mcg), vitamin C (ascorbic acid) (35 mg), vitamin D3 (cholecalciferol) (5.0 mcg),	Daily for 90 days	MNP (without zinc)	1 sachet: vitamin A (vitamin A acetate) (375mcg), vitamin B1 (thiamine mononitrate) (0.5mg), vitamin B2 (riboflavin) (0.5 mg), vitamin B6 (pyridoxine) (0.5 mg), vitamin B12 (cyanocobalamin) (0.9 mcg), vitamin C (ascorbic acid) (35 mg), vitamin D3

						vitamin E (vitamin E acetate) (6.0 mg), niacin (niacinamide) (6.0 mg), copper (copper sulfate) (0.6 mg), iodine (potassium iodide) (50 mcg), iron (ferrous fumarate) (12.5 mg), zinc (zinc gluconate) (5.0 mg)			(cholecalciferol) (5.0 mcg), vitamin E (vitamin E acetate) (6.0 mg), niacin (niacinamide) (6.0 mg), copper (copper sulfate) (0.6 mg), iodine (potassium iodide) (50 mcg), iron (ferrous fumarate) (12.5 mg)
Sazawal, 1997 Associated refs: Sazawal, 1998	RCT	India	6-35 months	609	MMN (zinc) supplementation	5 mL of liquid: vitamin A (240ug retinol equivalents), thiamine (0.6 mg), riboflavin (0.5 mg), vitamin B-6 (0.5 mg), cholecalciferol (2.5ug). vitamin E (3 mg a-tocopherol equivalents), niacin (10 mg niacin equivalents), zinc gluconate (10 mg elemental Zn). During diarrheal illness, this was increased to 10mL to provide for excess stool losses	Daily for 6 months	MMN (without zinc) supplementation	5 mL of liquid: vitamin A (240ug retinol equivalents), thiamine (0.6 mg), riboflavin (0.5 mg), vitamin B-6 (0.5 mg), cholecalciferol (2.5ug). vitamin E (3 mg a-tocopherol equivalents), niacin (10 mg niacin equivalents)
Swami, 2007	Natural experiment	India	1-5 years	528	Vitamin A supplementation		Two rounds of vitamin A supplementation	No intervention	
Taneja, 2013 Associated refs: Kumar, 2017; Kvestad, 2015; Strand, 2015	RCT	India	6-30 months	1000	1) LNS (with folic acid only) 2) LNS (with vitamin B12 only)	1) 5g for children 6-11 months of age and 10g for children ≥12 months; Per 10g: energy (54.1kcal), protein (0.7g), fat (3.3g), folic acid (150ug) 2) 5g for children 6-11 months of age and 10g for children ≥12 months; Per 10g: energy (54.1kcal), protein (0.7g), fat (3.3g), vitamin B12 (1.8ug)	Daily for 6 months	LNS (without vitamins and minerals)	5g for children 6-11 months of age and 10g for children ≥12 months; Per 10g: energy (54.1kcal), protein (0.7g), fat (3.3g)
Teshome, 2017	RCT	Kenya	12-36 months	338	1) MNP (with iron as NaFeDTA) 2) MNP (with iron as ferrous fumarate)	1 and 2) 1 sachet: vitamin A (300ug RE) vitamin D (5ug), vitamin E (5mg), vitamin C (30mg), thiamin (0.5mg), riboflavin (0.5mg), niacin (6mg), vitamin B6 (0.5mg), vitamin B12 (0.9ug), iron (either NaFeDTA 3mg or ferrous fumarate 12.5mg), zinc (5mg), copper (0.56mg),	Daily for 30 days	MNP (without iron)	1 sachet: vitamin A (300ug RE) vitamin D (5ug), vitamin E (5mg), vitamin C (30mg), thiamin (0.5mg), riboflavin (0.5mg), niacin (6mg), vitamin B6 (0.5mg), vitamin B12 (0.9ug), zinc (5mg), copper (0.56mg), selenium (17ug), iodine (90ug)

						selenium (17ug), iodine (90ug)			
Venkatarao, 1996	RCT	India	At birth (supplementation given at 6 months of age)	909	Vitamin A	200,000IU	1 dose at 6 months of age	Placebo	
Warthon-Medina, 2015	RCT	Peru	6-17 months	902 in main trial; 200 in this follow-up study	MNP	1 sachet: iron (12.5mg), zinc gluconate (10mg), folic acid (160ug), vitamin C (30mg), vitamin A (300ug)	Daily for 6 months	MNP (with iron only)	1 sachet: 12.5mg
Yadav, 2012	Controlled before-after study	India	12-50 months		Fortified blended food		Duration: ~30 months	No intervention	
Zlotkin, 2013 Associated refs: Aimore, 2013	cRCT	Ghana	6-35 months	1958 (1552 clusters)	MNP (with iron)	1 sachet: elemental iron (as microencapsulated ferrous fumarate) (12.5mg), ascorbic acid (30mg), vitamin A (400µg), zinc (5 mg)	Daily for 5 months	MNP (without iron)	1 sachet: ascorbic acid (30mg), vitamin A (400µg), zinc (5 mg)

Appendix 3 – Eligible Studies Included in Meta-Analyses

First author, year	Study design	Country	Age range enrolled	Total study population	Intervention arms used in meta-analysis	Intervention dose and formulation	Intervention duration and frequency	Control	Control dose and formulation
Aboud, 2011	cRCT	Bangladesh	8-20 months	302 (mother and child pairs)	MNP (Efficacy)	1 sachet: Iron (12.5mg), vitamin A (300ug), folic acid (150ug), vit C (50mg), zinc (5mg)	Daily for 6 months	No intervention	
Adu-Afarwuah, 2007 Associated refs: Adu-Afarwuah, 2008	RCT	Ghana	6 months	409	1) MNP (Efficacy) 2) MMN supplementation (Efficacy) 2) LNS (Efficacy)	1) 1 sachet: beta-carotene (300mcg RE), vit C (50mg), vit D (7.5mcg), folic acid (150mcg), iron (fumarate) (12.5mg), zinc (5mg) 2) 1 tablet: beta-carotene (400mcg RE), vit C (30mg), folic acid (80mcg), thiamine (0.3mg), riboflavin (0.4mg), vit B3 (4mg), pantothenic acid (1.8mg), vit B6 (0.3mg), vit B12 (0.5mg), iron (sulfate) (9mg), zinc (4mg), calcium (100mg), potassium (152mg), copper (0.2mg), selenium (10mcg), iodine (90mcg) 3) 20g: all nutrients in intervention 2 + phosphorus (82mg), magnesium (16mg), manganese (0.08mg), energy (108kcal), linoleic acid (1.29g), linolenic acid (0.29g), phytate (82mg)	Daily for 6 months	No intervention (recruited at baseline)	
Adu-Afarwuah, 2016 Associated refs: Prado, 2016a	RCT	Ghana	At birth (supplementation given at 6 months of age)	1228 infants; 1320 mothers	LNS (Efficacy)	20g: energy (118kcal), protein (2.6g), fat (9.6g), linoleic acid (4.46g), a-linolenic acid (0.58g), vitamin A (400mg RE), thiamin (0.3mg), riboflavin (0.4mg), niacin (4mg), vitamin B-6 (0.3mg), vitamin B-12 (0.5mg), vitamin C (30mg), vitamin D (5mg), vitamin E (6mg), vitamin K (30mg), folic acid (80mg),	Daily for 12 months	No intervention	

						pantothenic acid (1.8mg), iron (6mg), zinc (8mg), copper (0.34mg), calcium (280mg), phosphorus (190mg), potassium (200mg), magnesium (40mg), selenium (20mg), iodine (90mg), and manganese (1.2mg)			
Agarwal, 1995	cRCT	India	1-72 months	15, 247	Vitamin A (and vitamin E) supplementation (Efficacy)	15mL of syrup: children 1-6 months of age: vitamin A (50,000IU), vitamin E (10IU); children 7-72 months of age: vitamin A (100,000IU), vitamin E (20 IU)	Every 4 months for 12 months	Placebo: vitamin E supplementation	15 mL of syrup: children 1-6 months of age: vitamin E (10IU); children 7-72 months of age: vitamin E (20IU)
Anand 2007	RCT	India	3-6 years	415	MMN fortified candy (Targeted fortification – efficacy)	1 candy: vit A (1000IU), elemental iron (14mg), folic acid (50ug), ascorbic acid (20mg)	6 days a week for 12 weeks	Placebo: Unfortified candy	
Anonymous, 1998 Associated refs: Bahl, 2002	RCT	Ghana, India, Peru	Newborns (supplementation given at >2 months of age)	9424 (mother and child pairs)	Vitamin A supplementation (Efficacy)	1 capsule: 25,000IU/7.5mg	4 doses; at DPT/poliomyelitis and Measles immunization: India and Ghana: 6, 10 and 14 weeks and 9 months of age; Peru: 2, 3, 4 months and 9 months of age	Placebo & vitamin A at 9 months of age (and mothers received placebo)	Placebo (first 3 doses); 1 capsule: 100,000IU/30mg of vitamin A (4th dose)
Arcanjo, 2012	cRCT	Brazil	4 years	120	Iron fortified milk-based cornstarch porridge (Targeted fortification – efficacy)	600 mg ferrous sulfate in liquid form (10 mg elemental iron per portion)	Daily for 14 weeks	Unfortified milk-based cornstarch porridge	
Arcanjo, 2019	cRCT	Brazil	12-36 months	169 (8 clusters total)	MNP (Efficacy)	Vitamin A (400mcg), vitamin D (5mcg), vitamin E (5mg), vitamin C (30mg), vitamin B1 (0.5mg), B2 (0.5mg), B6 (0.5mg), B12 (0.9mcg), niacin (6mg), folic acid (150mcg), iron (10mg), zinc (4.1mg), copper (0.56mg), selenium (17mcg), iodine (90mcg)	5 days a week (Monday to Friday) for 12 weeks	No intervention	

Ashorn, 2015 Associated refs: Prado, 2016b	RCT	Malawi	At birth;	781 infants; 869 mothers	LNS (Efficacy)	20g LNS: energy (118kcal), protein (2.6g), fat (9.6g), linoleic acid (4.46g), a-linolenic acid (0.58g), vitamin A (400mg RE), thiamin (0.3mg), riboflavin (0.4mg), niacin (4mg), vitamin B-6 (0.3mg), vitamin B-12 (0.5mg), vitamin C (30mg), vitamin D (5mg), vitamin E (6mg), vitamin K (30mg), folic acid (80mg), pantothenic acid (1.8mg), iron (6mg), zinc (8mg), copper (0.34mg), calcium (280mg), phosphorus (190mg), potassium (200mg), magnesium (40mg), selenium (20mg), iodine (90mg), and manganese (1.2mg)	Daily for 12 months	No intervention	
Attanasio, 2014 Associated refs: Andrew, 2016	cRCT	Colombia	12-24 months	1420 (96 clusters)	MNP (Efficacy and effectiveness)	1 sachet: iron (12.5mg), zinc (5mg), vitamin A (300µg RE), folic acid (160µg), vitamin C (30mg)	Daily for 18 months	No intervention	
Awasthi, 2013	cRCT	India	~1-6 years	~1,000,000 (72 clusters)	Vitamin A supplementation (Efficacy)	1 capsule: 200,000IU	Every 6 months for 5 years until children reach 6 years of age	No intervention (usual care)	
Ayah, 2007	RCT	Kenya	At birth (supplementation given at 14 weeks of age)	564 (mother and child pairs)	Vitamin A supplementation (Efficacy)	1 capsule: 100,000IU	1Braz dose at 14 weeks of age	Placebo	
Bagni, 2009	cRCT	Brazil	12-60 months	387 (4 clusters)	Iron fortified rice (LSFF – efficacy)	Iron (4.2mg/100g of rice); 90g of rice per meal so approx. 3.78mg of iron/week was obtained	Weekly for 16 weeks	Unfortified rice	

Baqui, 2003 Associated refs: Baqui, 2005; Black, 2004; Fischer Walker 2009	RCT	Bangladesh	6 months	799	1) Iron (and riboflavin) supplementation (Efficacy) 2) Zinc (and riboflavin) supplementation (Efficacy) 3) MMN (and riboflavin) supplementation (Efficacy)	1) Iron (20mg), riboflavin (1mg) 2) Zinc (20mg), riboflavin (1mg) 3) Iron (20mg), zinc (20mg), riboflavin (1mg), twice the WHO recommended daily intakes of iodine, copper, manganese, selenium, vitamin C, vitamin D, vitamin E, thiamin, niacin, pyridoxine, folic acid, cyanocobalamin and pantothenic acid	Weekly for 6 months	Riboflavin	1mg
Barbosa, 2012	cRCT	Brazil	2-6 years	324 (4 clusters)	Iron fortified wheat rolls (LSFF – efficacy)	14 mg of iron/roll; max 3 rolls (20g each) offered per child	5 days a week per 24 weeks	Unfortified wheat rolls	
Barffour, 2019	RCT	Lao People's Democratic Republic (Lao PDR)	6-23 months	3407	1) Zinc supplementation (Efficacy) 2) MNP (Efficacy)	1) 1 tablet: zinc (7mg) 2) 1 sachet: zinc (10mg), iron (6mg), 13 other micronutrients	Daily for ~9 months	Placebo	Powder form
Batra, 2016	cRCT	Guinea-Bissau	3-5 years	533 (9 clusters)	LNS (RUSF) – 15% protein from dairy sources (Efficacy and effectiveness)	92g: energy (478 kcal), protein (11.5g), fat (16.7g), vitamin A (506ug), vitamin D (6.1ug), vitamin E (15.2mg), vitamin K (25.3ug), vitamin C (75.9mg), thiamin (0.5mg), riboflavin (1.0mg), niacin (12.7mg), pantothenic acid (2.0mg), pyridoxine (1.0mg), biotin (10.1ug), folic acid (202ug), cyanocobalamin (2.0ug), sodium (<278mg), potassium (734mg), calcium (476 mg), phosphorus (430mg), magnesium (142mg), copper (0.5mg), iron (4.6mg), iodine (111ug), zinc (10.1mg), selenium (30.4ug)	5 days a week for 3 months	No intervention	

Baum, 2017	cRCT	Haiti	6-59 months	521 (34 clusters)	MNP (Effectiveness)	1 sachet: vitamin A, B, B2, B6, B12, C, D, and E, folic acid, niacin, copper, iodine, iron (2.5mg ferrous lactate), zinc and selenium	Daily for 3 months	No intervention	
Becquey, 2016	cRCT	Burkina Faso	6-30 months	7641 (36 clusters)	Zinc supplementation (Efficacy)	1 tablet: 7mg	Daily for 16, 32 or 48 weeks	No intervention/morbidity surveillance control	
Begin, 2008	RCT	Guatemala	6-7 months	259	MNP fortified maize based pudding (and whey protein concentrate) (Efficacy)	Vitamin A (400ug RE), vitamin B1 (0.4mg), vitamin B2 (0.5mg), niacin (0.6mg), vitamin B6 (0.6mg), vitamin B12 (0.5ug), vitamin C (35mg), vitamin D3 (400IU), folic acid (35ug), iron (10mg), zinc (5mg), iodine (50ug), selenium (15ug)	Daily for 8 months	Whey protein concentrate maize based pudding	
Bentley, 1997 Associated refs: Rivera, 1998; Ruel, 1997	RCT	Guatemala	6-9 months	108	Zinc supplementation (Efficacy)	4mL liquid: 10mg	Daily for 7 months	Placebo	
Berger, 2000	RCT	Togo	6-36 months	197	Iron supplementation (Efficacy)	1 tablet: 2–3 mg of elemental iron per kg of body weight	Daily for 3 months	Placebo	
Berger, 2006	RCT	Vietnam	4-7 months	915	1) Iron supplementation (Efficacy) 2) Zinc supplementation (Efficacy)	1) Syrup: 10mg 2) Syrup: 10mg	Daily for 6 months	Placebo	
Bhandari, 2002a Associated refs: Bhandari, 2002b; Taneja, 2005; Taneja, 2010	RCT	India	6-30 months	2482	Zinc supplementation (Efficacy)	6 mL for infants: 10mg; 12 mL to older children: 20mg	Daily for 4 months	Placebo	

Brooks, 2005	RCT	Bangladesh	2-12 months	1621	Zinc supplementation (Efficacy)	Syrup: zinc (70mg)	Weekly for 12 months (endline measurements taken at 10 months to minimize attrition)	Placebo	
Cardoso, 2016 Associated refs: Silva, 2017	Non-RCT	Brazil	Intervention group: 6-8 months; control group: 10-14 months	1085	MNP (Efficacy)	1 sachet: iron (ferrous fumarate) (10mg), zinc (gluconate) (4.1mg), folic acid (150ug), vitamin A (RE) (400ug), vitamin C (30mg), vitamin D3 (5ug), vitamin E (5mg), vitamin B1 (0.5mg), vitamin B2 (0.5mg), vitamin B6 (0.5mg), vitamin B12 (0.9ug), niacin (6mg), copper (0.56mg), iodine (90ug), selenium (17ug)	Flexible use; 2 months supply (60 sachets) over a follow up period of 2-3 months (when intervention group reached the age of the control group at enrollment)	No intervention	
Chang, 2010	RCT	Bangladesh	6-18 months	1000	1) Daily alternating zinc and placebo supplementation (Efficacy) 2) Daily alternating IFA and placebo supplementation (Efficacy) 3) Daily alternating MMN and placebo supplementation (Efficacy)	1) 1 tablet: 10mg zinc 2) 1 tablet: 12.5 mg iron and 50IU folic acid 2) 1 tablet: 12.5mg iron, 50IU folic acid, 10mg zinc	Daily for 6 months	Placebo	
Chen, 2005	cRCT	China	≥3 years (3-6 years subgroup)	14,016 residents ≥3 years of age (9 clusters)	Iron fortified soy sauce (LSFF – efficacy)	The actual measured iron concentration of the fortified soy sauce was 23 mg/dL (range, 21–25). The average daily soy sauce consumption of the group consuming the fortified product was 16.4 ml per person, which provided 4.9 mg of iron	Daily for 18 months	Unfortified soy sauce	
Chen, 2008	RCT	China	2-6 years	282	MNP fortified seasoning	1 sachet: vitamin A (500ug), iron (12mg), thiamine (0.7mg), riboflavin (0.7mg),	5 days a week for 6 months	Vitamin A fortified	1 sachet: 500ug

Associated refs: Chen, 2011					powder (Efficacy)	folic acid (0.2mg), niacinamide (7mg), zinc (12mg), calcium (800mg)		seasoning powder	
Chen, 2013 Associated refs: Chen, 2014	RCT	China	3-6 years	445	1) Vitamin A supplementation (Efficacy) 2) Iron supplementation (Efficacy)	1) 1 capsule: 200,000IU 2) 1 tablet: 1-2 mg iron/kg	1) 1 dose 2) Daily for 6 months	No intervention	
Christian, 2015	cRCT	Bangladesh	6 months	5939 (596 clusters)	1) LNS (Plumpy' doz) (Efficacy) 2) MMN fortified wheat soy blend (Targeted fortification – efficacy)	1) ~23g for children 6-12 months; ~46g for children 12-18 months 2) 1 sachet (32g) for children 6-12 months; 2 sachets for children 12-18 months	Daily for 12 months	No intervention	
Dewey, 2017 Associated refs: Matias, 2017; Matias, 2018; Ullah, 2019	cRCT	Bangladesh	At birth (supplementation given at 6 months of age)	3664 children (live births); 4011 women (64 clusters)	1) LNS (Efficacy and effectiveness) 2) MNP (Efficacy)	1) 20g: energy (118kcal), protein (2.6g), fat (9.6g), linoleic acid (4.46g), α -linolenic acid (0.58g), vitamin A (400ug RE), thiamin (0.5mg), riboflavin (0.5mg), niacin (6mg), folic acid (150ug), pantothenic acid (2mg), vitamin B6 (0.5mg), vitamin B12 (0.9ug), vitamin C (30mg), vitamin D (5ug), vitamin E (6mg), vitamin K (30ug), calcium (280mg), copper (0.34mg), iodine (90ug), iron (9mg), magnesium (40mg), manganese (1.2mg), phosphorus (190mg), potassium (200mg), selenium (20ug), zinc (8mg) 2) 1 sachet: vitamin A (400ug RE), thiamin (0.5mg), riboflavin (0.5mg), niacin (6mg), folic acid (150ug), vitamin B6 (0.5mg), vitamin B12 (0.9ug), vitamin C (30mg), vitamin D (5ug), vitamin E (5mg), copper (0.56mg), iodine (90ug), iron (10mg), selenium (17ug), zinc (4.1mg)	Daily for 18 months	Placebo	

Dibley, 1996 Associated refs: Hadi 2000; Hadi 2004	RCT	Indonesia	6-47 months	1405; on average 782 participated in each cycle	Vitamin A (and vitamin E) supplementation (Efficacy)	Children <12 mos. of age: 1 capsule: 107umol (103,000IU) RE vitamin A and 40umol (17IU) vitamin E; Older participants: 1 capsule: 214umol (206,000IU) RE vitamin A and 84umol (37IU) vitamin E	Every 4 months for 6 cycles	Placebo: vitamin E	Children <12 mos. of age: 40umol (17IU); Older participants: 84umol (37IU)
Dijkhuizen, 20001	RCT	Indonesia	4 months	478	1) Iron supplementation (Efficacy) 2) Zinc supplementation (Efficacy)	1) Syrup: 10mg 2) Syrup: 10mg	5 days a week for 6 months	Placebo	
Domellof, 2001 Associated refs: Domellof 2002; Dewey 2002	RCT	Honduras	4 months	142	Iron supplementation (Efficacy)	Liquid: 1 mg/kg iron - adjusted monthly according to infant weight	Daily for 5 months	Placebo	
Dossa, 2001	RCT	Benin	3-5 years	177	Iron supplementation (Efficacy)	elemental iron (60mg)	Daily for 3 months	Placebo	
Drammeh, 2002	RCT	The Gambia	2-7 years	176	Vitamin A (and vitamin E) supplementation (Efficacy)	1 Capsule: vitamin A (60,000ug) and vitamin E (40mg)	1 dose at baseline	Placebo: vitamin E	1 capsule: 40mg
Ekvall, 2000	RCT	Tanzania	5 months-3 years	207	MMN supplementation (Efficacy)	Liquid: vitamin A (1500IU), vitamin D (400IU), vitamin E (5IU), vitamin C (35mg), vitamin B1 (0.5mg), vitamin B2 (0.6mg), niacin (8mg), vitamin B6 (0.4mg), iron (10mg)	3 times a week for 5 months (56 doses total)	Placebo	
Ermis, 2002	RCT	Turkey	5 months	113	Iron supplementation (Efficacy)	Drops: 1 mg/kg iron - adjusted monthly according to infant weight	Daily for 4 months	Placebo	

Esamai, 2014	RCT	Kenya	5 months	45	MNP (with iron) (Efficacy)	1 sachet: zinc (5mg), vitamin A (300ug), vitamin C (30mg), folic acid (160ug), iron (12.5mg)	Daily for 3 months	Placebo	
Faber, 2005	RCT	South Africa	6-12 months	361	MMN fortified maize porridge (Targeted fortification – efficacy)	40g of dry product: β-carotene (3mg), iron (11mg), zinc (3mg), copper (11ug), selenium (10ug), riboflavin (0.4mg), vitamin B6 (0.15mg), vitamin B12 (0.25ug), vitamin E (2.5mg), 2.5 mg vitamin E	Daily for 6 months	Unfortified maize porridge	
Fahmida, 2007	RCT	Indonesia	3-6 months	800	1) Zinc supplementation (Efficacy) 2) MMN supplementation (Efficacy)	1) 2mL of syrup: zinc (10mg) 2) 2mL of syrup: iron (10mg), zinc (10mg), vitamin A (1000IU)	Daily for 6 months	Placebo	
Fisker, 2013 Associated refs: Fisker, 2014	RCT	Guinea-Bissau	6-17 months	7587	Vitamin A (and vitamin E) supplementation (Efficacy)	Per 0.5mL liquid: vitamin A (100,000IU), vitamin E (20IU); per 1mL: vitamin A (200,000IU), vitamin E (40IU); children <1 years of age received 0.5mL; children ≥1 years of age received 1mL	1 dose at randomization	Placebo	
Ghosh, 2019	cRCT	Africa	6 months	970 (38 clusters)	MNP (Efficacy)	1 sachet: vitamin A (200.1ug RE), folic acid (45ug), niacin (3.1mg), riboflavin (0.3mg), thiamin (0.3mg), vit B6 (0.3mg), vit B12 (0.5ug), vit C (30.4mg), Ca (220.3mg), Fe (7mg), P (154.4mg), Zn (2.4mg), choline (62.5mg), vit D (2.5ug), vit E (2.7mg), iodide (0mg), vit K (11ug)	Daily for 12 months	No intervention	

Giovanni, 2006 Associated refs: Agnostoni, 2007	RCT	Cambodia	6 months	204	MNP (Efficacy)	1 sachet: fe (fumarate) (12.5mg), Zn (5mg), vitamin C (50mg), vitamin A (300mcg), vitamin D3 (7.5mcg), folic acid (150mcg)	Daily for 12 months	Placebo	
Glinz, 2015 Associated refs: Glinz, 2017	cRCT	Cote d'Ivoire	12-36 months	629 (40 clusters)	Iron fortified maize and soy-based porridge 1) with ferrous fumarate 2) ferrous pyrophosphate; We combined groups 1 and 2 (Targeted fortification – efficacy)	25g dry weight: iron as NaFeDTA (2mg), iron as ferrous fumarate or ferric pyrophosphate (3.8mg), and native iron (0.6mg)	6 days a week for 9 months	No intervention	
Gokay, 2012	RCT	India	6 months	120	Iron supplementation (Efficacy)	1mg/kg	Daily for 6 months	No intervention	
Gupta, 2003	RCT		6-41 months	280	Zinc supplementation (Efficacy)	5mL syrup: elemental zinc (10mg)	5 days a week for 16 weeks	Placebo	
Gupta, 2007	RCT	India	6-48 months	1878	Zinc supplementation (Efficacy)	5mL syrup: zinc (25mg)	Weekly for 6 months	Placebo	
Hamadani, 2001 Associated refs: Osendarp, 2002	RCT	Bangladesh	1 month	301	Zinc supplementation (Efficacy)	Syrup: elemental zinc (5mg)	Daily for 5 months	Placebo	
Hess, 2015a Associated refs:	cRCT	Burkina Faso	8.8-9.9 months	3220 (2390 concessions/ clusters)	1) LNS 5mg zinc + placebo (LNS-Zn5)	1-2) 20g: energy (118kcal), protein (2.6g), fat (9.6g), vit A (400mg), B1 (0.3mg), B2 (0.4mg), B3 (4mg), B5	Daily for 9 months	No intervention	

Abbeddou, 2015; Hess 2015b; Prado 2016c; Some, 2015					2) LNS 10mg zinc + placebo (LNS-Zn10) We combined groups 1 and 2 (Efficacy)	(1.8mg), B6 (0.3mg), B12 (0.5mg), folic acid (80mg), vit C (30mg), vit D (5mg), vit E (6mg), vit K (30mg), Ca (280mg), copper (0.34mg), I (90mg), Fe (6mg), Mg (40mg), Mn (1.2mg), P (190mg), K (200mg), Se (20mcg), Zinc (5, or 10mg)			
Huybregts, 2012	cRCT	Chad	6-36 months	1038 (14 clusters)	LNS (Plumpy'Doz) (Efficacy and effectiveness)	46g (247 kcal/day)	Daily for 4 months	No intervention	
Jack, 2012	cRCT	Cambodia	6-7 months	3112 (20 clusters); 1350 recruited to subsample	MNP (Efficacy)	1 sachet: Iron (12.5mg), zinc gluconate (10mg), vit A (300mcg), iodine (90mcg), vit B1 (0.5mg), vit B2 (0.5mg), B6 (0.5mg), B12 (0.9mcg), niacin (6mg), folic acid (160mcg), vit C (30mg), copper (0.3mg), vit D (5mcg), vit E (6IU)	Daily for 6 months	No intervention	
Kemmer, 2012	RCT	Honduras	6-60 months	199	MNP (Efficacy)	1 sachet: iron (12.5mg), zinc (5mg), folic acid (150ug), vitamin A (1600IU), vitamin C (50mg), and vitamin D (300IU)	Daily for 4 months	No intervention	
Kikafunda, 1998	RCT	Uganda	30-89 months	155	Zinc supplementation (Efficacy)	1 tablet: zinc (10mg)	5 days a week (Monday to Friday) for 6 months (2 supplementation phases lasting 3 months each with a 2 month break in between due to school break)	Placebo	

Kounnavong, 2011	RCT	Lao People's Democratic Republic (Lao PDR)	6-52 months	336	MNP (Efficacy)	1 sachet: vitamin A (RE 400ug), vitamin D3 (5ug), vitamin E (TE 5mg), vitamin B1, B2, B6 each (0.5mg), folic acid (150ug), niacin (6mg), vitamin B12 (0.9ug), vitamin C (30mg), iron (10mg), zinc (4.1mg), selenium (17ug), copper (0.56mg), and iodine (90ug)	Daily for 24 weeks	Standard of care	
Larson, 2018	cRCT	India	6-18 months	10,000 (90clusters)	MNP (Efficacy and effectiveness)	1 sachet: iron (Ferrous Fumarate) 12.5 mg Zinc (Zinc Gluconate) 5 mg Folic Acid 0.160 mg Vitamin-A (Vit-A Acetate) 0.30 mg Vitamin-C (Ascorbic Acid) 30 mg Vitamin-B12 0.9 mcg Iodine 90 mcg	Daily; baseline and endline surveys conducted on August to September 2014 and from February to March 2016, respectively	No intervention	
Lartey, 1999	RCT	Ghana	<1 month (supplementation given at 6 months of age)	208	MMN fortified Weanimix (cereal-legume blend of maize, soybeans and groundnuts) (Targeted fortification – efficacy)	High: consuming > 60g or low: consuming ≤ 60g: energy (4350kcal), protein (150g), fat (114g), calcium (high 17360mg, low 8950mg), iron (high 366mg, low 183mg), zinc (high 171mg, low 86mg), copper (high 25mg, low 13mg), magnesium (1400mg), potassium (high 18960mg, low 12310mg), sodium (30mg), phosphorus (high 17900mg, low 9400mg), ascorbic acid (high 781mg, low 391mg), niacin (high 29mg, low 149mg), pyridoxine (high 31.3mg, low 17.4mg), riboflavin (high 19.5mg, low 9.8mg), thiamine (high 22.1mg, low 13.5mg), vitamin B-12 (high 7ug, low 35ug), folic acid (high 5470ug, low 3070ug), vitamin A (high 18360 RE, low 9360 RE))	Daily for 6 months	Unfortified Weanimix (cereal-legume blend of maize, soybeans and groundnuts)	

Le, 2005	RCT	Vietnam	6-12 months	346	1) MMN supplementation (Efficacy) 2) Iron supplementation (Efficacy)	1) 1 tablet: vitamin A (375ug RE/1250IU), vitamin D (5ug), vitamin E (6mg), vitamin K (10ug), vitamin C (35mg), vitamin B1 (0.5mg), vitamin B2 (0.5mg), vitamin B6 (0.5mg), vitamin B12 (0.9ug), niacin (6mg), folate (150ug), iron (10mg), zinc (5mg), copper (0.6mg), iodine (59ug) 2) 1 tablet: iron (10mg)	Daily for 6 months (both intervention arms)	Placebo	
Le Port 2017	cRCT	Senegal	24-59 months	462 children from 310 households (247 concessions)	MMN fortified yoghurt (traditional Senegalese yoghurt mixed with millet) (LSFF – efficacy)	80g sachet: iron-EDTA (2.1mg), zinc (2.25mg), iodine (24ug), vitamin A (120ug)	Daily for 11 months	No intervention	
Lind, 2003 Associated refs: Lind, 2004; Lind, 2008	RCT	Indonesia	≤6 months	680	1) Iron supplementation (Efficacy) 2) Zinc supplementation (Efficacy)	1) 1.6mL of syrup: iron (10mg) as ferrous sulphate 2) 1.6 mL of syrup: zinc (10mg) as zinc sulphate	Daily for 6 months	Placebo	
Lo, 2011	RCT	Senegal	9-17 months	137	Iron fortified maize and millet-based porridge and MMN supplement (Targeted fortification – efficacy)	25g: per kg dry weight of complementary food: iron as ferrous fumarate (60mg), zinc as zinc oxide (240mg); Per 5mL of MMN supplement: thiamine (0.2mg), riboflavin (0.2mg), niacin (2mg), vitamin B6 (0.2mg), vitamin B12 (0.3ug), pantothenic acid (0.7mg), biotin (2.6mg), vitamin C (5mg)	Daily for 15 days	Iron fortified maize and millet-based porridge, and MMN (without zinc) supplement	25kg: per kg dry weight of complementary food: iron as ferrous fumarate (60mg); Per 5mL of MMN supplement: thiamine (0.2mg), riboflavin (0.2mg), niacin (2mg), vitamin B6 (0.2mg), vitamin B12 (0.3ug), pantothenic acid (0.7mg), biotin (2.6mg), vitamin C (5mg)
Long, 2006 Associated refs: Rosado, 2009	RCT	Mexico	6-15 months	786	1) Vitamin A supplementation (Efficacy) 2) Zinc supplementation (Efficacy)	1) 5mL of liquid: retinol (20,000IU) for children ≤1 years of age or 45,000IU for children >1 years of age 2) 5mL of liquid: zinc as zinc methionine (20mg)	1) Every 2 months for a year 2) Daily for a year	Placebo	
Long, 2007	RCT	Mexico	6-15 months	195	Vitamin A supplementation (Efficacy)	5 mL of liquid: retinol (20,000IU) for children ≤1 years of age or 45,000IU for children >1 years of age	Every 2 months for 15 months	Placebo	

Lopez, 2005	RCT	Peru	6-12 months	313	1) MMN supplementation (Efficacy) 2) Iron supplementation (Efficacy)	1) 1 foodlet: 1 RDA: vitamin A as retinyl acetate (375ug RE), vitamin D (5ug), vitamin E (6mg), vitamin K (10ug), vitamin C (35mg), vitamin B1 (0.5mg), vitamin B2 (0.5mg), vitamin B6 (0.5mg), vitamin B-12 (0.9ug) , niacin (6mg), folate (150ug), iron as ferrous fumarate (10mg), zinc as zinc gluconate (5mg), copper as cupric gluconate (0.6mg), and iodine as potassium iodide (50ug) 3) 1 foodlet: iron as ferrous sulfate (10mg)	Daily for 6 months (both intervention arms)	Placebo	
Lopez, 2014	Controlled before-after study	Nicaragua	Anemia sample: 0-60 months; cognitive sample: 30-60 months	57 in the anemia sample and 1047 in the cognitive assessment sample	MNP (Effectiveness)	1 sachet: six micronutrients (Sprinkles) were administered as per World Health Organization (WHO)/Sprinkles Global Health Initiative (SPGH) protocol	Daily for 2 months	No intervention	
Lozoff, 1996	RCT	Costa Rica	12-23 months	87 (32 ID anemic infants, 54 non-anemic infants)	Iron supplementation (Efficacy)	Drops: 3mg/kg	Twice daily for 6 months	Placebo	
Lozoff, 2016 Associated refs: Angulo-Barroso, 2016	RCT	China	At birth (supplementation at 6 weeks of age)	1482 infants; 2371 mothers	Iron supplementation (Efficacy)	Liquid: ~1mg/kg of elemental iron. Each mL contained 2.7 mg elemental iron. To simplify dosing, the volume was 2 mL/d for infants aged <6 mos. and 3 mL/d for infants aged ≥6 mos.	Daily for ~7.5 months	Placebo	
Luby, 2018 Associated refs: Tofail, 2018	cRCT	Bangladesh	Supplementation given at 6 months	720 clusters	LNS (Efficacy and effectiveness)	2 x 10 g sachets: 118 Kcal, 9.6 g of fat, 2.6 g of protein, 12 vitamins and 10 minerals	Daily for 18 months	No intervention	
Lucia, 2017	cRCT	Brazil	2-6 years	112	MMN fortified rice (LSFF – efficacy)	50g rice portion containing 0.5 g of UR: iron (4.2mg), zinc (2.1mg), thiamine (vitamin B1) (0.36mg), folic acid (72mg).	5 days a week for 4 months	Unfortified rice	

Lundeen, 2010	cRCT	Kyrgyz Republic (Kyrgyzstan)	6-36 months	2193 (24 clusters)	MNP (Efficacy)	1 sachet: elemental iron as microencapsulated ferrous fumarate (12.5mg), vitamin A as retinol acetate (300ug), zinc as zinc gluconate (5mg), vitamin C as ascorbic acid (30mg), and folic acid (160ug)	Daily for 2 months	No intervention	
Luo, 2017	cRCT	China	6-11 months	1802 (351 clusters)	MNP (Efficacy and effectiveness)	1 sachet: Iron (ferrous lactate) (6.0mg), zinc (zinc sulfate) (4.80mg), vitamin A (200µgRE), vitamin C (50.0mg), vitamin D (5.0µg), vitamin E (1.55mg), vitamin B1 (0.30mg), vitamin B2 (0.50mg), vitamin B6 (0.30mg), vitamin B12 (0.5µg), folic acid (66µg), niacin (3.0mg)	Daily for 18 months	No intervention	
Ma, 2016 Associated refs: Sheng, 2019	cRCT	China	6 months	1465	MMN fortified rice cereal (Targeted fortification – efficacy)	20g: iron (1.10 mg), zinc and vitamin B 12	Daily for 12 months	Unfortified local rice cereal	20g
Macharia-Mutie, 2012	RCT	Kenya	12-59 months	279	MNP (Efficacy)	1 sachet: retinyl palmitate (100µg RE), cholecalciferol (5µg), 1-α tocopheryl acetate (5mg TE), phyloquinone (30µg), thiamin (0.5mg), riboflavin (0.5mg), pyridoxine (0.5mg), folic acid (90µg), niacin (6mg), vitamin B12 (0.9µg), vitamin C (60mg), iron as NaFeDTA (2.5mg), zinc (2.5mg), selenium (17µg), copper (0.34mg), iodine (30µg)	Daily for 16 weeks	Unfortified maize porridge	
Maleta, 2015 Associated refs: Bendaadenda 2016; Prado, 2016d	RCT	Malawi	5.5-6.5 months	1932	LNS (Efficacy)	20g: energy (490kJ), protein (2.5g), fat (9.5g), linoleic acid (4.44g), alpha-linolenic acid (0.58g), phytate (56mg), vitamin A (400ug RE), vitamin C (30mg), thiamin (0.3mg), riboflavin (0.4mg), niacin (4mg), folic acid (80ug), pantothenic acid (1.8mg), vitamin B6 (0.3mg), vitamin B12 (0.5ug), vitamin D (5ug), vitamin E (6mg), vitamin K (30ug), Fe (6mg),	Daily for 12 months	No intervention	

						Zn (8mg), Cu (0.34mg), Ca (240mg), P (208mg), K (265mg), Mg (50mg), Se (20ug), iodine (90ug), Mn (1.2mg)			
Malik, 2013 Associated refs: Malik, 2014	RCT	India	6-11 months	272	Zinc supplementation (Efficacy)	5ml of syrup: zinc as zinc sulfate (20mg)	Daily for 2 weeks	Placebo	
Mangani, 2014 Associated refs: Mangani, 2014b; Mangani, 2015	RCT	Malawi	5.5-6.5 months	840	LNS (with milk protein base) (Efficacy)	54g: energy (285kcal), protein (8.2g), fat (17.9g), retinol (400ug RE), folate (160ug), niacin (6mg), pantothenic acid (2mg), riboflavin (0.5mg), thiamin (0.5mg), vitamin B6 (0.5mg), vitamin B12 (0.9ug), vitamin C (30mg), vitamin D (5ug), calcium (366mg), copper (0.4mg), iodine (90ug), iron (6mg), magnesium (78.5mg), selenium (20ug), zinc (6.0mg), phosphorus (186mg), potassium (319mg), manganese (0.6mg)	Daily for 12 months	No intervention	
Massaga, 2003	RCT	Tanzania	12-16 weeks	291	Iron supplementation (Efficacy)	2.5mL of liquid: iron as ferric ammonium citrate mixture (3mg elemental iron/mL)	Daily for 6 months	Placebo	
Mazariegos, 2010	RCT	Guatemala	6-11 months	412	Zinc supplementation (Efficacy)	Half a tablet: zinc (5mg)	Daily for 6 months	Placebo	
McDonald, 2015 Associated refs: Carter, 2018; Locks, 2016	RCT	Tanzania	5-7 weeks	2400	1) MMN supplementation (Efficacy) 2) Zinc supplementation (Efficacy)	1 capsule: vitamin C (60mg), vitamin E (8mg), vitamin B1 (0.5mg), vitamin B2 (0.6mg), niacin (4mg), vitamin B6 (0.6mg), folate (130ug), vitamin B12 (1ug), zinc (5mg) 2)1 capsule: zinc (5mg) 1 capsule through 6 months of age, and 2 capsules from 7 months of age to end of follow-up	Daily for 18 months	Placebo	

