

Risk Factors of Stunting

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Nima Hejazi, Ivana Malenica, Alan E. Hubbard, Mark J. van der Laan, John M. Colford,
Jr., Benjamin F. Arnold*

2018-06-14

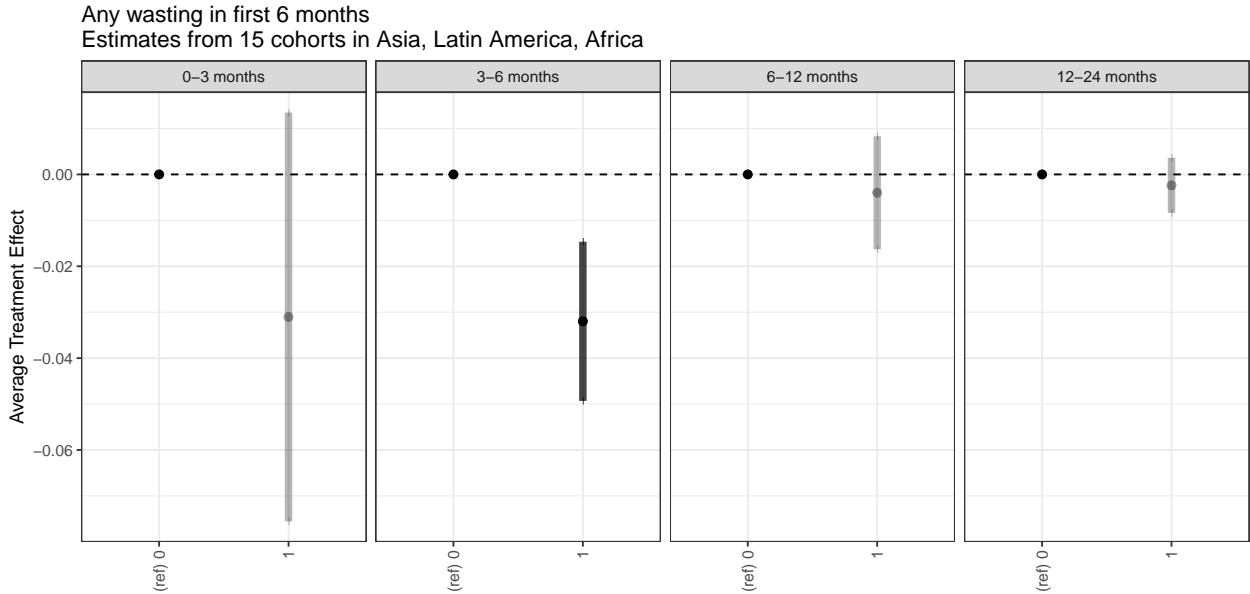
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HAZ growth velocity	1
Length growth velocity	19
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HAZ growth velocity	37
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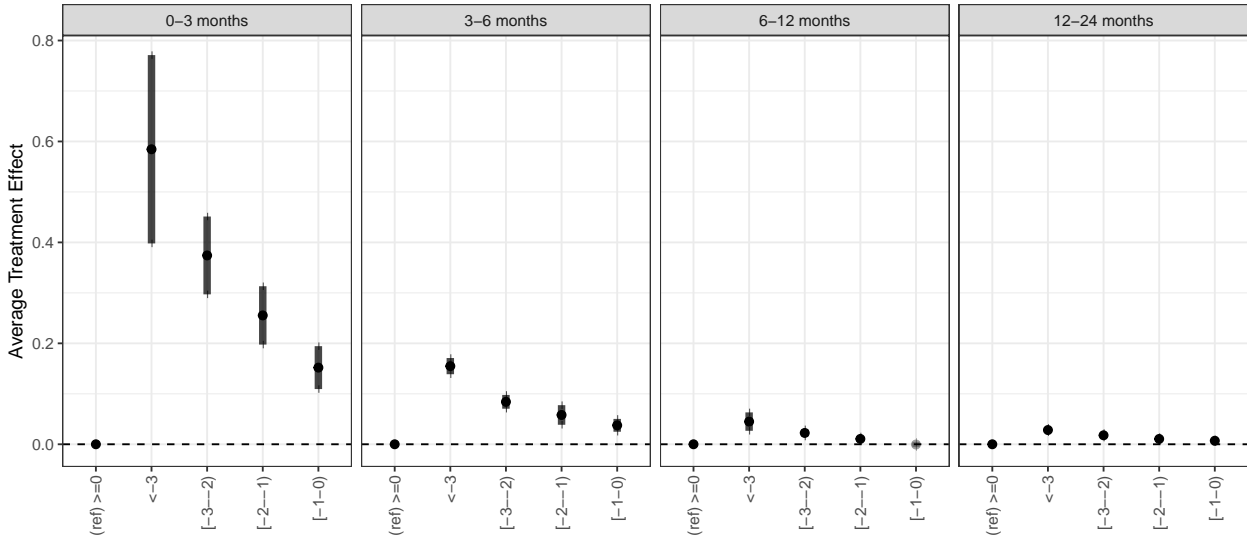
Average treatment effect pooled across cohorts

HAZ growth velocity

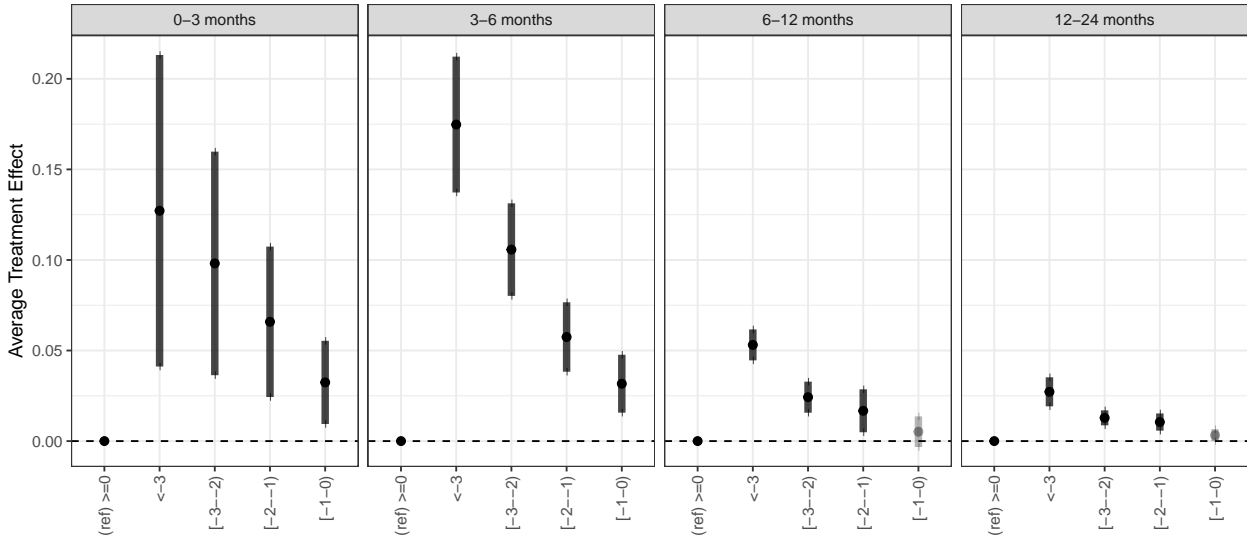
Child characteristics



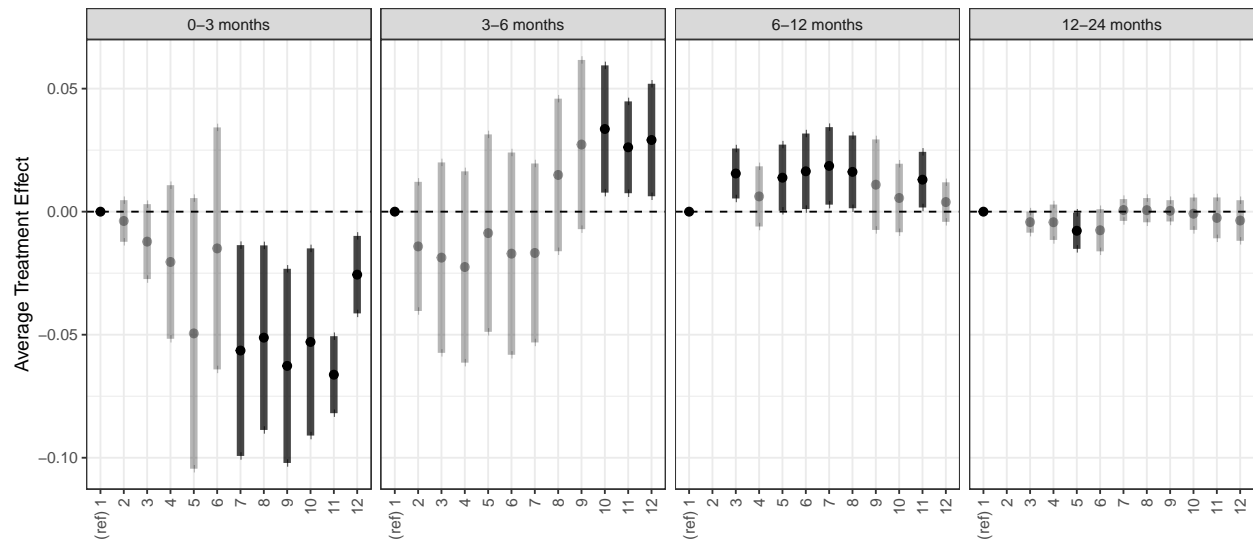
Birth length
 Estimates from 15 cohorts in Latin America, Asia, Africa, Europe



