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Folate intake in pregnancy and psychomotor development at 18 months

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Hypothesis & background

- Hypothesis
  - Low folate intake in pregnancy is a risk factor for delayed cognitive development in the child

- Background
  - Several studies have suggested that low folate status in the elderly is associated with early cognitive decline, possibly via vascular mechanisms

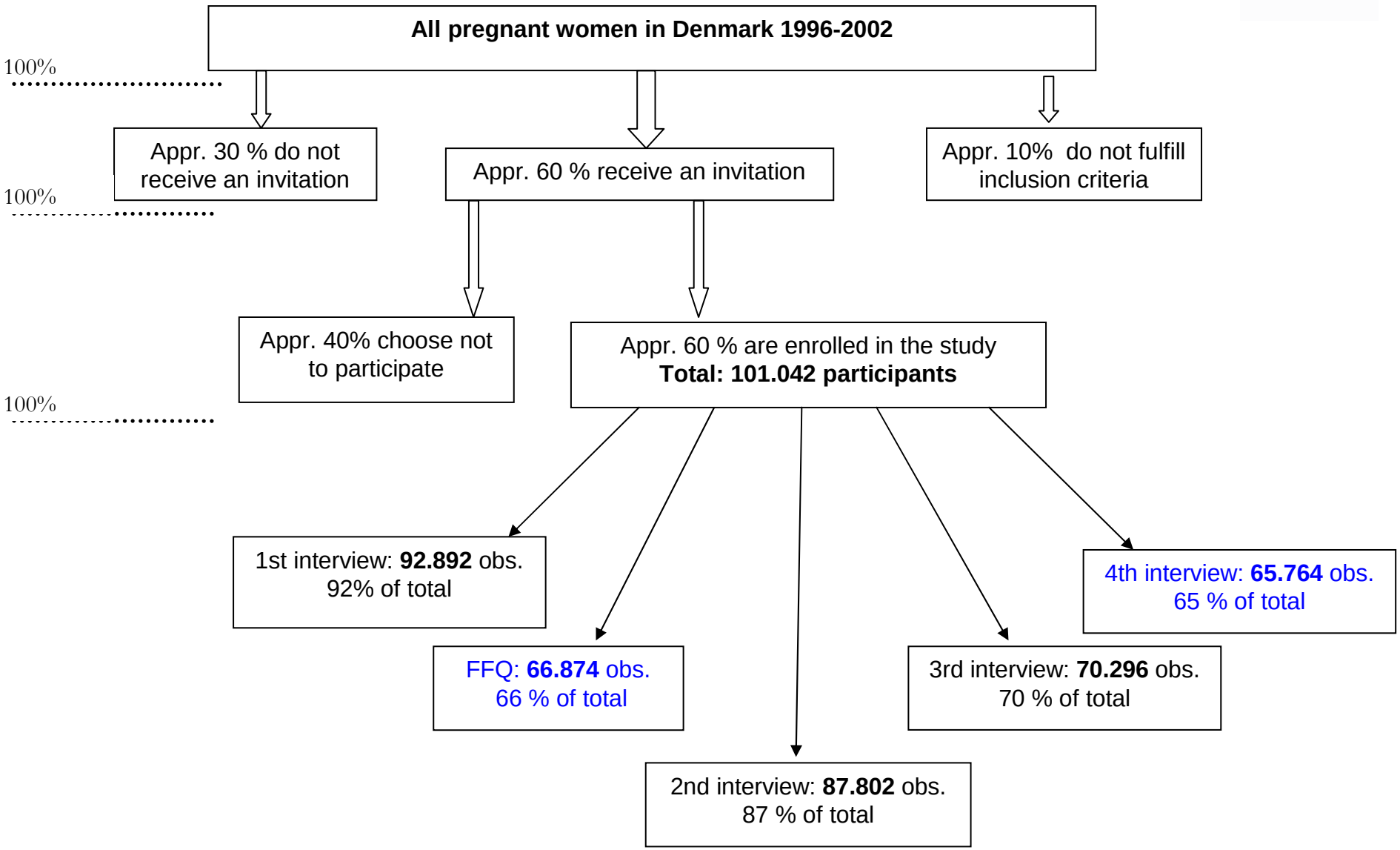
  - Studies in rodents have shown associations of maternal folate deficiency with structural brain abnormalities and poor postnatal learning ability in the offspring

  - A recent observational study from South India showed an inverse association between low serum folate in pregnancy and poorer cognitive scores at 9-10 year old offspring (Veena et al. J Nutr 2010)