Menendez, 1997 Associated refs: Menendez, 2004	RCT	Tanzania	8 weeks	832	Iron supplementation (Efficacy)	2mg/kg; we assumed average body weight of 6kg, therefore children received 2.4 mL of ferrous glycine sulphate containing 5 mg of ferrous sulfate per 5 mL	Daily for 4 months	Placebo	
Menon, 2007	cRCT	Haiti	9-24 months	425 (10 clusters)	MNP (to be added in wheat soy blend) (Efficacy and effectiveness)	1 sachet MMN: iron (12.5mg), zinc (5mg) , vitamin A (400ug), folic acid (160ug) and vitamin C (30mg)	Daily for 2 months	Fortified wheat soy blend	
Monteiro, 2001	Non-RCT	Brazil	6-59 months	1134	Iron supplementation (Efficacy)	Children 6-9 months old (30mg of elemental iron), children 10 to 17 months old (40mg), children 18 to 29 months old (50mg), children 30 to 35 months old (60mg), children 36 to 59 months old (80mg).	Weekly for ~7 months	No intervention	
Muller, 2001 Associated refs: Garenne, 2007; Muller, 2003	RCT	Burkina Faso	6-31 months	709	Zinc supplementation (Efficacy)	1 tablet: zinc (12.5mg)	6 days a week for 6 months	Placebo	
Nagpal, 2004	RCT	India	4-6 months	100	Iron supplementation (Efficacy)	Drops: 2mg/kg	Daily for 2 months	Placebo	
Nestel, 2004	cRCT	Sri Lanka	9\71 months	3228 in total: 745 preschoolers (9-71 months old)	1) Reduced iron fortified wheat flour 2) Electrolytic iron fortified wheat flour; We combined groups 1 and 2 (LSFF – efficacy)	1) 66ppm; analysis of iron content: $76 \pm 6.6\text{mg/kg}$ 2) 66ppm; analysis of iron content: $78 \pm 15.2\text{mg/kg}$	24 months	Unfortified wheat flour	
Nguyen, 2002	cRCT	Vietnam	5-12 months	280	Iron supplementation (Efficacy)	2.5mL of syrup: elemental iron (15mg)	Daily for 3 months	Placebo	

Northrop-Clewes, 1996	RCT	Pakistan	<2 years	268	Iron supplementation (Efficacy)	Liquid: iron (15mg) as ferrous sulfate	Daily for 12 weeks	Placebo	
Null, 2018	cRCT	Kenya	Supplementation given at 6 months of age	762 clusters	LNS (Efficacy and effectiveness)	2 x 10 g sachets of SQ LNS (to be mixed with food): provided 118 kcal per day and 12 essential vitamins and 10 minerals	Daily for 18 months	No intervention	
Oelofse, 2003	RCT	South Africa	6-12 months	60	MMN fortified cereal (porridge) (Targeted fortification – efficacy)	60g of dry cereal: energy (1304 kJ), protein (12g), fat (6g), carbohydrates (54.8g), vitamin A (1200IU), vitamin C (40mg), vitamin B1 (0.64mg), vitamin B2, (0.24mg), niacin (3.2mg), calcium (368mg), iron (8mg), vitamin D (160IU), vitamin E (4 IU), biotin (20ug), folic acid (17.6ug), pantothenic acid (0.6mg), vitamin B12 (0.6ug), vitamin B6 (0.24mg), phosphorous (232mg), iodine (26ug), zinc (5.6mg), potassium (632mg), sodium (272mg), chloride (440mg)	Daily for 6 months	Normal diet	
Ogunlade, 2011	RCT	South Africa	36-79 months	151	MNP in stiff maize porridge (Efficacy)	35g porridge and MNP: iron (2.86mg), zinc (2.86mg), iodine (34.3ug), calcium (457mg), vitamin A (457 RE), vitamin C (68.6mg), vitamin E (5.71mg), vitamin B12 (1.03ug), thiamine (0.57mg), niacin (6.86mg), riboflavin (0.57mg), folate (103ug), and vitamin B6 (0.57mg).	5 days a week for 11 weeks	Soft maize-meal porridge plus placebo (maize maltodextrin)	28g
Osei, 2015	cRCT	Nepal	6-9 months	335	MNP and enhanced homestead food production program (Efficacy)	10 mg iron (encapsulated ferrous fumarate), 4.1 mg zinc (zinc gluconate), 90 g iodine (potassium iodide), 400 g vitamin A (vitamin A acetate), 150 g folic acid, 0.5 mg vitamin B1 (thiamine mononitrate), 0.5 mg vitamin B2 (riboflavin), 0.5 mg vitamin B6 (pyridoxine), 0.9 g vitamin B12	60 sachets were provided within a 6-month period (twice, for a total of 11 months) and participants were instructed to feed MNP on any day of	Enhanced homestead food production program	

						(cyanocobalamin), 30 mg vitamin C (ascorbic acid), 5 g vitamin D3 (cholecalciferol), 5 mg vitamin E (vitamin E acetate), 6 mg niacin (niacinamide) and 0.6 mg copper (cupric gluconate)	their preference, but to ensure not to feed more than one sachet per day.		
Owino, 2007	RCT	Zambia	6 or 8 months of age	185	Fortified blend of maize, beans, Bambara nuts, and groundnuts (Targeted fortification – efficacy)	Vitamin A 700 ug, vitamin C 200 mg, vitamin D 10 ug, thiamine 0.9 mg, riboflavin 1.0 mg, pyridoxine 860 ug, folate 220 ug, pantothenic acid 4 mg, calcium 700 mg, phosphorus 550 mg, magnesium 100 mg, electrolytic iron 41.8 mg, zinc oxide 400 mg, copper 400 ug, manganese 1200 ug, selenium 20 ug	Daily for 3 months	No intervention	
Palupi, 1997	RCT	Indonesia	2-5 years	299	Iron supplementation (Efficacy)	30g	Weekly for 9 weeks	Placebo	
Phu, 2010 Associated refs: Phu, 2012	cRCT	Vietnam	5 months	426	1) Fortified instant flour made into energy-dense gruel 2) Fortified food complement made into energy-dense gruel We combined groups 1 and 2 (Targeted fortification – efficacy)	1) Raw protein (3.9g), digestible protein (3.6g), lipids (2.24g), vitamin A (38ug RE), ascorbic acid (20mg), thiamin (68ug), riboflavin (95ug), nicotinamide (368ug), folic acid (12ug), pantothenic acid (330ug), vitamin B12 (0.06ug), vitamin B6 (53ug), vitamin K1 (8.4ug), vitamin D (117IU), sodium (73mg), potassium (143mg), chlorine (121mg), calcium (138mg), phosphorus (117mg), magnesium (21.5mg), iron (7.6mg), zinc (1.7mg), iodine (5.1ug), copper (92ug), manganese (319ug), selenium (2.1ug) 2) raw protein (9.7g), digestible protein (8.8g), lipids (5.3g), vitamin A (154ug RE), ascorbic acid (87mg), thiamin (229ug), riboflavin (309ug),	Daily for 6 months	Usual care (traditional gruel made at home by parents)	

						nicotinamide (535ug), folic acid (46ug), pantothenic acid (904ug), vitamin B12 (0.16ug), vitamin B6 (98ug), vitamin K1 (38ug), vitamin D (516IU), sodium (343mg), potassium (512mg), chlorine (553mg), calcium (710mg), phosphorus (473mg), magnesium (61mg), iron (33mg), zinc (5.9mg), iodine (22ug), copper (284ug), manganese (942ug), selenium (4.5ug)			
Radhakrishna, 2013	RCT	India	4 months	324	Zinc (and riboflavin) supplementation (Efficacy)	0.5mL of syrup: zinc (5mg) as zinc sulfate, riboflavin (0.5mg)	Daily for 14 months (effective duration 12 months)	Placebo (and riboflavin)	0.5mL of syrup: riboflavin (0.5mg)
Rahman, 1996 Associated refs: Mahalanabis, 1997; Rahman, 1998	RCT	Bangladesh	6-17 weeks	165	Vitamin A supplementation (Efficacy)	15mg	3 doses at DPT/oral polio (OPV) immunizations (baseline, 4 and 8 weeks)	Placebo	
Rahman, 2001 Associated refs: Rahman, 2002a; Rahman, 2002b	RCT	Bangladesh	12-35 months	800	Zinc supplementation and 1 placebo capsule on day 14 (Efficacy)	5mL of syrup: (20mg) elemental zinc	Daily for 14 days	Placebo	
Rim, 2008	RCT	North Korea	6-12 month	234	MNP with iron (to be used for home fortification in rice porridge) (Efficacy)	Elemental iron (10mg)	6 days per week for 6 months	Placebo fortified rice porridge	
Rivera, 2001 Associated refs:	RCT	Mexico	8-14 months	337	MMN supplementation (Efficacy)	25mL of liquid: 1 Recommended Dietary Allowance (RDA) for children age 1-3 y of vitamins D, E, K, niacin, B-1, B-6,	6 days a week for 12 months	Placebo	

Rivera, 2001; Rosado, 1999						folic acid, pantothenic acid, iodine, copper, manganese fluoride and selenium; 1.2 RDA of vitamin A; and 1.5 RDA of ascorbic acid, riboflavin, vitamin B-12, iron and zinc			
Rivera, 2010	cRCT	Mexico	12-30 months	795 (12 clusters)	Iron fortified milk (LSFF – efficacy)	Per unit/400mL reconstituted milk (48g powdered milk in 400mL of water): energy (236.8kcal), protein (12.4g), fat (12.4g), carbohydrates (18.6g), sodium (178mg), iron (5.28mg), zinc (5.28mg) vitamin A (216ug), vitamin D (1.8ug), vitamin C (48.0mg), vitamin B12 (0.44ug), folic acid (32.1ug), riboflavin (0.52mg).	Daily for 12 months	Unfortified whole milk (as milk powder)	
Rosado, 1997 Associated refs: Allen, 2000; Munoz, 2000; Rosado 1999	RCT	Mexico	18-36 months	219	1) Iron supplementation (Efficacy) 2) Zinc supplementation (Efficacy)	1) 20mL of syrup: 20mg 2) 20mL of syrup: 20mg	6 days per week for 12 months	Placebo	
Rosado, 2011	RCT	Mexico	12-24 months	224	LNS (Oportunidades food supplement) (Efficacy and effectiveness)	44g: energy (194kcal), protein (5.8g), fat (6.6g), carbohydrates (27.9g), Na (24.5mg), Fe (10mg), zinc (10mg), vitamin A (400ug), vitamin E (6mg), vitamin C (40mg), vitamin B12 (0.7ug), folic acid (50ug), riboflavin (0.8mg)	Daily for 6 months	Placebo	
Ross, 1995 Associated refs: Binka, 1995 Dollimore, 1997; Kirkwood, 1996	Survival study: cRCT	Ghana	Survival study: 6-90 months	Survival study: 21,906 (185 clusters)	Vitamin A supplementation (Efficacy)	30mg retinol equivalents (RE) for children 6-11 mos, (100,000IU); 60mg RE for children aged 12+ mos. (200,000IU)	Survival study: every 4 months for 2 years	Placebo	

Samuel, 2018	Controlled before-after study	Ethiopia	6-11 months	2356 (9 districts)	MNP (to be used with complementary food) (Efficacy and effectiveness)	1 sachet: vit A (400mcg), vit D (5mcg), vit E (5mg TE), vit B1 (0.5mg), vit B2 (0.5mg), vit B6 (0.5mg), vit B12 (0.9mcg), niacin (6mg), folate (150mcg), vit C (30mg), iron (6mg), zinc (4.1mg), copper (0.56 mg), selenium (17mcg), iodine (90mcg)	Every other day for 37 weeks	No intervention	
Sazawal, 2006 Associated refs: Olney, 2006; Sazawal, 2007b	RCT	Tanzania	1-35 months	32,155	1) MMN supplementation (Efficacy) 2) IFA supplementation (Efficacy) 3) Zinc supplementation (Efficacy)	1) 1 tablet: iron (12.5mg), folic acid (50ug), and zinc (10mg). months received half a tablet. 2) 1 tablet: iron (12.5mg), folic acid (50ug) 3) 1 tablet: zinc (10mg) Children aged 12 months or older received 1 tablet daily while children under 2	Daily until stopping of the trial (max duration of 18 months)	Placebo	
Sazawal, 2007a Associated refs: Sazawal, 2010	RCT	India	1-3 years	663	MMN fortified powdered milk (LSFF – efficacy)	Per 3 servings: energy (1890kJ), protein (20.1g), taurine (48mg), carbohydrates (48.9g), fat (18.9g), vitamin A (330ug), vitamin D3 (3.6ug), vitamin E (8.1mg), vitamin C (48mg), thiamin (0.6mg), riboflavin (1.8mg), niacin (4.5mg), vitamin B6 (0.6mg), pantothenic acid (2.7mg), folate (114ug), vitamin B12 (2.7ug), biotin (24.9ug), choline (114mg), calcium (720mg), phosphorus (600mg), magnesium (84mg), iron (9.6mg), zinc (9.6mg), iodine (36ug), selenium (6.6ug), copper (0.3mg), sodium (360mg), potassium (1260mg), chloride (900mg)	3 sachets daily for 12 months	Unfortified powdered milk	
Sazawal, 2014	cRCT	India	6-24 months	292 (12 clusters)	1) MNP (Efficacy) 2) Rice-based fortified complementary food (Targeted fortification – efficacy)	1) 1 sachet (1.5g) for children >1 year and half a sachet for children <1 year. Per 1.5g sachet: vitamin A (978.26ug), thiamine (0.98mg), riboflavin (1.11mg), niacin (13.04mg), pyridoxine (1.3mg),	Daily for 6 months	No intervention	

						<p>cyanocobalamin (3.91ug), biotin (19.57ug), folic acid (260.87ug), vitamin C (39.13mg), vitamin D (6.52ug), vitamin E (9.78ug), calcium (494.02mg), magnesium (69.13mg), phosphorus (81.52mg), iron (12.5mg), zinc (10mg), copper (1.3mg), manganese (2.58mg), pantothenic acid (6.52mg)</p> <p>2) 20g sachet for children <1 year and 40g sachet for children >1 year of age, to be reconstituted in water or milk to make 100 or 200ml, in addition to normal diet. Per 20g (100mL mix): energy (80.4kcal), protein (3.0g), fat (1.5g), linoleate (0.18g), vitamin A (1800IU), thiamine (0.51mg), riboflavin (0.58mg), niacin (6.6mg), pyridoxine (0.83mg), cyanocobalamin (0.21mg), biotin (0.11mg), folic acid (0.144mg), vitamin C (23.4mg), vitamin D (145IU), vitamin E (10.5IU), calcium (138.7mg), magnesium (20mg), phosphorus (64mg), iron (7.9mg), zinc (6.5mg), copper (1.0mg), manganese (0.16mg)</p>			
Semba, 2000	RCT	Indonesia	3-6 years	236	Vitamin A supplementation (Efficacy)	60mg RE	1 dose	Placebo	
Sempertegui, 1999	RCT	Ecuador	6-36 months	400	Vitamin A supplementation (Efficacy)	0.2mL of syrup: 10,000 IU of vitamin A (3000ug of retinol)	Weekly for 40 weeks	Placebo	
Shamah-Levy, 2008	RCT	Mexico	12-30 months	486	1) Fortified complementary food based on powdered milk (Nutrisano) with iron as ferrous sulphate	Per portion (44g powder): energy (194kcal), protein (5.8g), carbohydrates (27.9g), fat (6.6g), iron as ferrous sulphate or gluconate (10mg), zinc as zinc oxide (10mg), vitamin A as retinol palmitate	Daily for 6 months	Complementary food without iron	Per portion (44g powder): energy (194kcal), protein (5.8g), carbohydrates (27.9g), fat (6.6g), zinc as zinc oxide (10mg), vitamin A as retinol palmitate (400ug RE), vitamin E as

					2) fortified complementary food as above, but with iron as ferrous gluconate We combined groups 1 and 2 (Targeted fortification – efficacy)	(400ug RE), vitamin E as tocopherol acetate (6mg), vitamin C as ascorbic acid (49.9mg), riboflavin (0.8mg), vitamin B12 as cyanocobalamin (0.7ug), folic acid (0.05mg)			tocopherol acetate (6mg), vitamin C as ascorbic acid (49.9mg), riboflavin (0.8mg), vitamin B12 as cyanocobalamin (0.7ug), folic acid (0.05mg)
Shankar, 1999	RCT	Papua New Guinea	6-60 months	480	Vitamin A (and vitamin E) supplementation (Efficacy)	1 capsule for children aged 12 months and above and half a capsule for children below 12 months of age. 1 capsule: vitamin A (200,000IU), vitamin E (10ug)	Every 3 months for 13 months	Placebo	
Sharieff, 2006	cRCT	China	3-6 years	415 (16 clusters)	MNP (Efficacy)	1 sachet: iron as encapsulated ferrous fumarate (30mg), zinc gluconate (5mg), vitamin C (50mg), vitamin A (300ug), vitamin D3 (7.5ug) and folic acid (150ug) mixed with semi-solid meal of rice porridge or congee	Daily for 13 weeks	No intervention (children were served congee)	
Sharma, 2011	cRCT	India	6-36 months	158 (5 clusters)	IFA supplementation (Efficacy)	1 tablet: elemental iron (19.8mg)	Daily for 60 days	No intervention	
Siega-Riz, 2014	cRCT	Honduras	6-18 months	300 mother-child pairs (18 clusters)	LNS (Plumpy'Doz) (Efficacy)	46.3g: energy (247kcal), protein (5.9g), fat (16g), vitamin A (400ug), vitamin B12 (0.9ug), iron (9mg), zinc (9mg)	Daily for 12 months	No intervention	
Silva, 2006	RCT	Brazil	12-59 months	60	Zinc supplementation (Efficacy)	5mL of syrup: zinc (10mg) as zinc sulfate	Daily for 4 months	Placebo	
Smuts, 2005	RCT	South Africa	6-12 months	265	1) MMN supplementation (Efficacy) 2) Iron supplementation (Efficacy)	1) 1 tablet: 1recommended daily allowance (RDA): vitamin A (400ug RE), folic acid (150ug), vitamin D3 (5ug), iodine (90ug), Se (17ug), vitamin B12 (0.9ug), niacin (6mg), Fe (10mg), Zn (4.1mg), Cu (0.56mg), thiamin (0.5mg), riboflavin (0.5mg), vitamin C (30mg),	Daily for 6 months	Placebo	

						vitamin B6 (0.5mg), vitamin E (5mg) 2) 1 tablet: iron (10mg)			
Smuts, 2019	RCT	South Africa	6 months	750	LNS (Efficacy)	20g: energy (114kcal), protein (3g), fat (8g), linoleic acid (1.5g), alpha-linolenic acid (265mg), linoleic acid: alpha linolenic acid (5.7g), vitamin A (200ug), vitamin D 92.5ug), vitamin E (2.5mg), vitamin K (7.5ug), thiamine (0.25mg), riboflavin (0.25mg), niacin (3mg), pantothenate (1mg), vitamin B6 (0.25mg), biotin (4ug), folate (80ug), vitamin B12 (0.45ug), vitamin C (23.3mg), calcium (250mg), iodine (45ug), iron (5.8mg), zinc (6.2mg), copper (0.28mg), selenium (8.5ug), choline (2.0mg)	Daily for 6 months	No intervention	
Somasse, 2018	cRCT	Mali	6-23 months	722 (40 clusters)	MNP (Efficacy and effectiveness)	1 sachet: vitamin A (400ug RE), folic acid (150ug), vitamin D3 (5ug), iodine (90ug), Se (17ug), vitamin B12 (0.9ug), niacin (6mg), Fe (10mg), Zn (4.1mg), Cu (0.56mg), thiamin (0.5mg), riboflavin (0.5mg), vitamin C (30mg), vitamin B6 (0.5mg), vitamin E (5mg)	Daily for 3 months	No intervention	
Soofi, 2013 Associated refs: Ariff, 2014	cRCT	Pakistan	<5 months	2746 (256 clusters)	MNP (Efficacy)	1 sachet: iron (12.5mg), vitamin C (50mg), vitamin A (300ug), vitamin D (5ug), and folic acid (150ug) and zinc (10mg)	Daily for 12 months	No intervention	
Stoltzfus, 2001 Associated refs: Stoltzfus, 2004	RCT	Tanzania	5-59 months	684	Iron supplementation (Efficacy)	0.mL of syrup: 10mg iron as ferrous sulphate	Daily for 12 months	Placebo	

Suchdev, 2012	cRCT	Kenya	6-35 months	1063	MNP (Efficacy and effectiveness)	1 sachet: 12.5 mg Fe as microencapsulated ferrous fumarate, 375 ug vitamin A, 5 mg Zn, 150 ug folic acid; 35 mg vitamin C, 5 ug vitamin D3, 6 mg vitamin E, 6 mg niacin; 0.6 mg Cu, 50 ug iodine, 0.5 mg thiamine, riboflavin, and vitamin B-6, and 0.9 mg vitamin B-12	12 months	Placebo	
Surono, 2014	RCT	Indonesia	12-24 months	48	Zinc supplementation (Efficacy)	20mg as zinc sulfate monohydrate= 8mg zinc elemental	Daily for 90 days	Placebo	
Thu, 1999	RCT	Vietnam	6-24 months	168	MMN supplementation (Efficacy)	1mL of syrup: retinol as retinyl acetate (333ug), iron (8mg), zinc (5mg), vitamin C (20mg)	5 days per week for 12 weeks	Placebo	
Tielsch, 2006 Associated refs: Christian, 2011; Katz, 2010; Murray-Kolb, 2012; Surkan, 2012; Surkan, 2013 Tielsch, 2007	cRCT	Nepal	1-35 months	43,124	1) IFA supplementation (Efficacy) 2) MMN supplementation (Efficacy) 3) Zinc supplementation (efficacy)	1) 1 tablet: iron (12.5mg), folic acid (50ug) (half a tablet if <1-year-old) 2) 1 tablet: iron (12.5mg), folic acid (50ug), zinc (10mg) (half a tablet if <1-year-old) 3) 1 tablet: zinc (10mg) tablet (half a tablet if <1-year-old)	Enrollment until 36 months of age	Placebo	
Umeta, 2000 Associated refs: Umeta, 2003	RCT	Ethiopia	6-12 months	200	Zinc supplementation (Efficacy)	3mL of syrup: zinc as zinc sulphate (10mg)	6 days a week for 6 months	Placebo	
Untoro, 2005 Associated refs: Wijaya-Erhardt, 2007	RCT	Indonesia	6-12 months	284	1) MMN supplementation (Efficacy) 2) Iron supplementation (Efficacy)	1) 1 foodlet: 1 RDA: vitamin A as retinyl acetate (375ug RE), vitamin D (5ug), vitamin E (6mg α -tocopherol equivalents), vitamin K (10ug), vitamin C (35mg), thiamine (0.5mg), riboflavin (0.5mg), vitamin B-6 (0.5mg), vitamin B-12 (0.9ug) , niacin as niacinamide (6mg),folate	Daily for 23 weeks	Placebo	

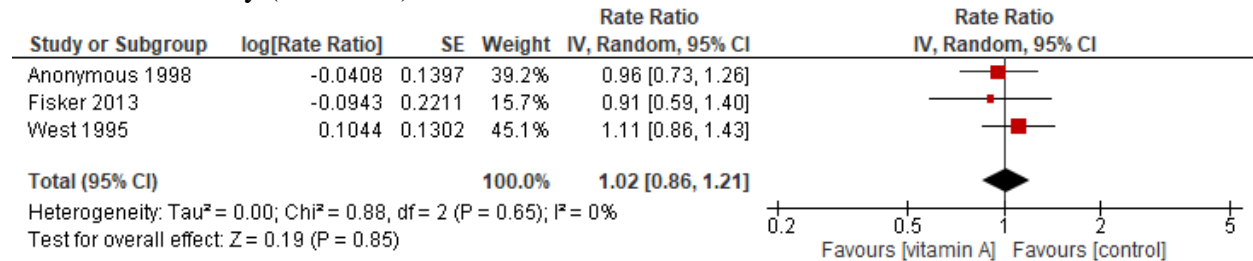
						(150ug), iron as ferrous fumarate (10mg), zinc as zinc gluconate (5mg), copper as cupric gluconate (0.6mg), and iodine as potassium iodide (59ug) 2) Iron as ferrous sulfate (10mg)			
Varma, 2007	cRCT	India	36-66 months	684 (30 clusters)	MNP (to be mixed with local khichdi) (Efficacy)	200g of khichdi: ferrous fumarate (14mg), vitamin A retinyl acetate (500IU), folic acid (0.05mg)	6 days a week for 24 weeks	Unfortified khichdi with placebo premix	
Vijay, 2014	cRCT	India	6-36 months	1294	MNP (to be mixed with supplementary baby mix) (Efficacy)	1 sachet: 12mg ferrous fumarate, 300ug vitamin A (retinyl acetate), 5mg zinc oxide, 30mg vitamin C, 50ug folic acid and dextrose	5 days a week for 6 months	Supplementary baby mix	
Villalpando, 2006	RCT	Mexico	10-30 months	130	MMN fortified milk (LSFF – efficacy)	400 mL per day. Per unit/400mL reconstituted milk (48g powdered milk in 400mL of water): energy (992kJ), protein (12.5g), fat (12.5g), carbohydrates (18.7g), iron as ferrous gluconate (5.28mg), zinc as zinc oxide (5.28mg), retinol palmitate (21.6ug), vitamin C as sodium ascorbate (48mg), folic acid (32.1ug)	Daily for 6 months	Unfortified cow's whole milk (as milk powder)	
Wasantwisut, 2006 Associated refs: Pongcharoen, 2011	RCT	Thailand	4-6 months	674	1) Iron supplementation (Efficacy) 2) Zinc supplementation (Efficacy)	1) 2mL of syrup: zinc (10mg) 2) 2mL of syrup: zinc (10mg)	Daily for 6 months	Placebo	
Wessells, 2012	RCT	Burkina Faso	6-23 months	451	1) Zinc (liquid) supplementation 2) Zinc (tablet) supplementation We combined groups 1 and 2 (Efficacy)	1) 5 mL: zinc as zinc sulfate (5mg) 2) 1 tablet: zinc as zinc sulfate (5mg)	Daily for 3 weeks	Placebo	

West, 1995 Associated refs: Bishai, 2005; Katz, 1995	cRCT	Nepal	6-72 months	11918 (261 wards)	Vitamin A (and vitamin E) supplementation (Efficacy)	30000ug RE (100,000IU) for children 6-11 months old and 60000ug RE (200,000IU) for children 12 months or older; vitamin E (40IU) as antioxidant	Every 4 months for 12 months	Placebo	
Wieringa, 2003	RCT	Indonesia	4 months	387	1) Iron supplementation (Efficacy) 2) Zinc supplementation (Efficacy)	1) 2mL of syrup: 10mg iron (ferrous sulfate) 2) 12mL of syrup: 10mg zinc (zinc sulfate)	5 days a week for 6 months	Placebo	
Yurdakok, 2004	RCT	Turkey	4 months	79	Iron supplementation (Efficacy)	1 mg/kg iron - adjusted monthly according to infant weight	Daily for 3 months	No intervention	
Zlotkin, 2003	RCT	Ghana	8-20 months	437	MNP (with iron only) (Efficacy)	40mg	Daily for 6 months	Placebo	

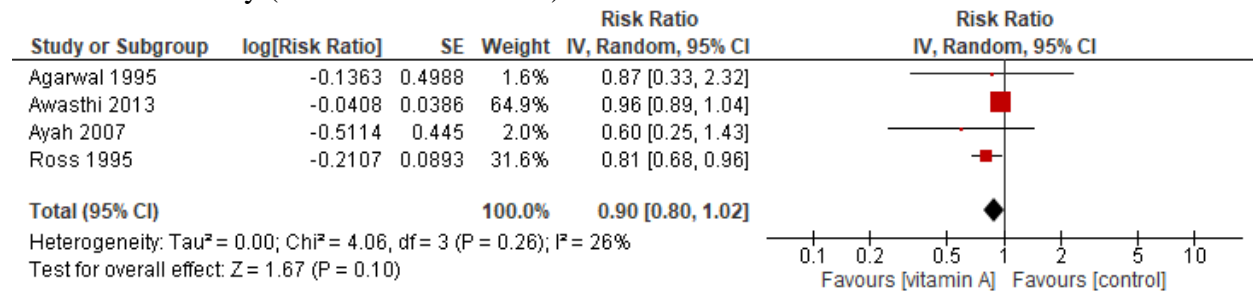
Appendix 4 – Additional Forest Plots

Comparison 1: Vitamin A Supplementation vs. Placebo/No Intervention (Efficacy)

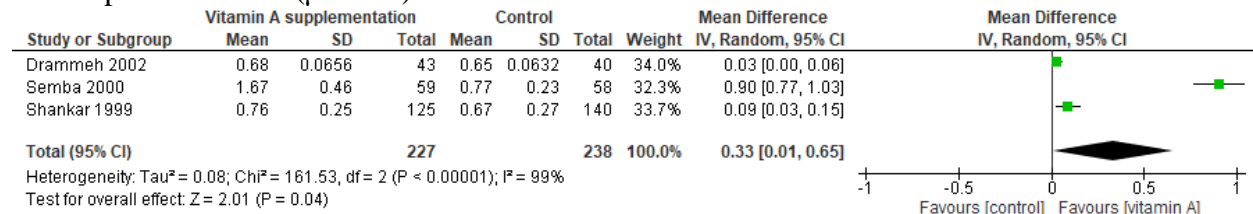
All-cause mortality (incidence)



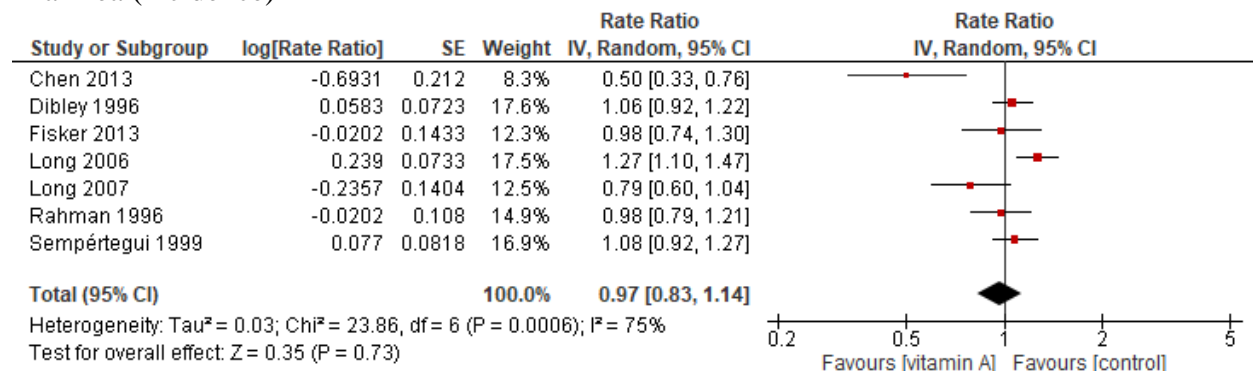
All-cause mortality (cumulative incidence)



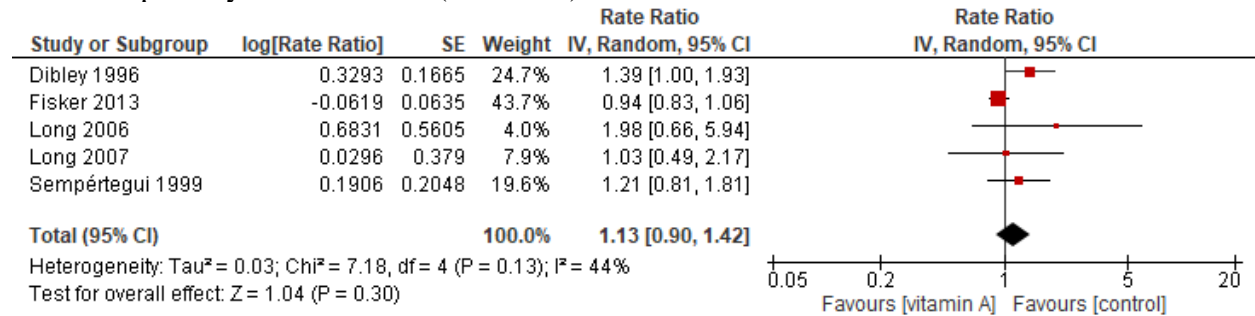
Serum/plasma retinol ($\mu\text{mol/L}$)



Diarrhea (incidence)

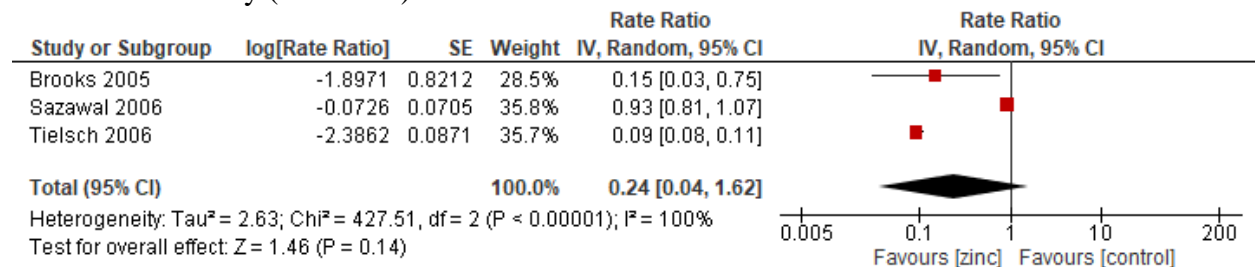


Lower respiratory tract infection (incidence)

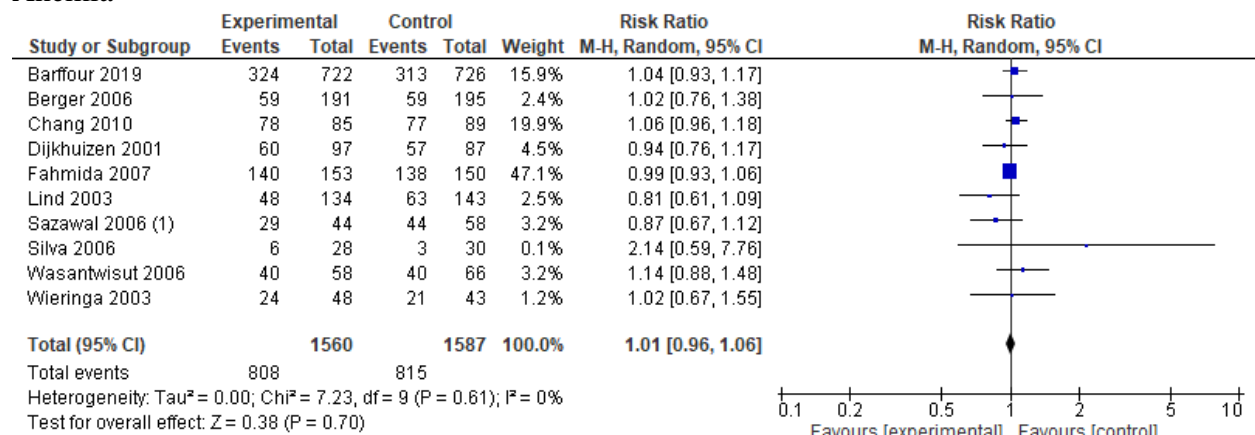


Comparison 2: Zinc Supplementation vs. Placebo/No Intervention (Efficacy)

All-cause mortality (incidence)



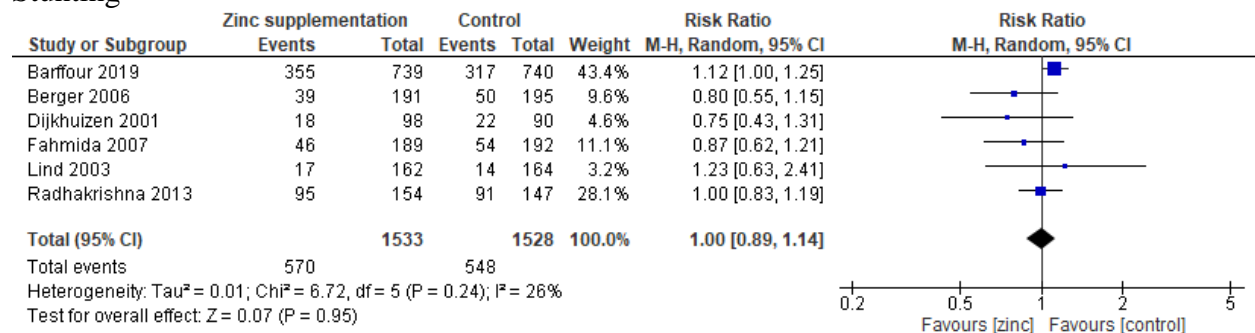
Anemia



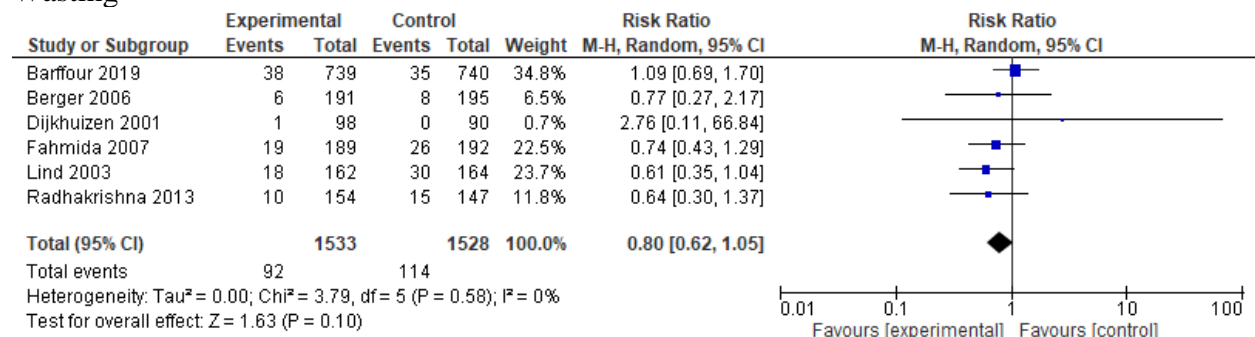
Footnotes

(1) hemoglobin concentration <100 g/L

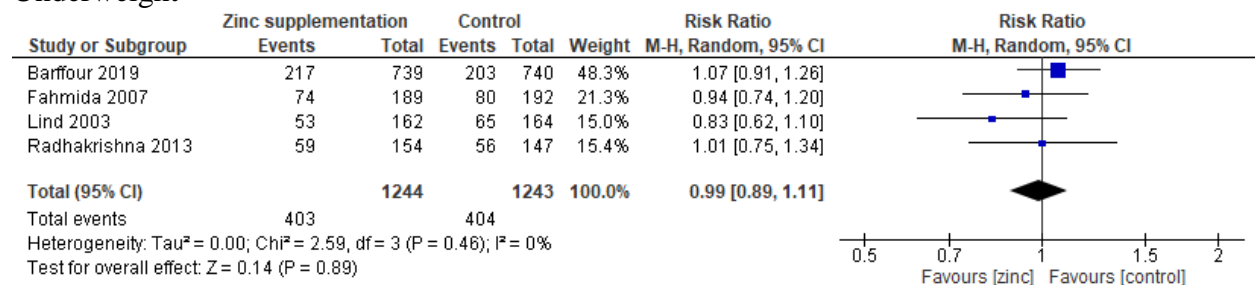
Stunting



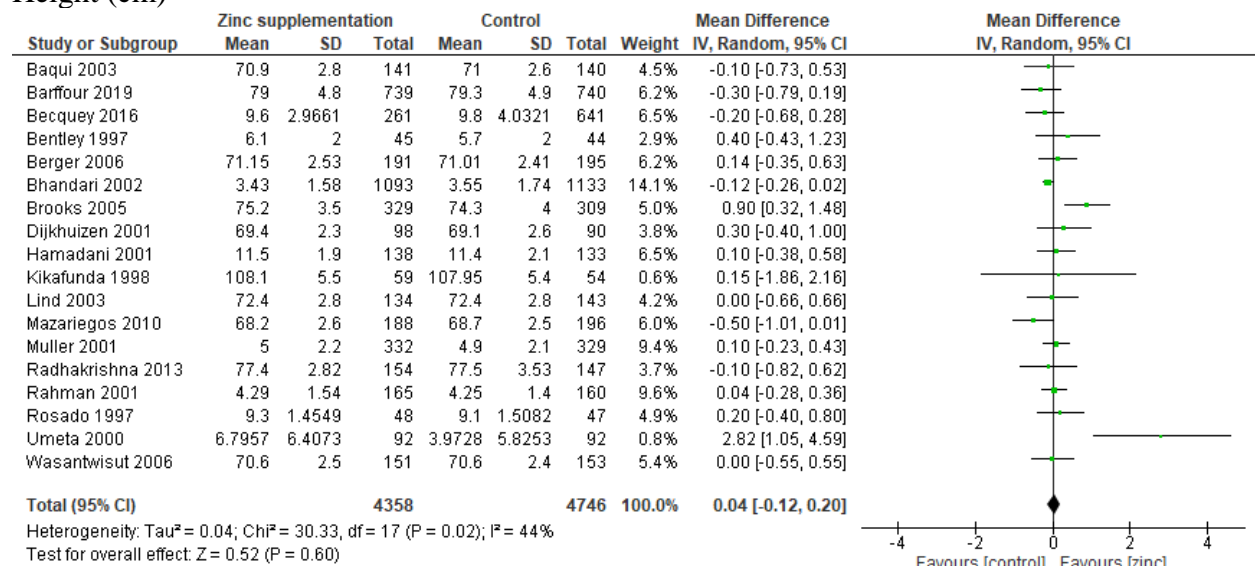
Wasting



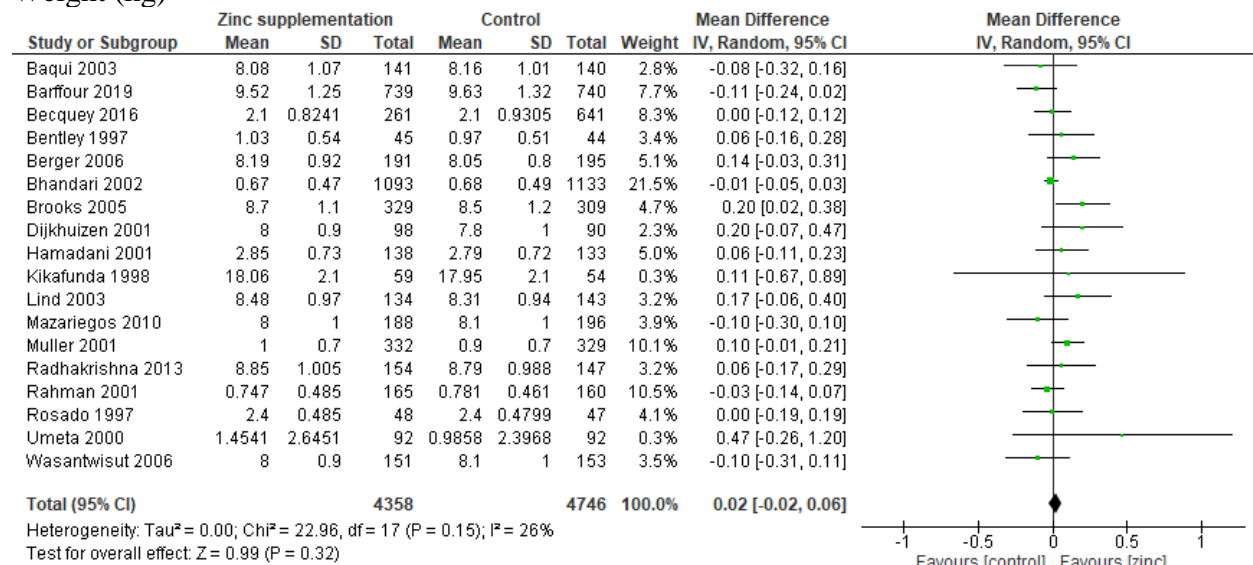
Underweight



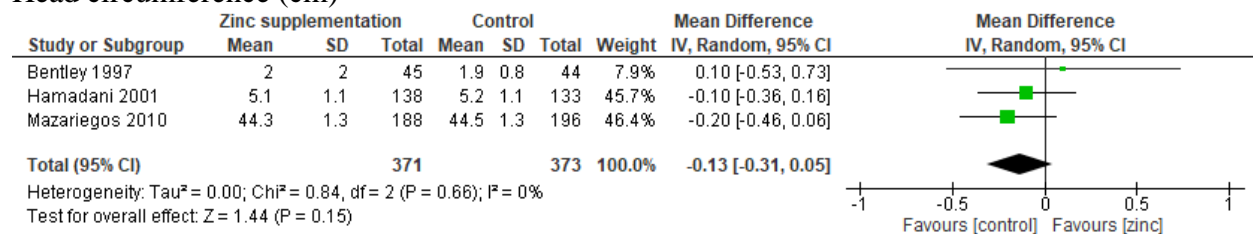
Height (cm)