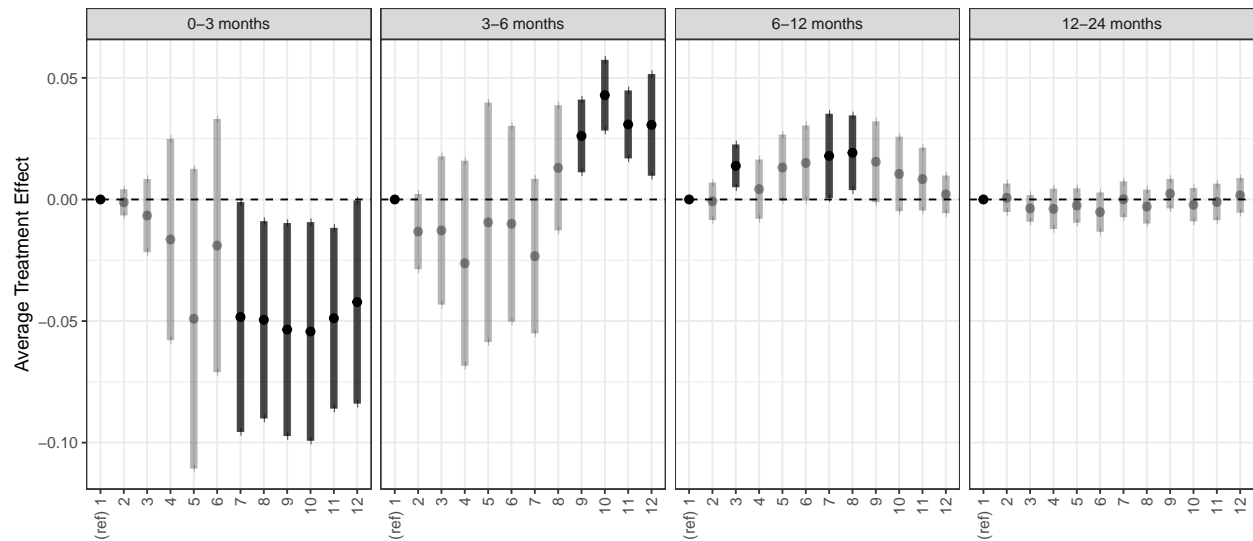
Birthweight
 Estimates from 15 cohorts in Asia, Latin America, Africa, Europe



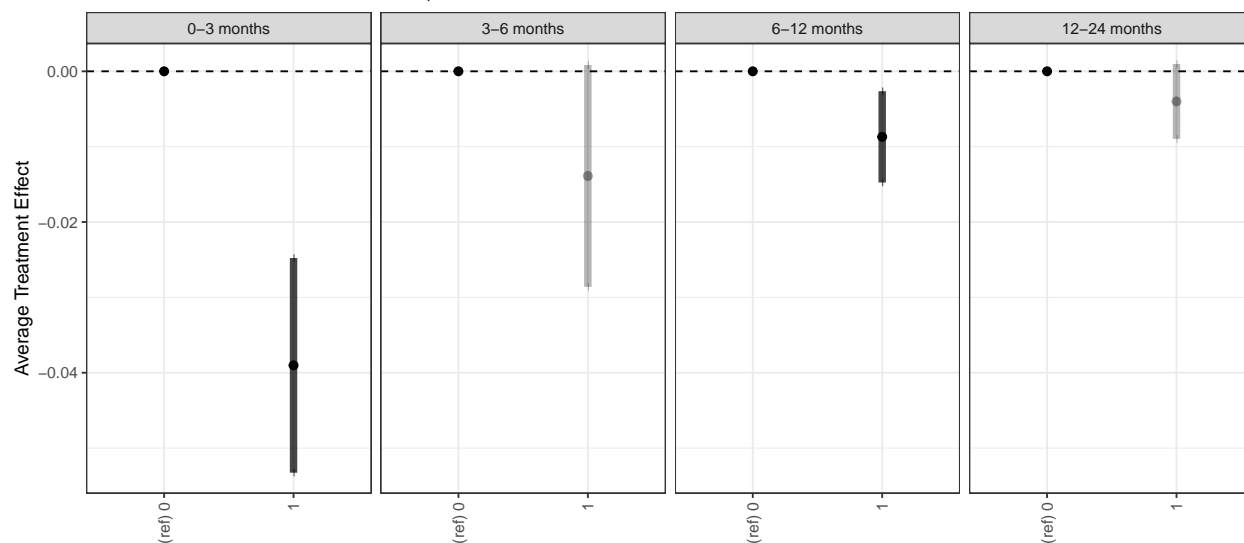
Calendar month of birth
Estimates from 19 cohorts in Asia, Latin America, Africa, Europe



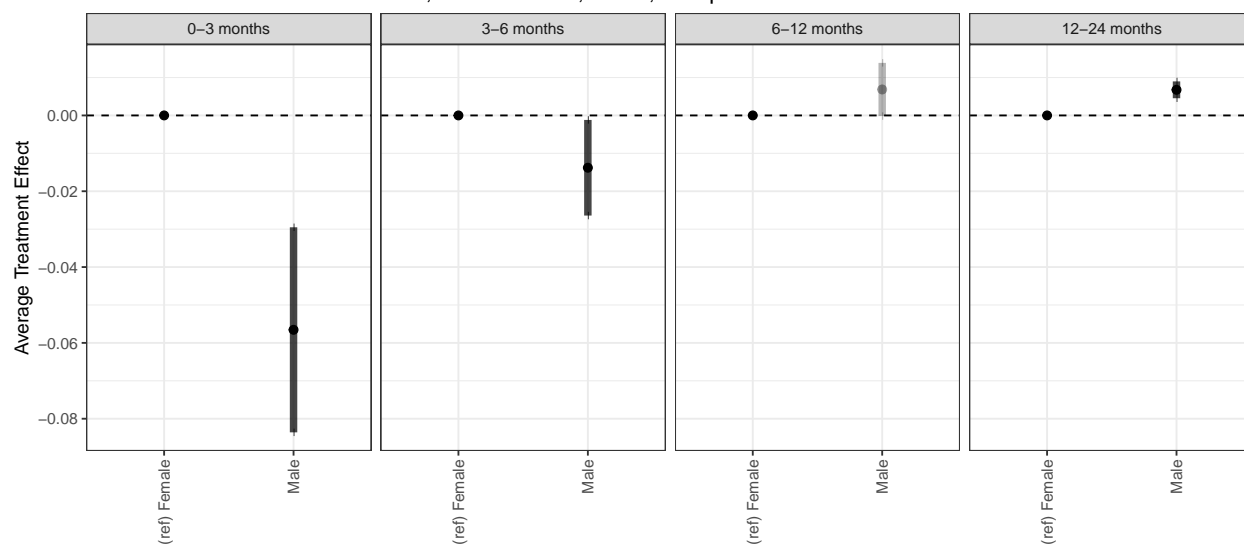
Calendar month of measurement
Estimates from 19 cohorts in Asia, Latin America, Africa, Europe



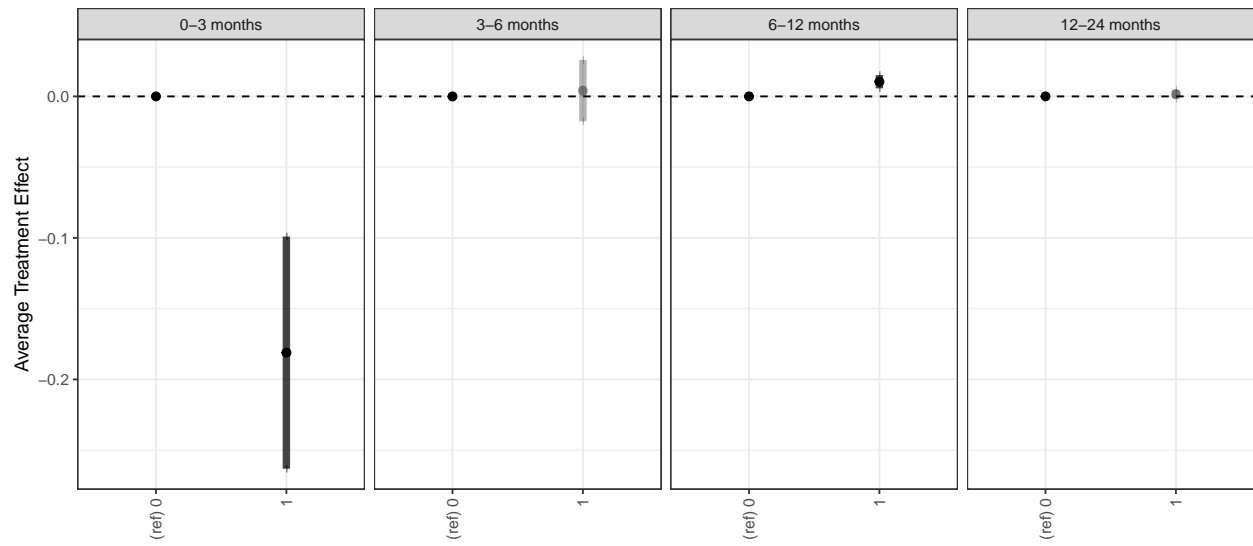
Child delivered at home
Estimates from 11 cohorts in Asia, Africa



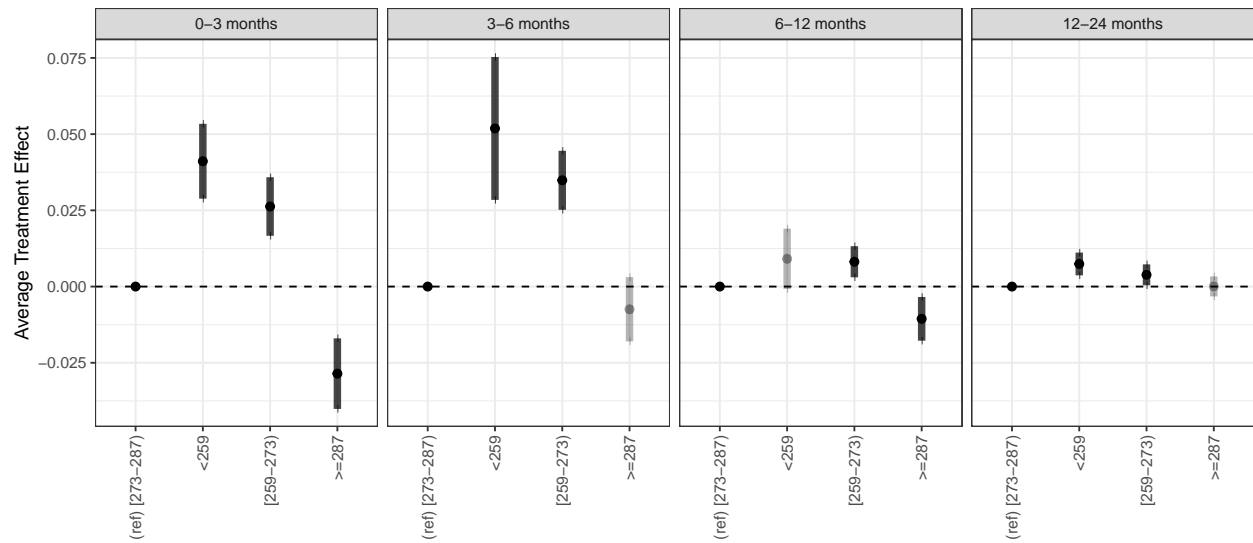
Child's sex
Estimates from 27 cohorts in Asia, Latin America, Africa, Europe