Objective

Study the association between maternal intake of dietary folate during pregnancy and psychomotor development in children at 18 months using the Danish National Birth Cohort (DNBC)

The Danish National Birth Cohort

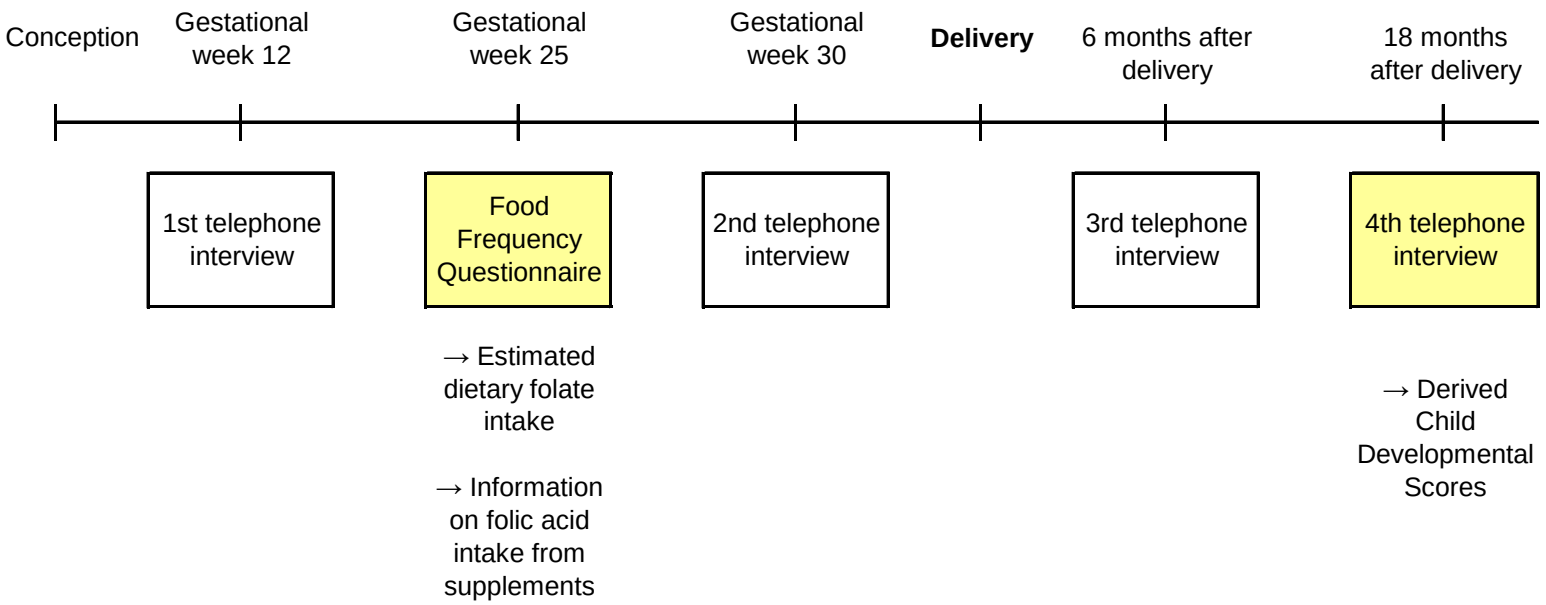


Data material

34649 children born to mothers participating in the DNBC

- 360-item Food Frequency Questionnaire in mid-pregnancy (gestation week 25) → estimated intake of dietary folate

- 4th interview with the mother 18 months after birth → child developmental scores



Child development scores (CDS)

- Remove socks and shoes - (yes/no)
- Drink from a cup - (yes/no)
- Be occupied fo 15 min without adult participation - (yes/no)
- Fetch an object when requested - (yes/no)
- Write or draw - (yes/no)
- Orient a book correctly - (yes/no)
- Use word-like sounds - (yes/no)
- Put two words together - (yes/no)
- Say more than 60 words - (yes/no)

Yes: 1 point
No: 0 points

CDS = sum of points
Maximum possible CDS: 9

Statistical method

- Multivariate cumulative ordinal logistic regression

  Modelling the OR of obtaining a given CDS or higher

- Adjustment for non-dietary confounders: smoking, physical activity, socioeconomic status, BMI, age at birth, parity