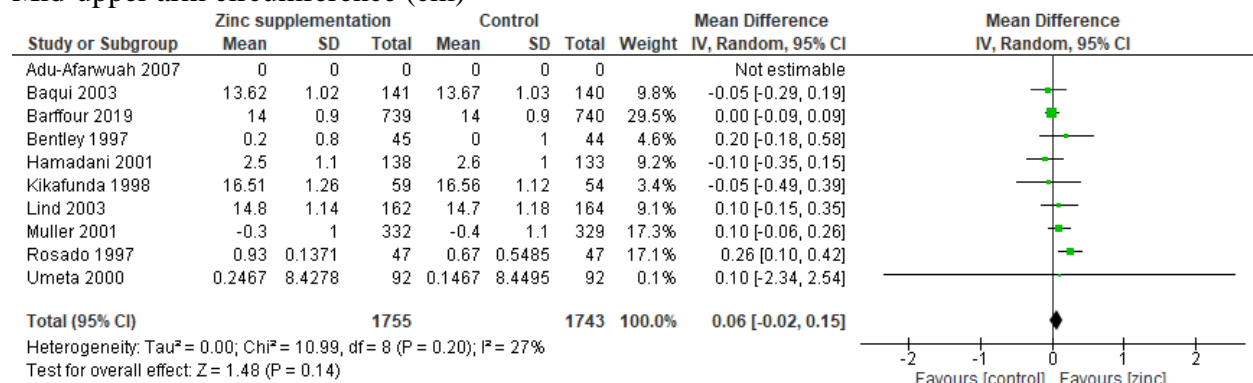
Weight (kg)



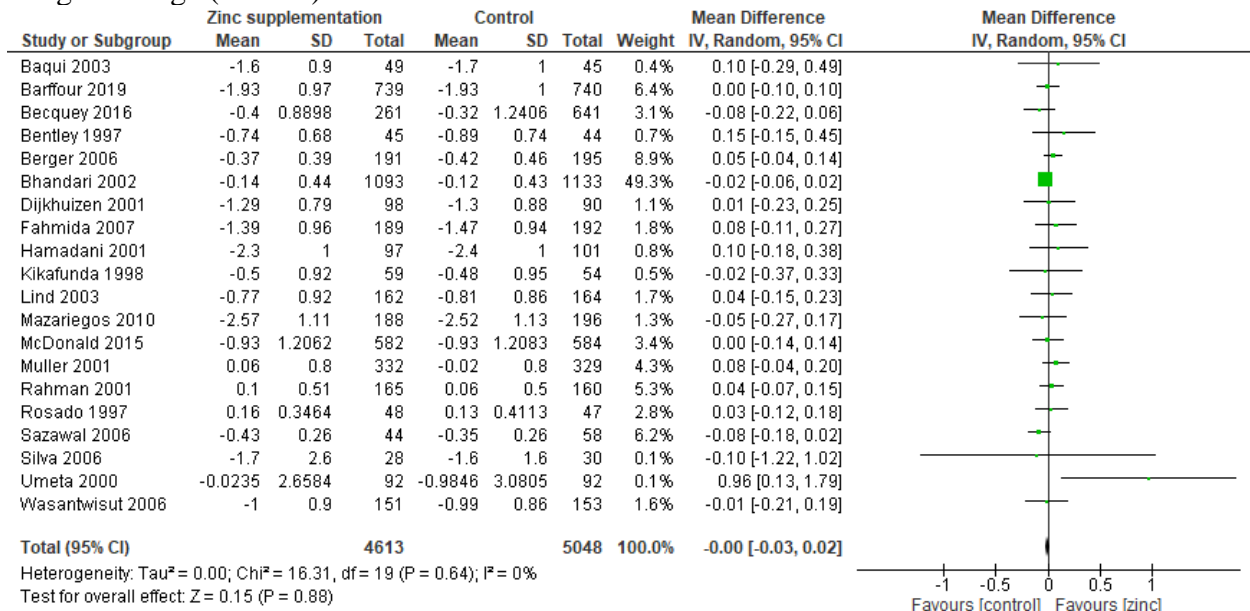
Head circumference (cm)



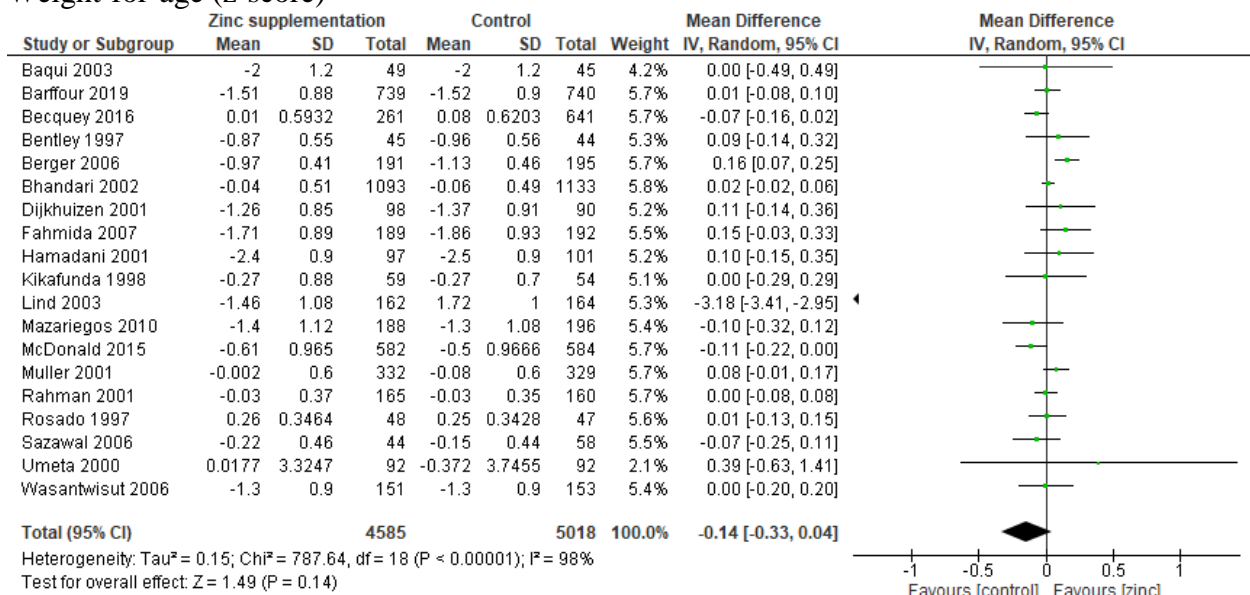
Mid-upper arm circumference (cm)



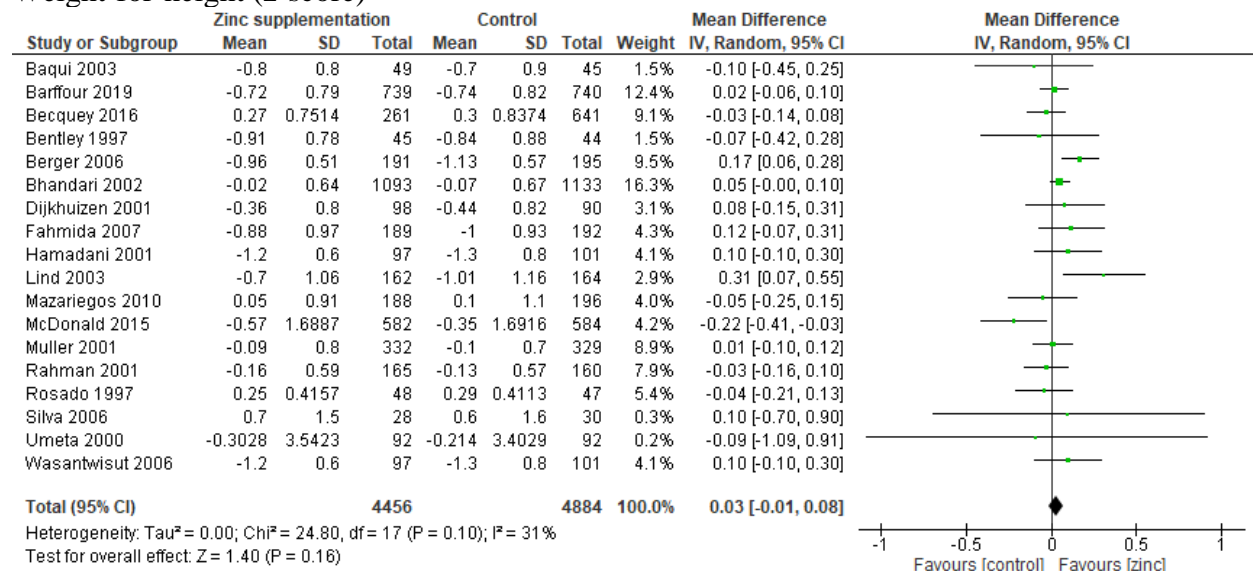
Length-for-age (z-score)



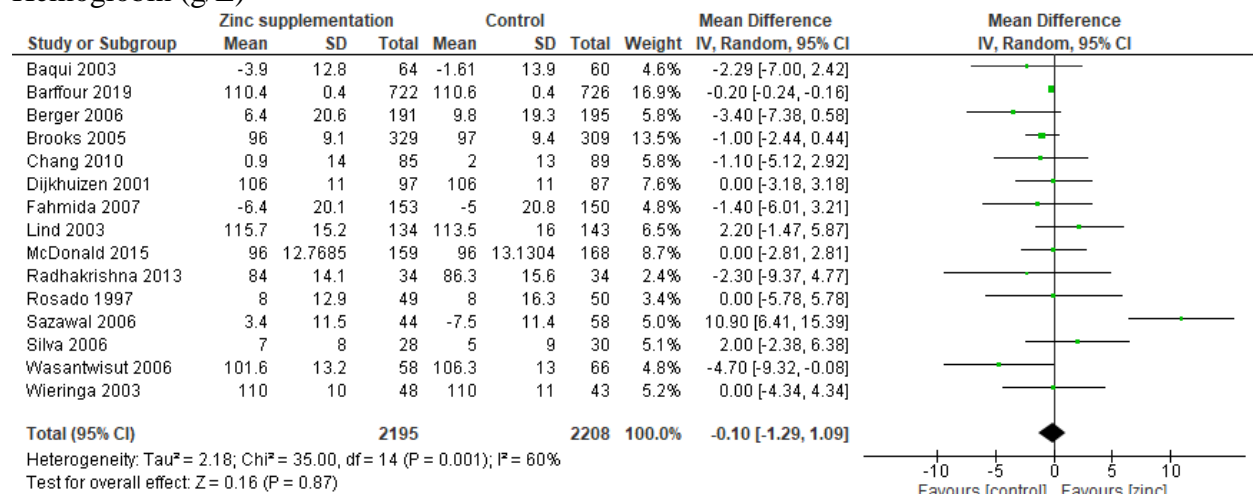
Weight-for-age (z-score)



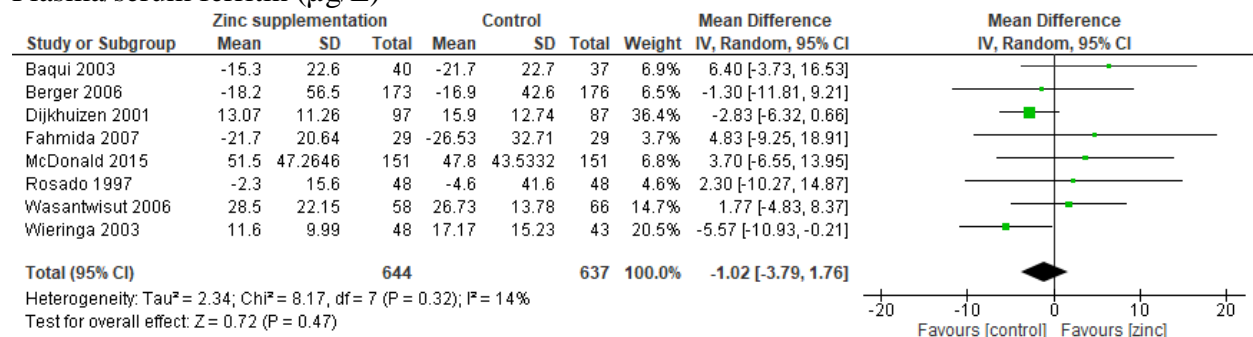
Weight-for-height (z-score)



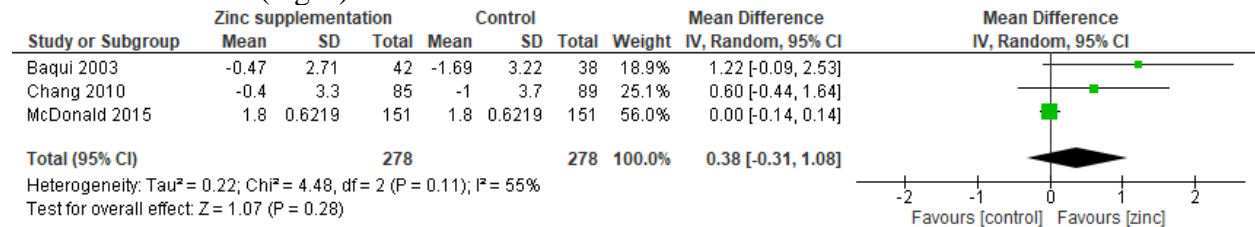
Hemoglobin (g/L)



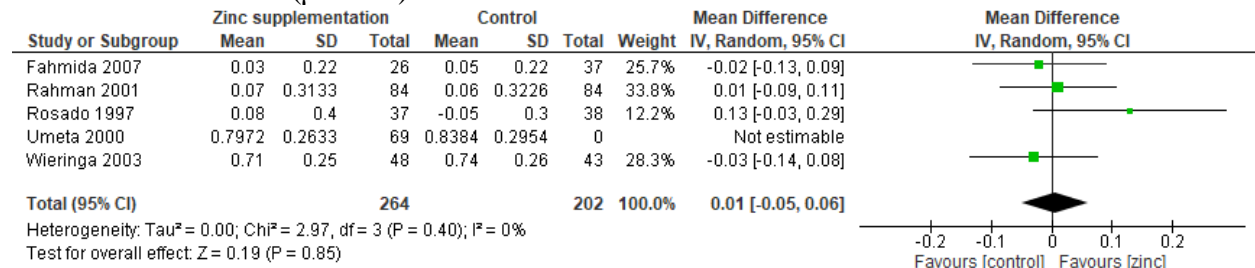
Plasma/serum ferritin (μg/L)



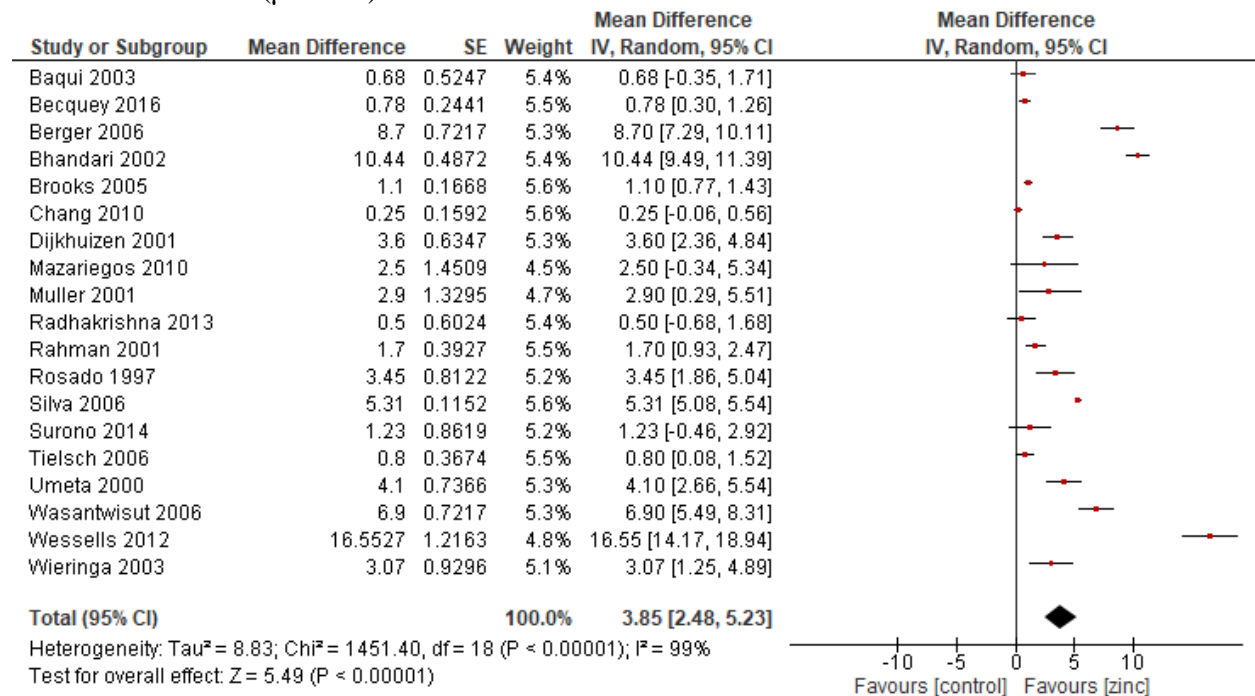
Plasma/serum TfR (mg/L)



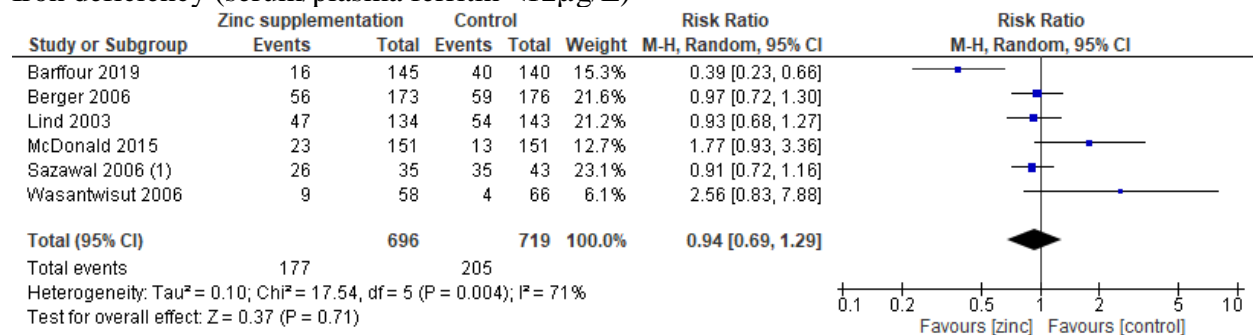
Plasma/serum retinol ($\mu\text{mol/L}$)



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



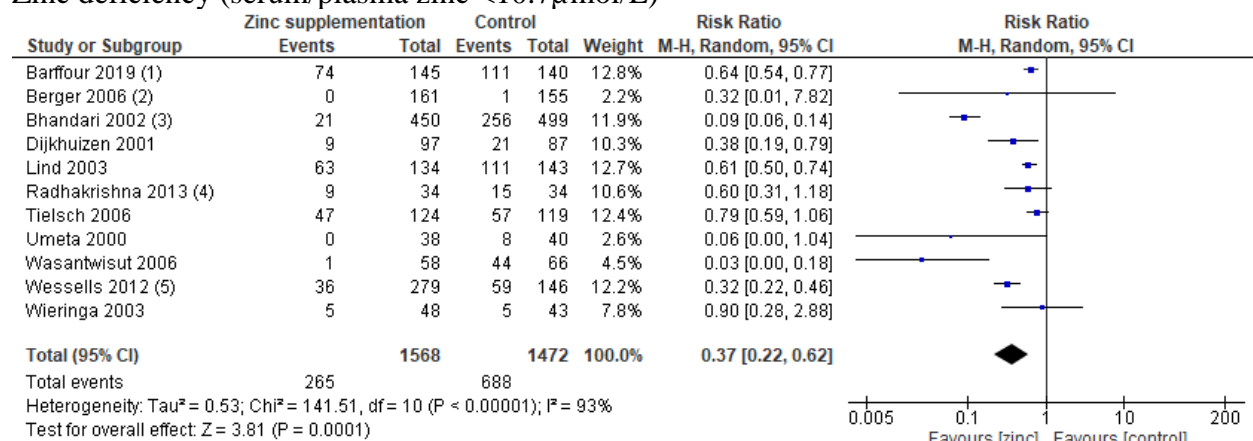
Iron deficiency (serum/plasma ferritin <12µg/L)



Footnotes

(1) Zinc protoporphyrin >=90µmol/mol heme

Zinc deficiency (serum/plasma zinc <10.7µmol/L)



Footnotes

(1) Plasma zinc <9.94µmol/L

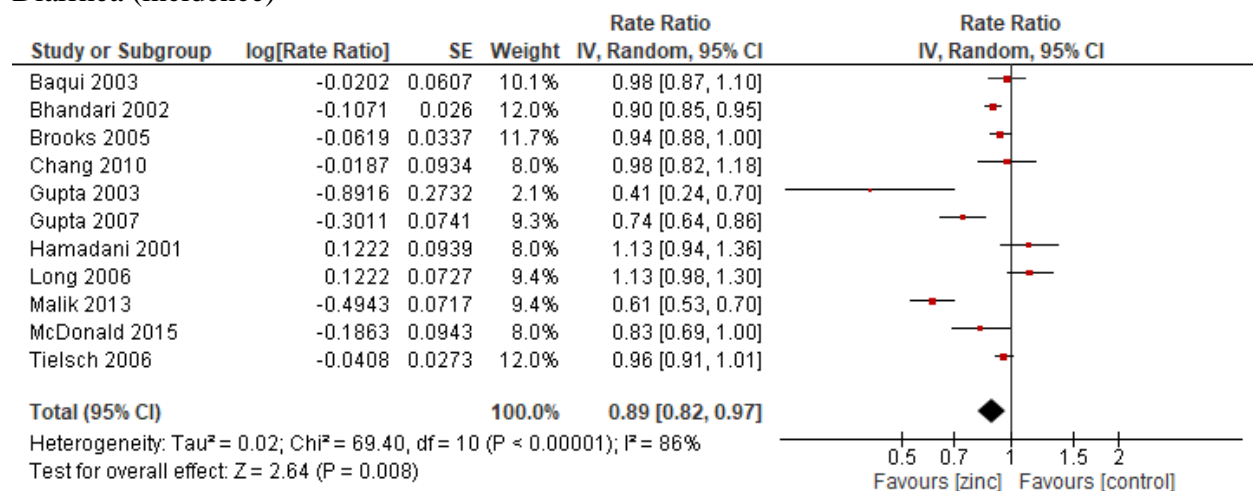
(2) Serum zinc <9.9µmol/L

(3) Plasma zinc <9.17µmol/L

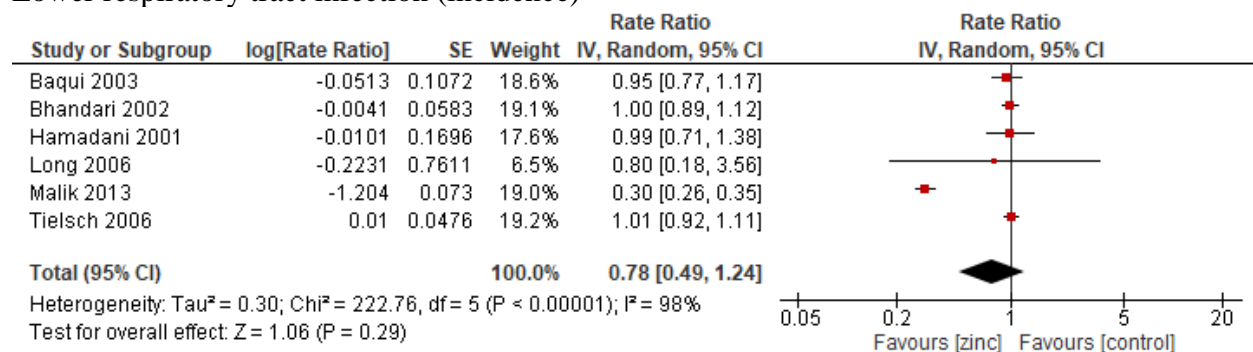
(4) Serum zinc <9.17µmol/L

(5) Plasma zinc <9.94µmol/L

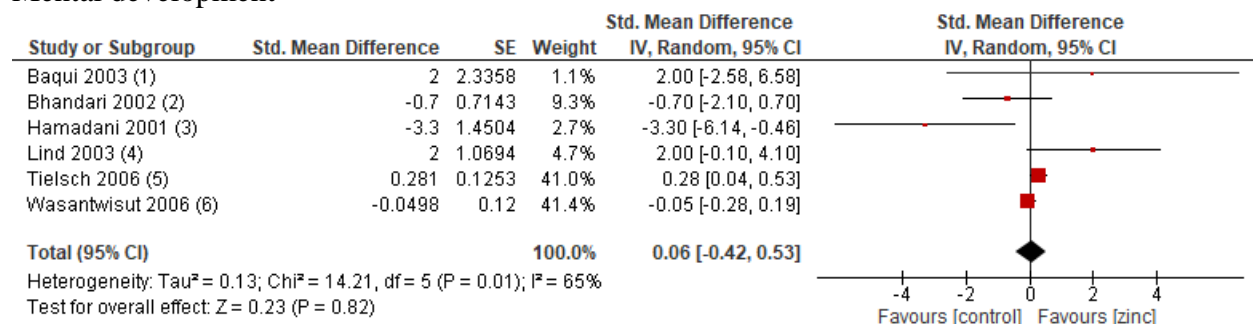
Diarrhea (incidence)



Lower respiratory tract infection (incidence)



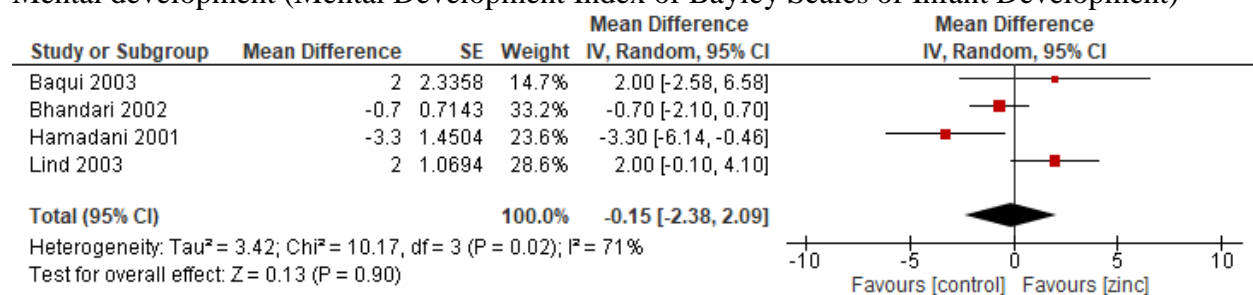
Mental development



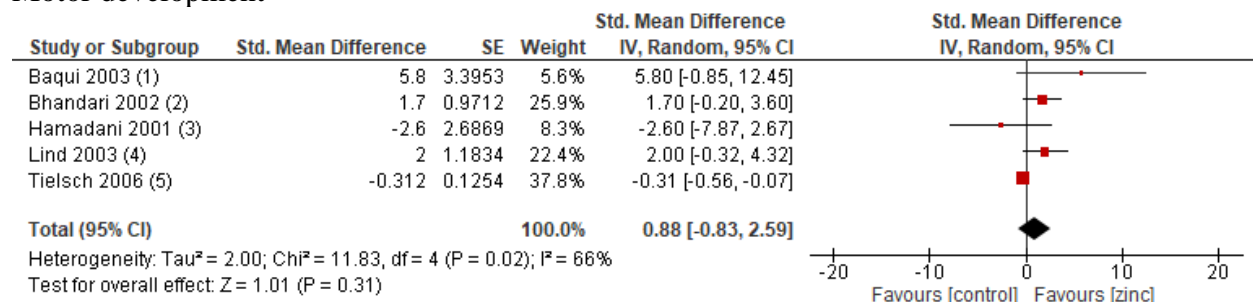
Footnotes

- (1) Mental Development Index (Bayley Scales of Infant Development)
- (2) Mental Development Index (Bayley Scales of Infant Development)
- (3) Mental Development Index (Bayley Scales of Infant Development)
- (4) Mental Development Index (Bayley Scales of Infant Development)
- (5) Universal Test of Nonverbal Intelligence
- (6) Full IQ (Wechsler Intelligence Scale for Children 3rd edition)

Mental development (Mental Development Index of Bayley Scales of Infant Development)



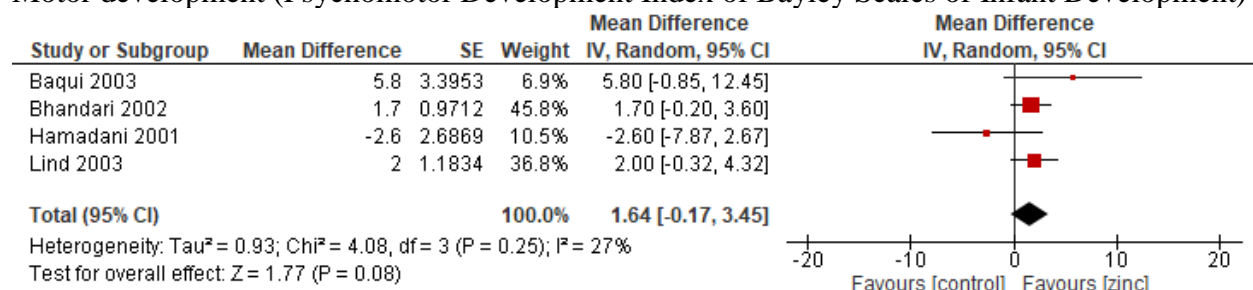
Motor development



Footnotes

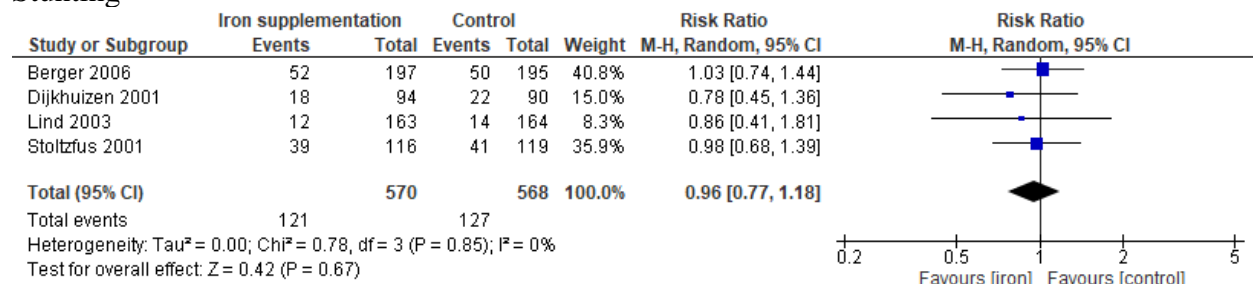
- (1) Psychomotor Development Index (Bayley Scales of Infant Development)
 (2) Psychomotor Development Index (Bayley Scales of Infant Development)
 (3) Psychomotor Development Index (Bayley Scales of Infant Development)
 (4) Psychomotor Development Index (Bayley Scales of Infant Development)
 (5) Movement Assessment Battery for Children

Motor development (Psychomotor Development Index of Bayley Scales of Infant Development)

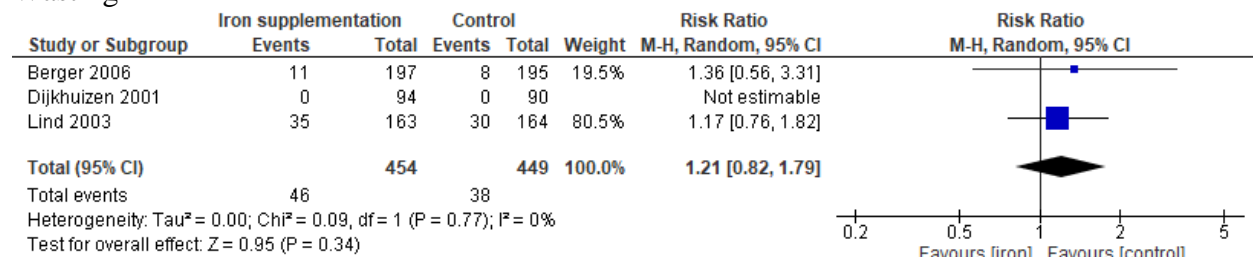


Comparison 3: Iron Supplementation vs. Placebo/No Intervention (Efficacy)

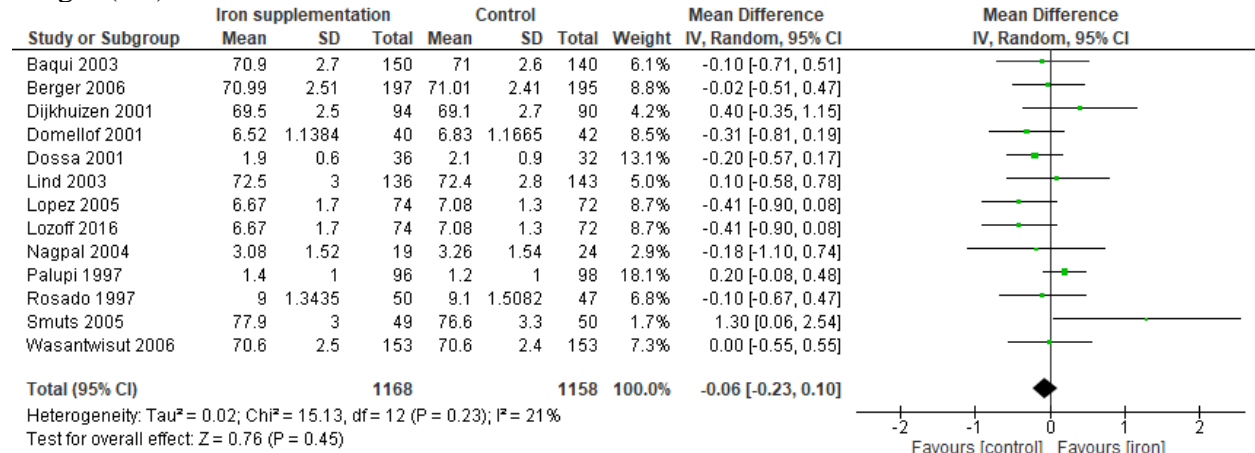
Stunting



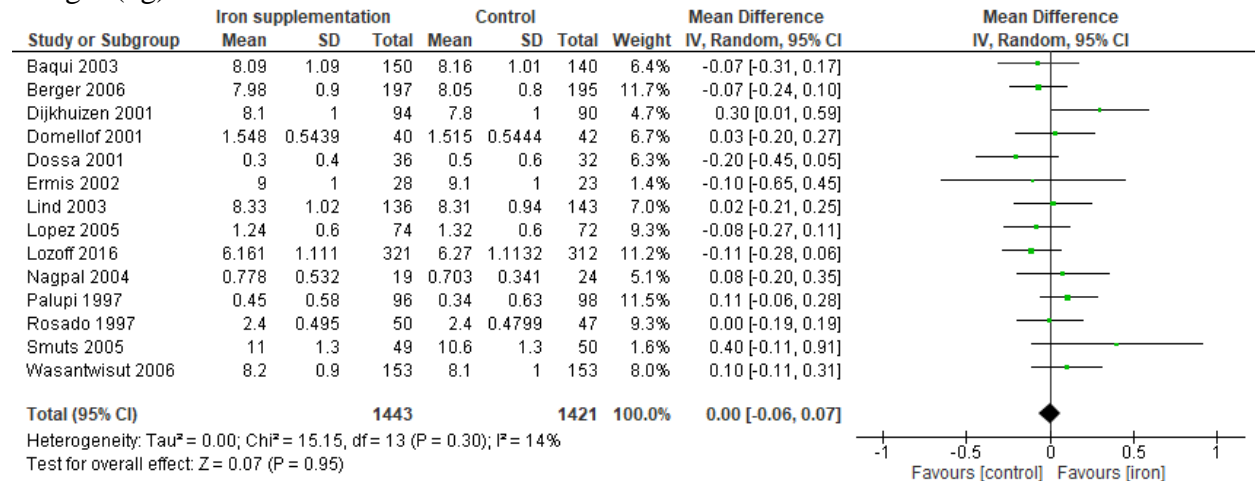
Wasting



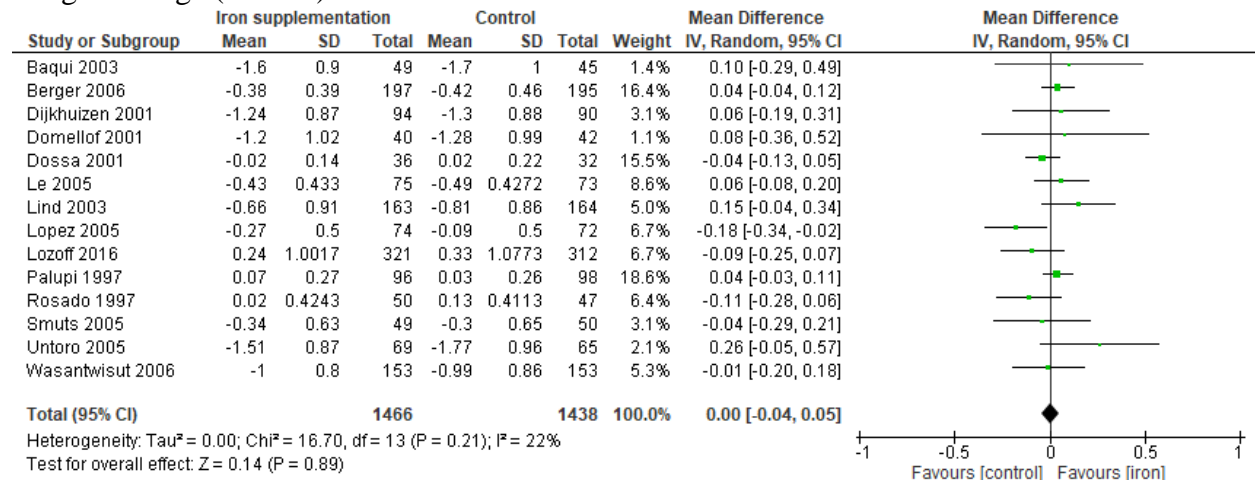
Height (cm)