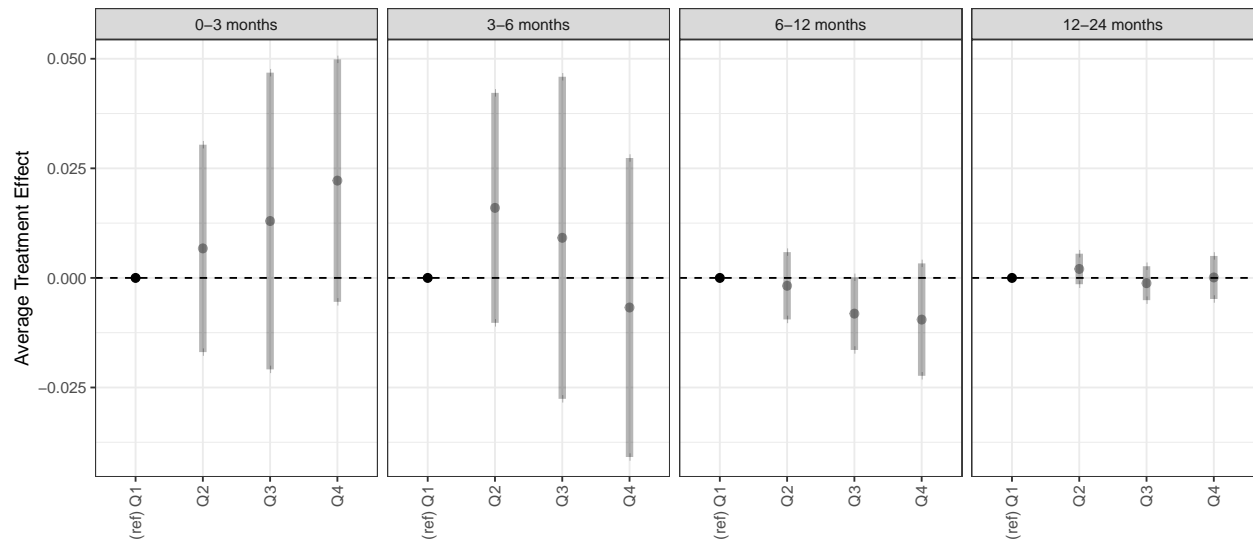
Enrolled wasted
Estimates from 19 cohorts in Asia, Latin America, Africa, Europe



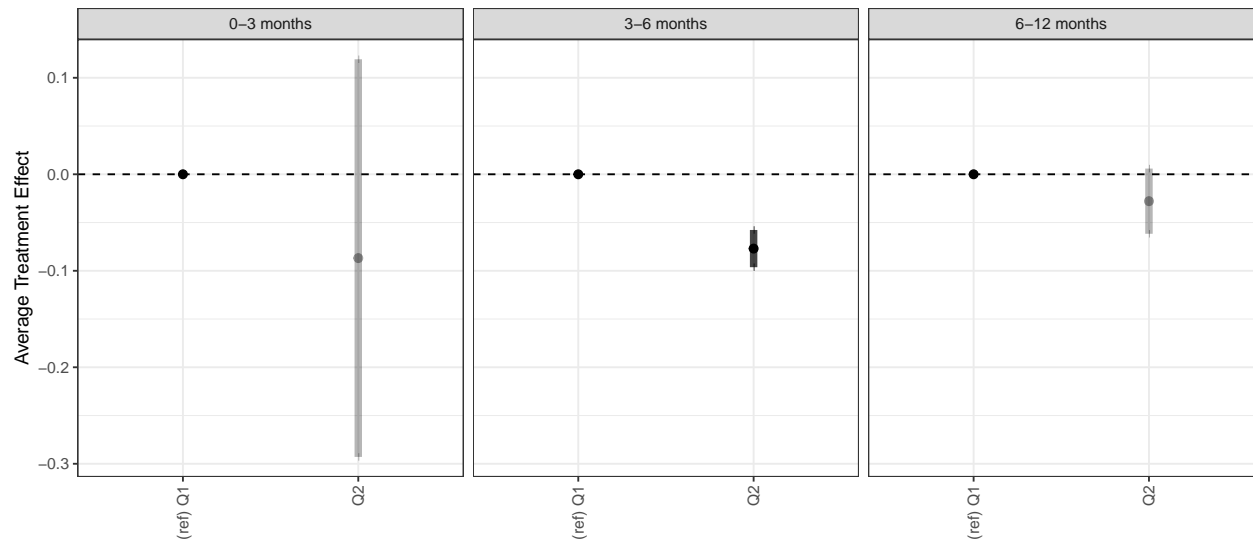
Gestational age at birth in days
Estimates from 8 cohorts in Asia, Latin America, Africa, Europe



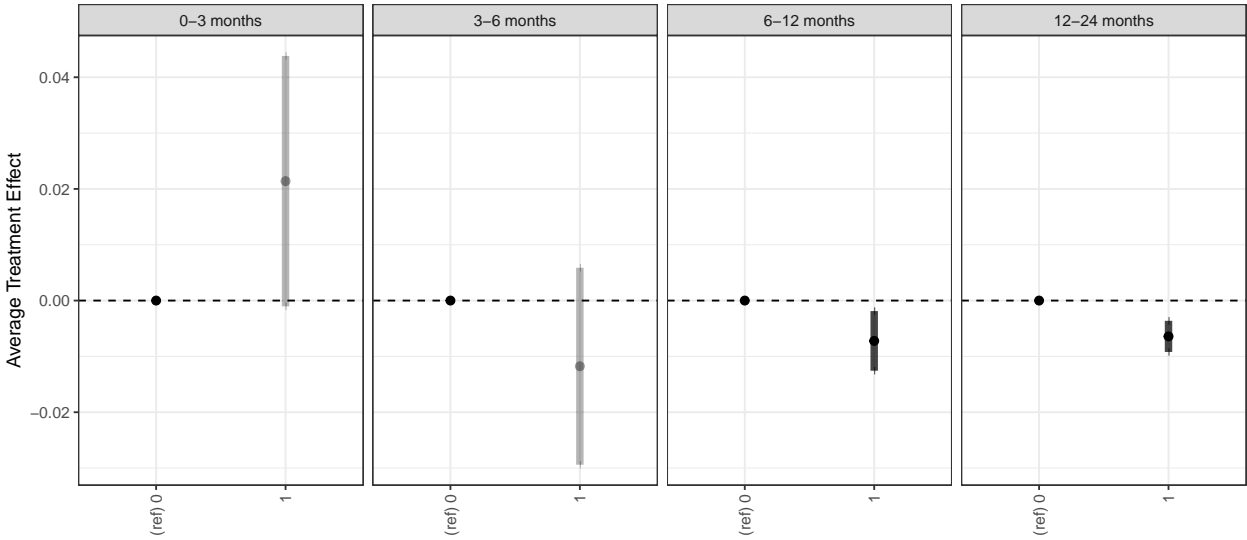
Percent diarrhea in first 24 months
Estimates from 12 cohorts in Latin America, Asia, Africa



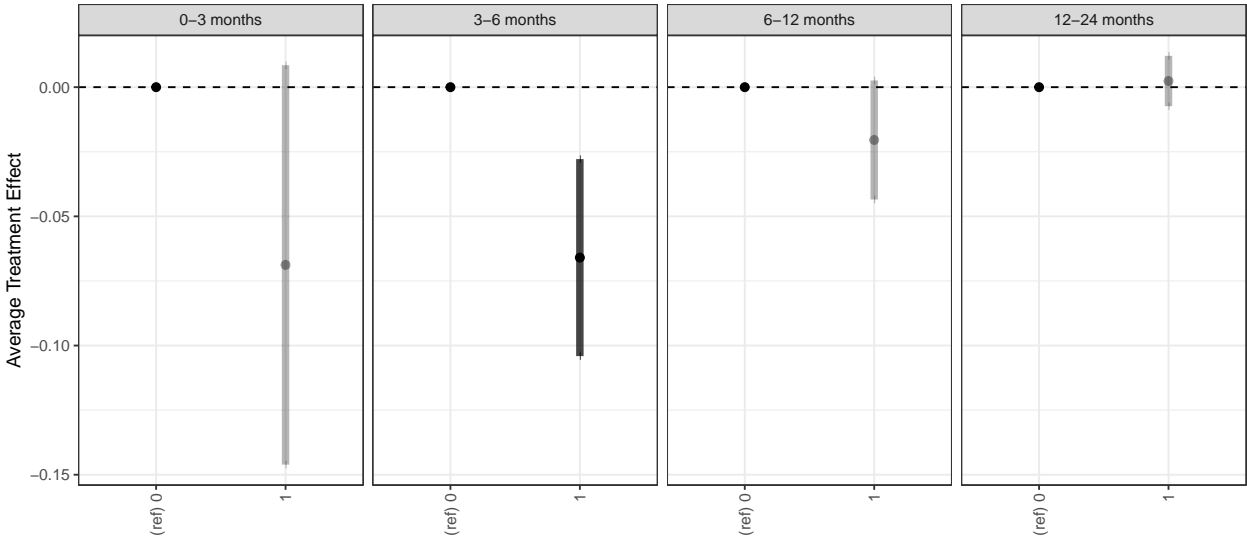
Percent diarrhea in first 6 months
Estimates from 3 cohorts in Africa, Asia



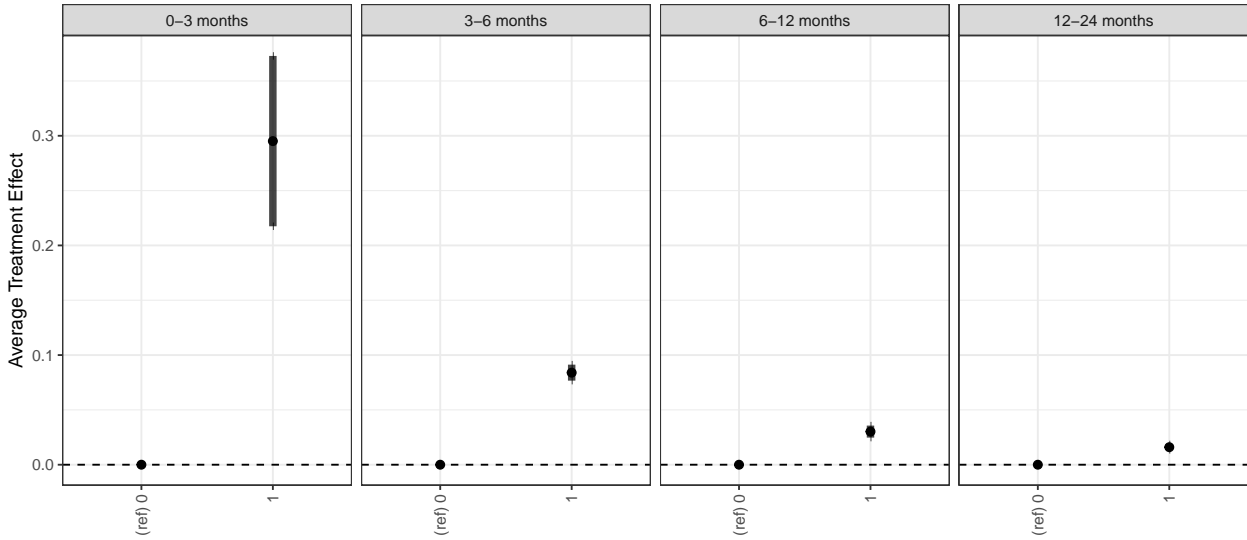
Percent exclusive breastfeeding
Estimates from 11 cohorts in Asia, Africa, Latin America