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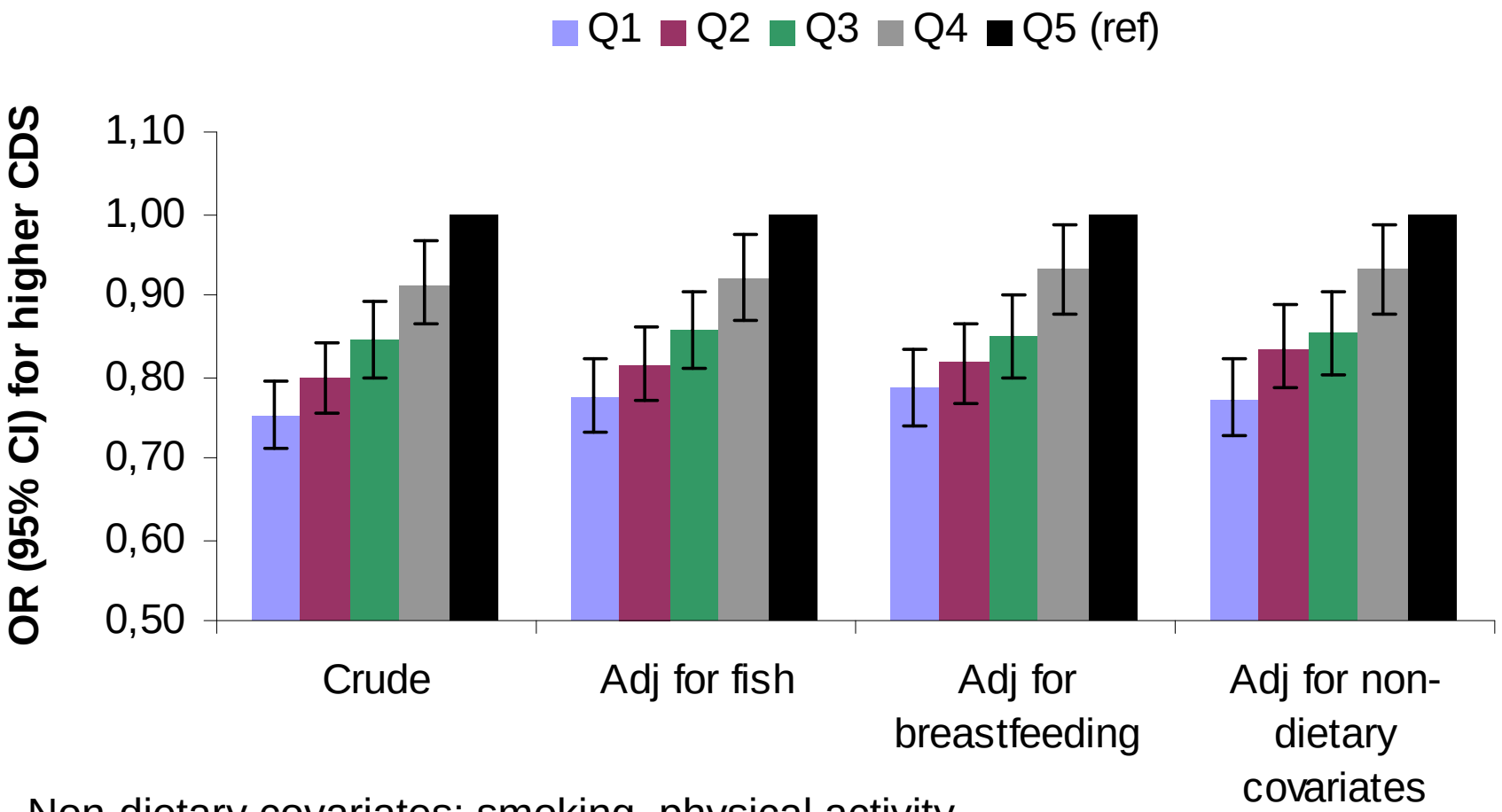
Maternal folate intake deriving from dietary sources (mcg/day)