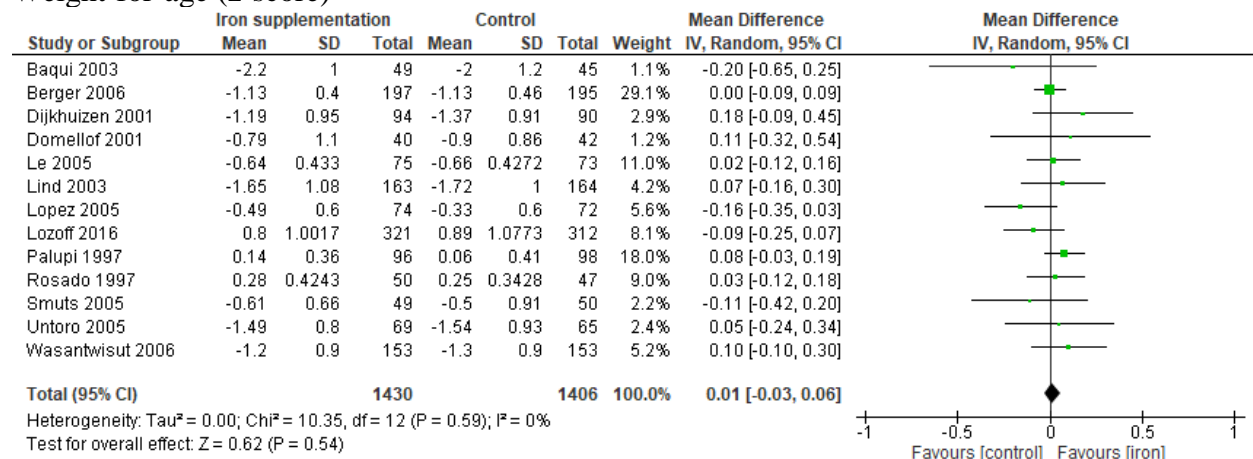
Weight (kg)



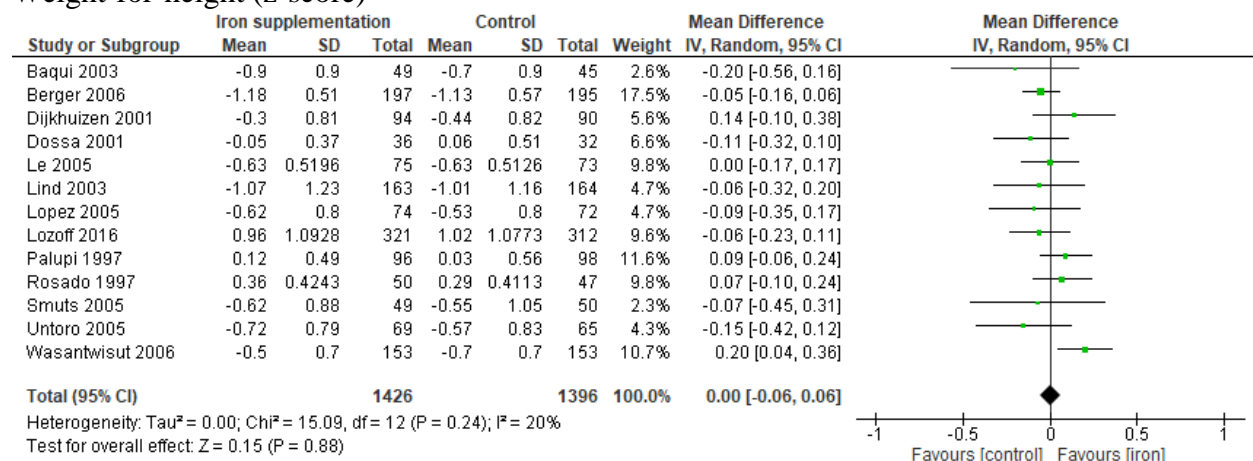
Length-for-age (z-score)



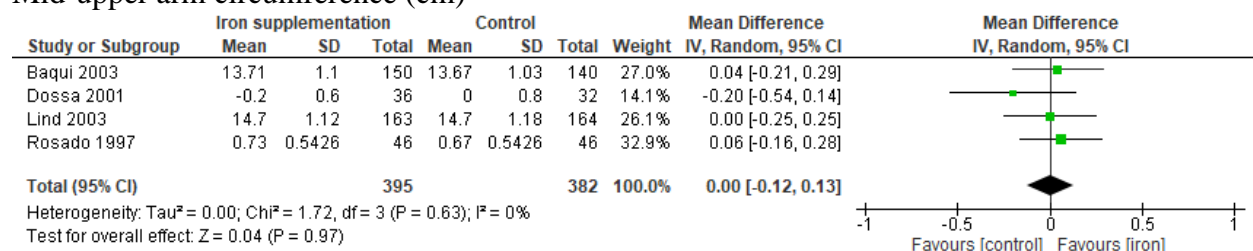
Weight-for-age (z-score)



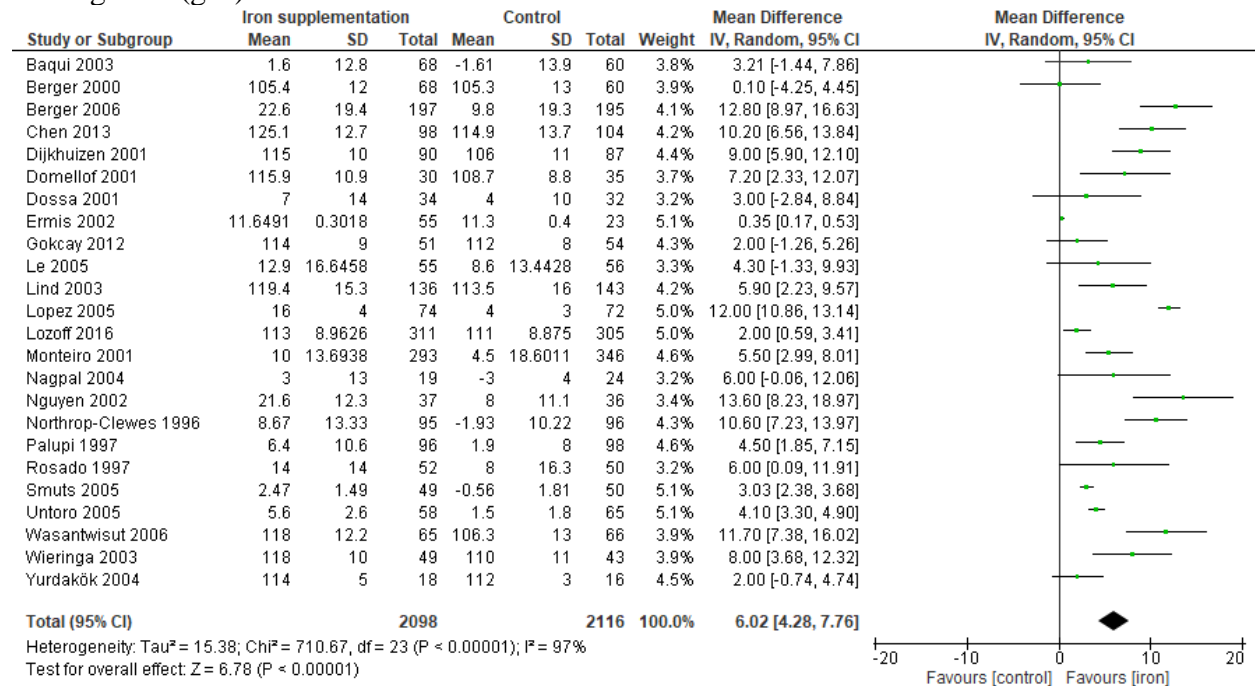
Weight-for-height (z-score)



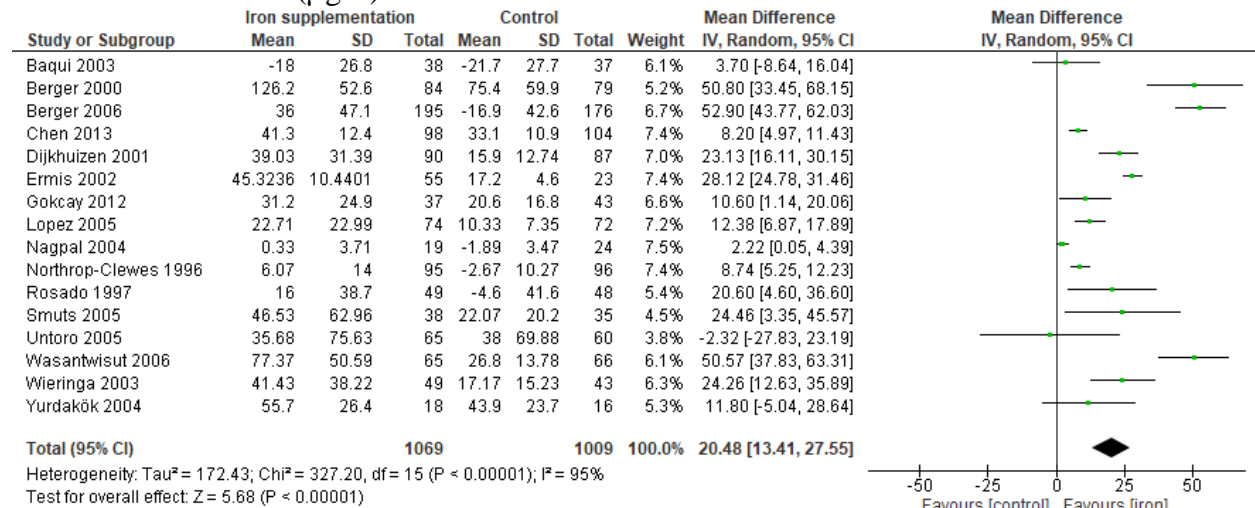
Mid-upper arm circumference (cm)



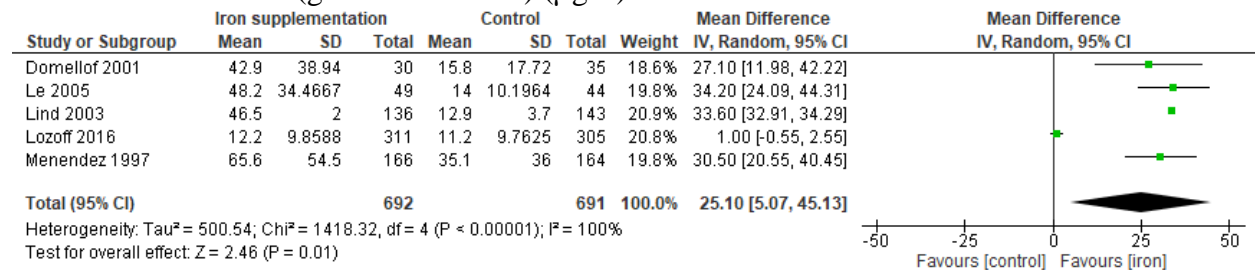
Hemoglobin (g/L)



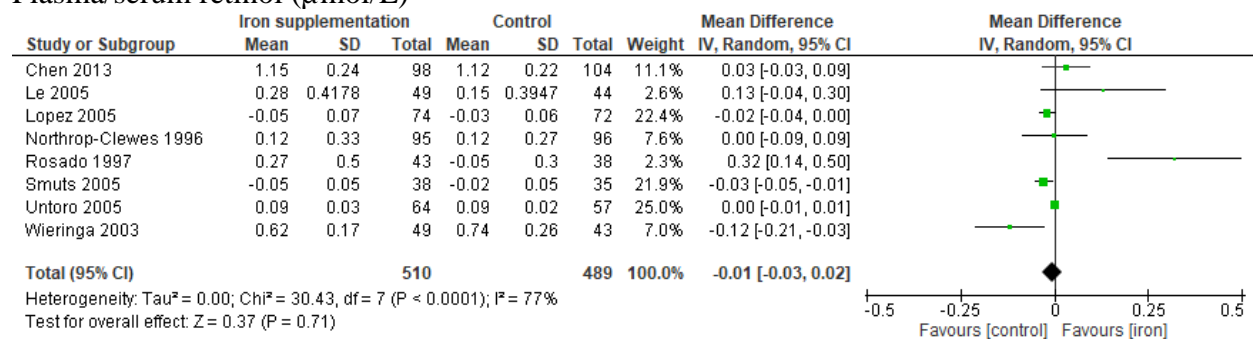
Plasma/serum ferritin ($\mu\text{g/L}$)



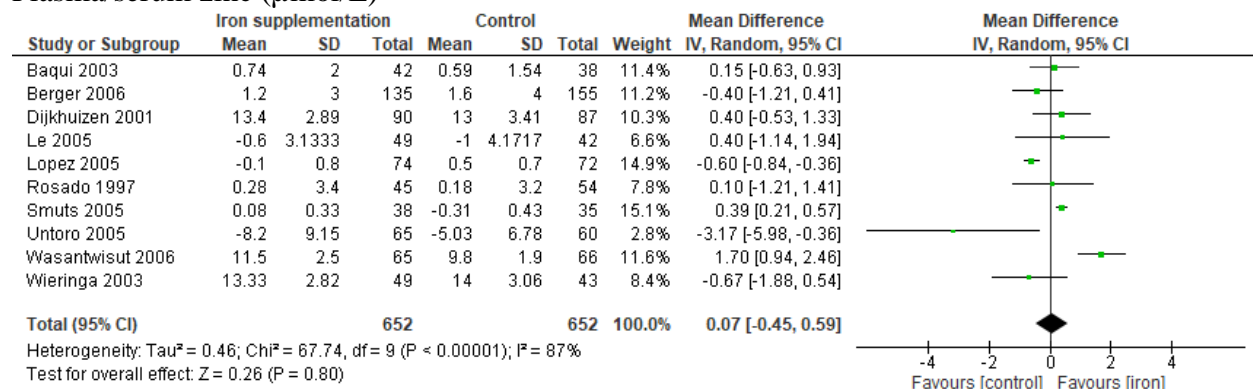
Plasma/serum ferritin (geometric means) ($\mu\text{g/L}$)



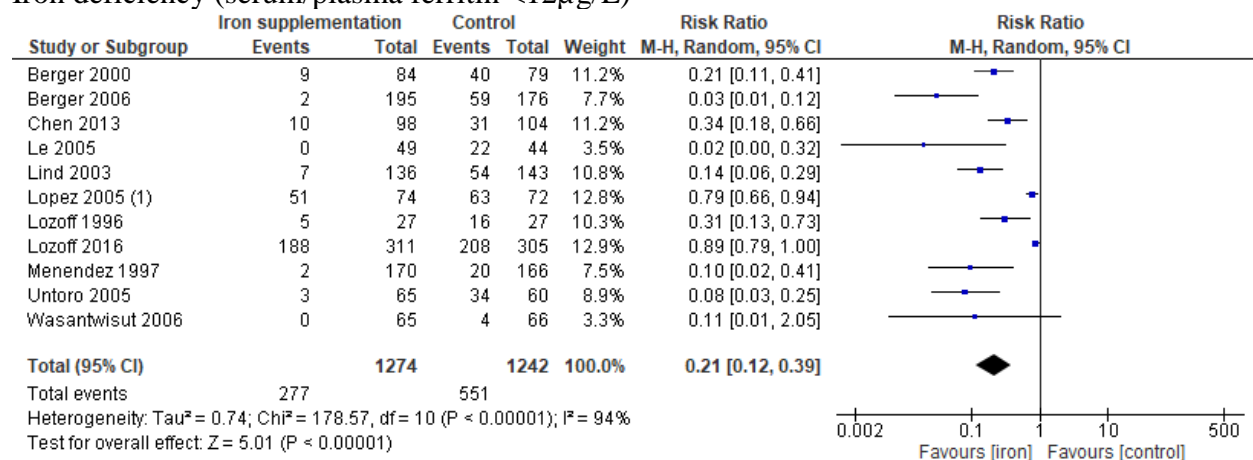
Plasma/serum retinol (μmol/L)



Plasma/serum zinc (μmol/L)



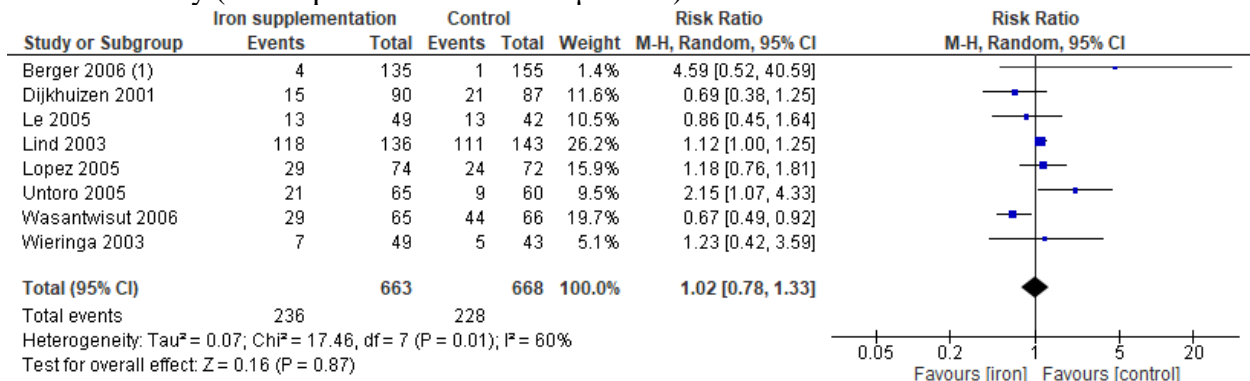
Iron deficiency (serum/plasma ferritin <12μg/L)



Footnotes

(1) Plasma ferritin <20ug/L

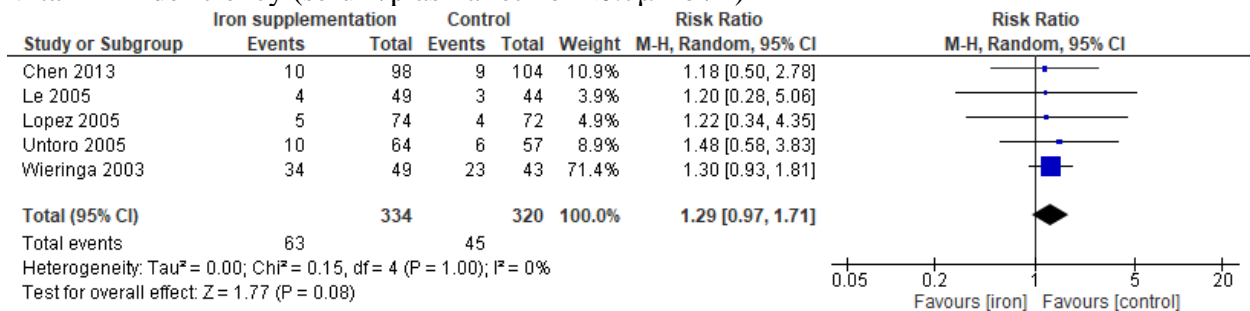
Zinc deficiency (serum/plasma retinol <10.7µmol/L)



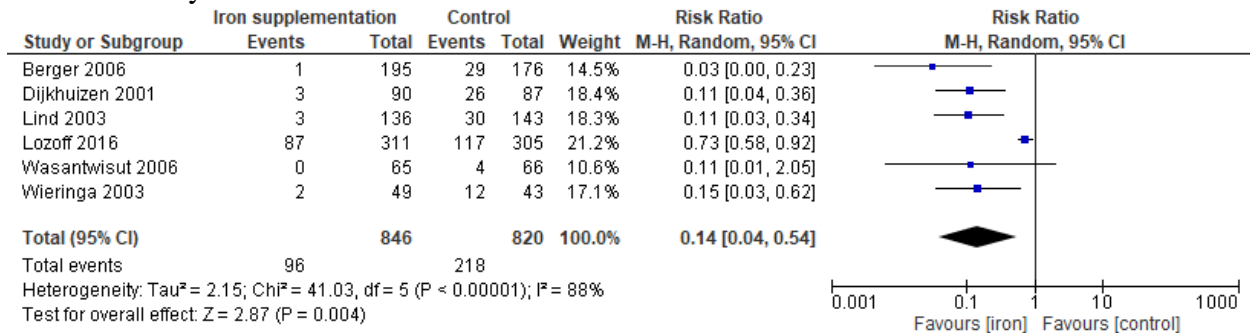
Footnotes

(1) Serum zinc <9.9µmol/L

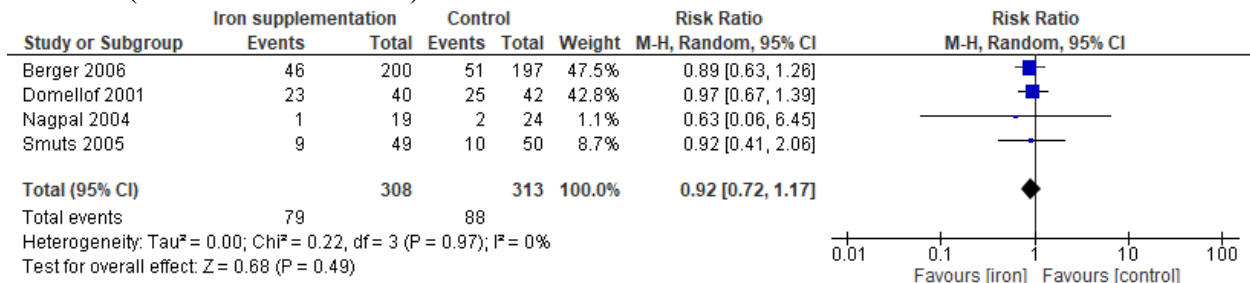
Vitamin A deficiency (serum/plasma retinol <0.7µmol/L)



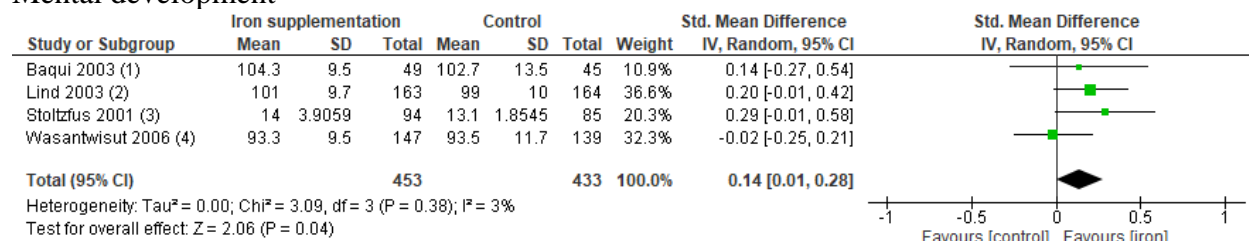
Iron-deficiency anemia



Diarrhea (cumulative incidence)



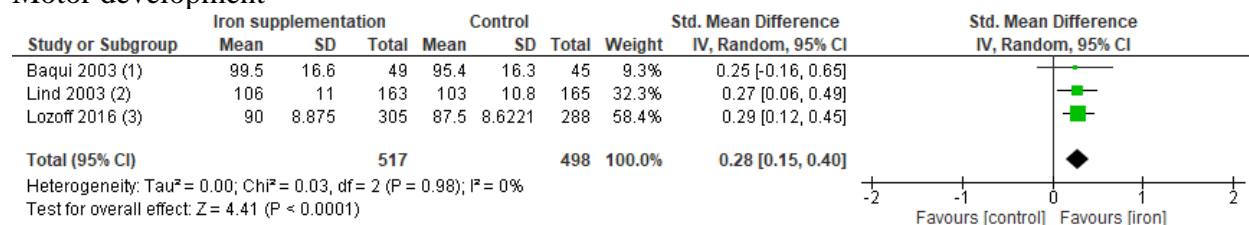
Mental development



Footnotes

- (1) Mental Development Index (Bayley Scales of Infant Development)
- (2) Mental Development Index (Bayley Scales of Infant Development)
- (3) Language (Griffiths and McCarthy scales of mental development)
- (4) Full IQ (Wechsler Intelligence Scale for Children 3rd edition)

Motor development

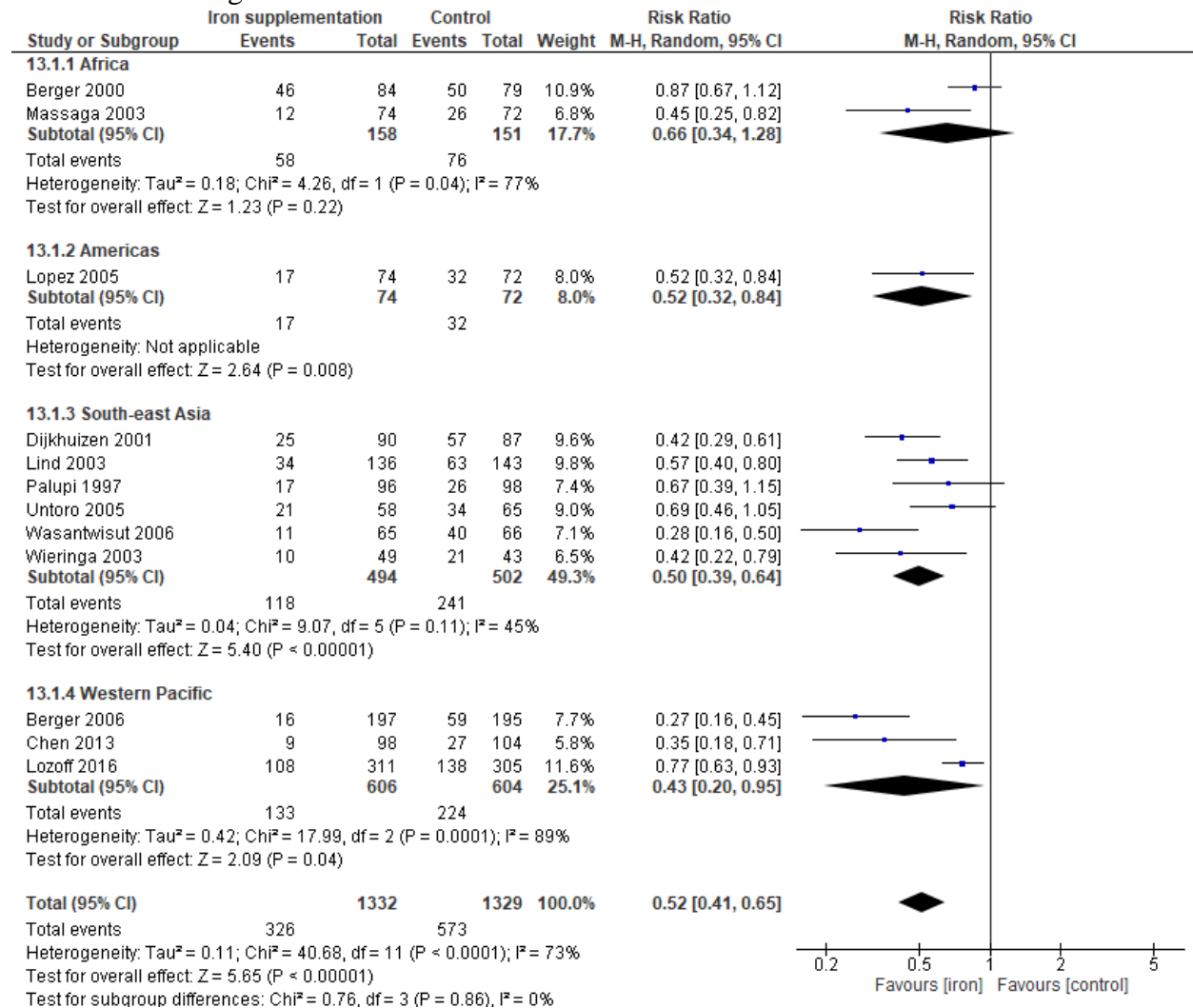


Footnotes

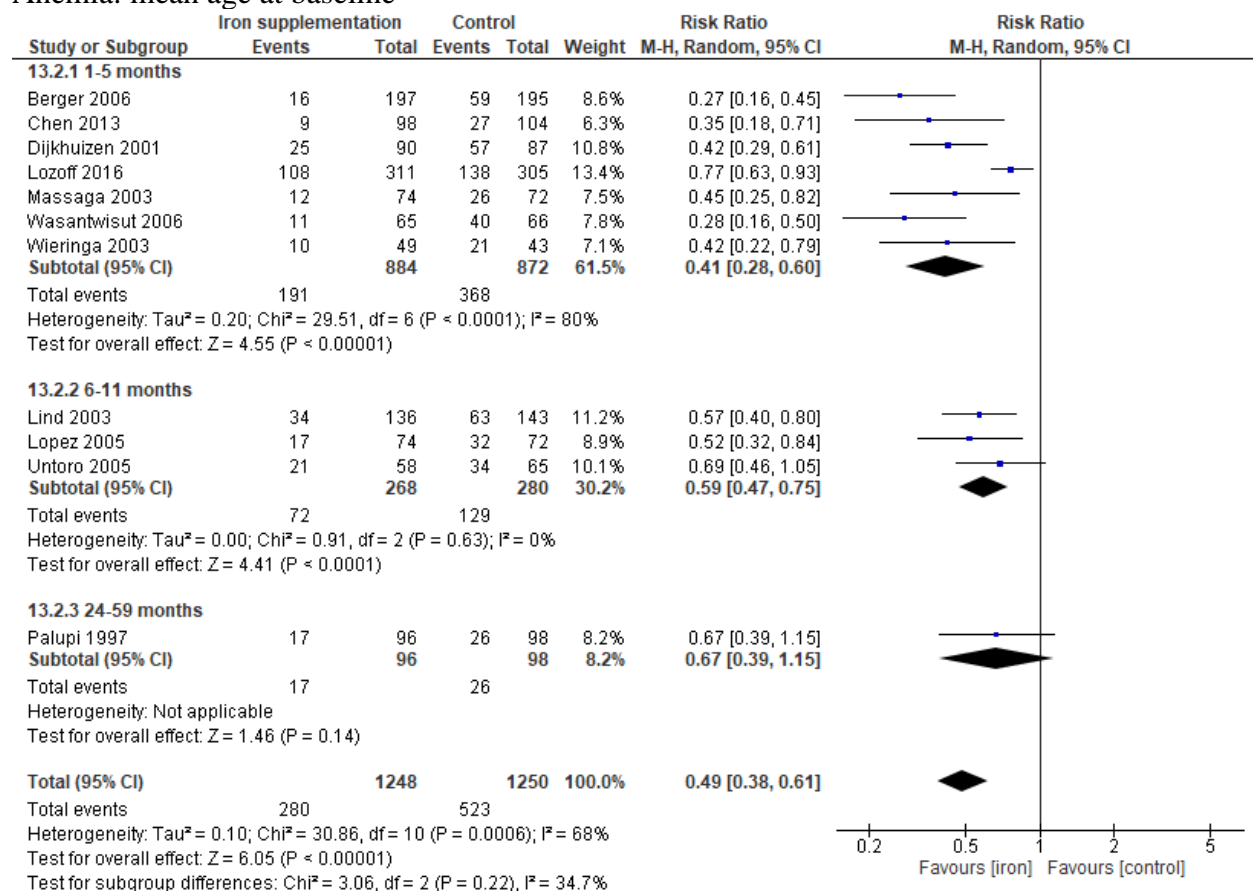
- (1) Psychomotor Development Index (Bayley Scales of Infant Development)
- (2) Psychomotor Development Index (Bayley Scales of Infant Development)
- (3) Gross motor score (Peabody Developmental Motor Scale 2nd Edition)

Comparison 3: Subgroup Analyses for Iron Supplementation vs. Placebo/No Intervention (Efficacy)

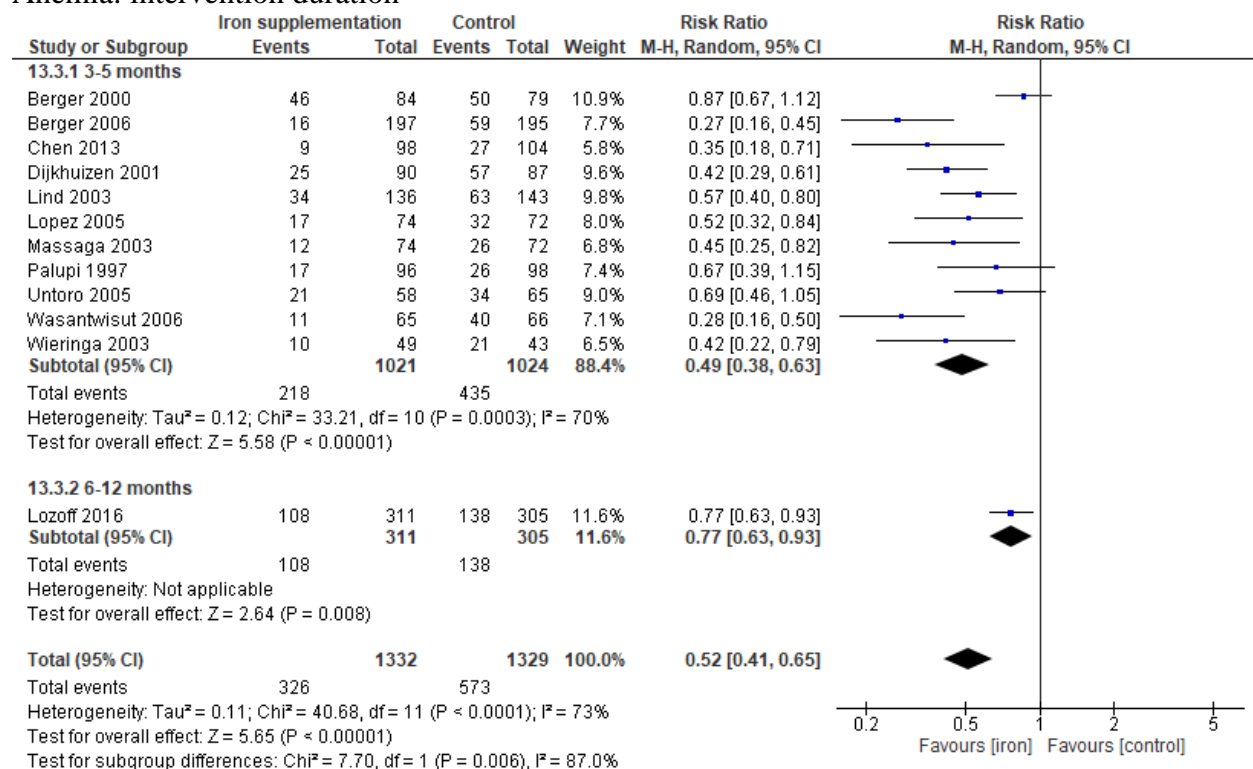
Anemia: WHO region



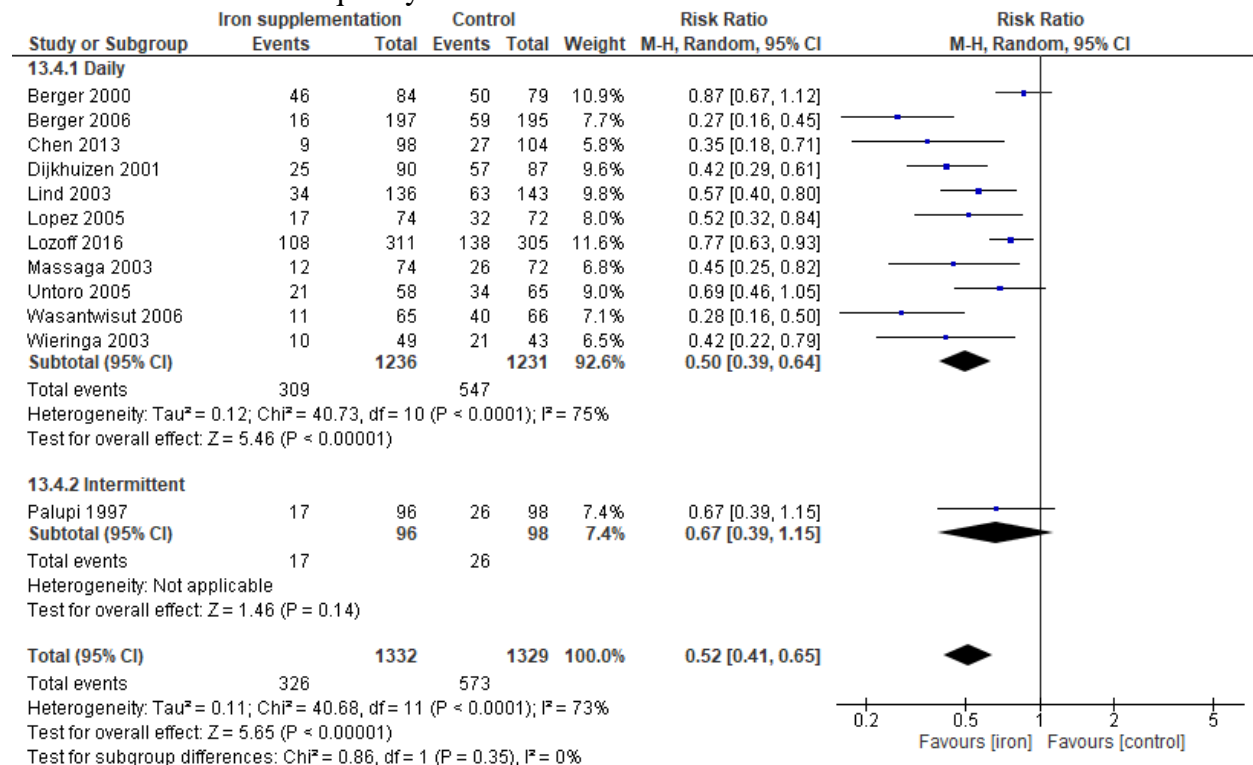
Anemia: mean age at baseline



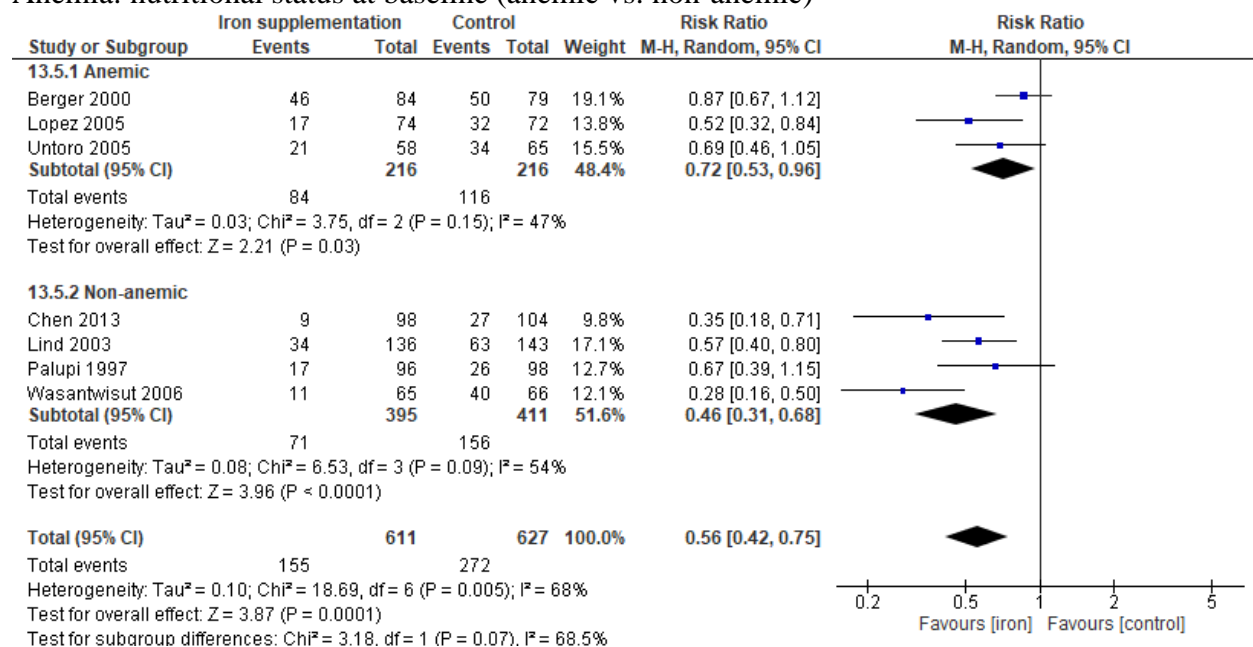
Anemia: intervention duration



Anemia: intervention frequency

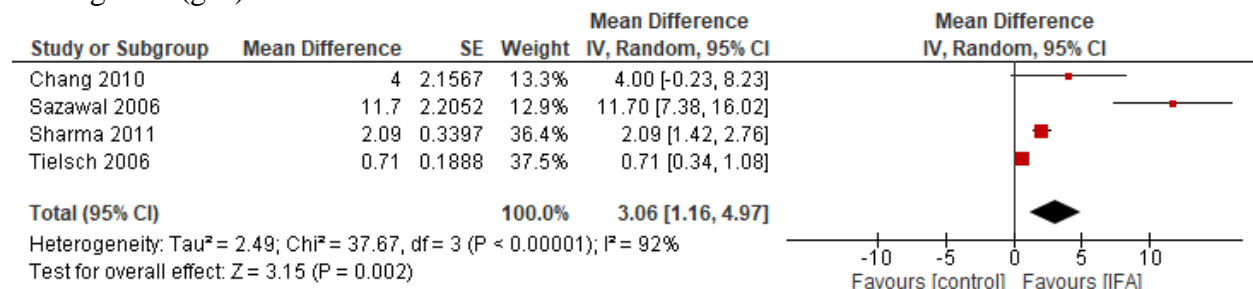


Anemia: nutritional status at baseline (anemic vs. non-anemic)