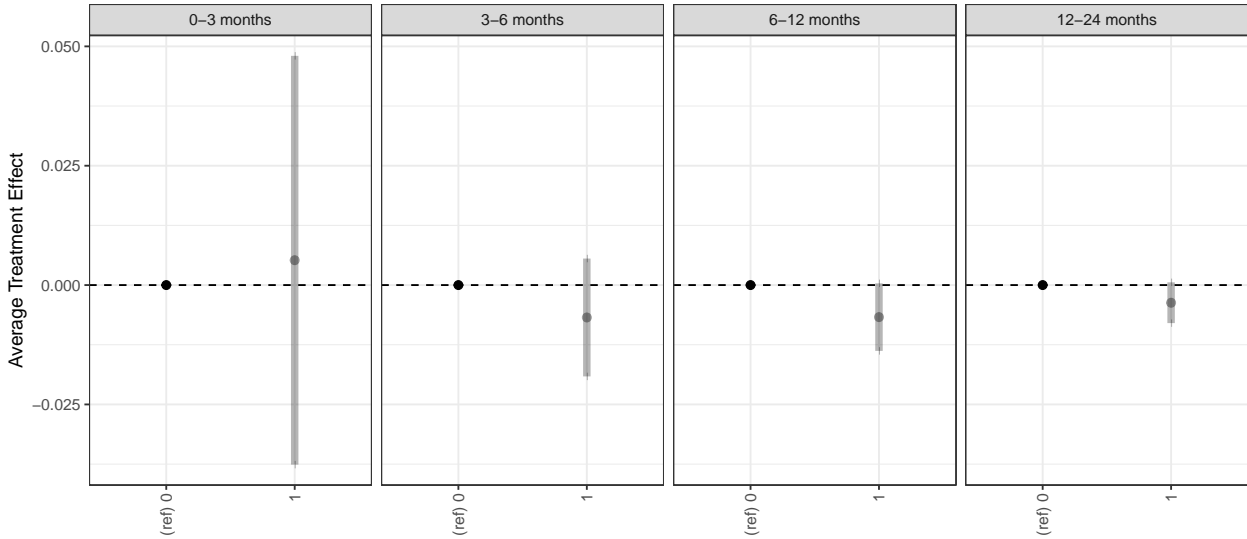
Persistent wasting in first 6 months
Estimates from 8 cohorts in Asia, Africa



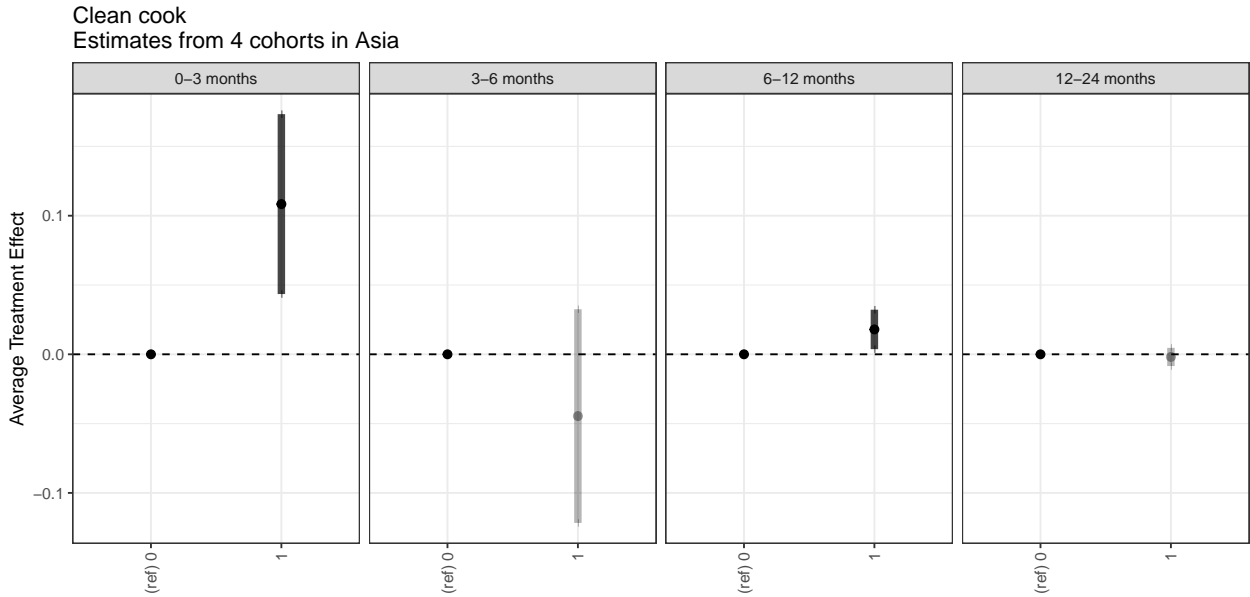
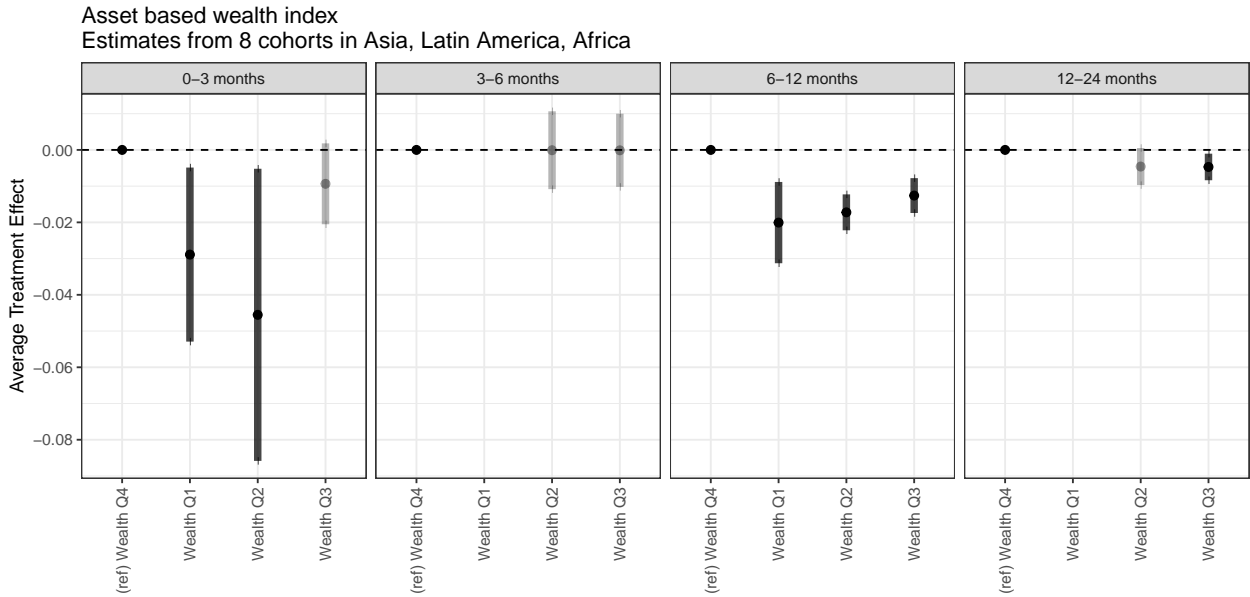
Stunted at enrollment
Estimates from 20 cohorts in Asia, Latin America, Africa, Europe



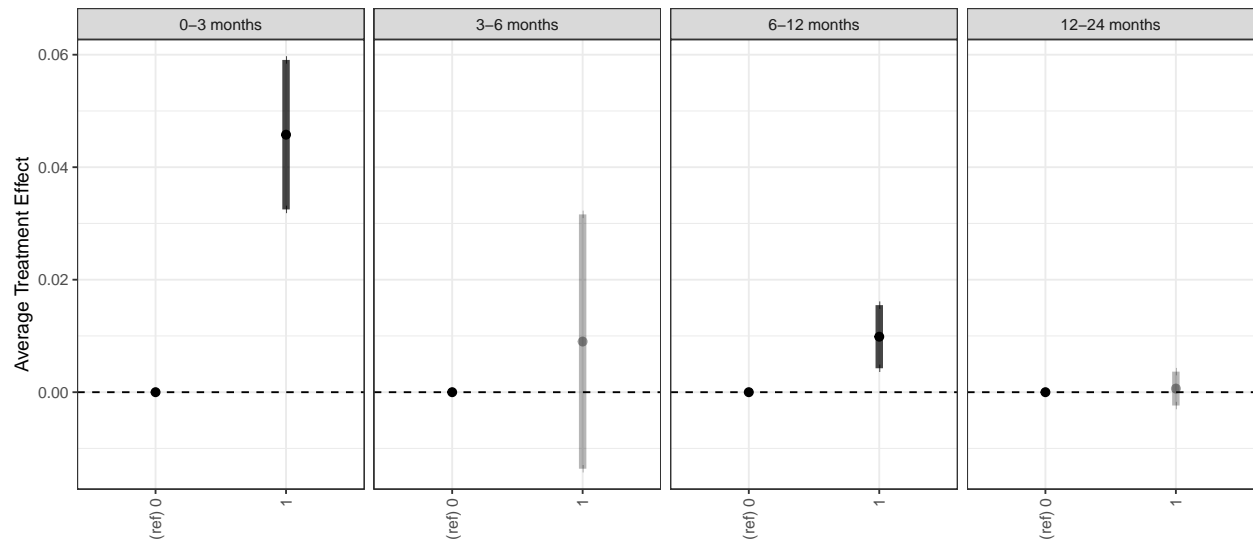
Vaginal delivery
Estimates from 8 cohorts in Asia, Europe, Africa