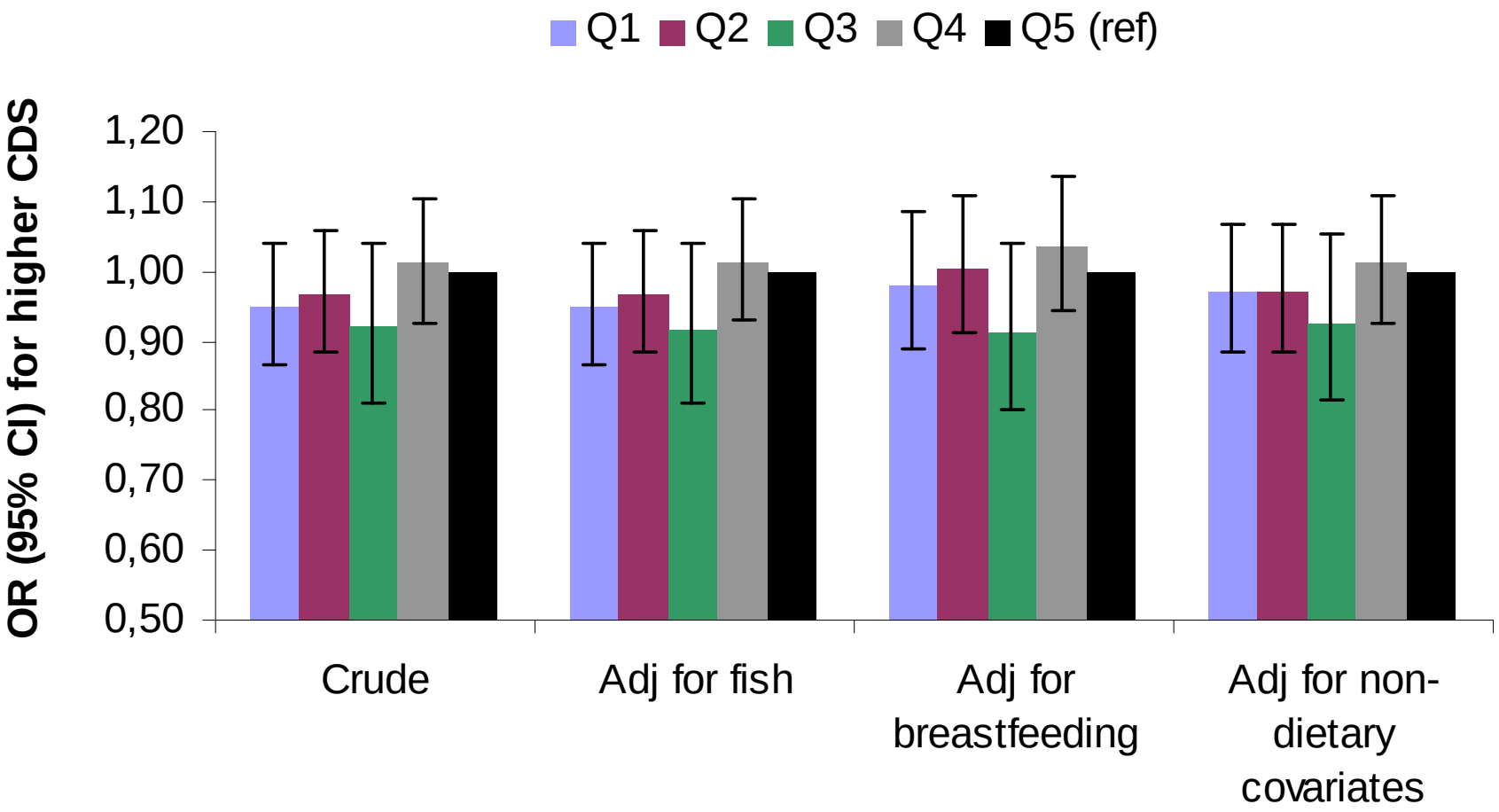
	N	Mean	Median	Std Dev
Quintile1 (lowest)	6941	265.4	271.7	24.7
Quintile 2	7070	311.1	311.3	9.2
Quintile 3	6967	341.4	341.3	8.7
Quintile 4	6956	375.2	374.5	11.3
Quintile 5 (highest)	6715	448.2	431.5	55.9
Overall	34649	347.5	340.5	67.3