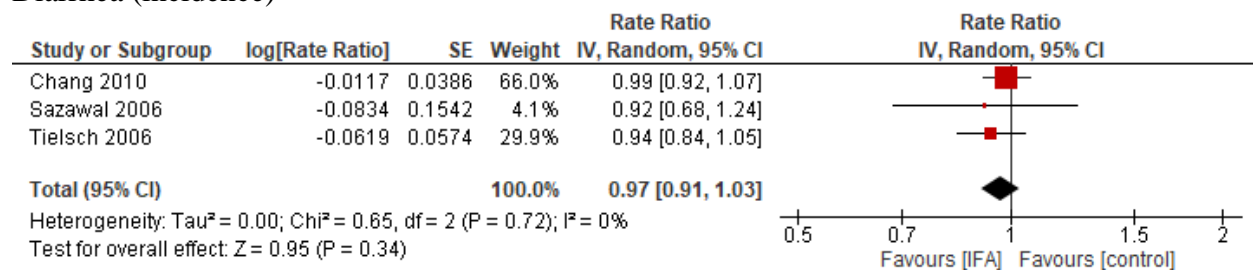


Comparison 4: Iron-folic Acid Supplementation vs. Placebo/No intervention (Efficacy)

Hemoglobin (g/L)

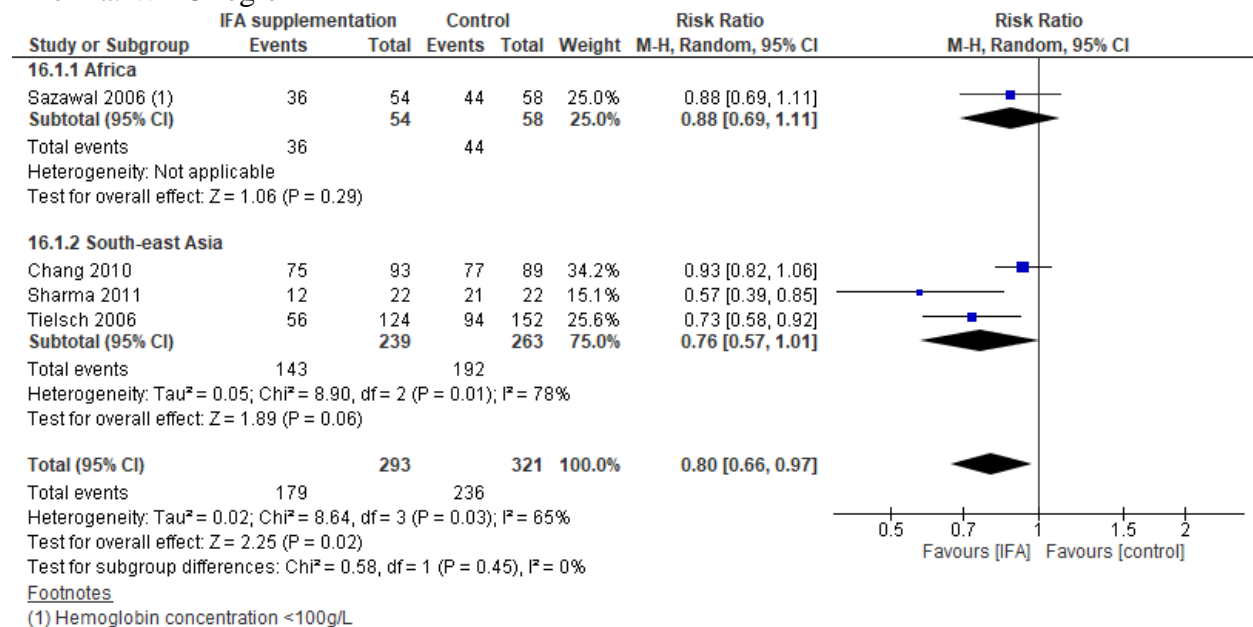


Diarrhea (incidence)

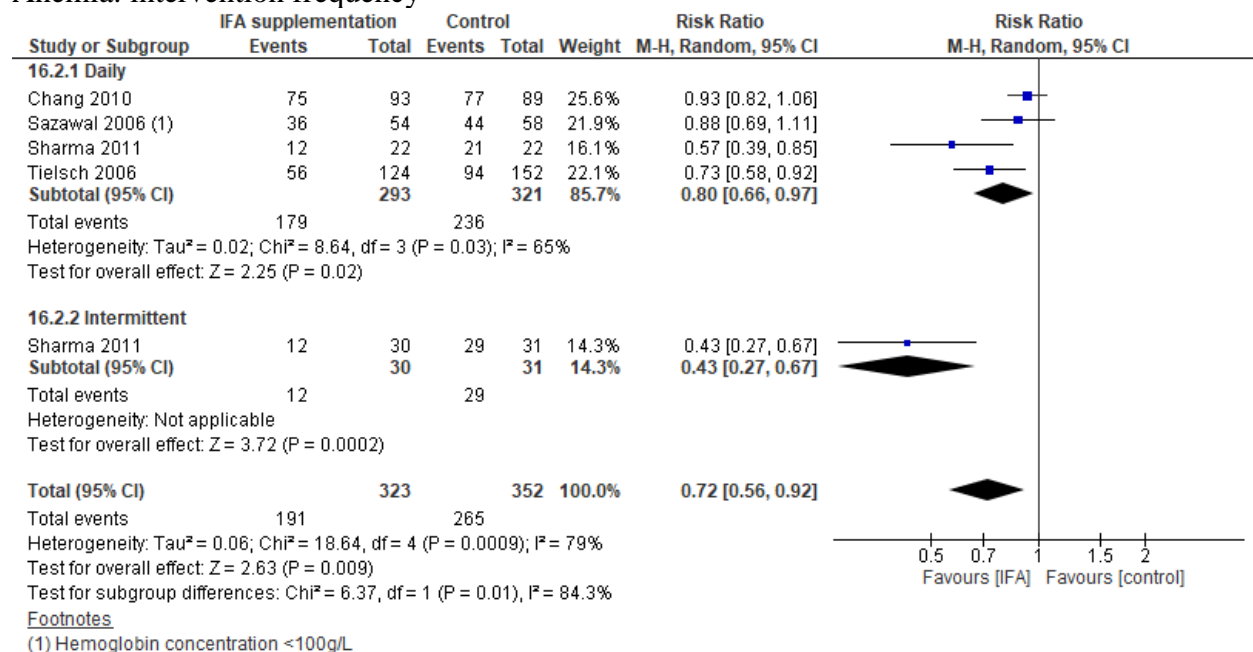


Comparison 4: Subgroup Analyses for Iron-folic Acid Supplementation vs. Placebo/No Intervention (Efficacy)

Anemia: WHO region

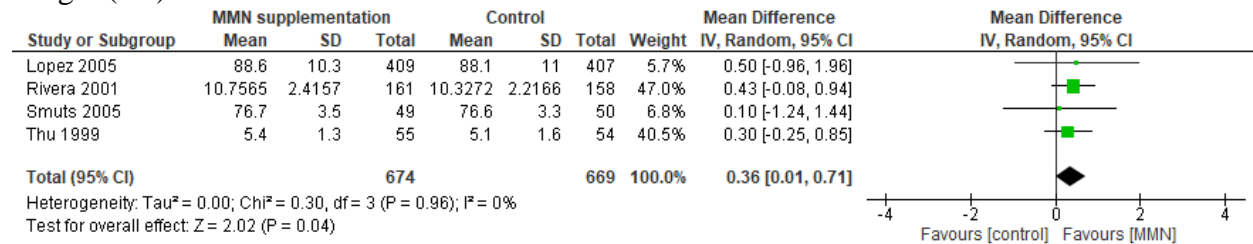


Anemia: intervention frequency

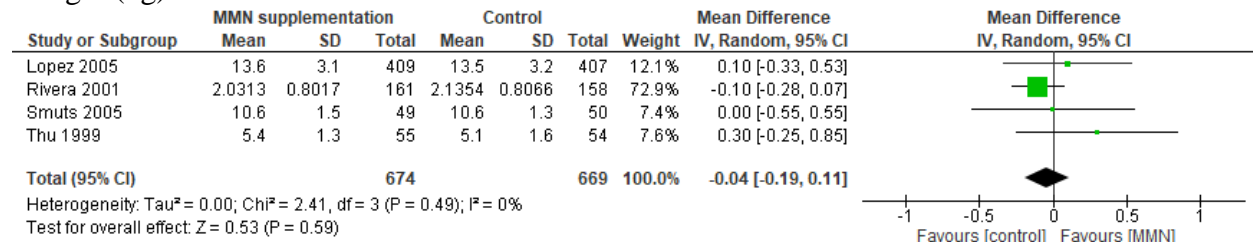


Comparison 5: MMN Supplementation vs. Placebo/No Intervention (Efficacy)

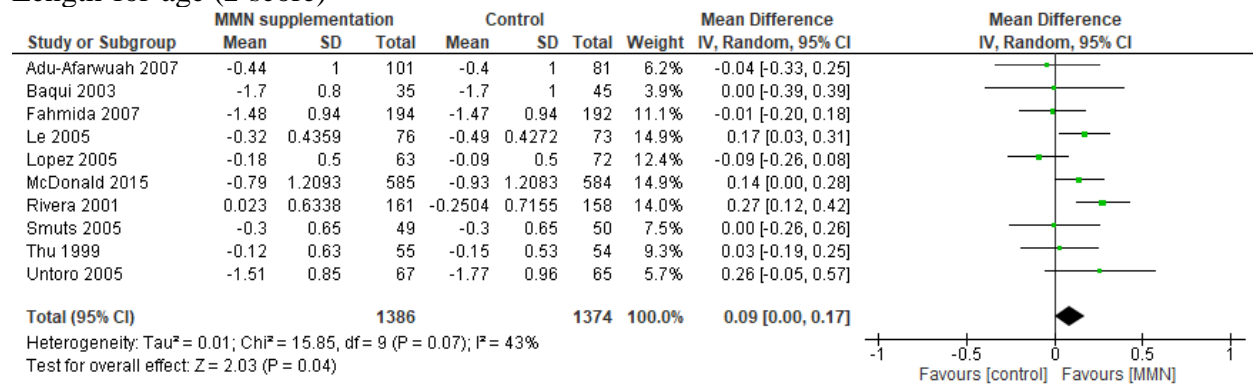
Height (cm)



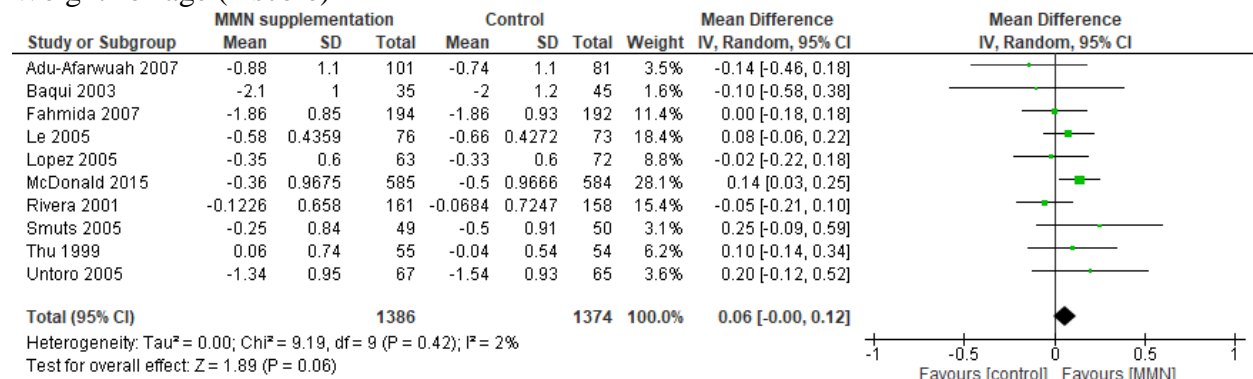
Weight (kg)



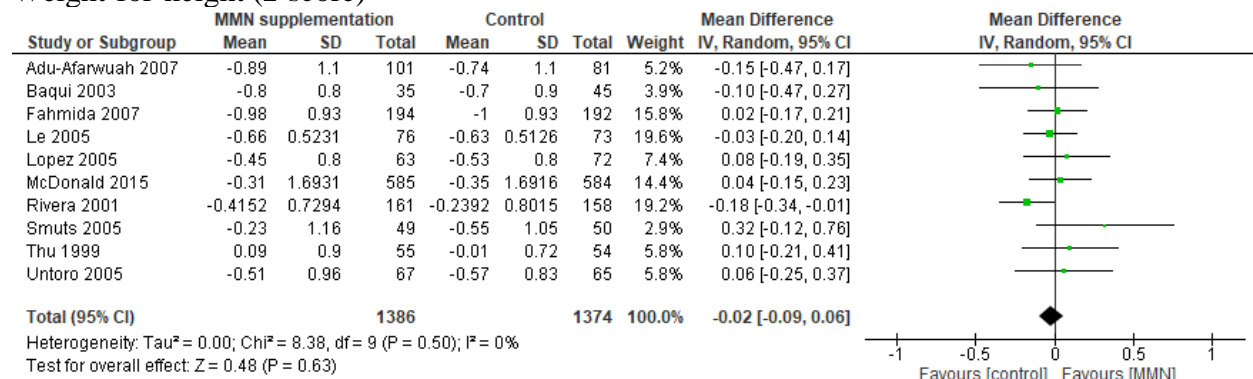
Length-for-age (z-score)



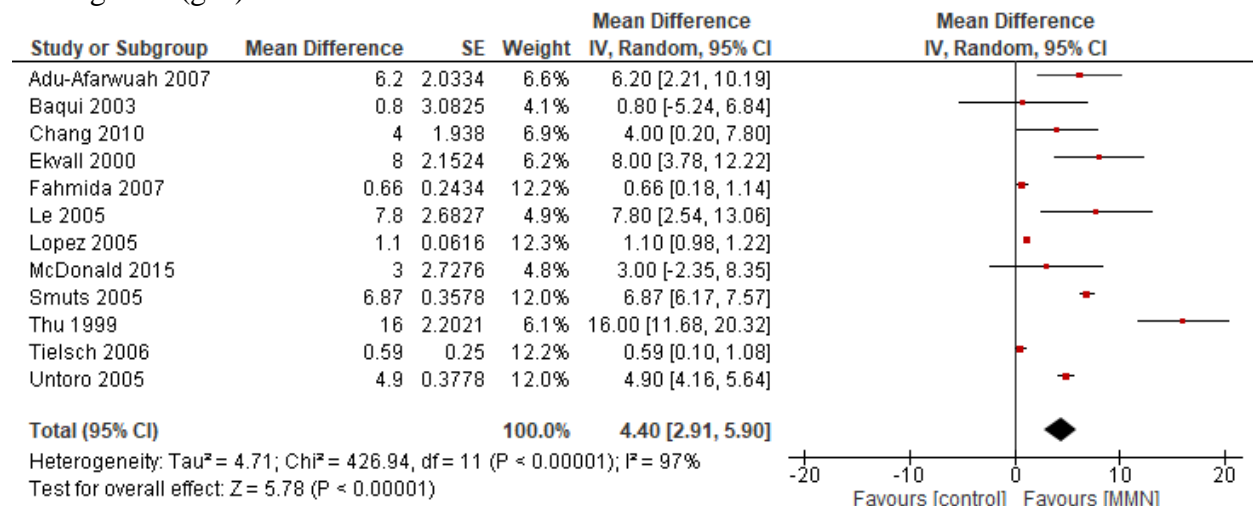
Weight-for-age (z-score)



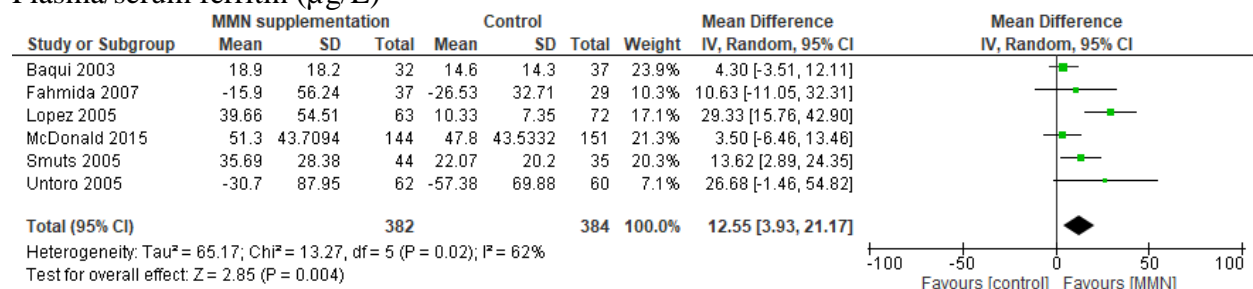
Weight-for-height (z-score)



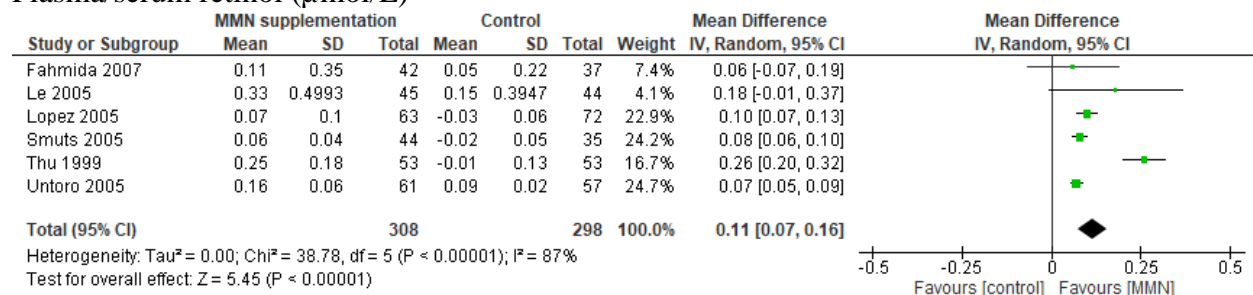
Hemoglobin (g/L)



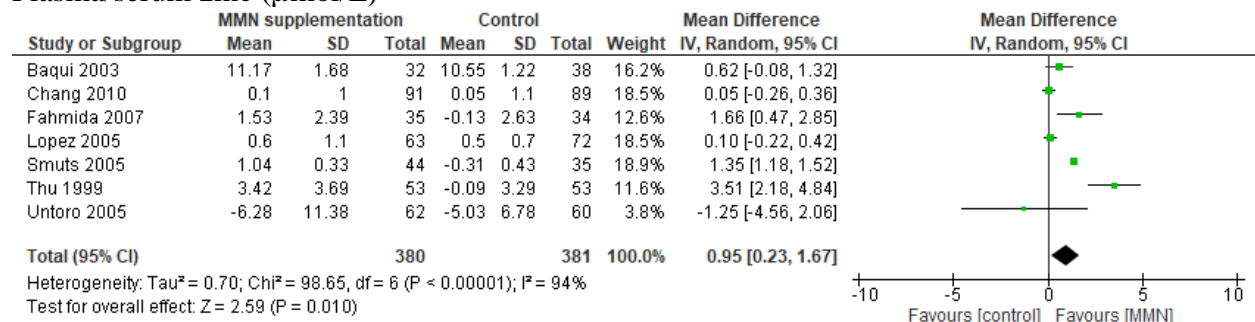
Plasma/serum ferritin ($\mu\text{g/L}$)



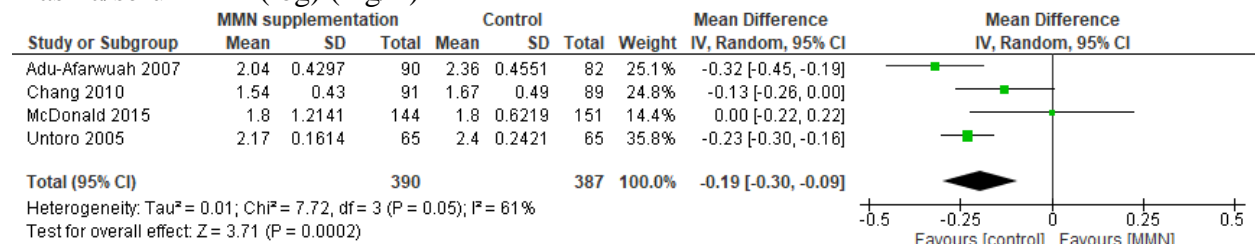
Plasma/serum retinol ($\mu\text{mol/L}$)



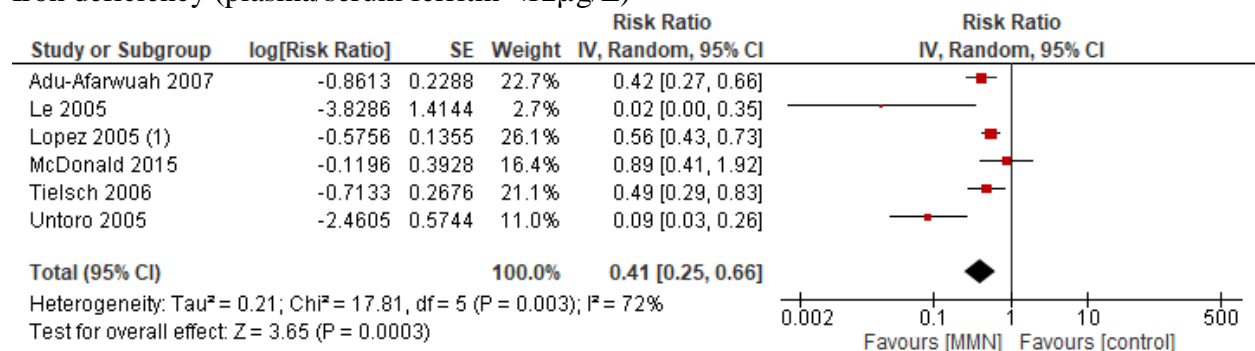
Plasma/serum zinc ($\mu\text{mol/L}$)



Plasma/serum TfR (log) (mg/L)



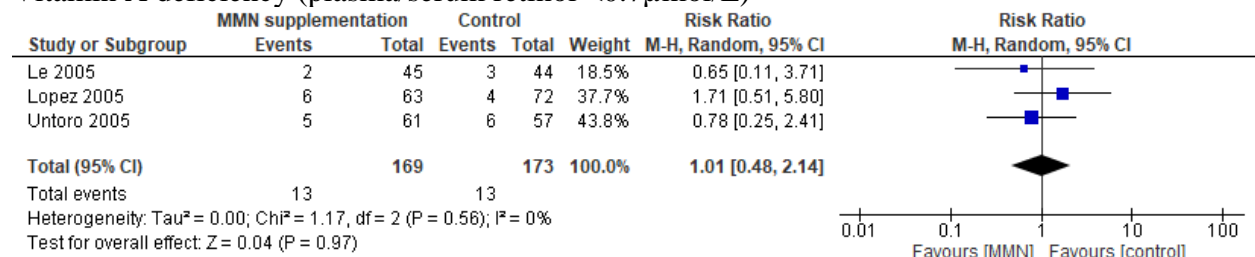
Iron deficiency (plasma/serum ferritin $<12\mu\text{g/L}$)



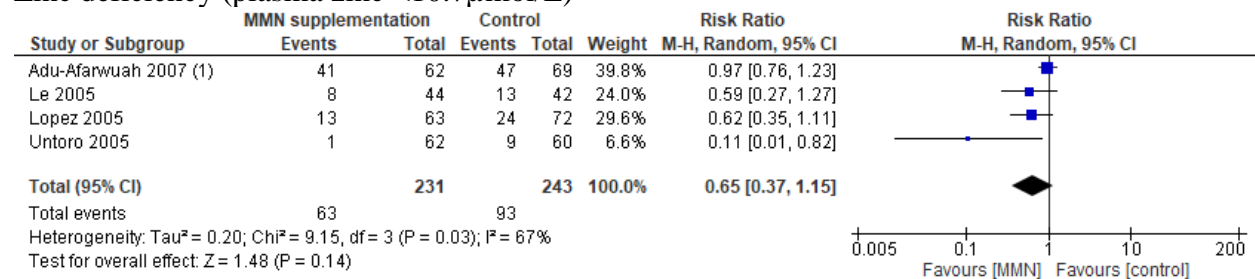
Footnotes

(1) Plasma ferritin $<20 \mu\text{g/L}$

Vitamin A deficiency (plasma/serum retinol $<0.7\mu\text{mol/L}$)



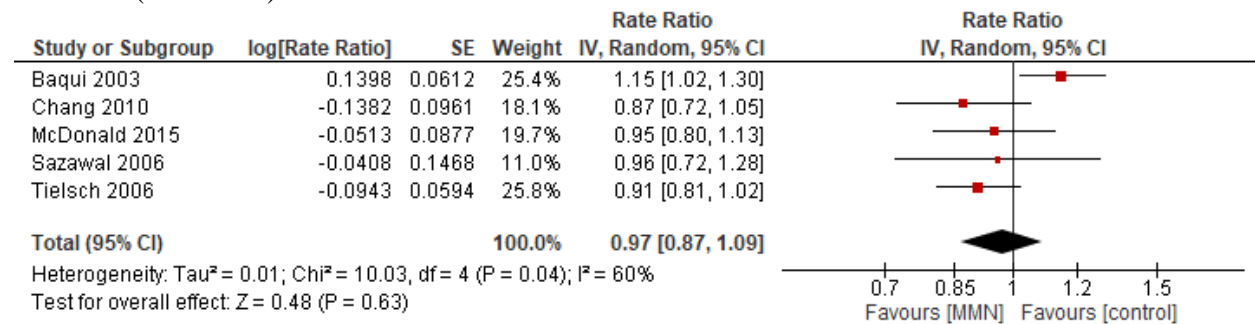
Zinc deficiency (plasma zinc <10.7μmol/L)



Footnotes

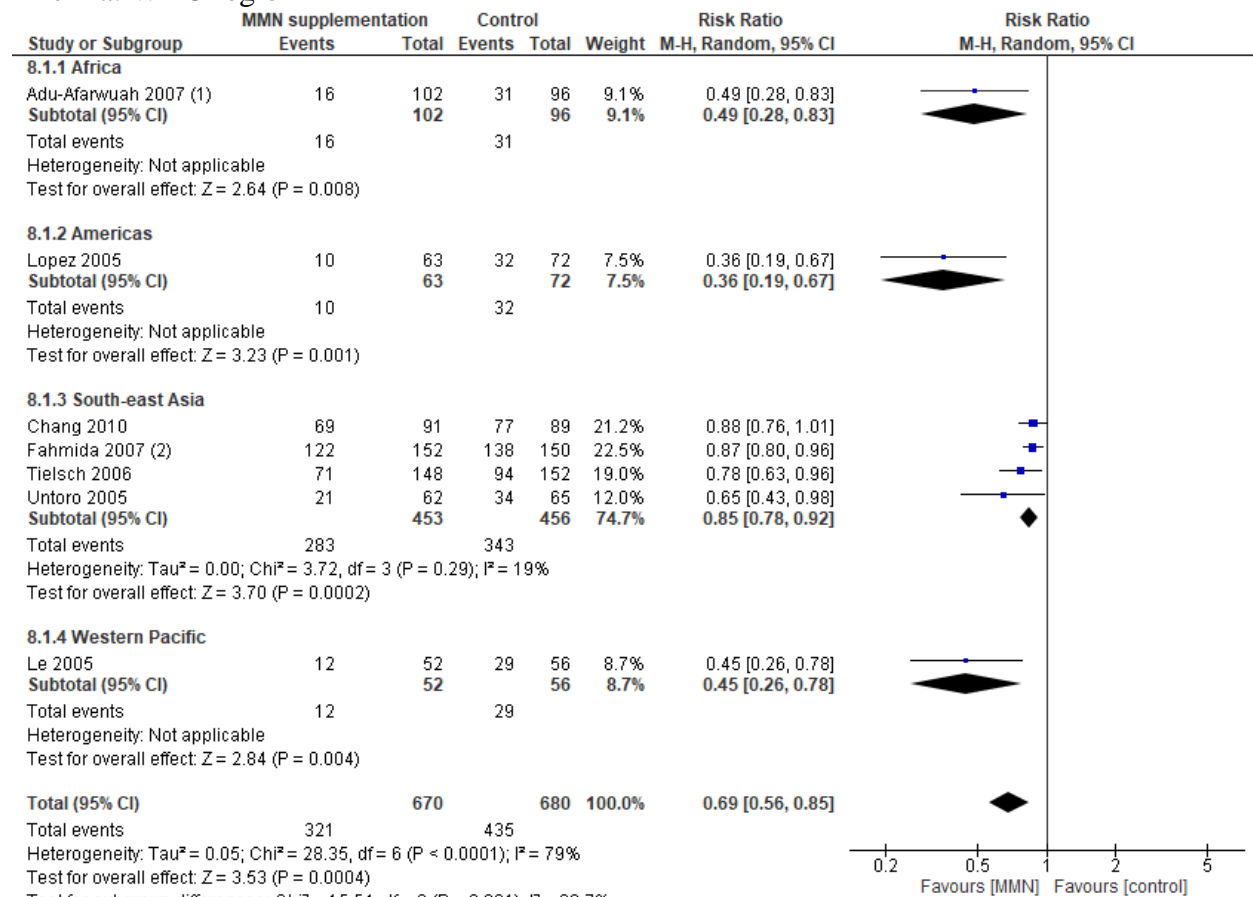
(1) plasma zinc <9.9μmol/L

Diarrhea (incidence)



Comparison 5: Subgroup Analyses for MMN Supplementation vs. Placebo/No Intervention (Efficacy)

Anemia: WHO region

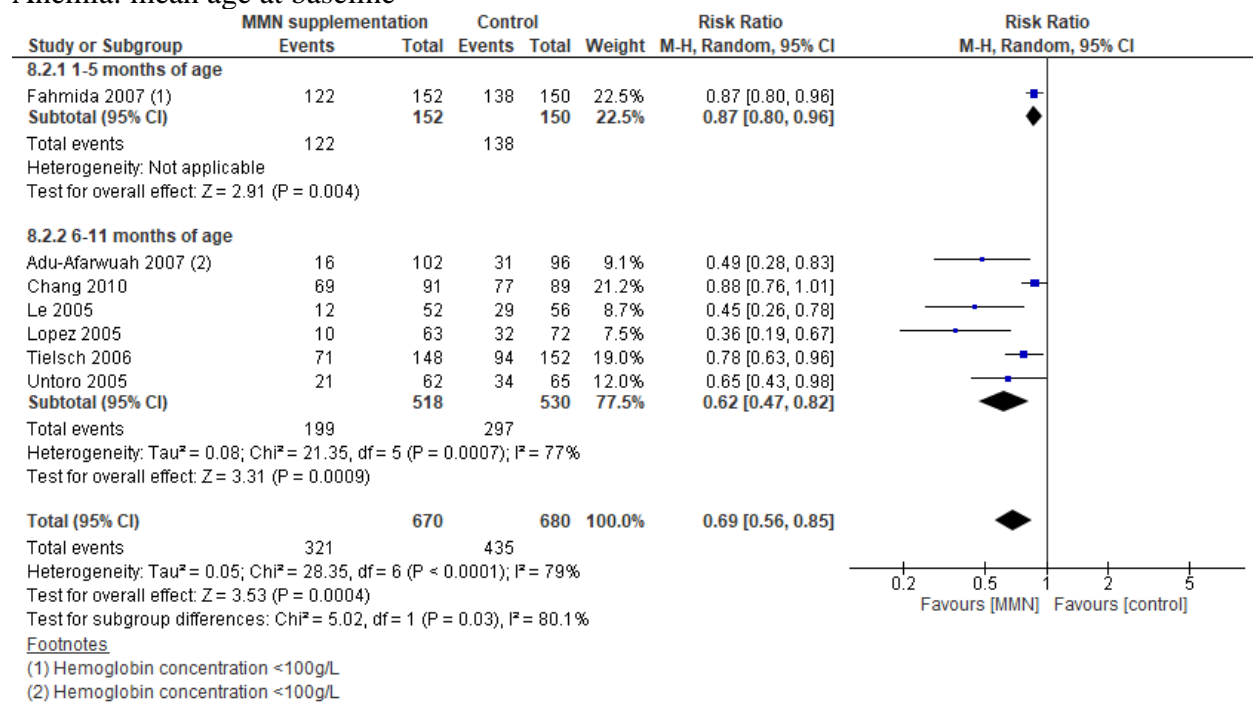


Footnotes

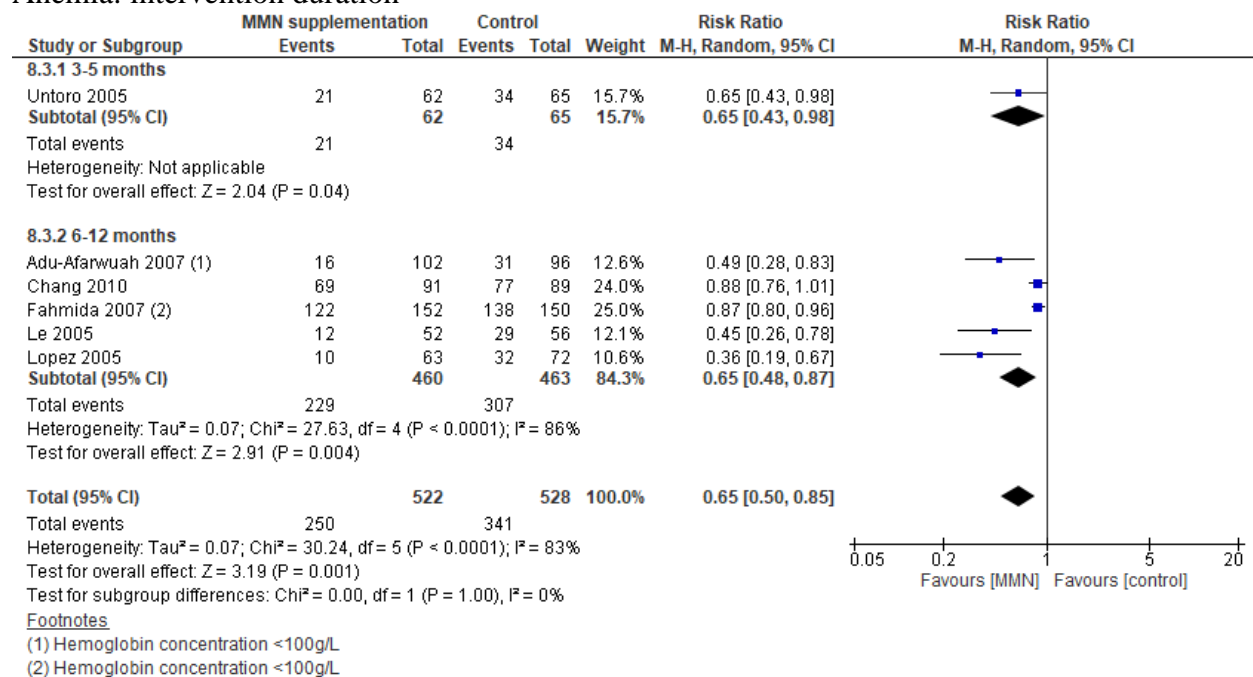
(1) Hemoglobin concentration <100g/L

(2) Hemoglobin concentration <100g/L

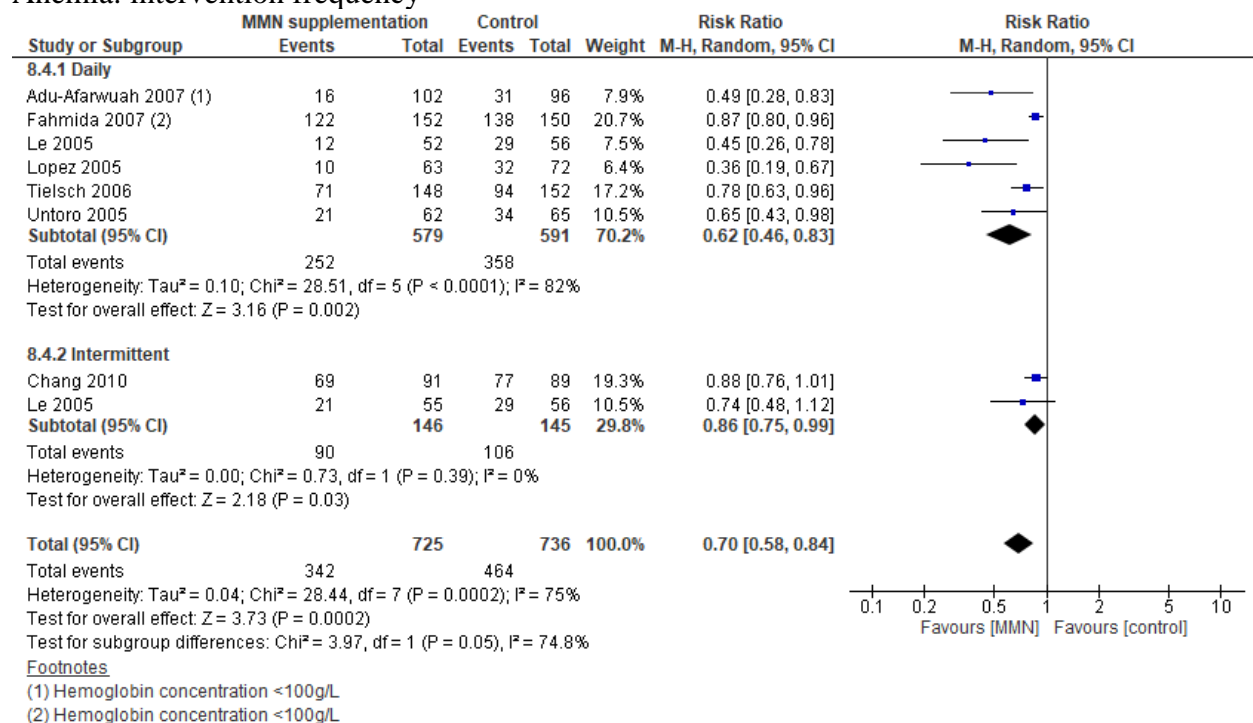
Anemia: mean age at baseline



Anemia: intervention duration

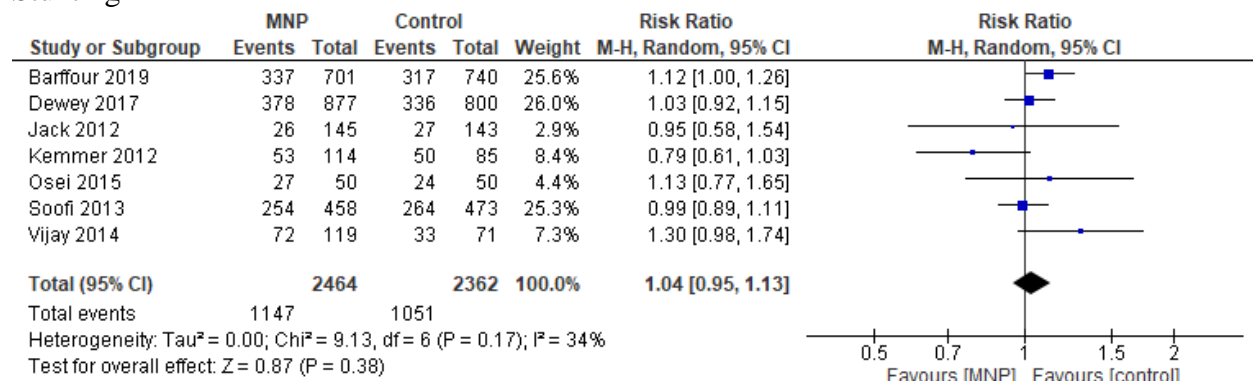


Anemia: intervention frequency

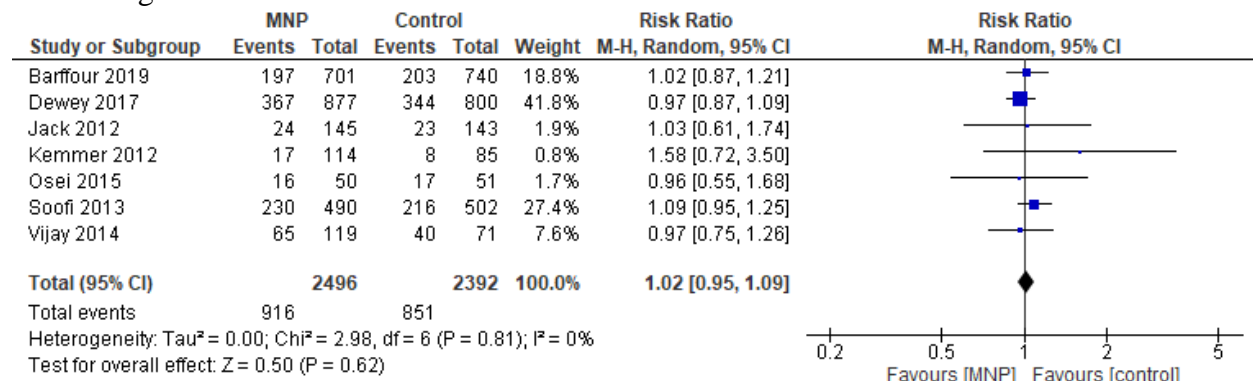


Comparison 6: Micronutrient powders vs. Placebo/No Intervention (Efficacy)