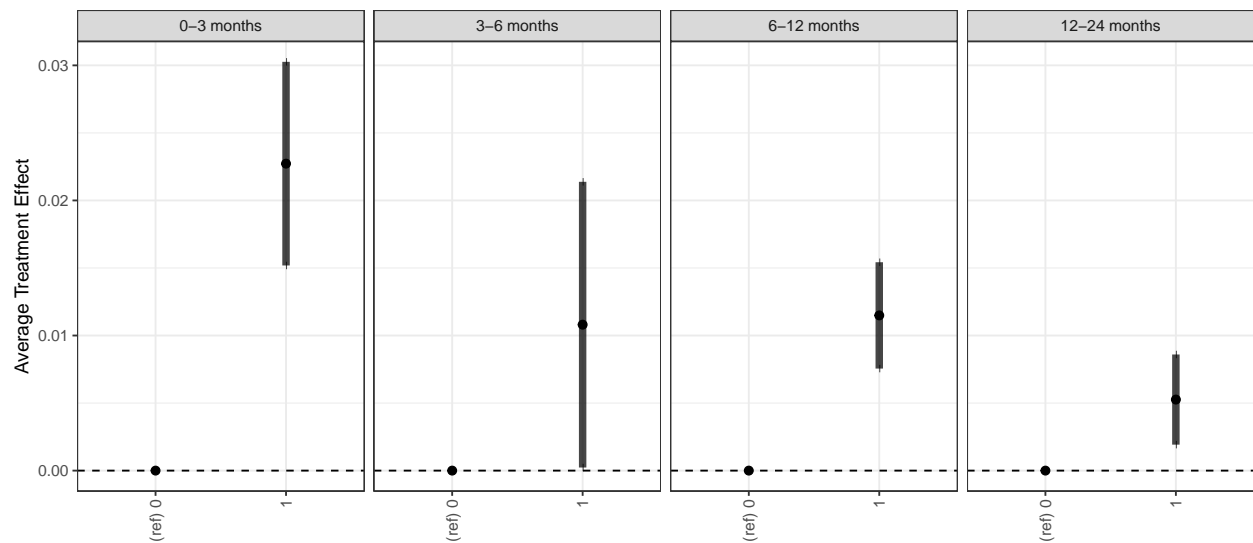
Household characteristics



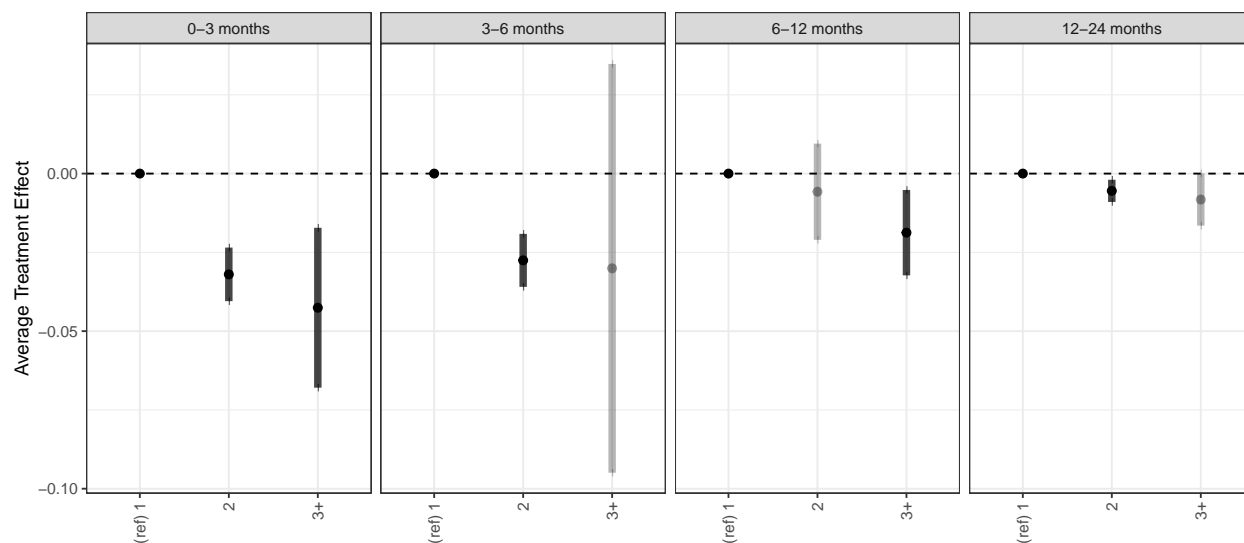
Improved floor
Estimates from 13 cohorts in Latin America, Asia, Africa



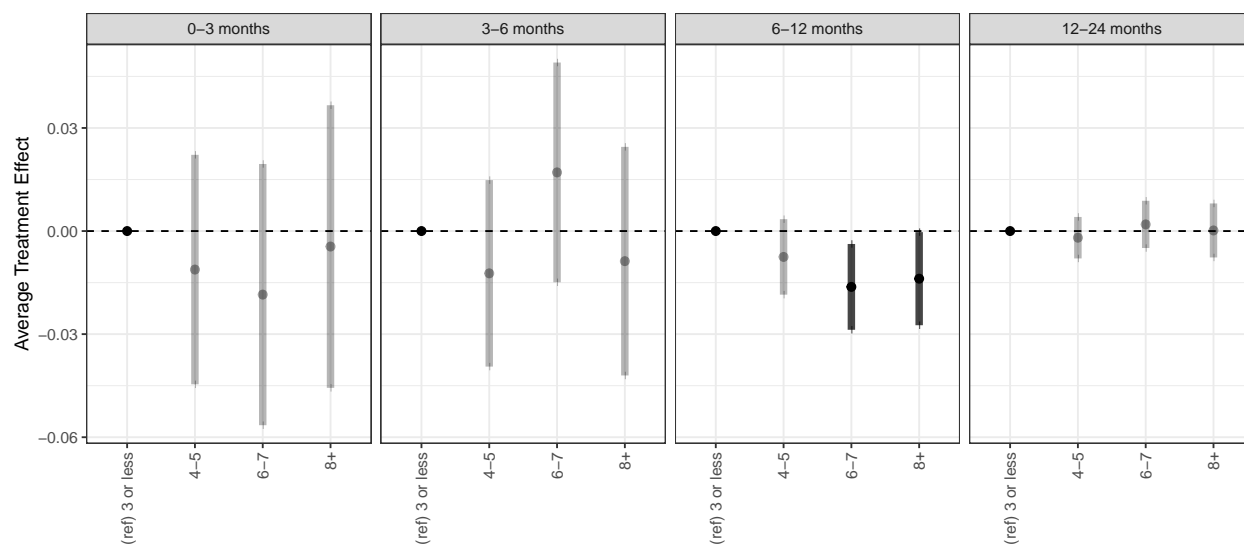
Improved sanitation
Estimates from 10 cohorts in Latin America, Asia



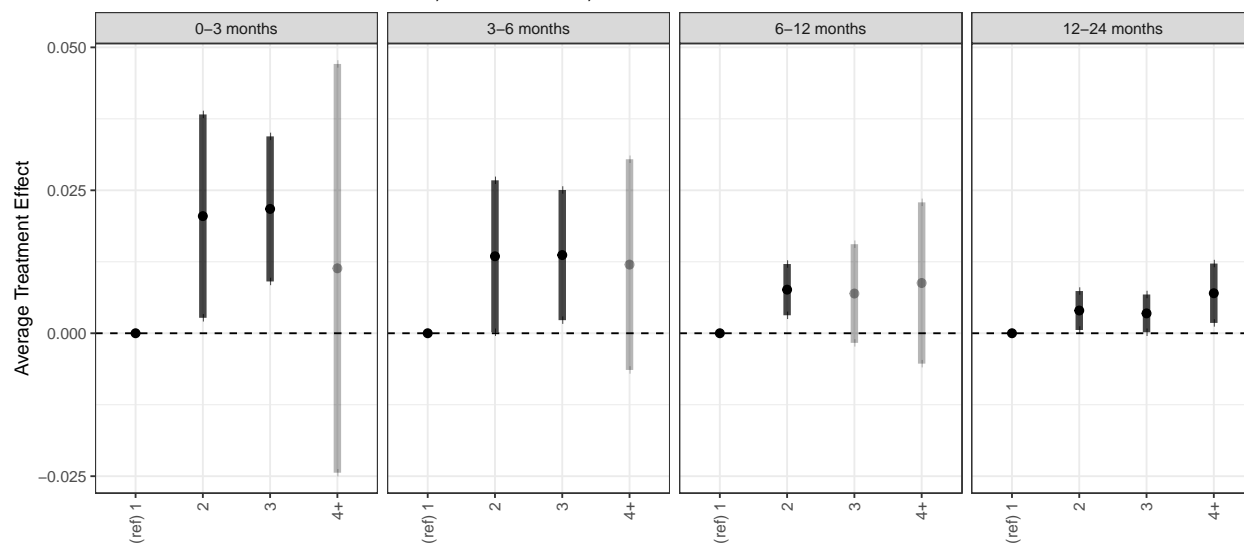
Number of children in the household under 5 years
Estimates from 4 cohorts in Asia



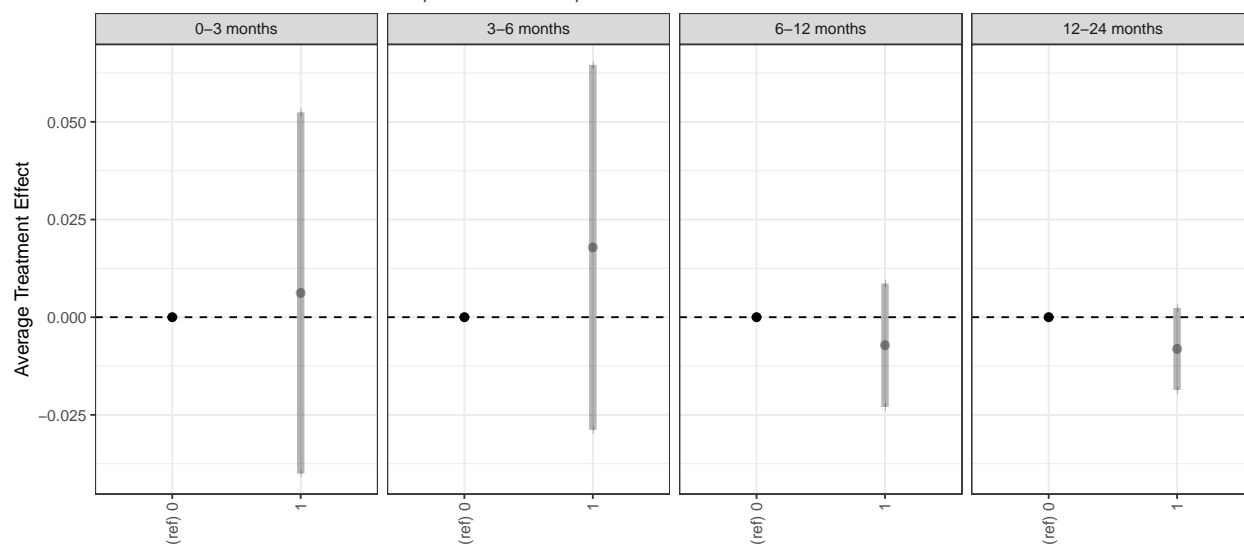
Number of people in the household
Estimates from 4 cohorts in Asia