Scores in relation to maternal intake of dietary folate



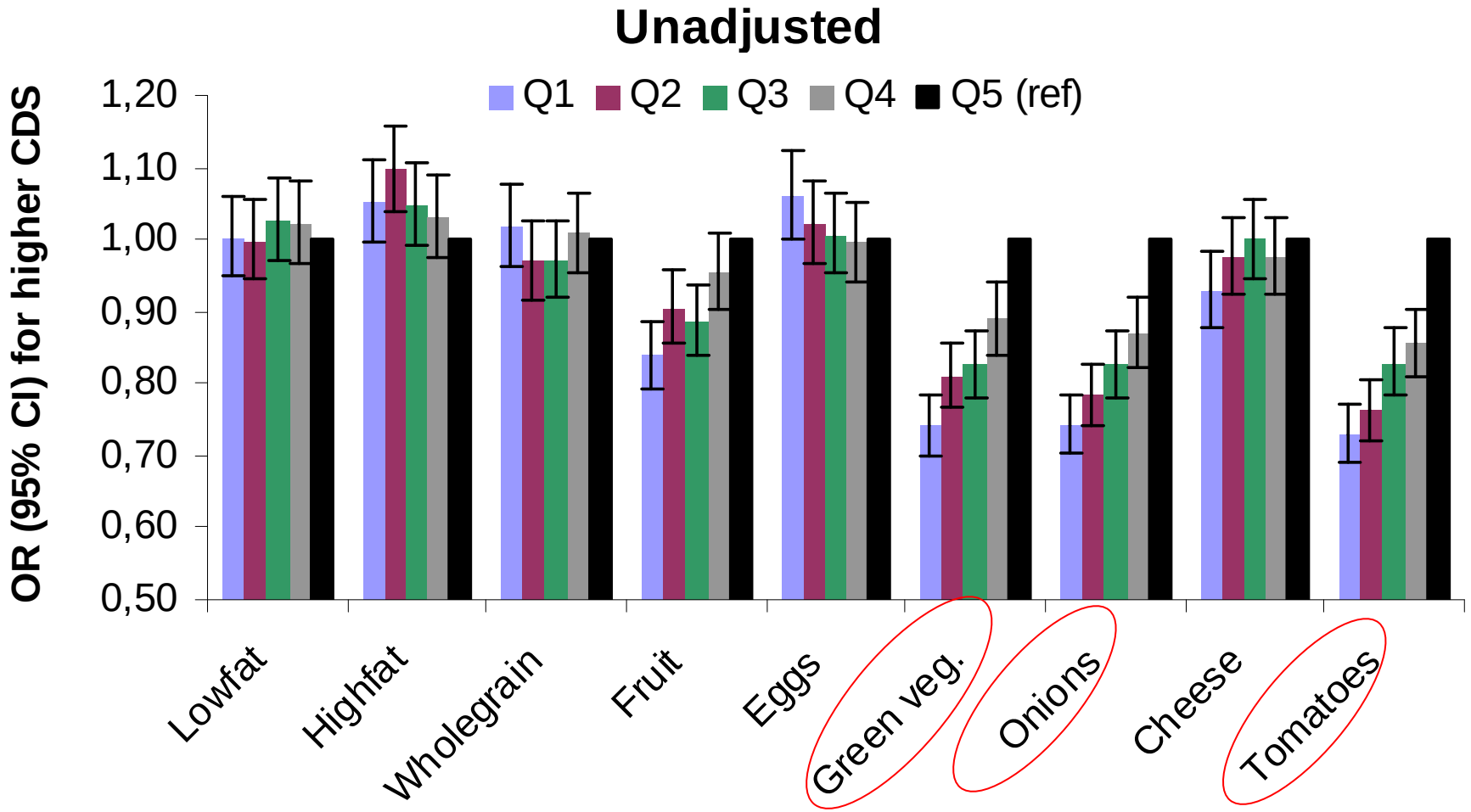
Non-dietary covariates; smoking, physical activity, socioeconomic status, BMI, age at birth, parity