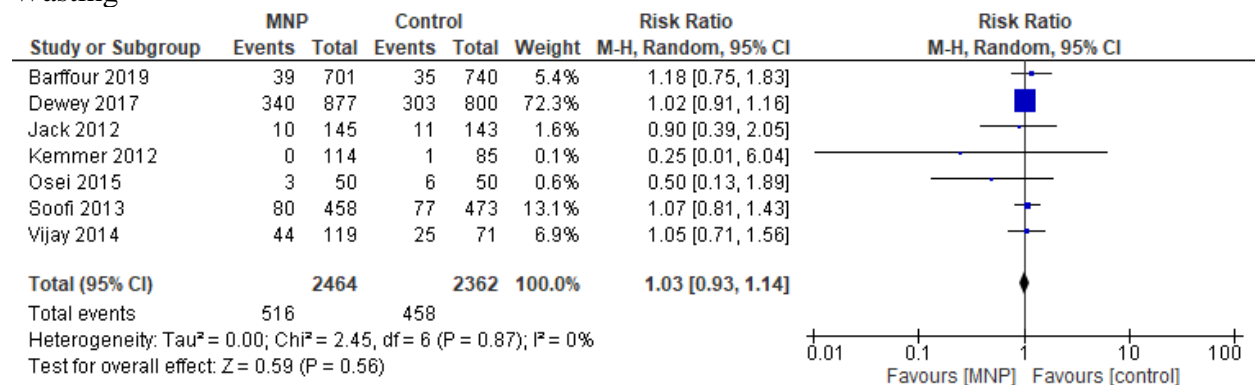
Stunting



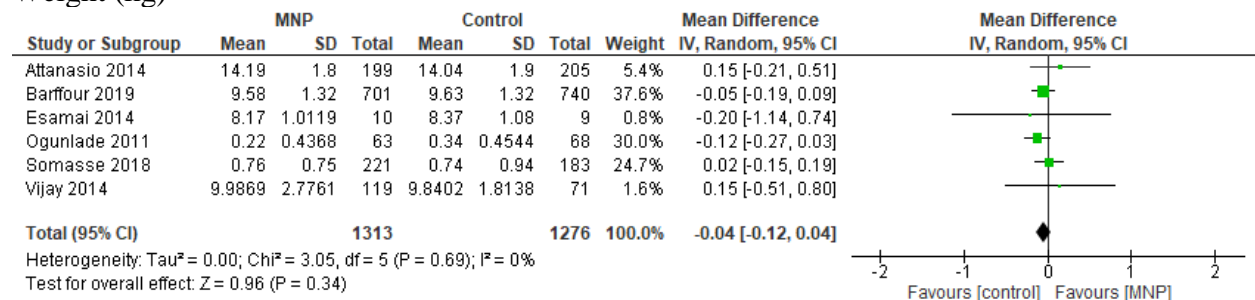
Underweight



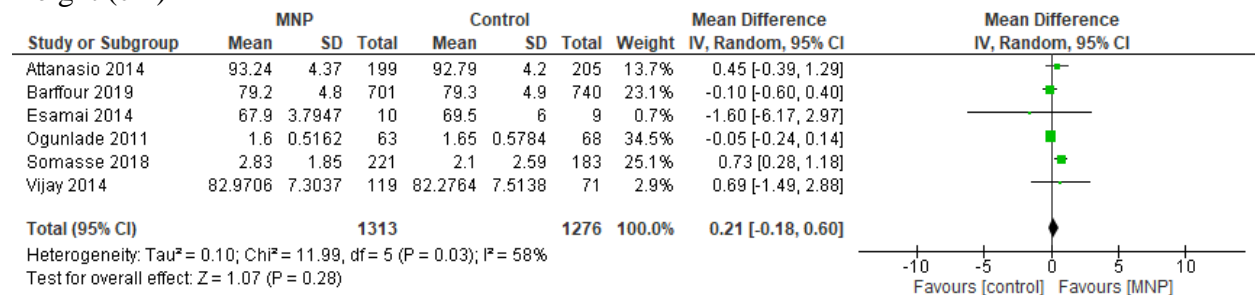
Wasting



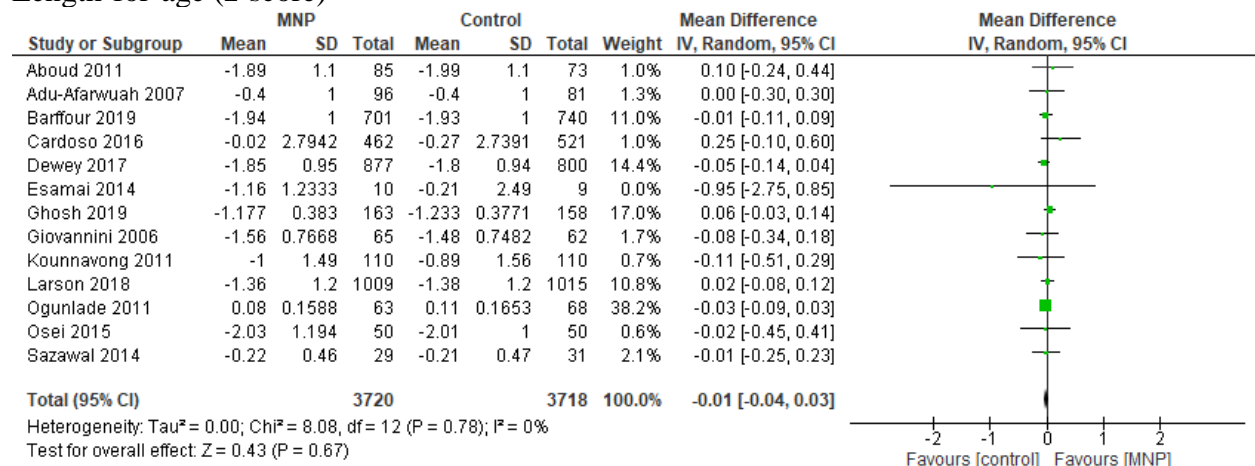
Weight (kg)



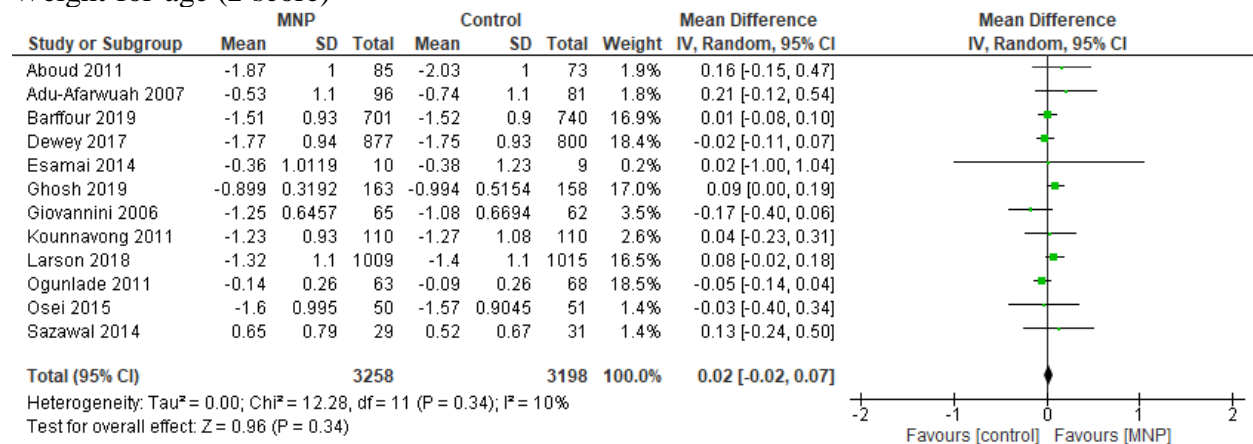
Height (cm)



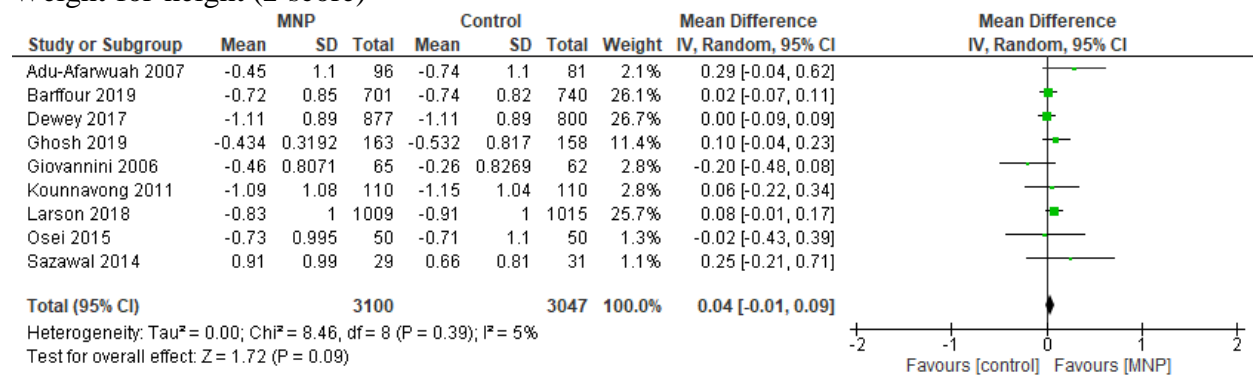
Length-for-age (z-score)



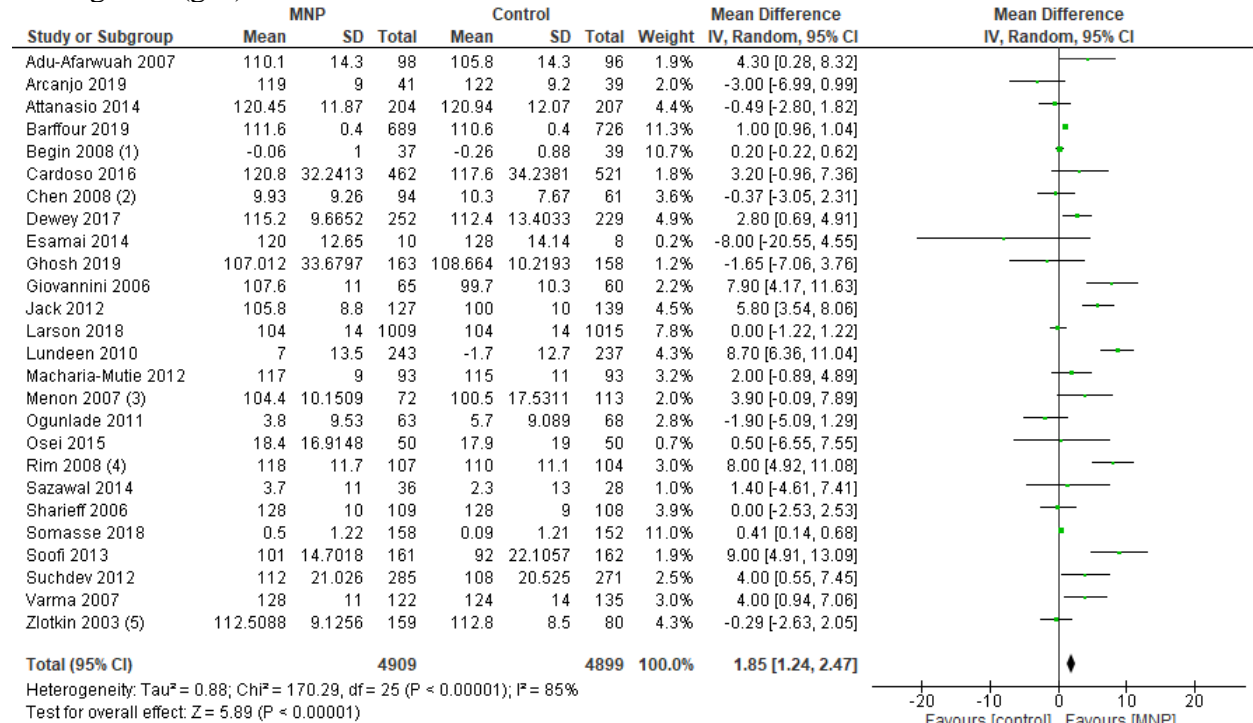
Weight-for-age (z-score)



Weight-for-height (z-score)



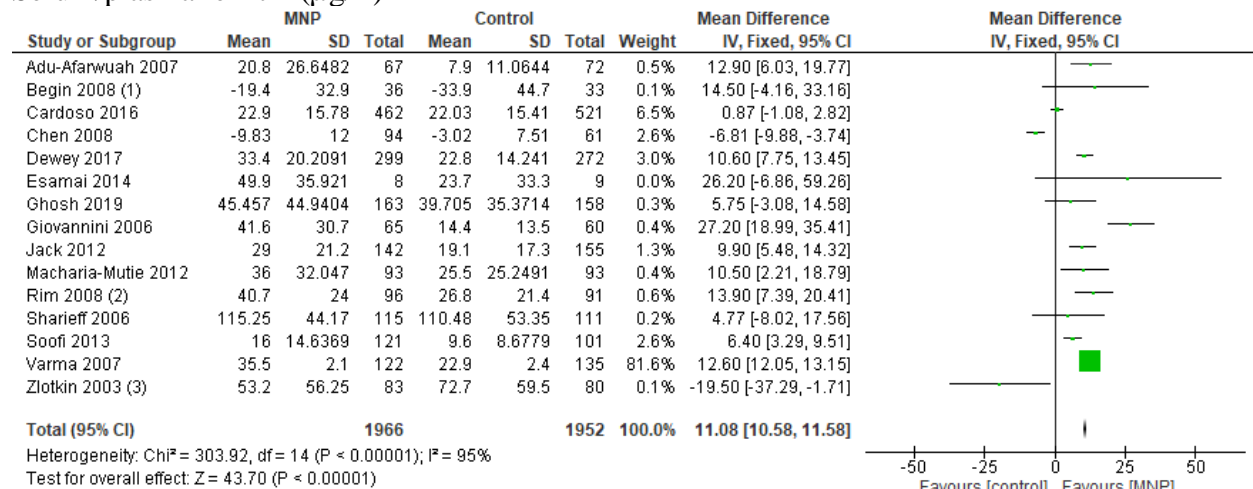
Hemoglobin (g/L)



Footnotes

- (1) Both groups received whey protein concentrate.
- (2) MMN (with vitamin A) versus vitamin A-fortified seasoning powder
- (3) Both groups received iron-fortified wheat-soy blend.
- (4) MNP contains iron only
- (5) MNP contains iron alone or iron + vitamin A

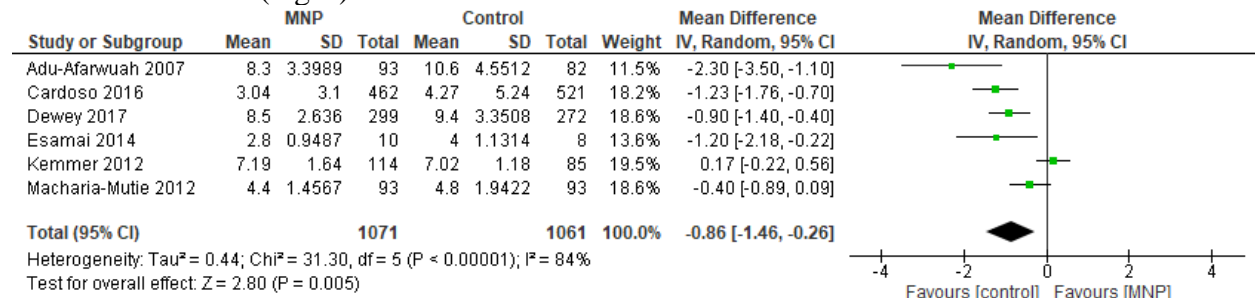
Serum/plasma ferritin (µg/L)



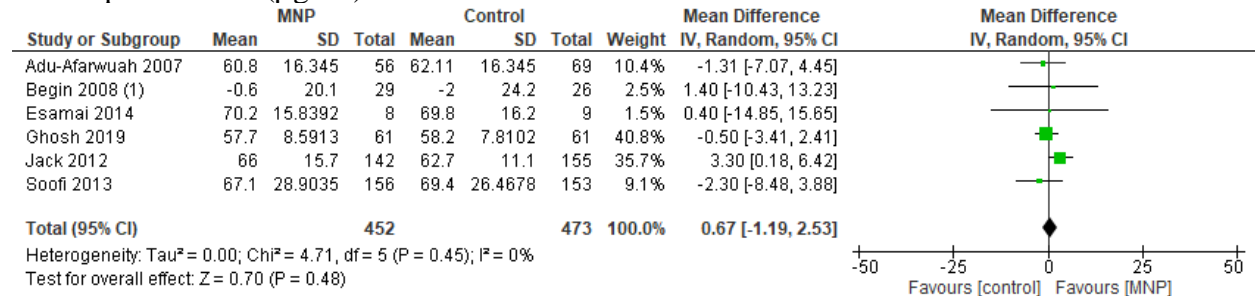
Footnotes

- (1) Both groups received whey protein concentrate.
- (2) MNP fortified with iron only (intervention)
- (3) MNP fortified with iron and vitamin A only

Plasma/serum TfR (mg/L)



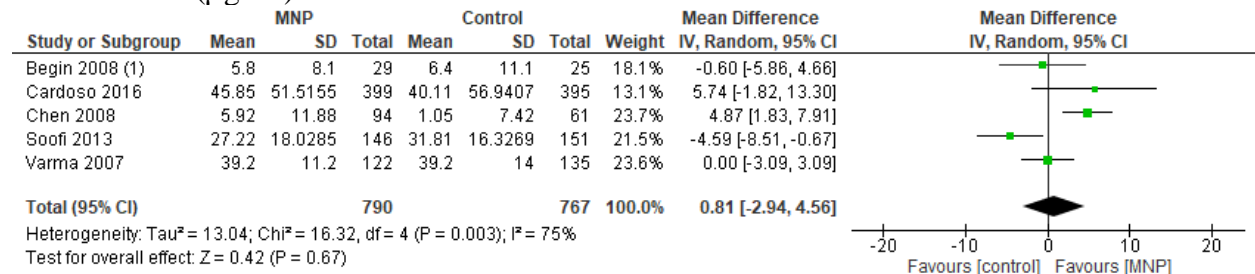
Serum/plasma zinc ($\mu\text{g/dL}$)



Footnotes

(1) Both groups received whey protein concentrate.

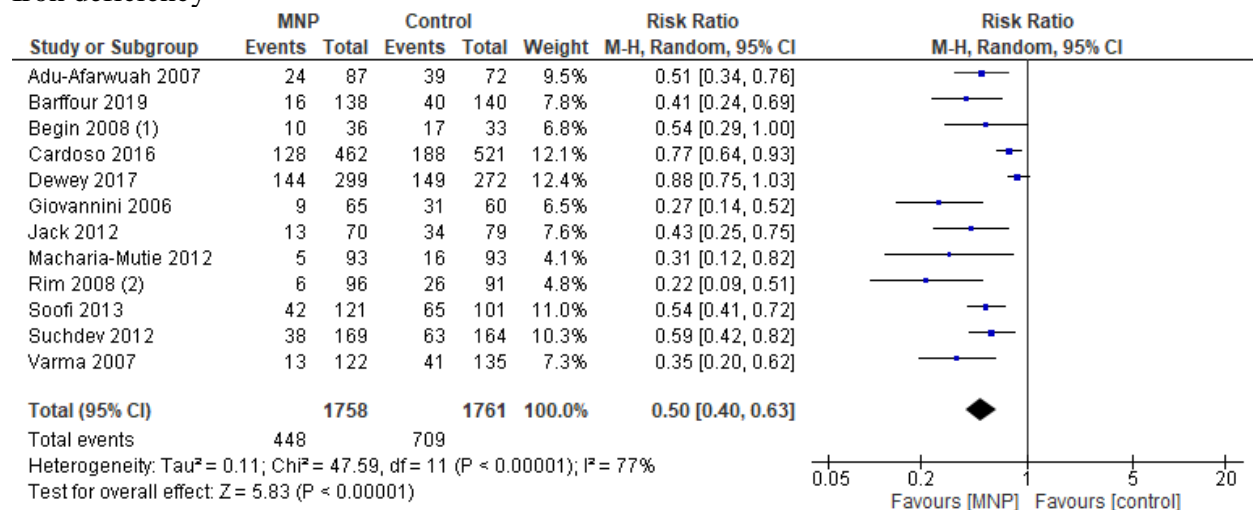
Serum retinol ($\mu\text{g/dL}$)



Footnotes

(1) Both groups received whey protein concentrate.

Iron deficiency

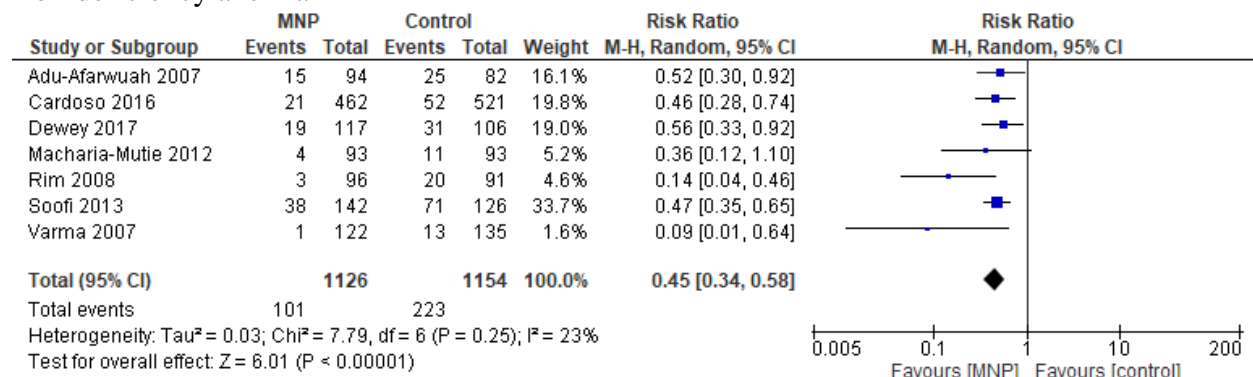


Footnotes

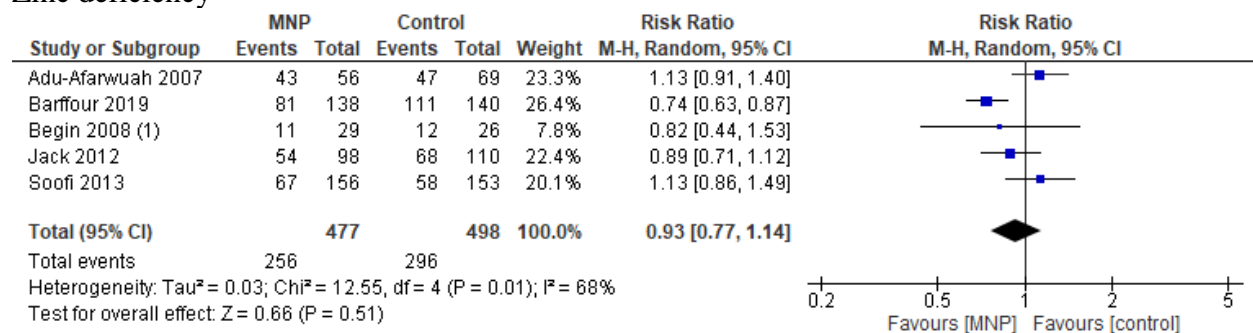
(1) Both groups received whey protein concentrate.

(2) MNP contains iron only

Iron-deficiency anemia



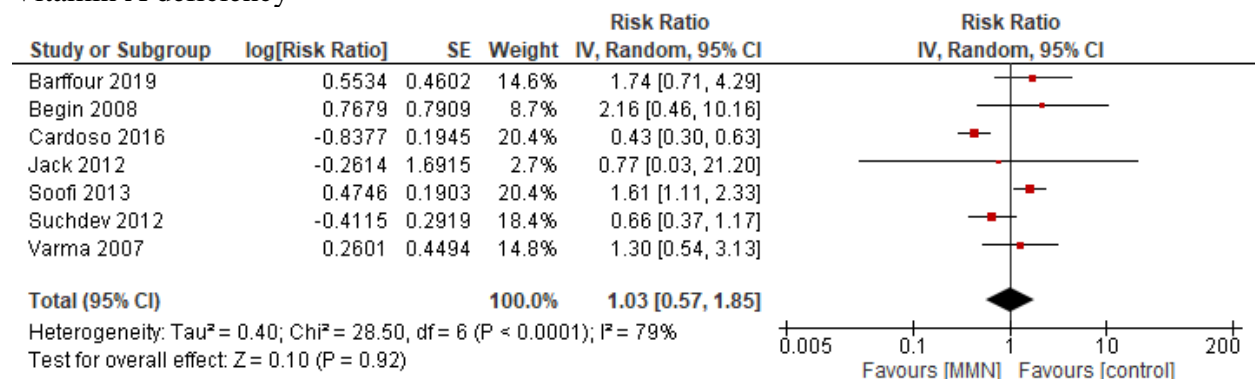
Zinc deficiency



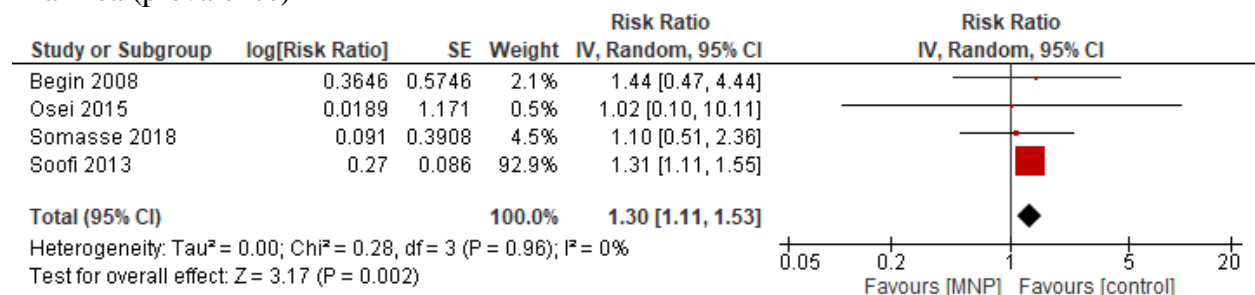
Footnotes

(1) Both groups received whey protein concentrate.

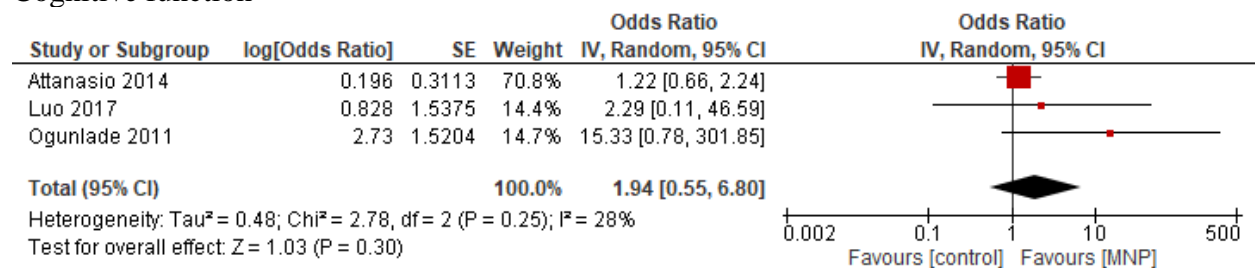
Vitamin A deficiency



Diarrhea (prevalence)

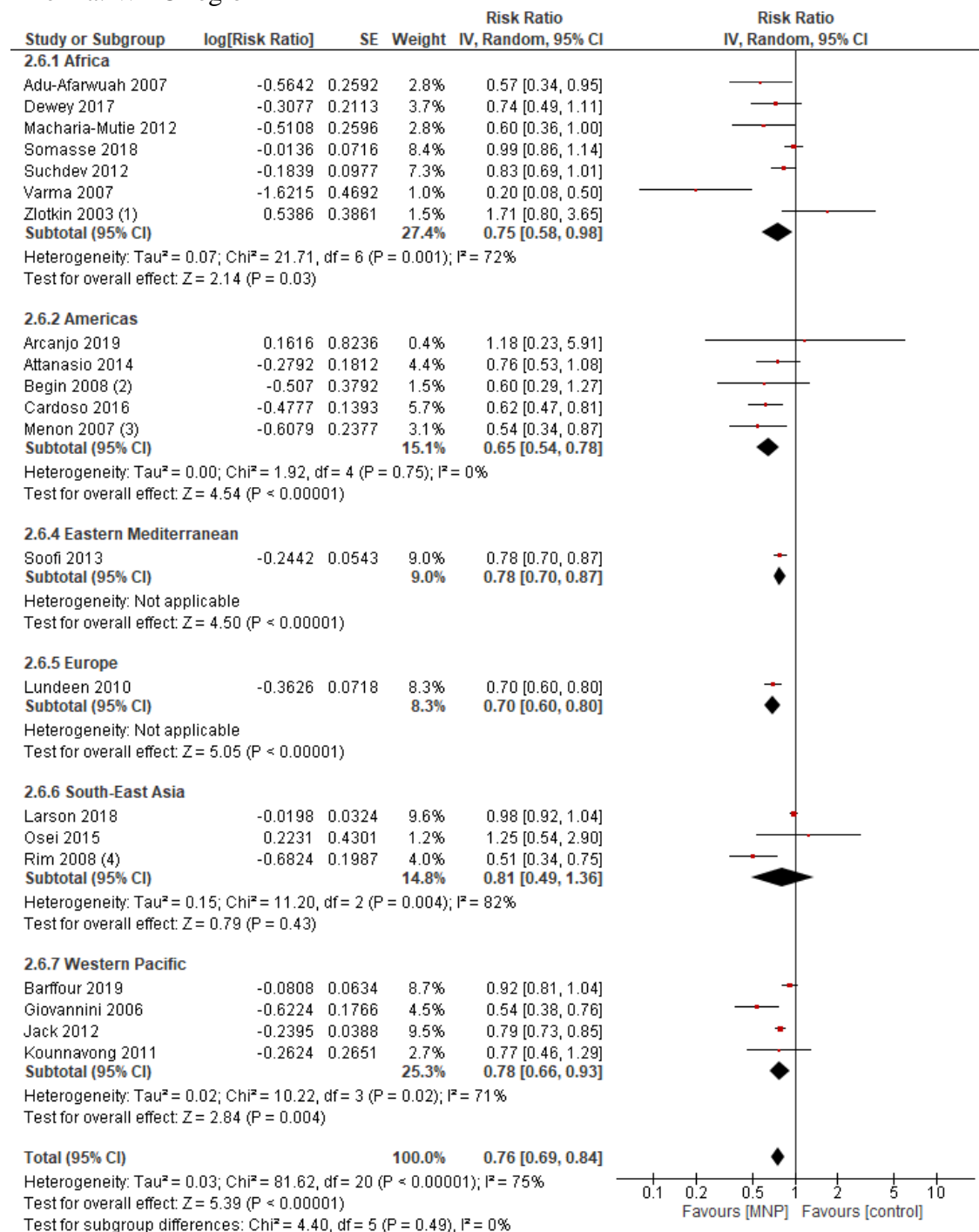


Cognitive function



Comparison 6: Subgroup Analyses for Micronutrient Powders vs. Placebo/No Intervention (Efficacy)

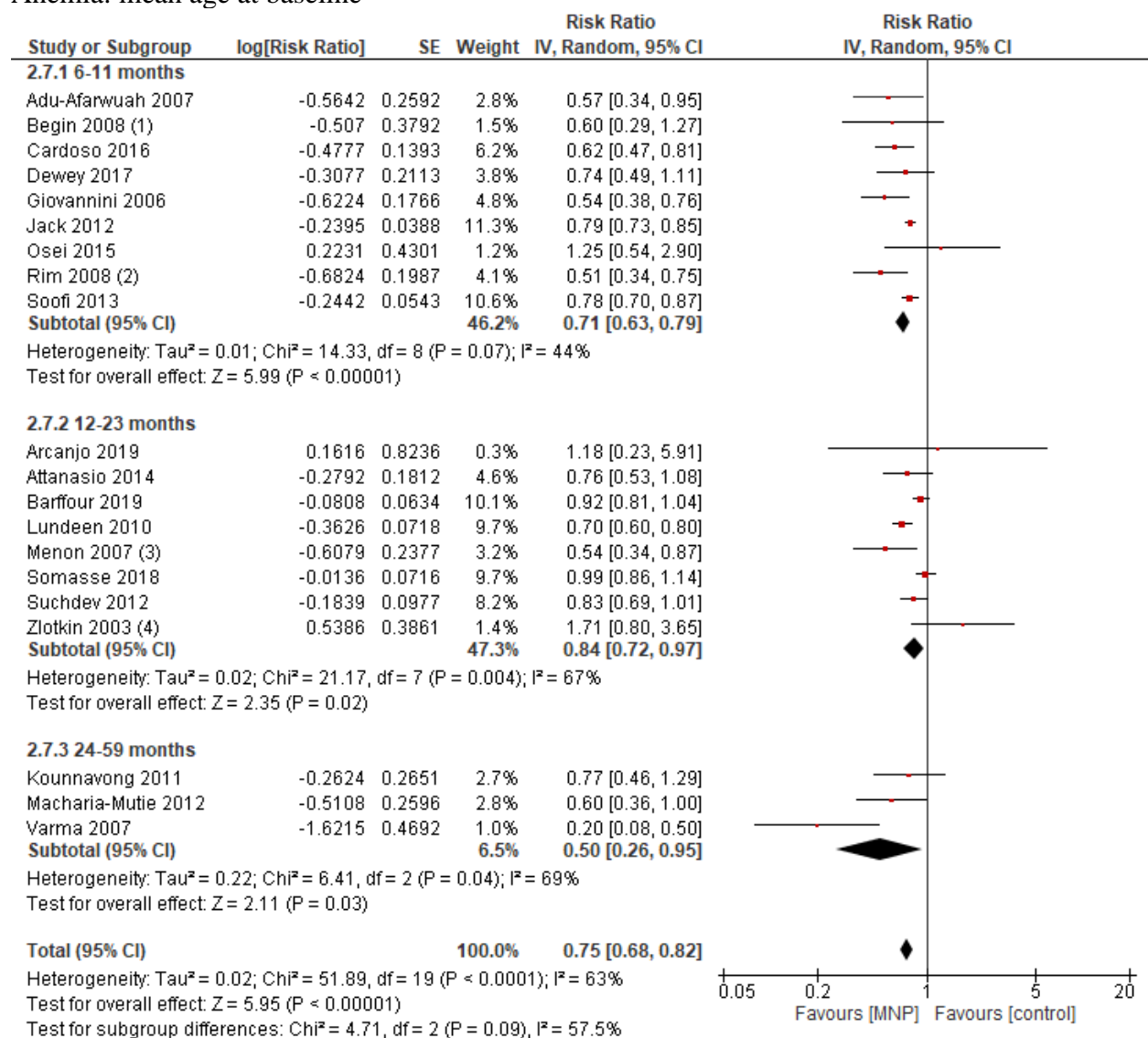
Anemia: WHO region



Footnotes

- (1) MNP contains iron & vitamin A only
- (2) Both groups received whey protein concentrate
- (3) Both groups received iron fortified wheat soy blend
- (4) MNP contains iron only

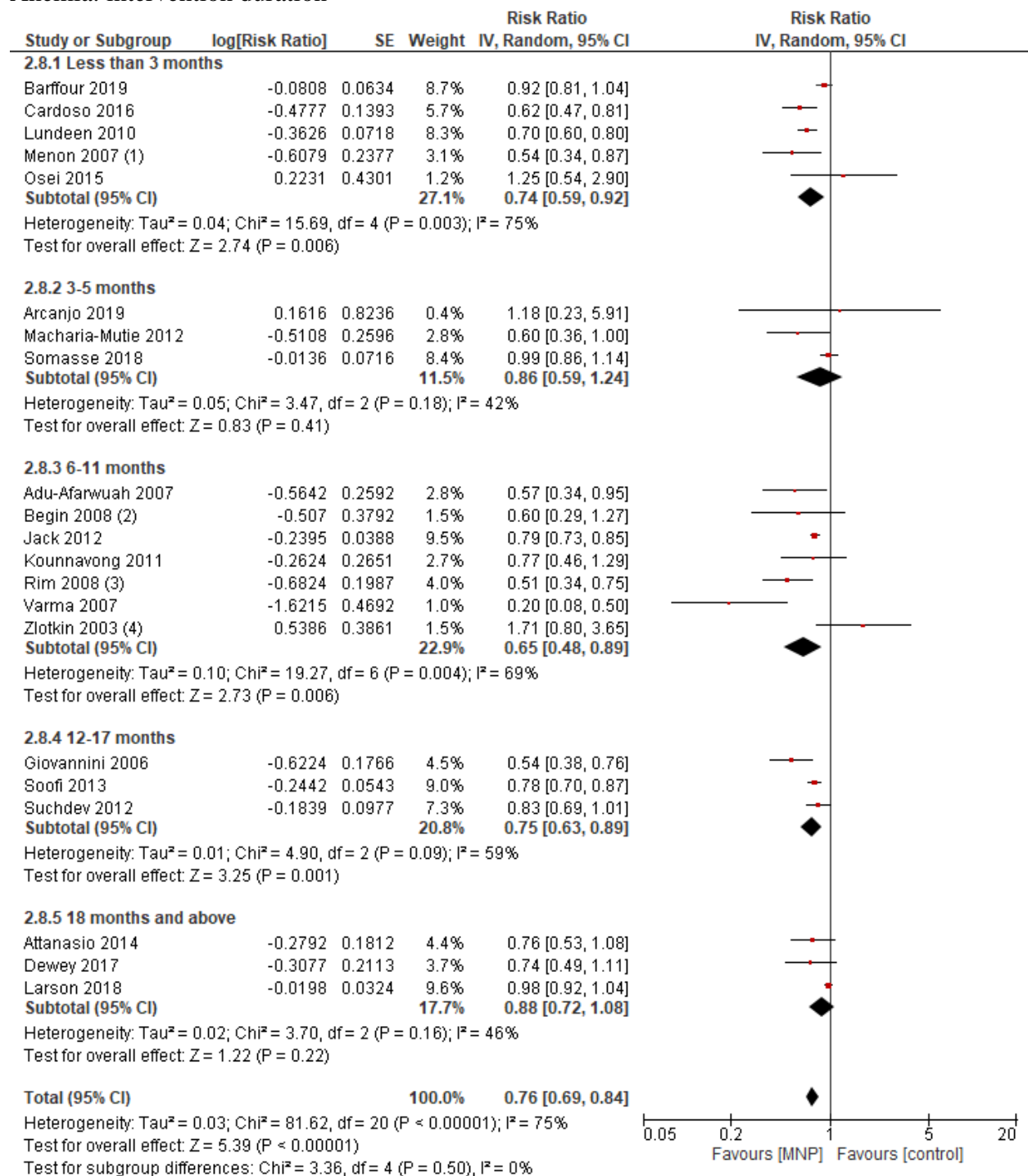
Anemia: mean age at baseline



Footnotes

- (1) Both groups received why protein concentrate
- (2) MNP contains iron only
- (3) Both groups received iron fortified wheat soy blend
- (4) MNP contains iron & vitamin A only