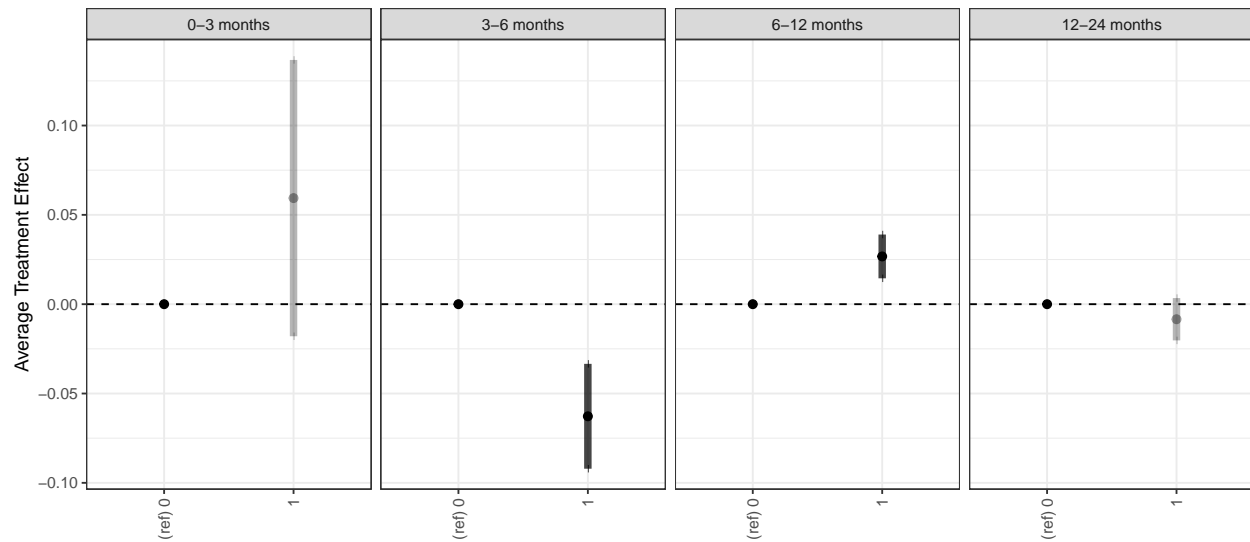
Number of rooms in household
Estimates from 15 cohorts in Asia, Latin America, Africa



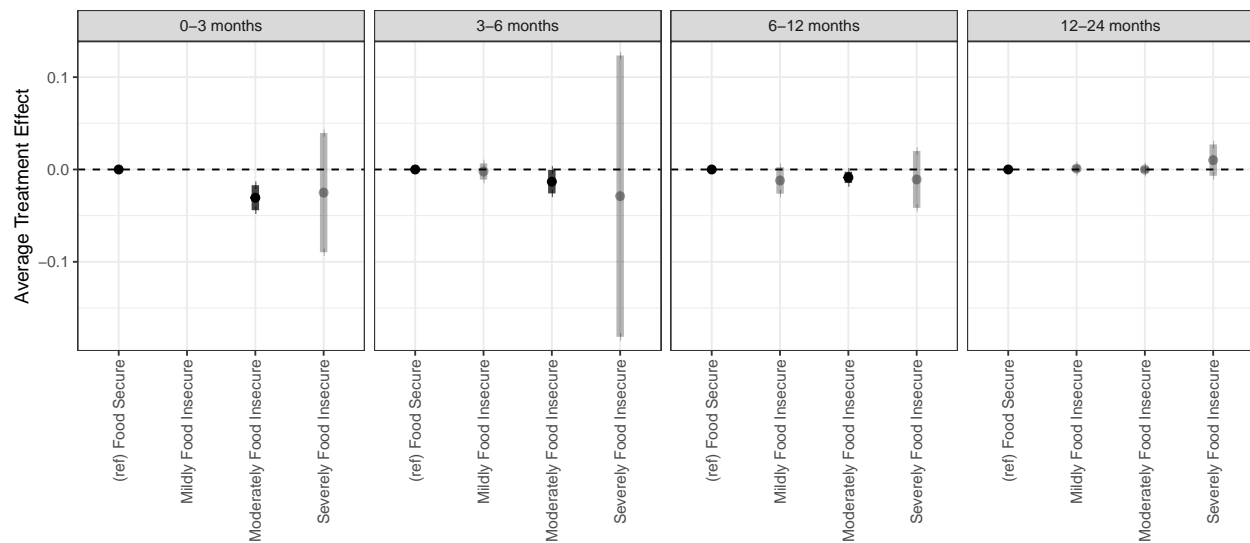
Safe water
Estimates from 4 cohorts in Asia, Latin America, Africa



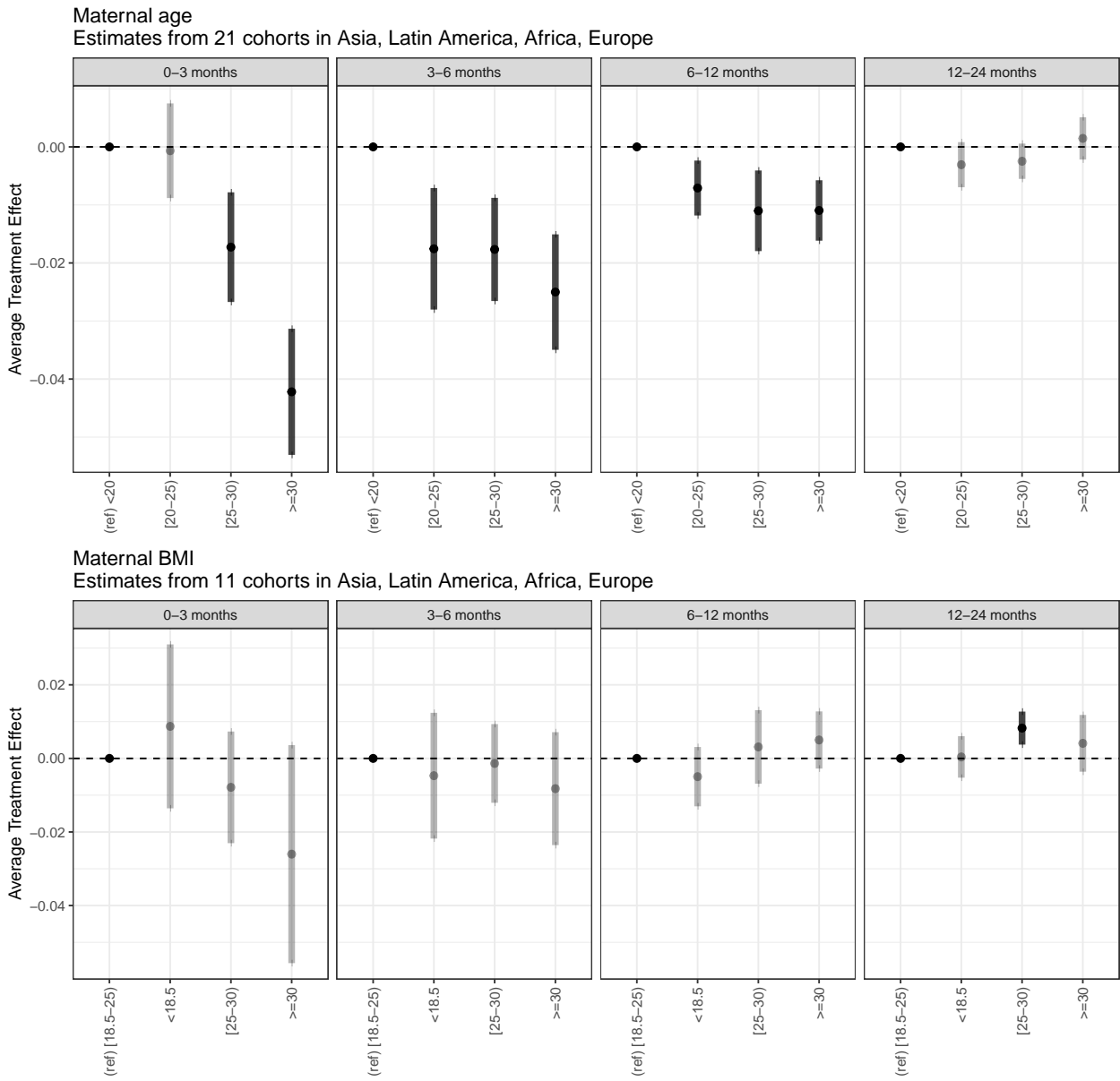
Treats water
Estimates from 6 cohorts in Latin America, Asia, Africa



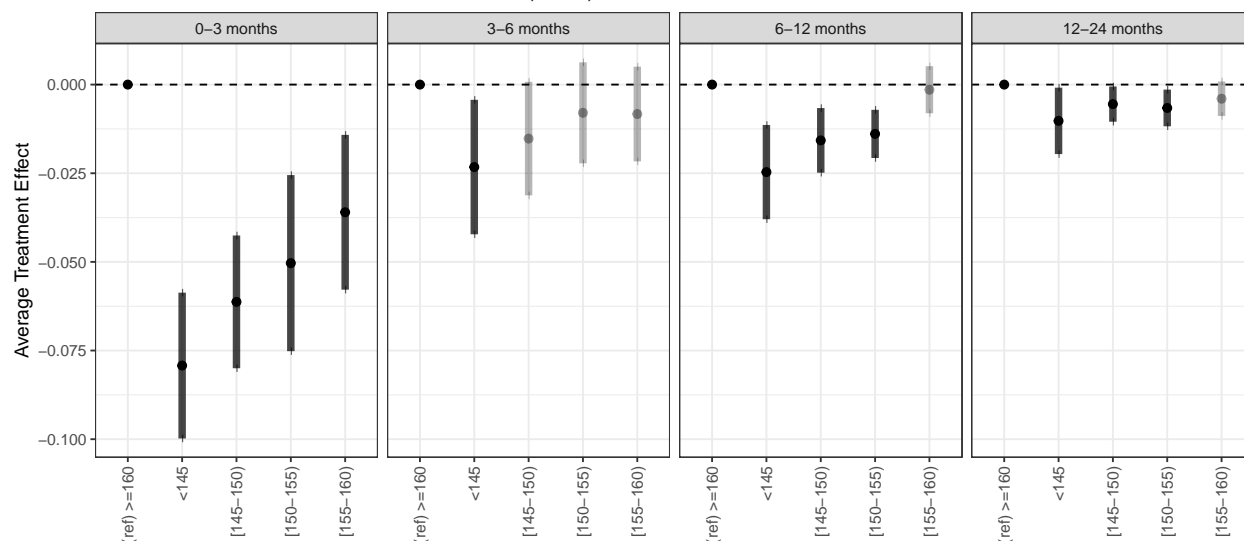
USAID Household Food Insecurity Access Scale (HFIAS) category
Estimates from 6 cohorts in Asia, Latin America, Africa