Scores in relation to maternal intake of folic acid from supplements

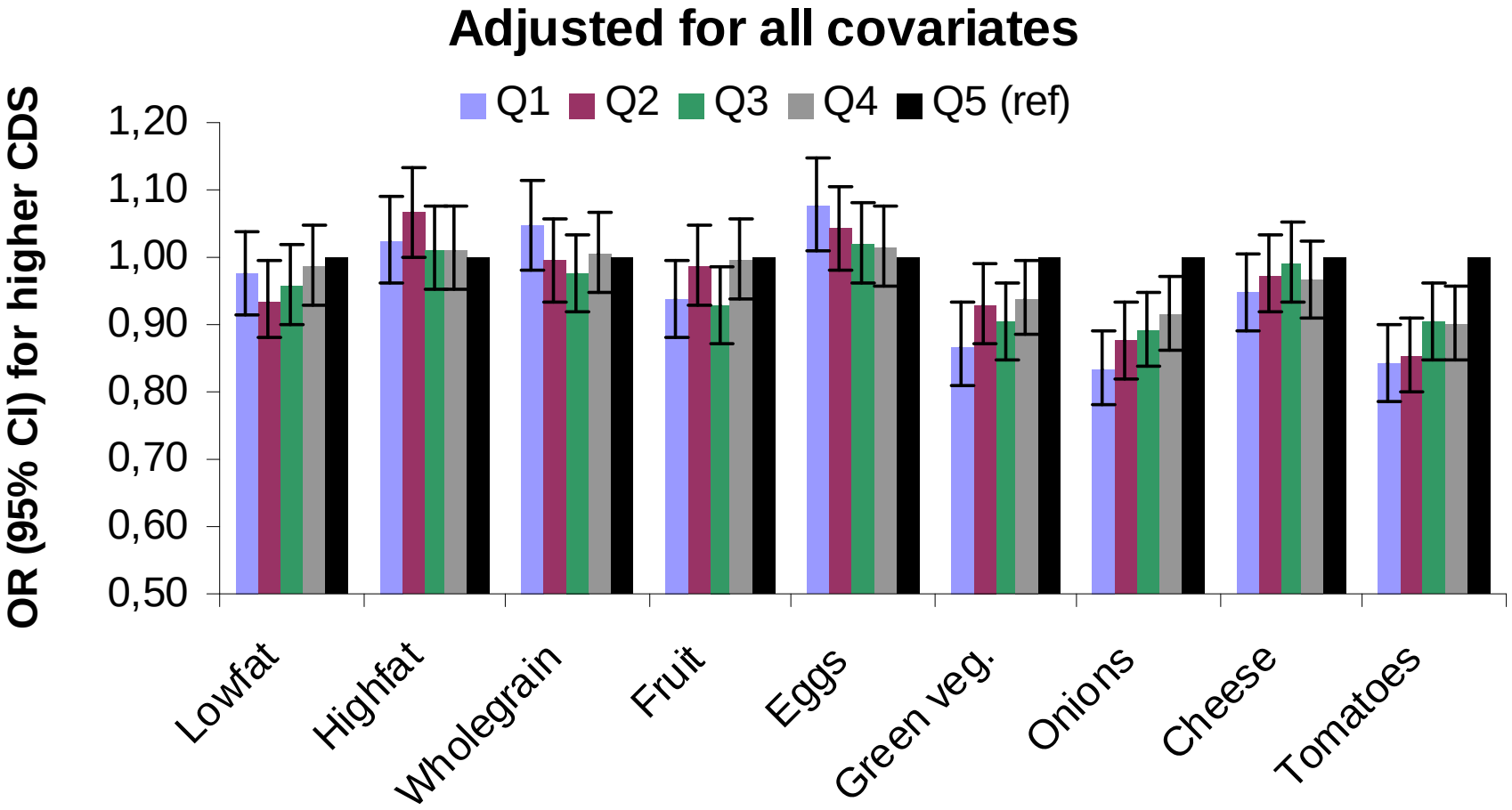


Non-dietary covariates: smoking, physical activity, socioeconomic status, BMI, age at birth, parity

Dietary folate from different sources



Dietary folate from different sources



Maternal folate intake deriving from green vegetables, onions and tomatoes (mcg/day)

	Green vegetables				Onions				Tomatoes			
	N	Mean	Median	Std Dev	N	Mean	Median	Std Dev	N	Mean	Median	Std Dev
Quintile 1	6648	4.6	4.8	2.3	6804	1.2	1.3	0.4	6492	1.1	1.2	0.4
Quintile 2	7024	11.6	11.6	2.0	7022	2.5	2.5	0.3	6980	2.3	2.3	0.3
Quintile 3	7040	19.2	19.0	2.5	7120	3.7	3.7	0.4	7081	3.6	3.6	0.4
Quintile 4	7041	30.2	29.8	4.1	6978	5.5	5.4	0.7	7067	5.5	5.4	0.7
Quintile 5	6896	62.9	53.6	28.9	6725	10.9	9.2	5.4	7029	11.6	9.5	6.0
Overall	34649	25.8	19.2	24.2	34649	4.7	3.7	4.1	34649	4.9	3.7	4.6

Main findings

- Association between higher maternal dietary folate intake and higher CDSs
- No association between higher folic acid intake from supplements and higher CDSs
- Association between higher CDSs and dietary folate intake from onions, tomatoes, and green vegetables
- No association between higher CDSs and dietary folate intake from whole grain, dairy products, and eggs

Conclusion

The associations between maternal dietary folate intake and early psychomotor development may not be due to folate, but may instead be attributed to other nutrients which coexist with folate in specific food groups

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Thank you