Anemia: intervention duration



Footnotes

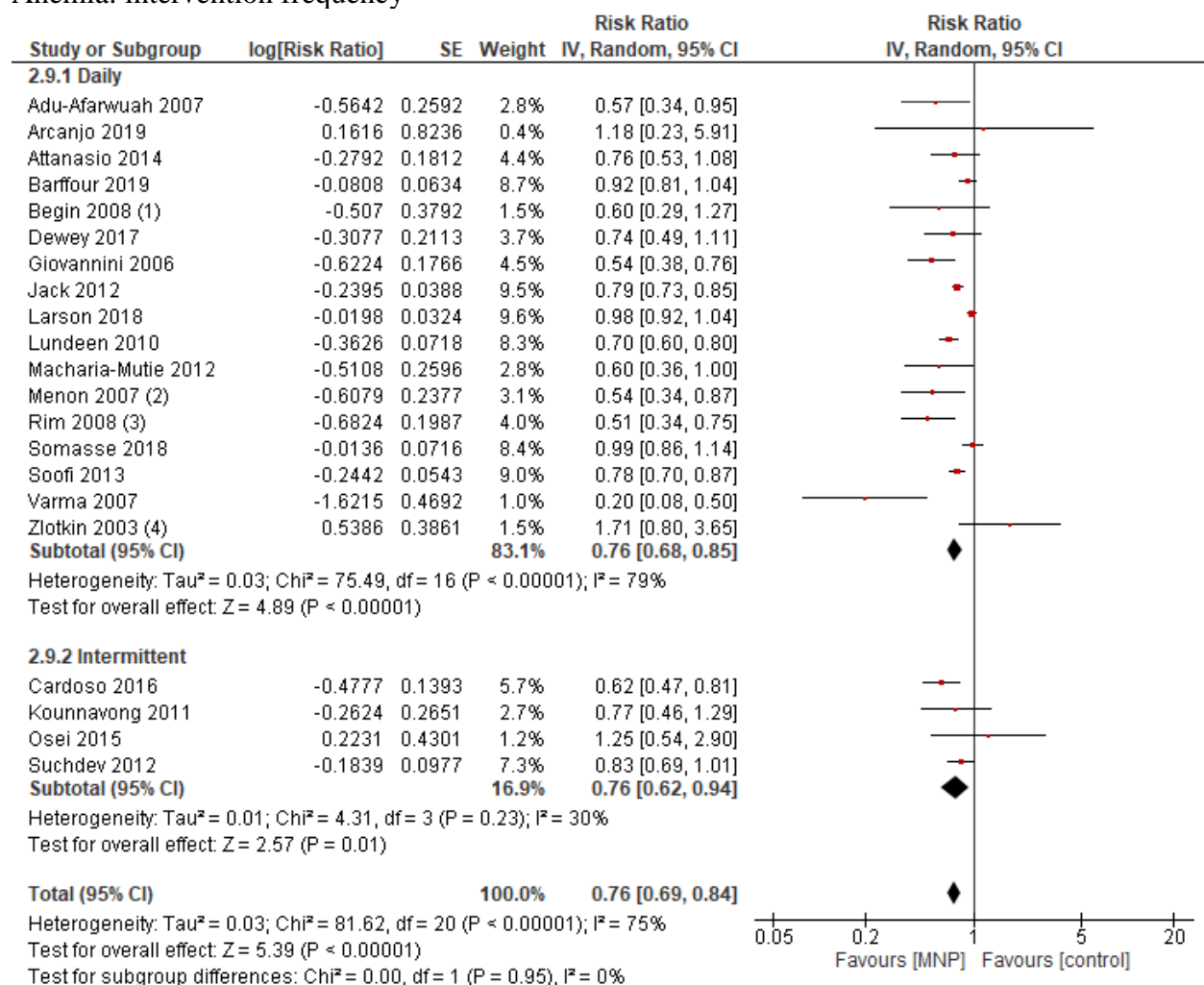
(1) Both groups received iron fortified wheat soy blend

(2) Both groups received whey protein concentrate

(3) MNP contains iron only

(4) MNP contains iron & vitamin A only

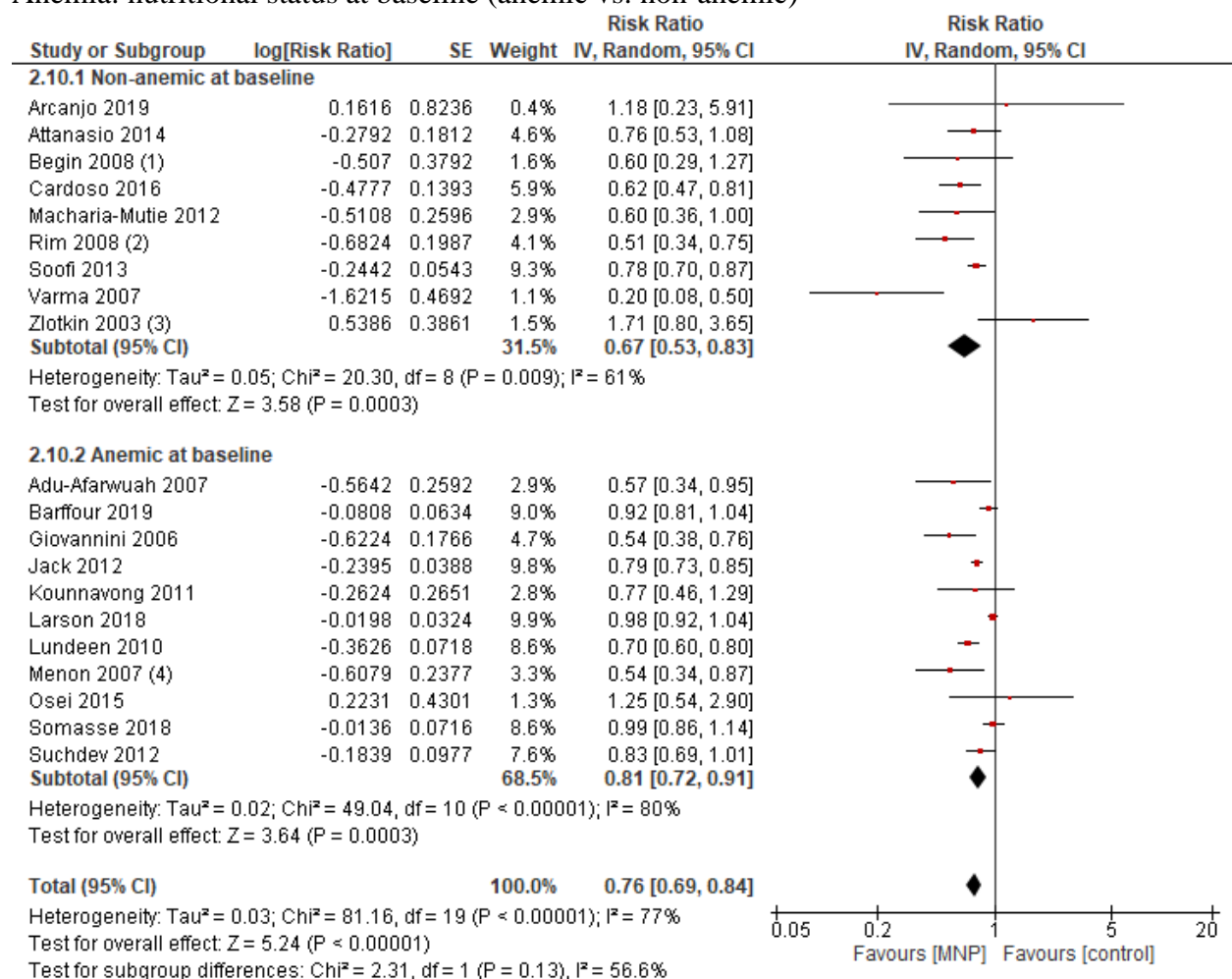
Anemia: intervention frequency



Footnotes

- (1) Both groups received why protein concentrate
- (2) Both groups received iron fortified wheat soy blend
- (3) MNP contains iron only
- (4) MNP contains iron & vitamin A only

Anemia: nutritional status at baseline (anemic vs. non-anemic)



Footnotes

(1) Both groups received why protein concentrate

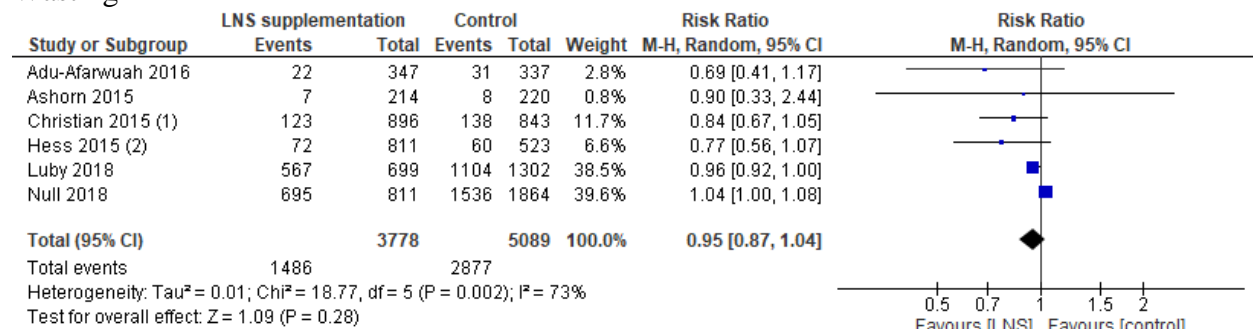
(2) MNP contains iron only

(3) MNP contains iron & vitamin A only

(4) Both groups received iron fortified wheat soy blend

Comparison 7: Lipid-based Nutrient Supplementation vs. Placebo/No Intervention (Efficacy)

Wasting

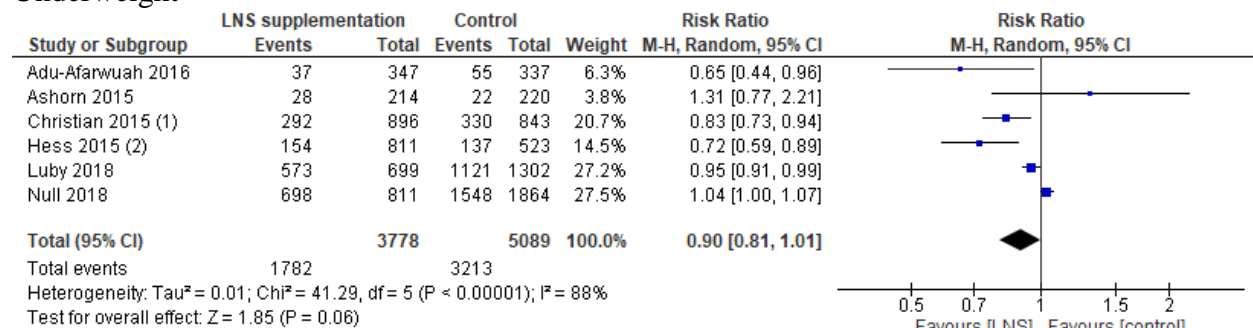


Footnotes

(1) Plumpy'doz group only

(2) LNS (Zn 5mg) and LNS (Zn 10mg) groups were combined into one group

Underweight

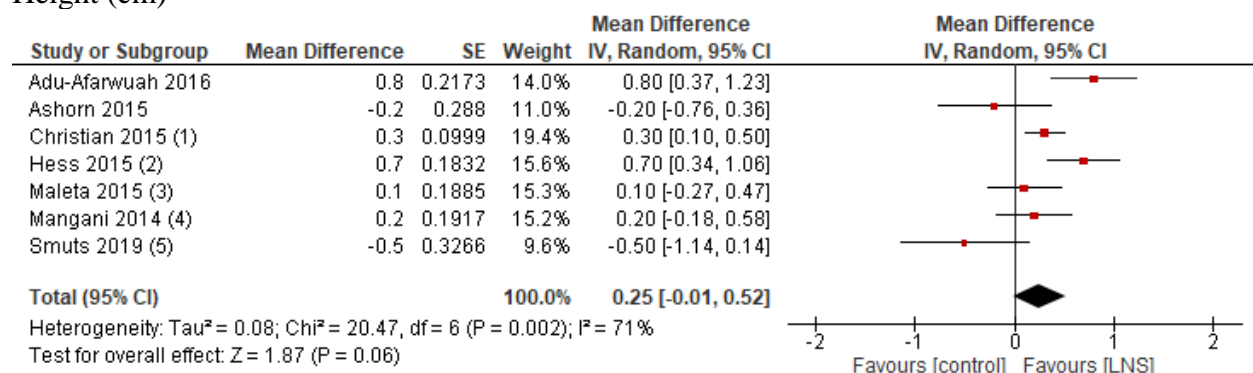


Footnotes

(1) Plumpy'doz group only

(2) LNS (Zn 5mg) and LNS (Zn 10mg) groups were combined into one group

Height (cm)



Footnotes

(1) Plumpy'doz group only

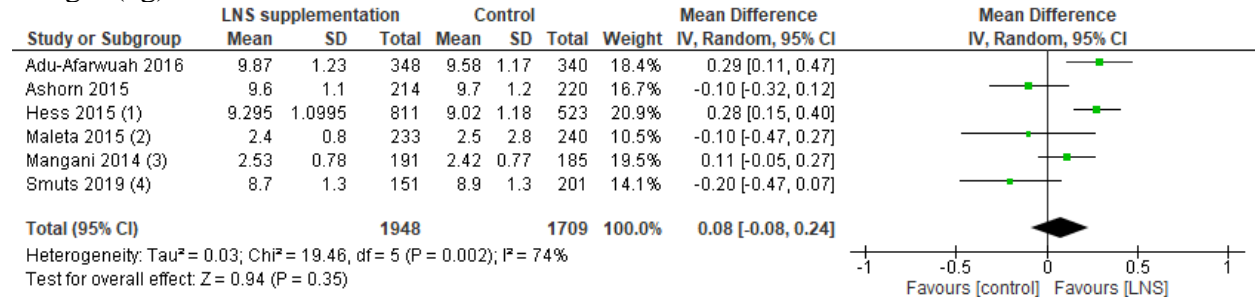
(2) LNS (Zn 5mg) and LNS (Zn 10mg) groups were combined into one group

(3) 20g LNS group only

(4) LNS (with milk) group only

(5) SQ LNS group only

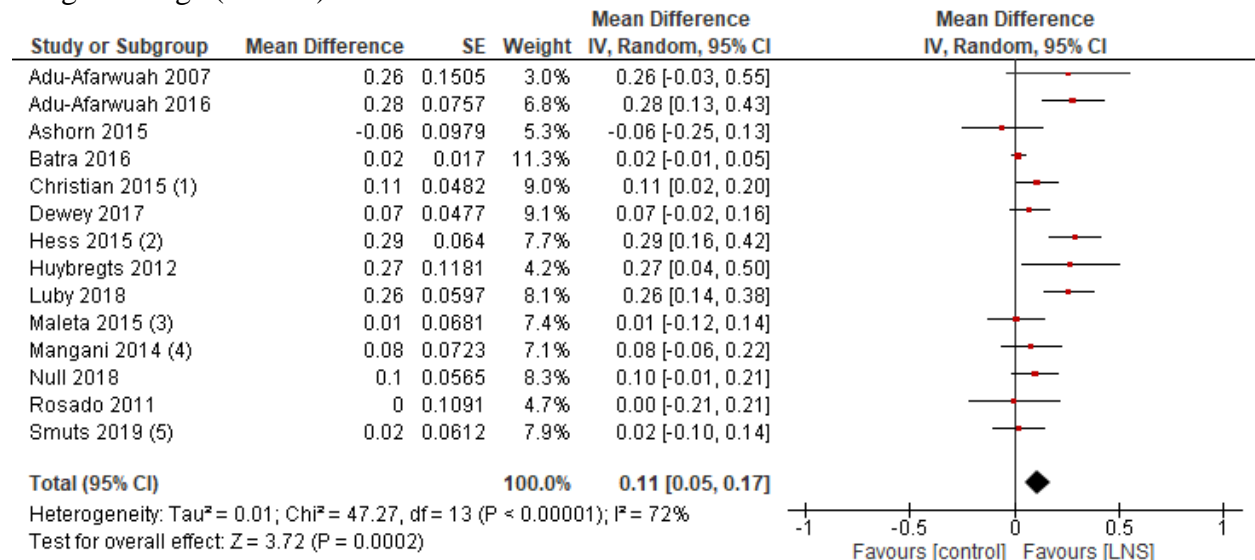
Weight (kg)



Footnotes

- (1) LNS (Zn 5mg) and LNS (Zn 10mg) groups were combined into one group
- (2) 20g LNS group only
- (3) LNS (with milk) group only
- (4) SQ LNS group only

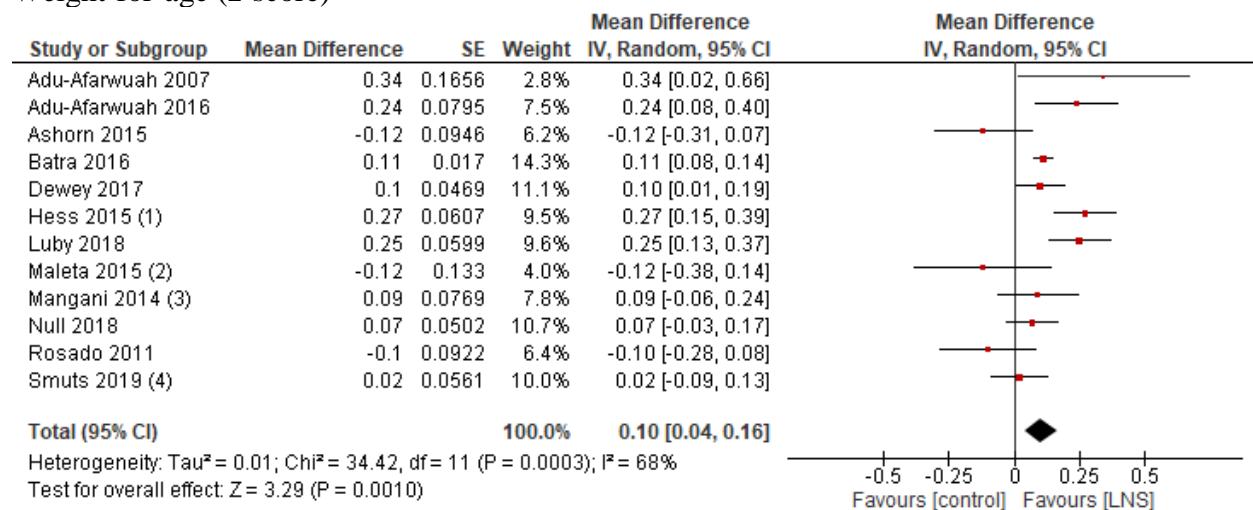
Length-for-age (z-score)



Footnotes

- (1) Plumpy'doz group only
- (2) LNS (Zn 5mg) and LNS (Zn 10mg) groups were combined into one group
- (3) 20g LNS group only
- (4) LNS (with milk) group only
- (5) SQ LNS group only

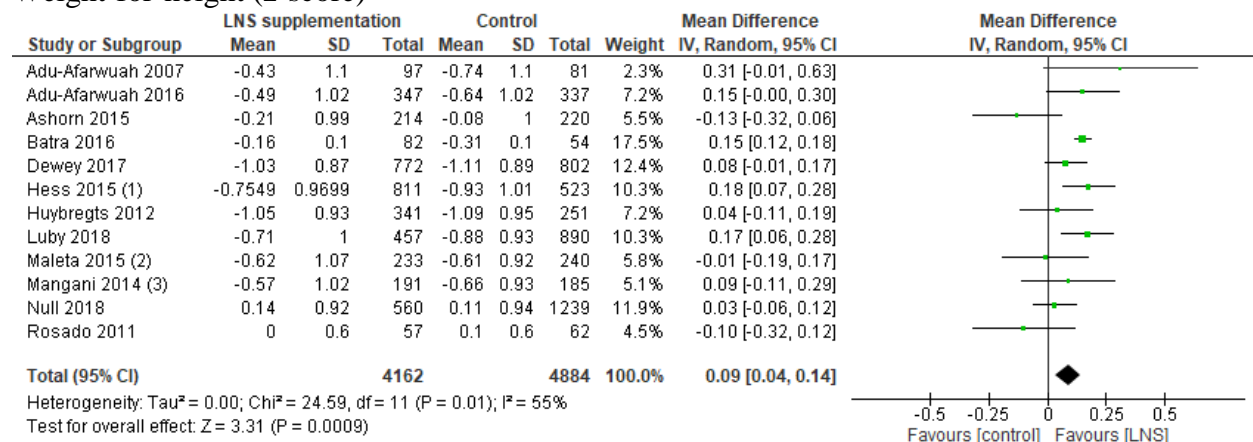
Weight-for-age (z-score)



Footnotes

- (1) LNS (Zn 5mg) and LNS (Zn 10mg) groups were combined into one group
- (2) 20g LNS group only
- (3) LNS (with milk) group only
- (4) SQ LNS group only

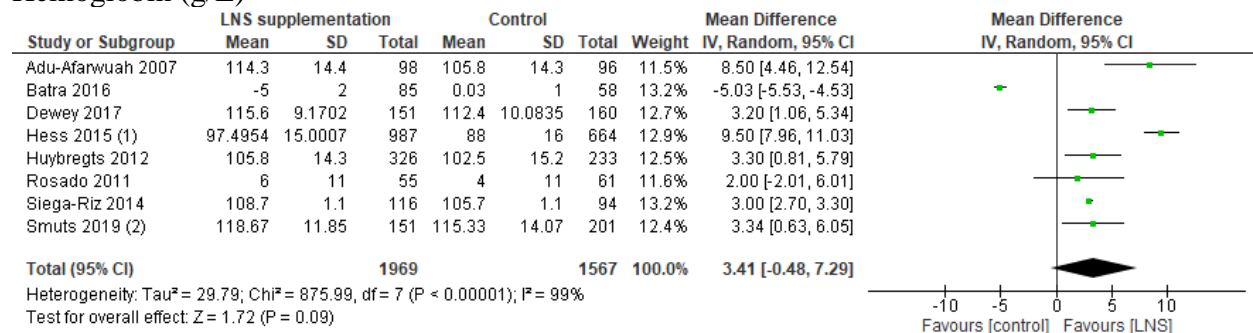
Weight-for-height (z-score)



Footnotes

- (1) LNS (Zn 5mg) and LNS (Zn 10mg) groups were combined into one group
- (2) 20g LNS group only
- (3) LNS (with milk) group only

Hemoglobin (g/L)

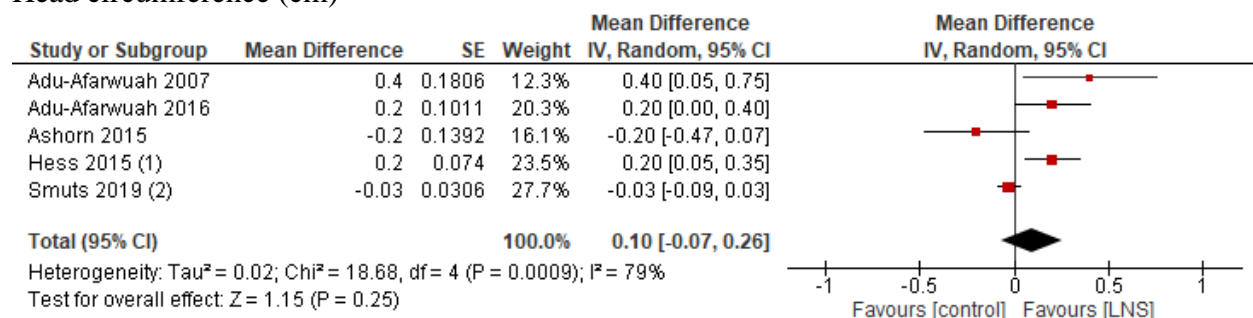


Footnotes

(1) LNS (Zn 5mg) and LNS (Zn 10mg) groups were combined into one group

(2) SQ LNS group only

Head circumference (cm)

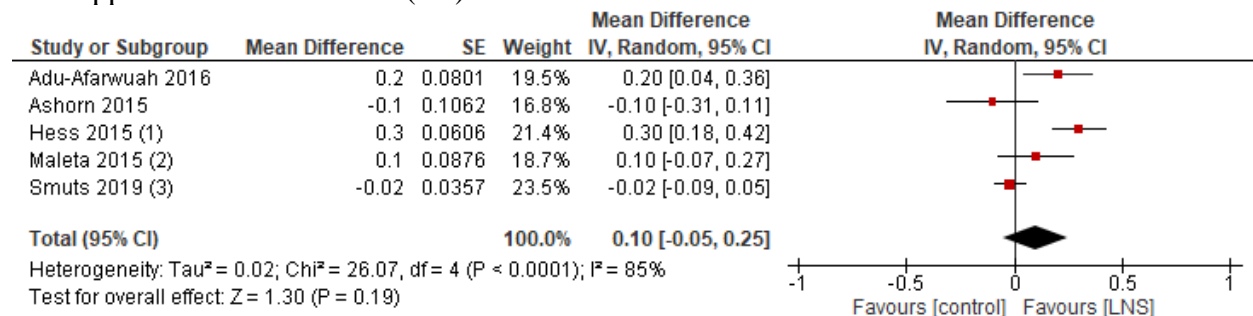


Footnotes

(1) LNS (Zn 5mg) and LNS (Zn 10mg) groups were combined into one group

(2) SQ LNS group only

Mid-upper arm circumference (cm)



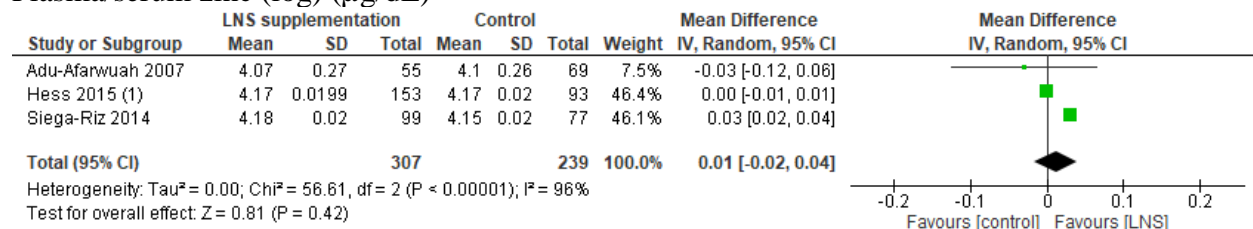
Footnotes

(1) LNS (Zn 5mg) and LNS (Zn 10mg) groups were combined into one group

(2) 20g LNS group only

(3) SQ LNS group only

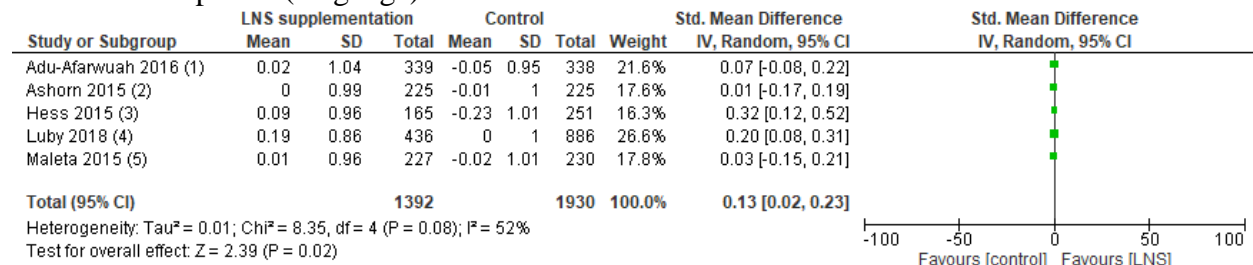
Plasma/serum zinc (log) (µg/dL)



Footnotes

(1) LNS (Zn 5mg) and LNS (Zn 10mg) groups were combined into one group

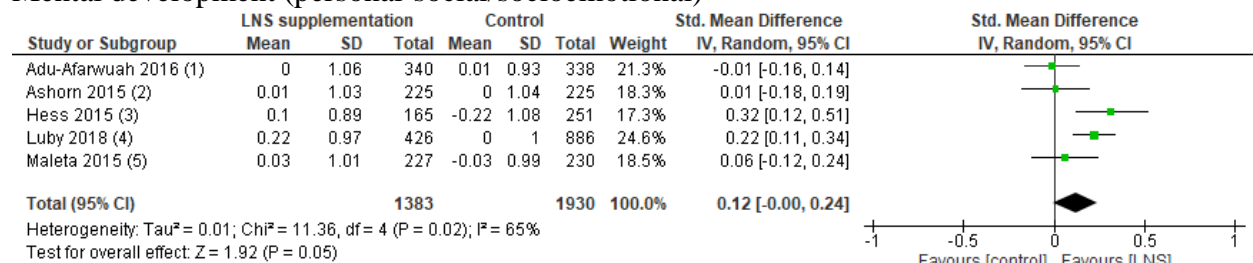
Mental development (language)



Footnotes

- (1) Language (100-word vocabulary checklist based on the MacArthur-Bates Communicative Development Inventory)
- (2) Language (100-word vocabulary checklist based on the MacArthur-Bates Communicative Development Inventory)
- (3) Language (Developmental Milestones Checklist II)
- (4) Extended Ages and Stages Questionnaire after 2 years of intervention
- (5) Language (100-word vocabulary checklist based on the MacArthur-Bates Communicative Development Inventory)

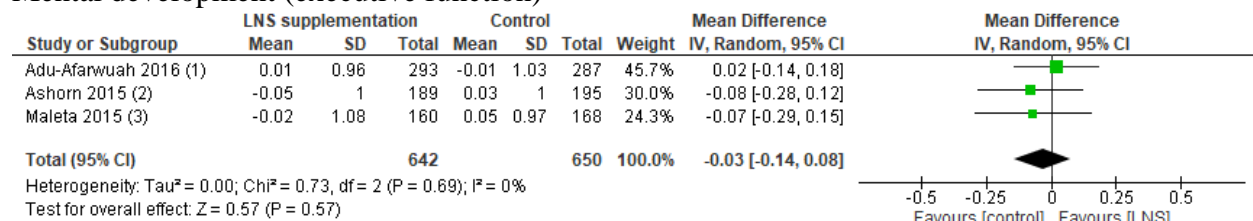
Mental development (personal-social/socioemotional)



Footnotes

- (1) Socioemotional (Profile of Social and Emotional Development)
- (2) Socioemotional (Profile of Social and Emotional Development)
- (3) Personal-social (Developmental Milestones Checklist II)
- (4) Extended Ages and Stages Questionnaire after 2 years of intervention
- (5) Socioemotional (Profile of Social and Emotional Development)

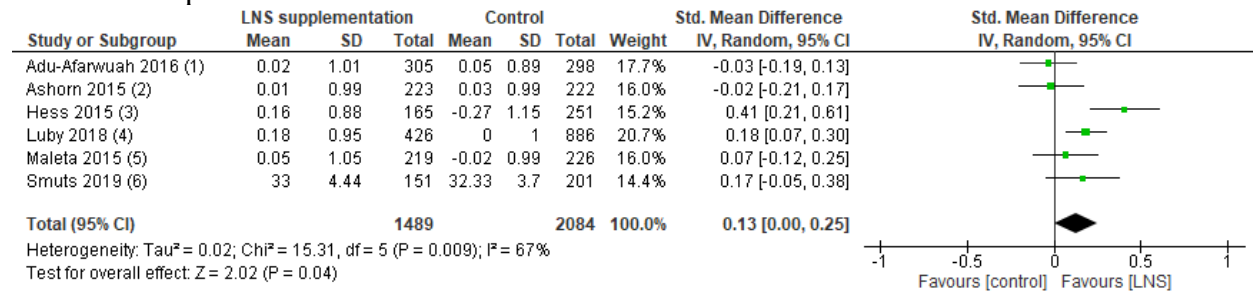
Mental development (executive function)



Footnotes

- (1) A not B correct score
- (2) A not B correct score
- (3) A not B correct score

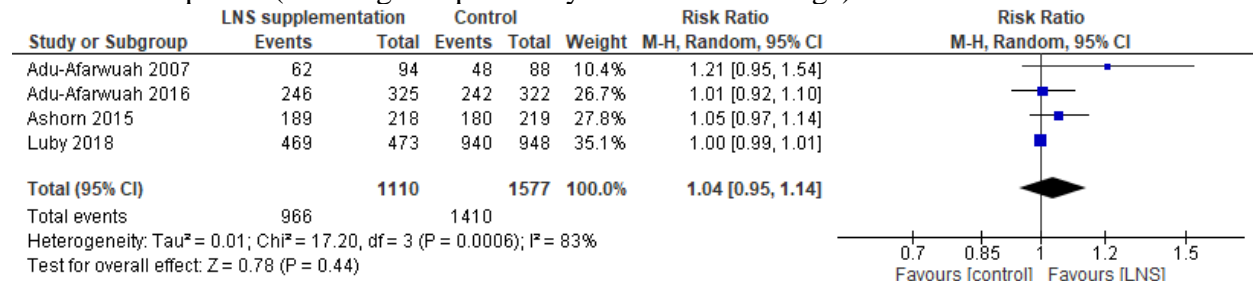
Motor development



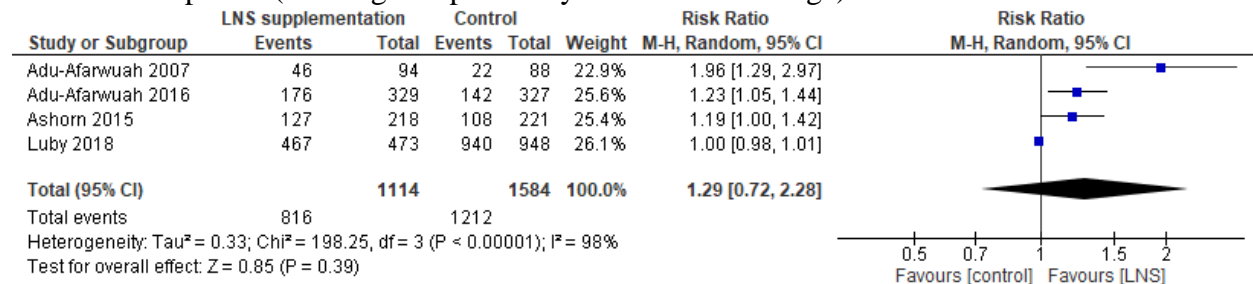
Footnotes

- (1) Kilifi Developmental Inventory
- (2) Kilifi Developmental Inventory
- (3) Developmental Milestones Checklist II
- (4) Extended Ages and Stages Questionnaire after 2 years of intervention
- (5) Kilifi Developmental Inventory
- (6) South African Parent Rating

Motor development (standing independently at 12 months of age)

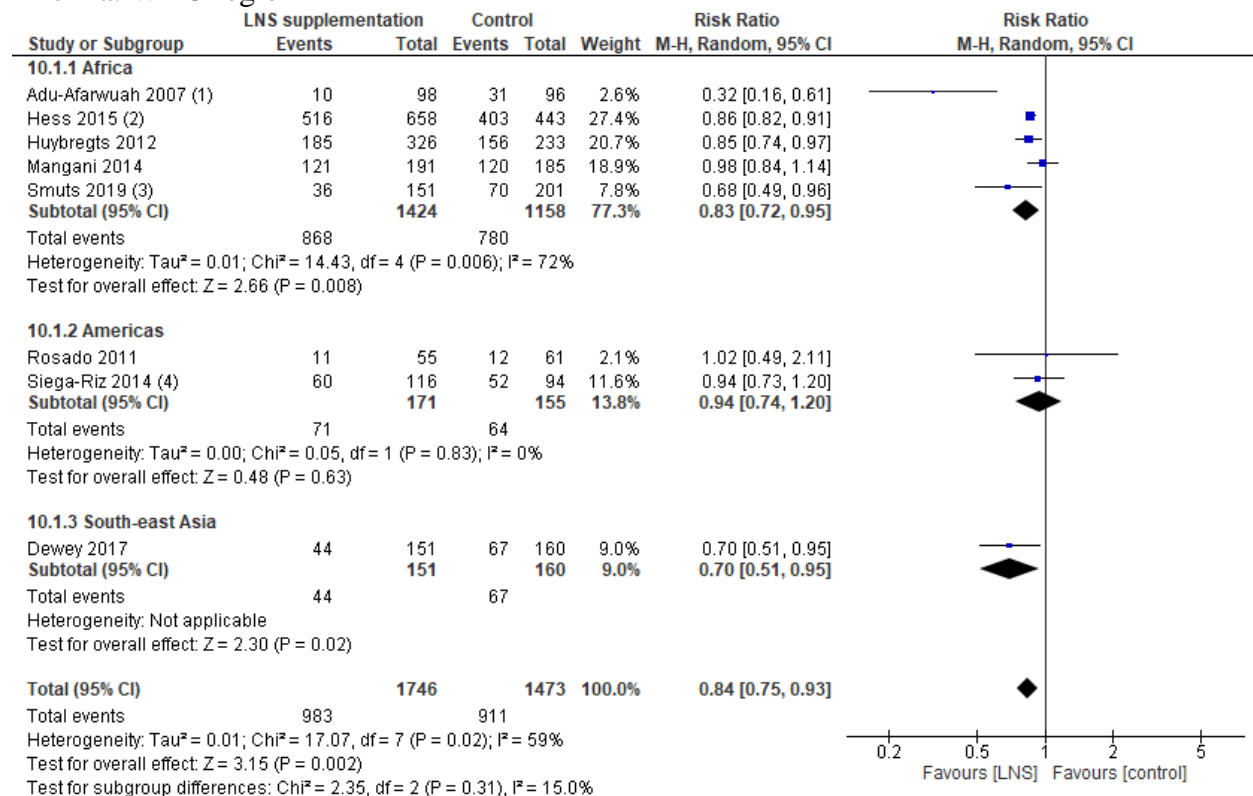


Motor development (walking independently at 12 months of age)



Comparison 7: Subgroup Analyses for Lipid Nutrient Supplementation vs. Placebo/No Intervention (Efficacy)

Anemia: WHO region



Footnotes

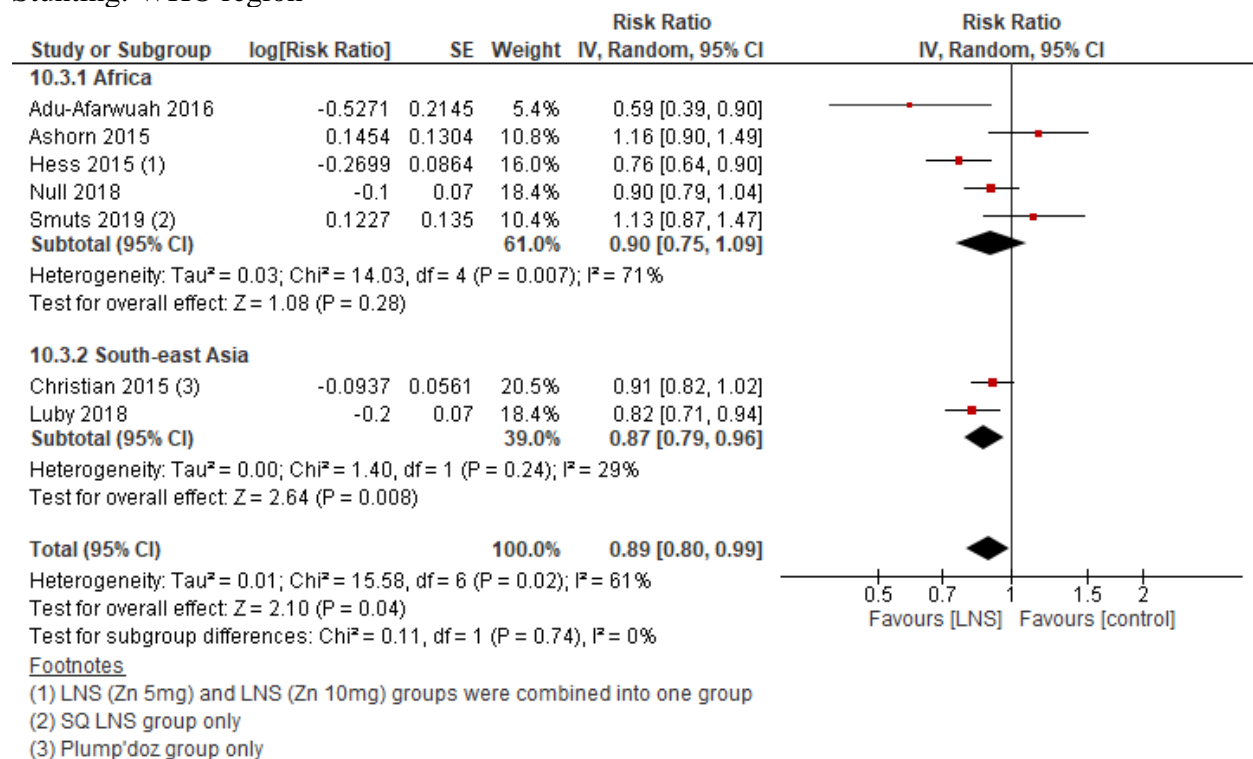
(1) Hemoglobin concentration <100g/L

(2) LNS (Zn 5mg) and LNS (Zn 10mg) groups were combined into one group

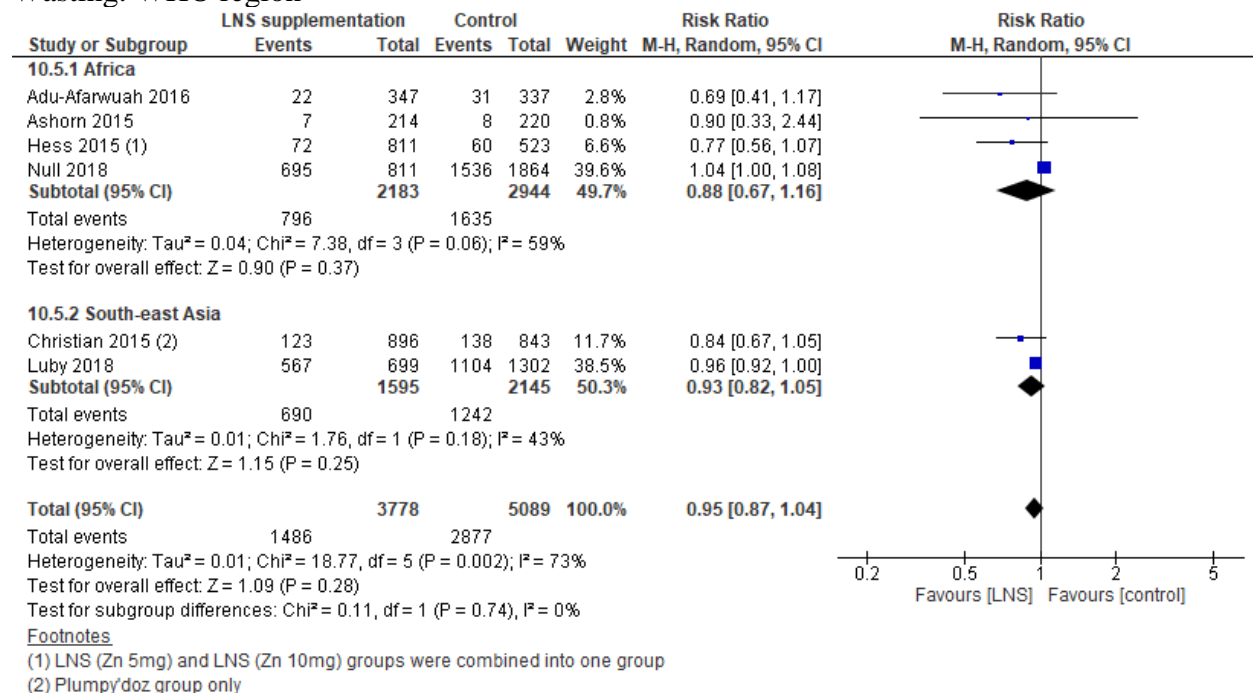
(3) SQ LNS group only

(4) Hemoglobin concentration <100 g/L for <12 month olds, <110 g/L for 12-24 month olds, and <111 g/l for 2-5 year olds