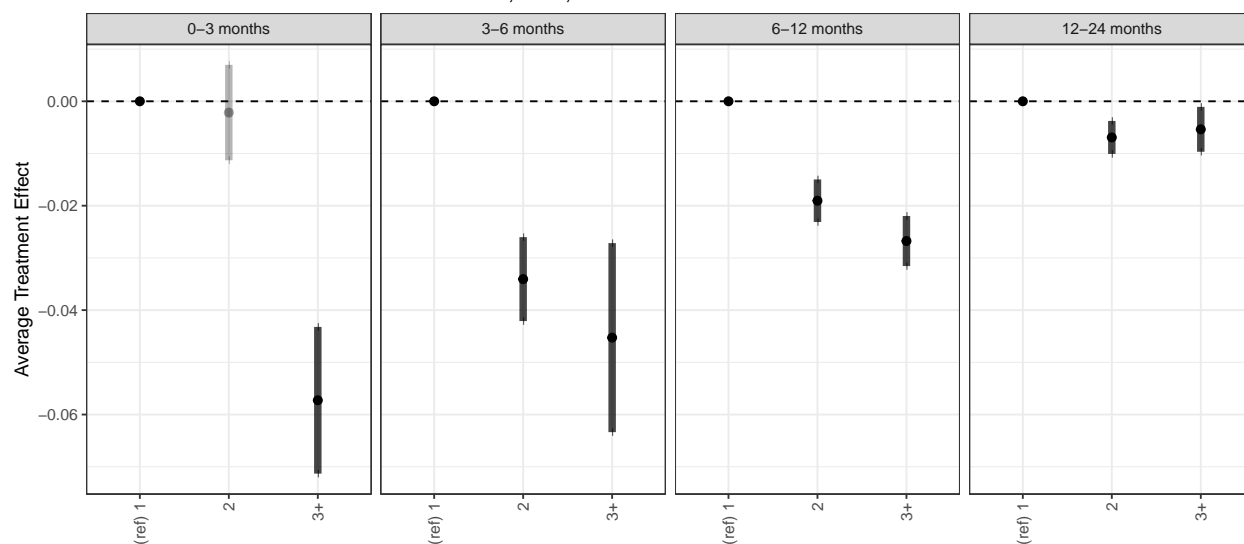
Maternal characteristics



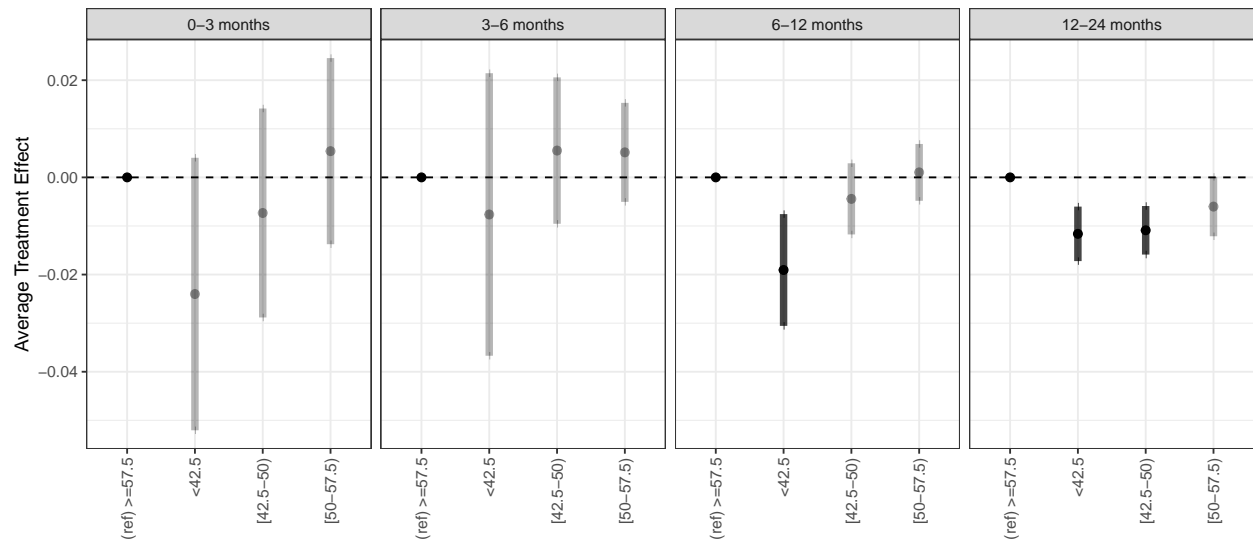
Maternal height
Estimates from 13 cohorts in Latin America, Asia, Africa



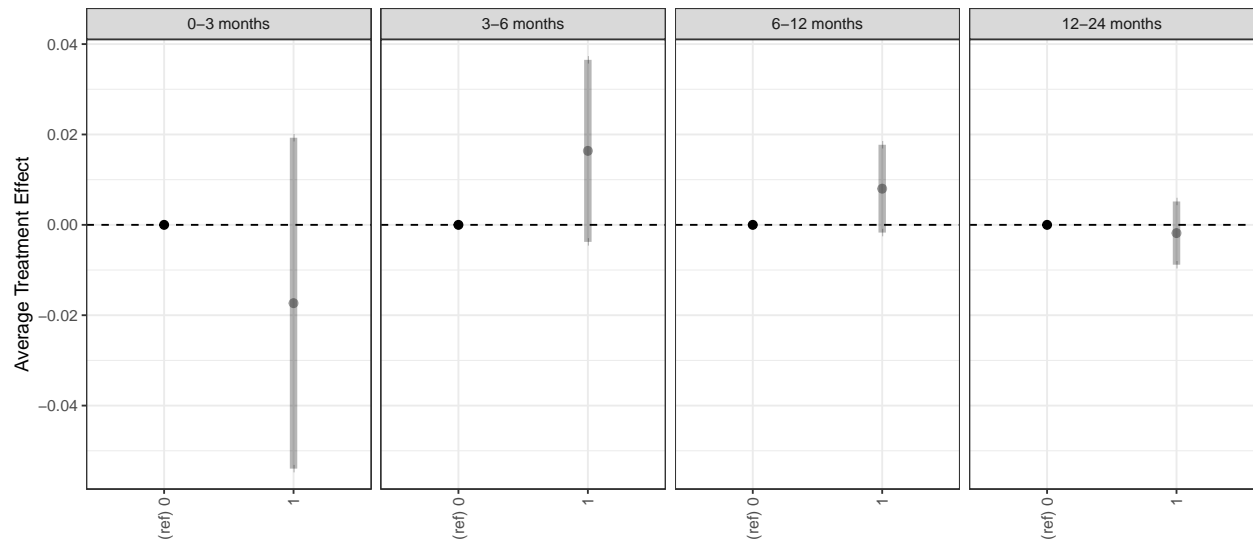
Maternal parity
Estimates from 7 cohorts in Latin America, Asia, Africa



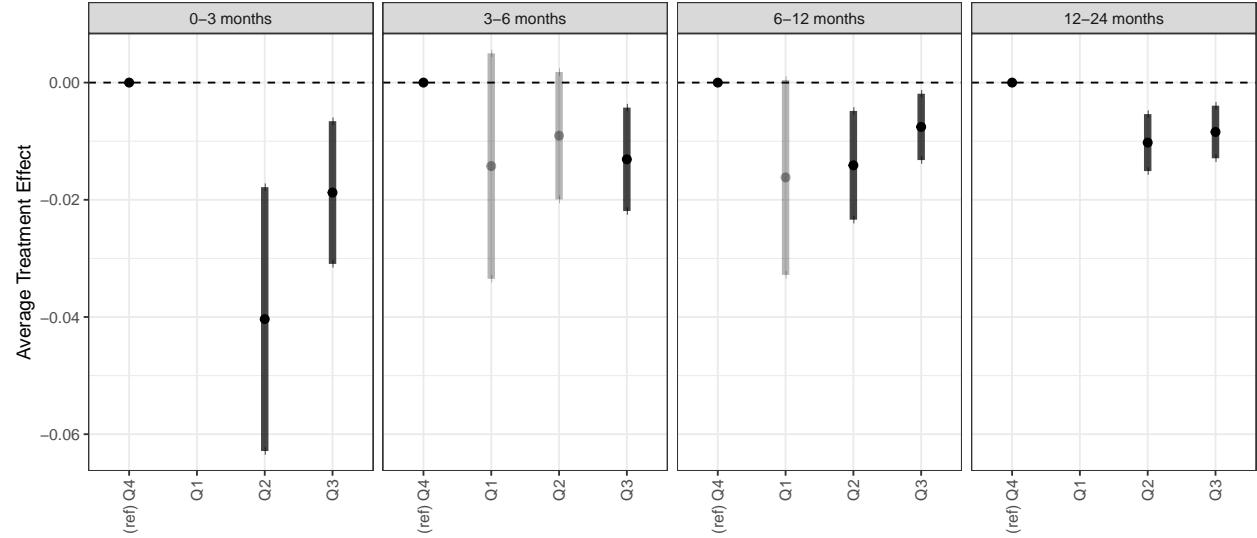
Maternal weight
Estimates from 13 cohorts in Africa, Asia, Latin America, Europe



Mother is unmarried
Estimates from 8 cohorts in Latin America, Asia, Africa, Europe