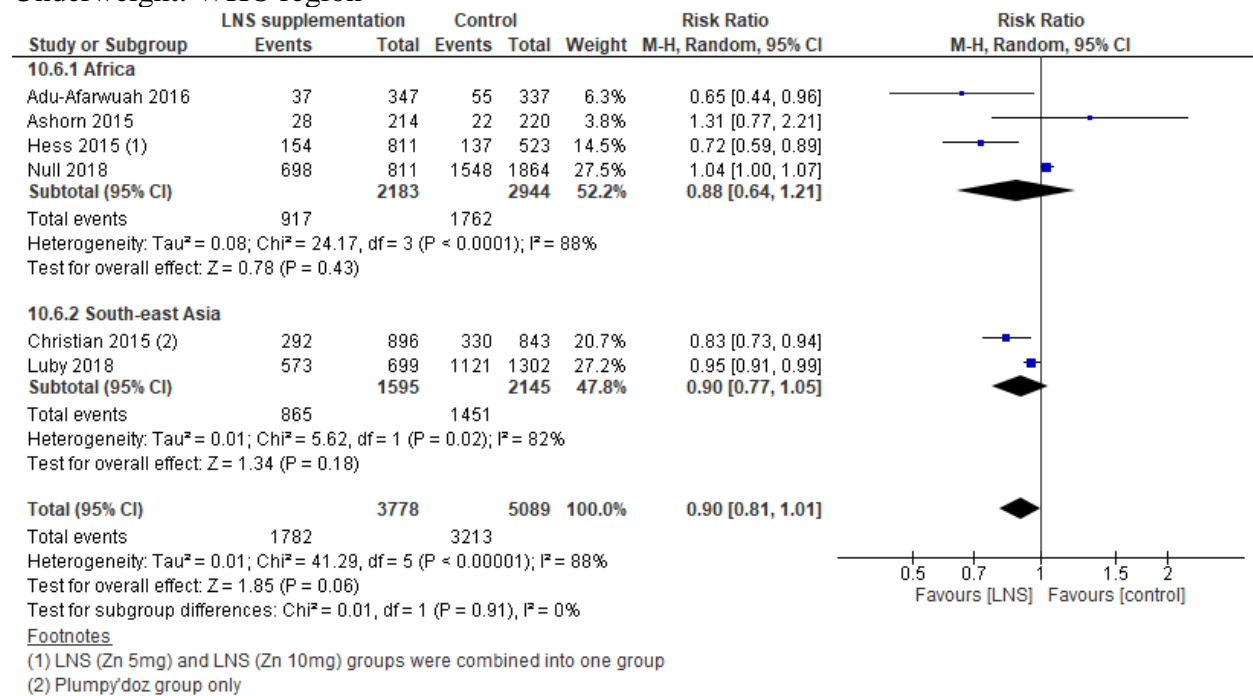
Stunting: WHO region



Wasting: WHO region

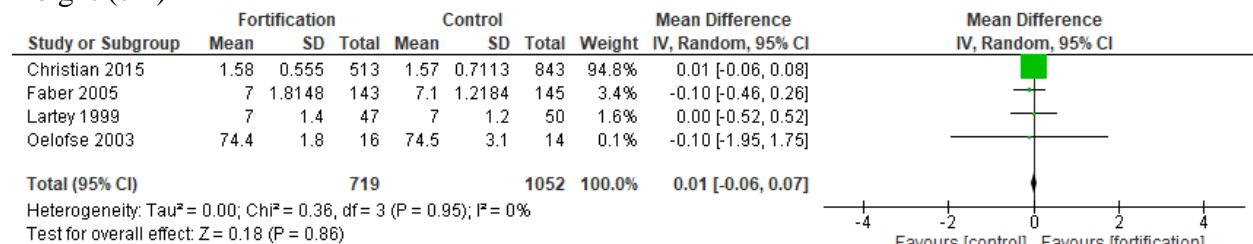


Underweight: WHO region

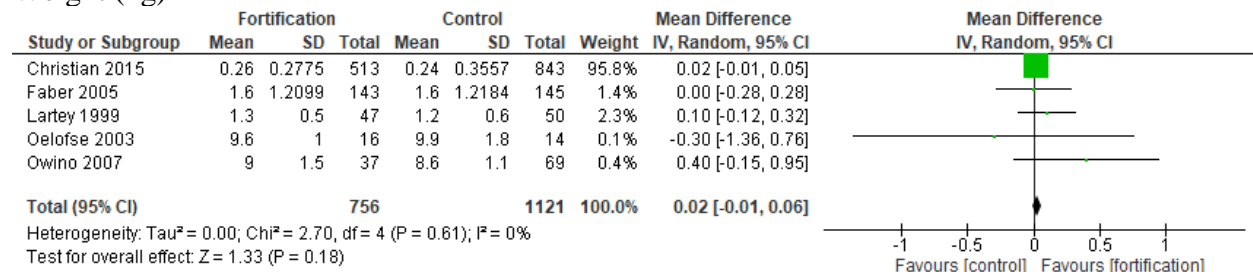


Comparison 8: Targeted Fortification (with MMN) vs. Placebo/No Intervention (Efficacy)

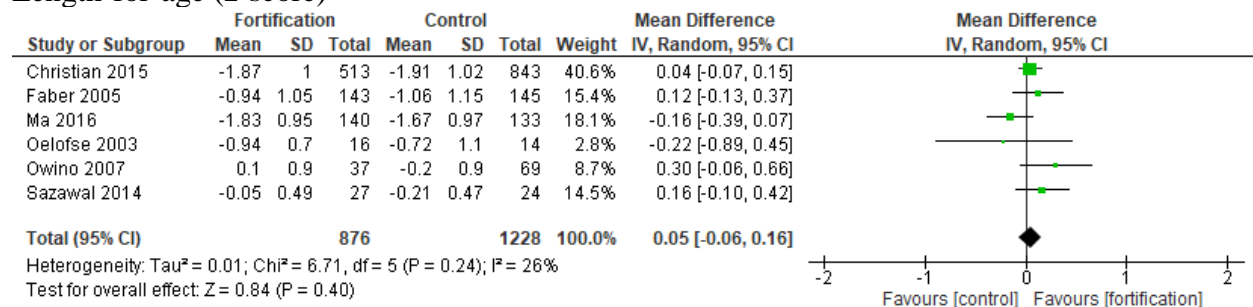
Height (cm)



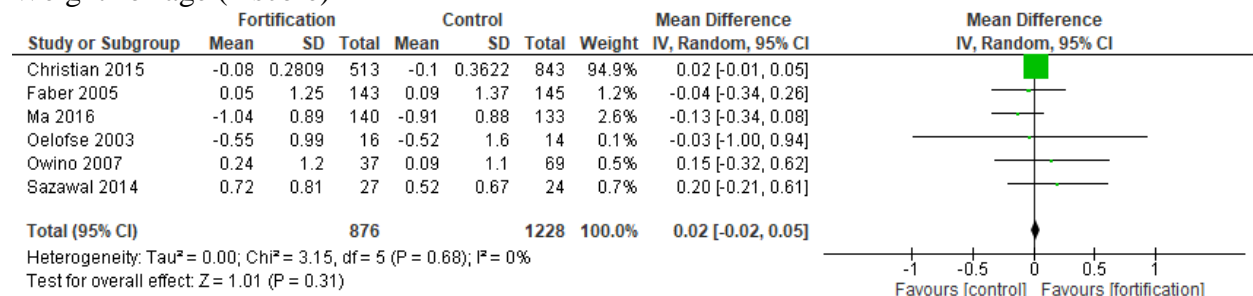
Weight (kg)



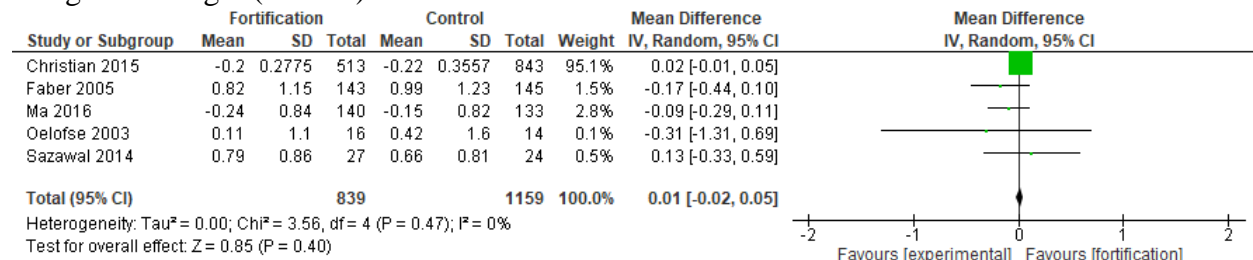
Length-for-age (z-score)



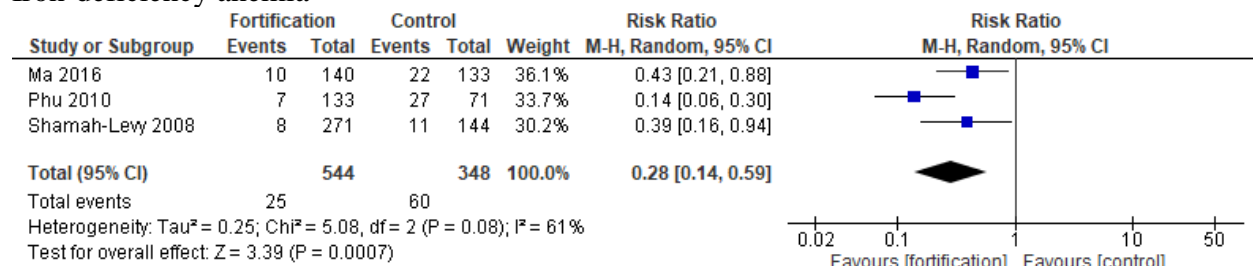
Weight-for-age (z-score)



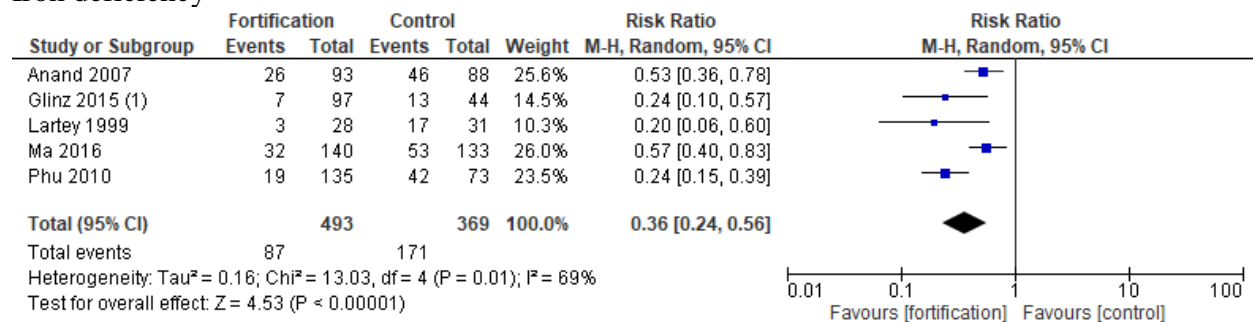
Weight-for-height (z-score)



Iron-deficiency anemia



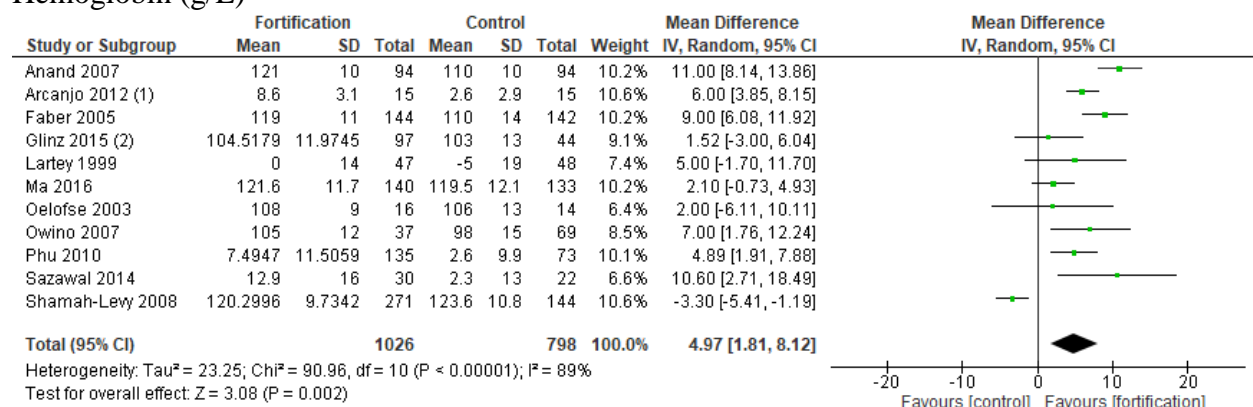
Iron deficiency



Footnotes

(1) Fortified with iron only

Hemoglobin (g/L)

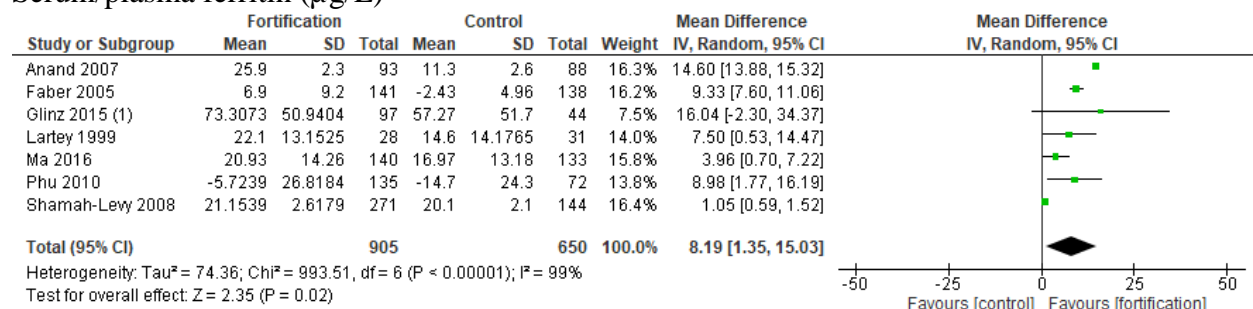


Footnotes

(1) Fortified with iron only

(2) Fortified with iron only

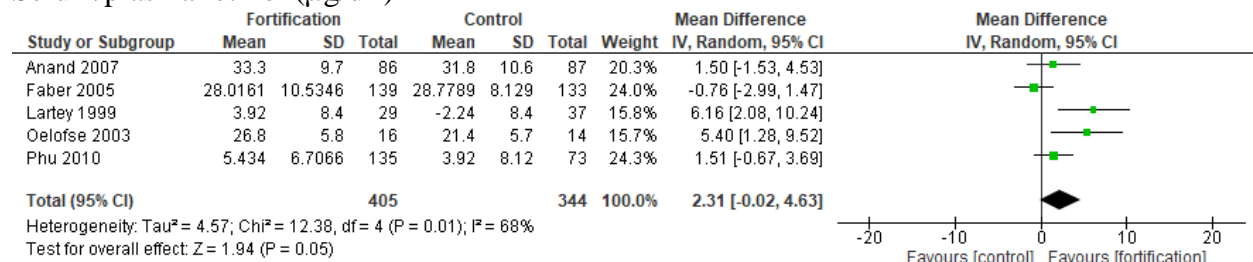
Serum/plasma ferritin (µg/L)



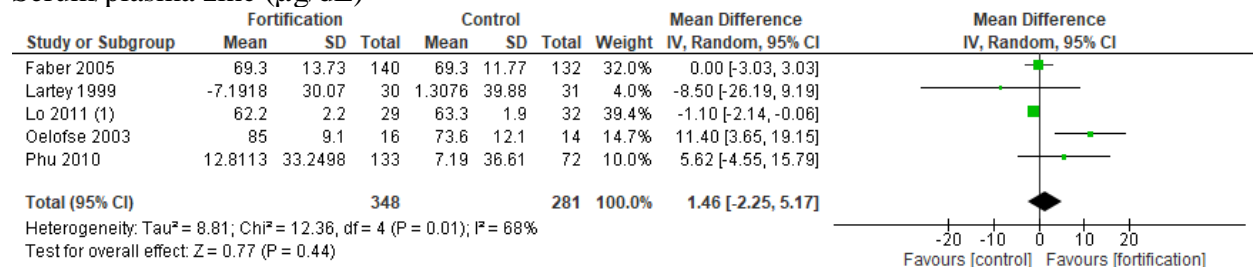
Footnotes

(1) Fortified with iron only

Serum/plasma retinol (µg/dL)



Serum/plasma zinc (µg/dL)

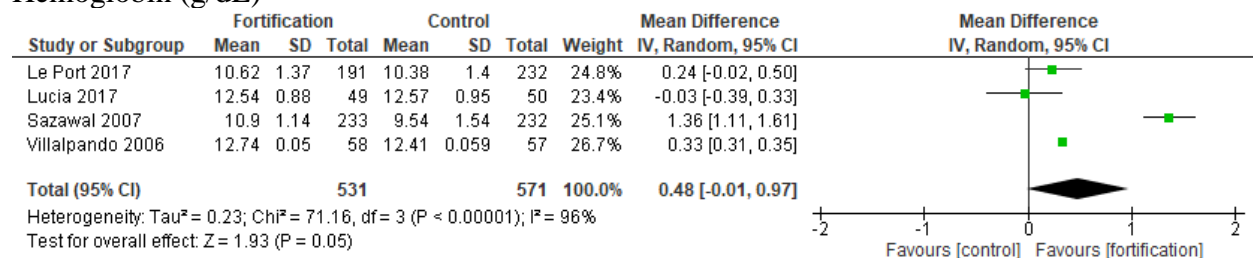


Footnotes

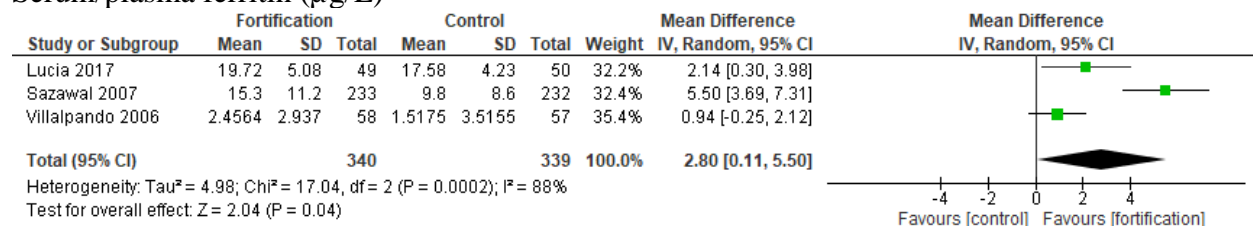
(1) Fortified with zinc only

Comparison 9a: Large-Scale Food Fortification (with MMN) vs. Placebo/No Intervention (Efficacy)

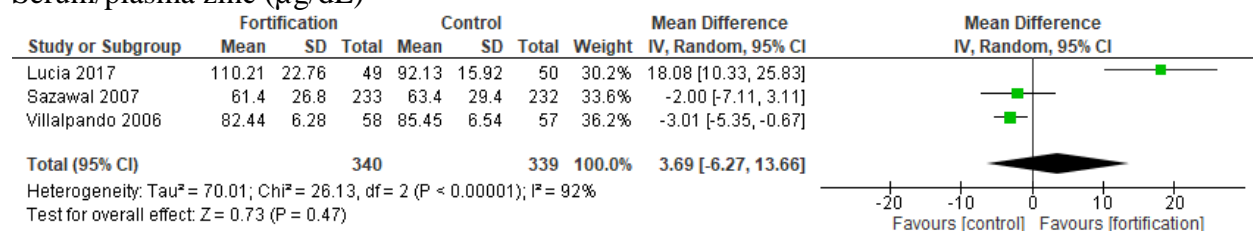
Hemoglobin (g/dL)



Serum/plasma ferritin (µg/L)

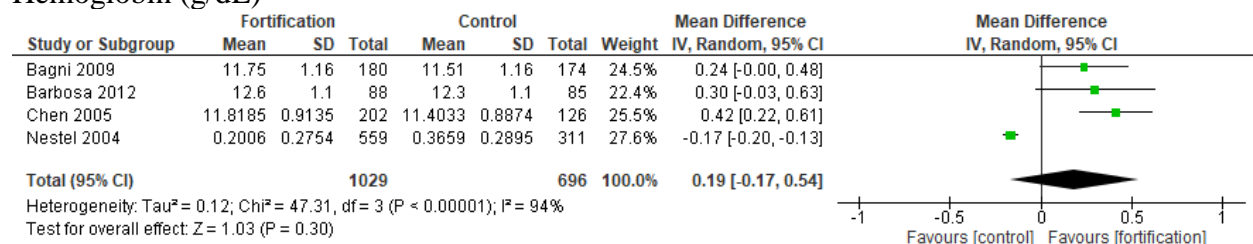


Serum/plasma zinc (µg/dL)



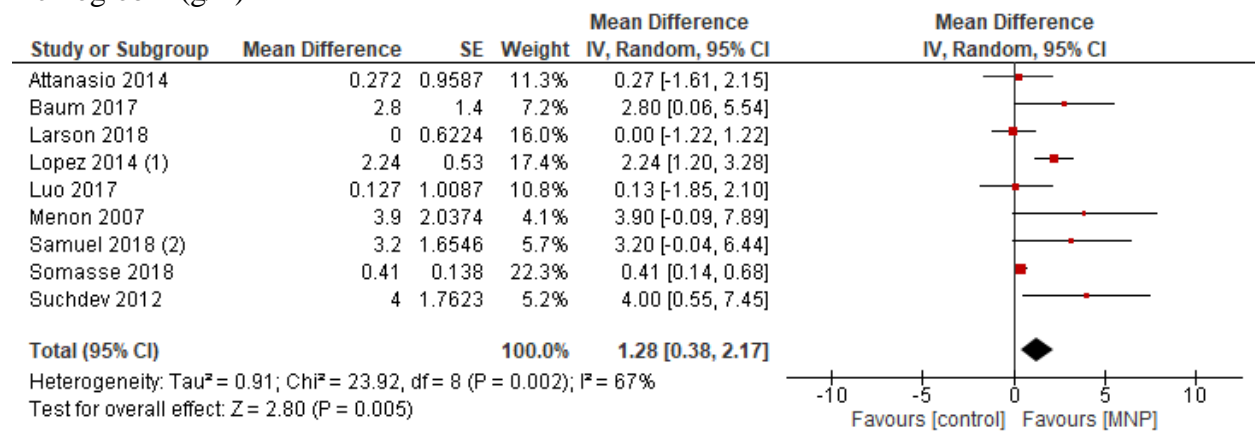
Comparison 9b: Large-Scale Food fortification (with Iron) vs. Placebo/No Intervention (Efficacy)

Hemoglobin (g/dL)



Comparison 10: Micronutrient Powder Supplementation vs. Placebo/No Intervention (Effectiveness)

Hemoglobin (g/L)



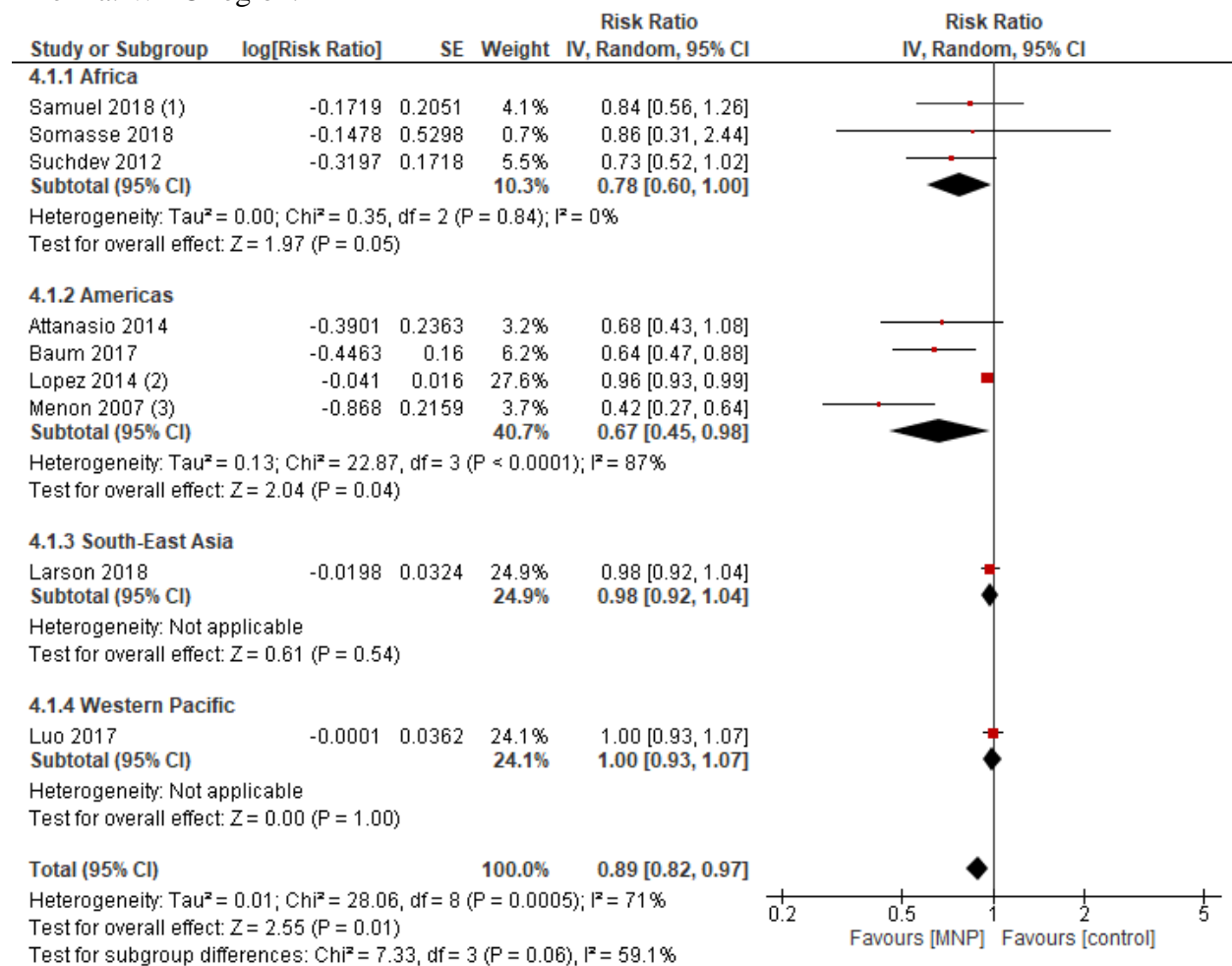
Footnotes

(1) Controlled before-after study

(2) Quasi experimental matched control design

Comparison 10: Subgroup Analyses for Micronutrient Powders vs. Placebo/No Intervention (Effectiveness)

Anemia: WHO region:



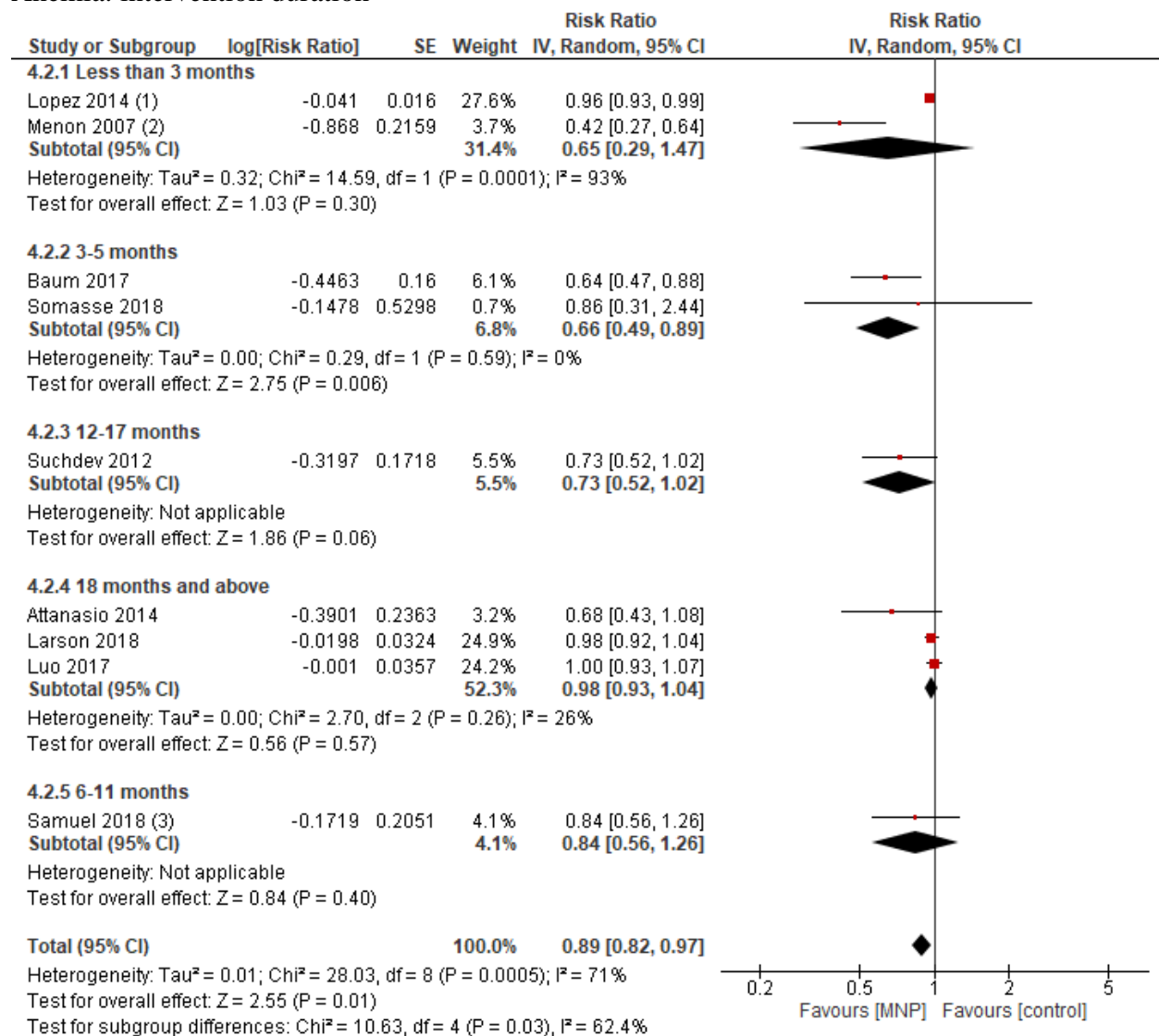
Footnotes

(1) Quasi experimental matched control design

(2) Controlled before-after study

(3) Both groups received iron-fortified wheat-soy blend

Anemia: intervention duration



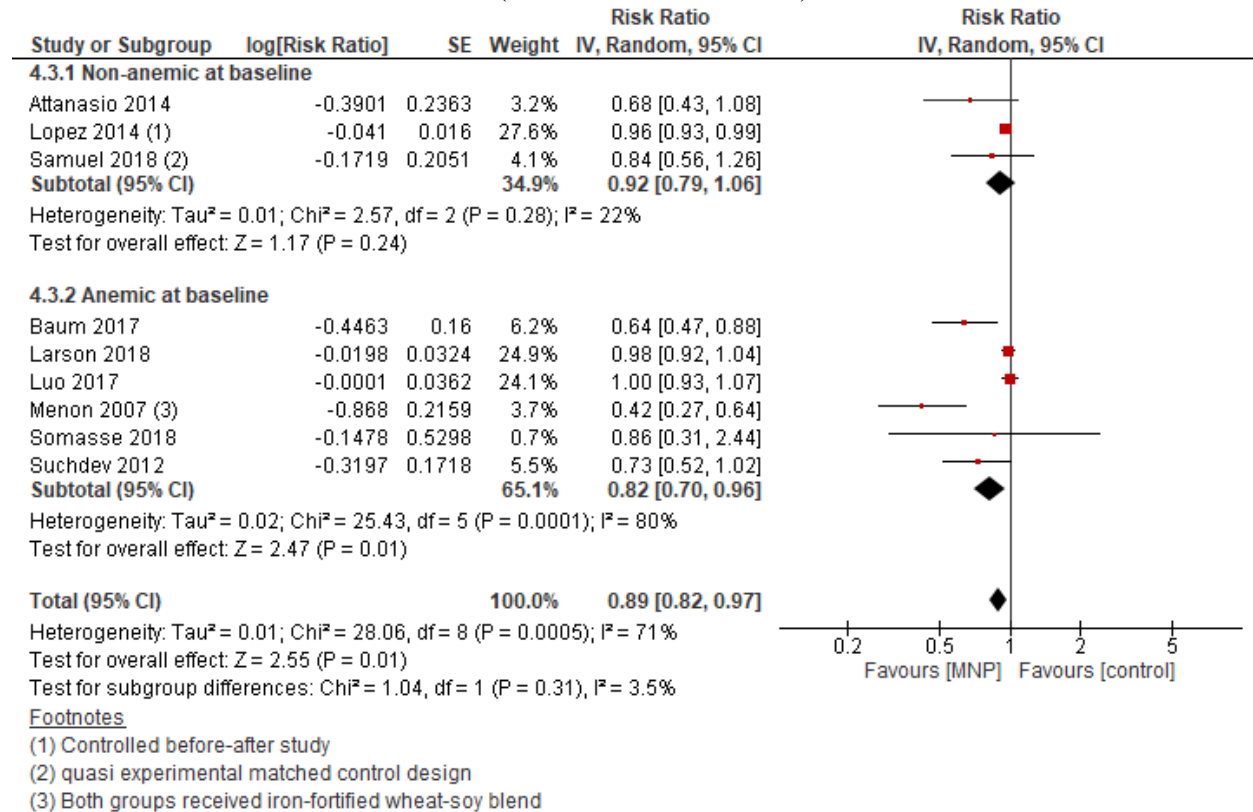
Footnotes

(1) Controlled before-after study

(2) Both groups received iron-fortified wheat-soy blend

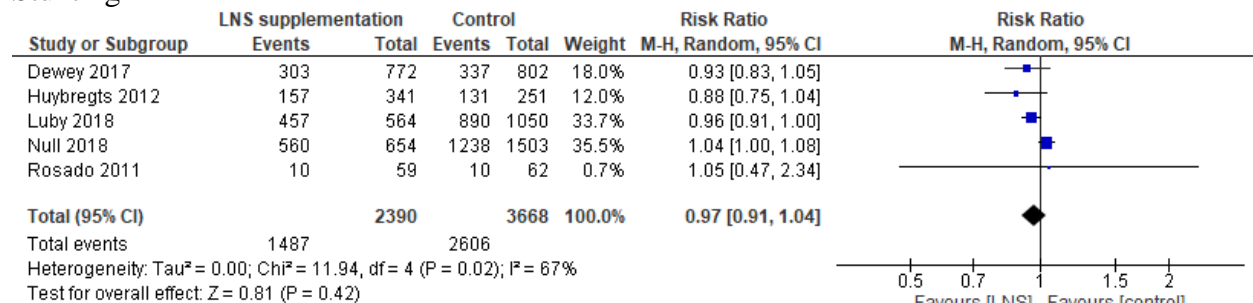
(3) Quasi experimental matched control design

Anemia: nutritional status at baseline (anemic vs. non anemic)

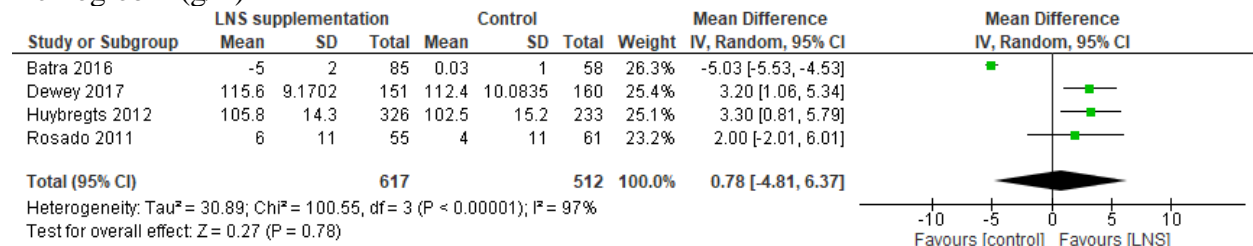


Comparison 11: Lipid-based Nutrient Supplementation vs. Placebo/No Intervention (Effectiveness)

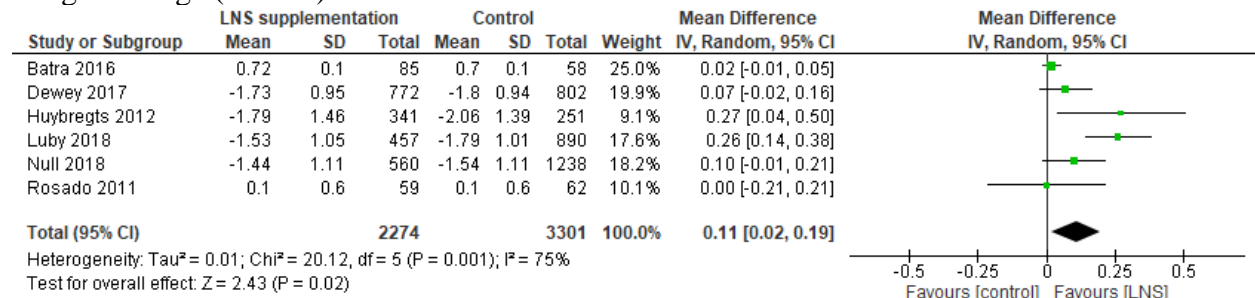
Stunting



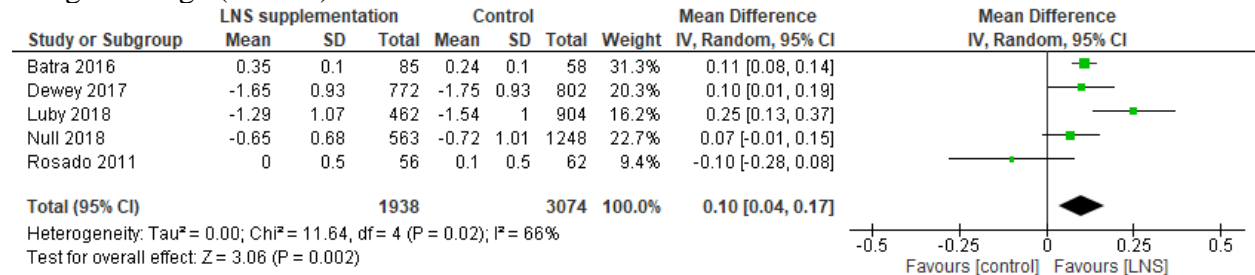
Hemoglobin (g/L)



Length-for-age (z-score)



Weight-for-age (z-score)



Weight-for-height (z-score)