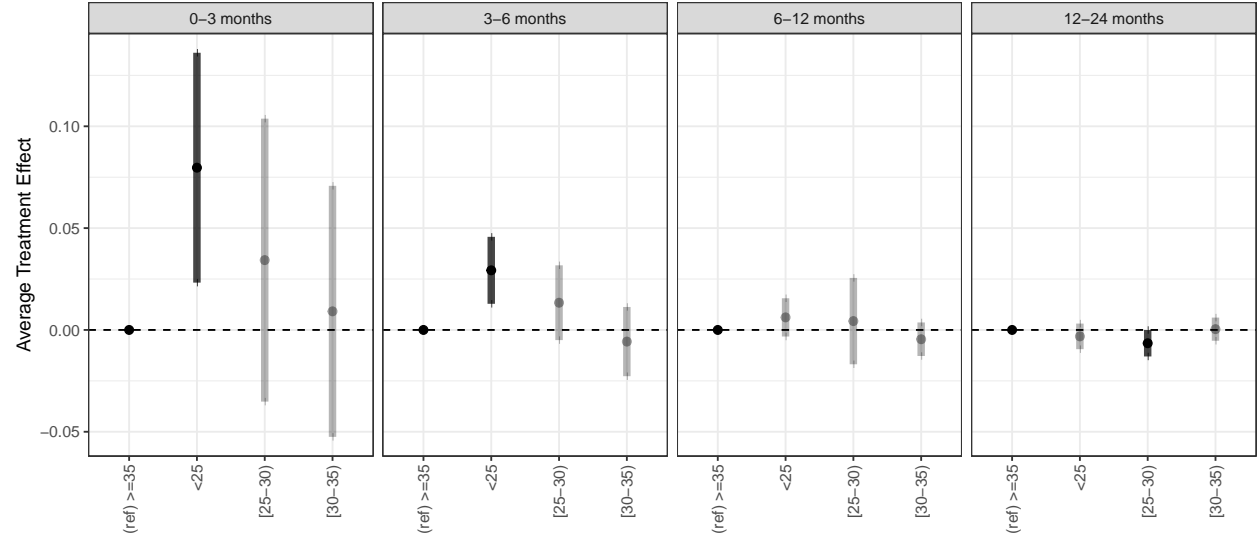


Mother's education
 Estimates from 16 cohorts in Asia, Latin America, Africa, Europe

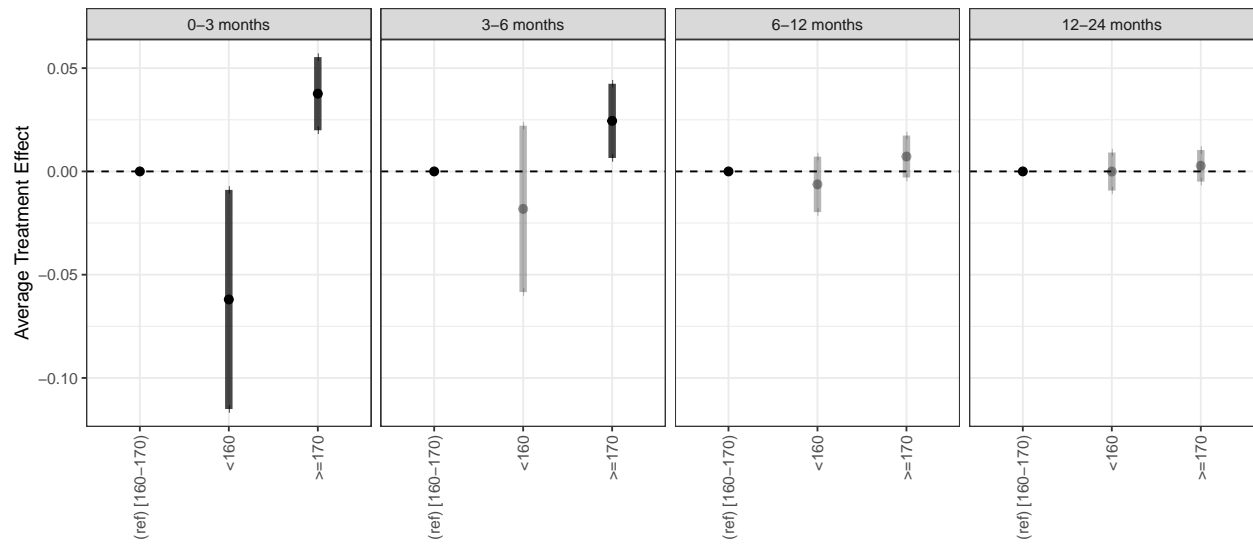


Paternal characteristics

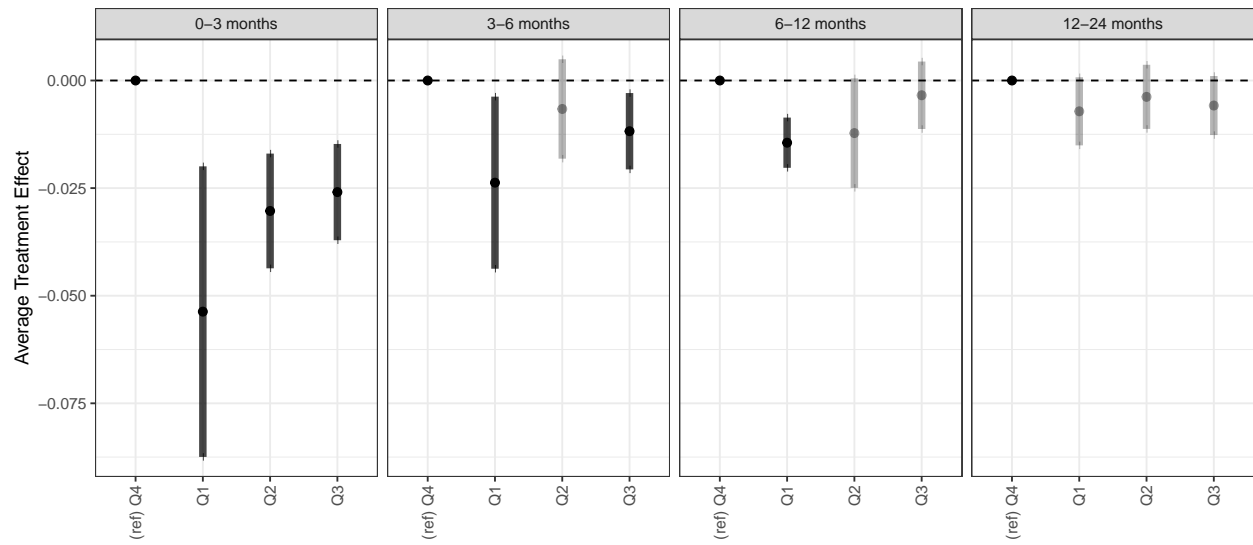
Father age
 Estimates from 5 cohorts in Latin America, Asia, Europe



Father height
Estimates from 4 cohorts in Latin America, Africa, Europe, Asia



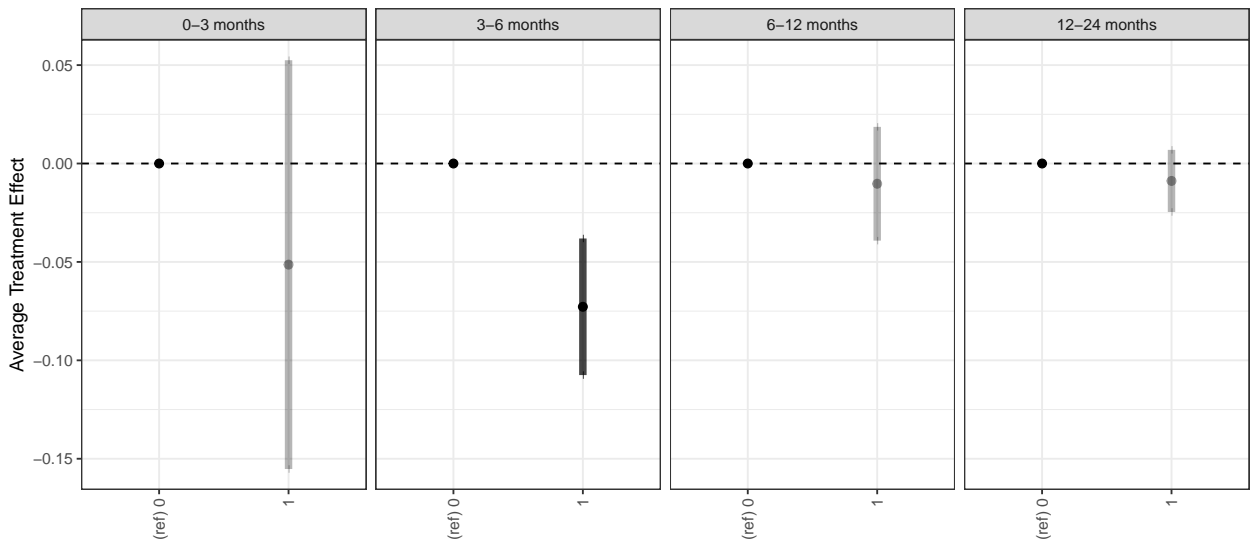
Father's education
Estimates from 14 cohorts in Asia, Latin America, Africa, Europe



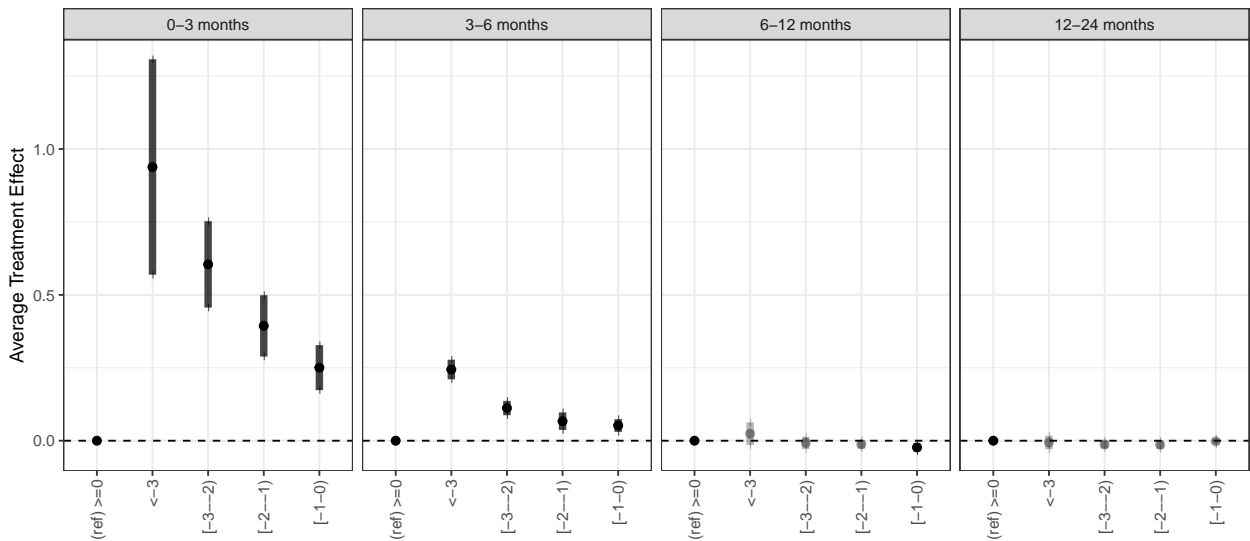
Length growth velocity

Child characteristics

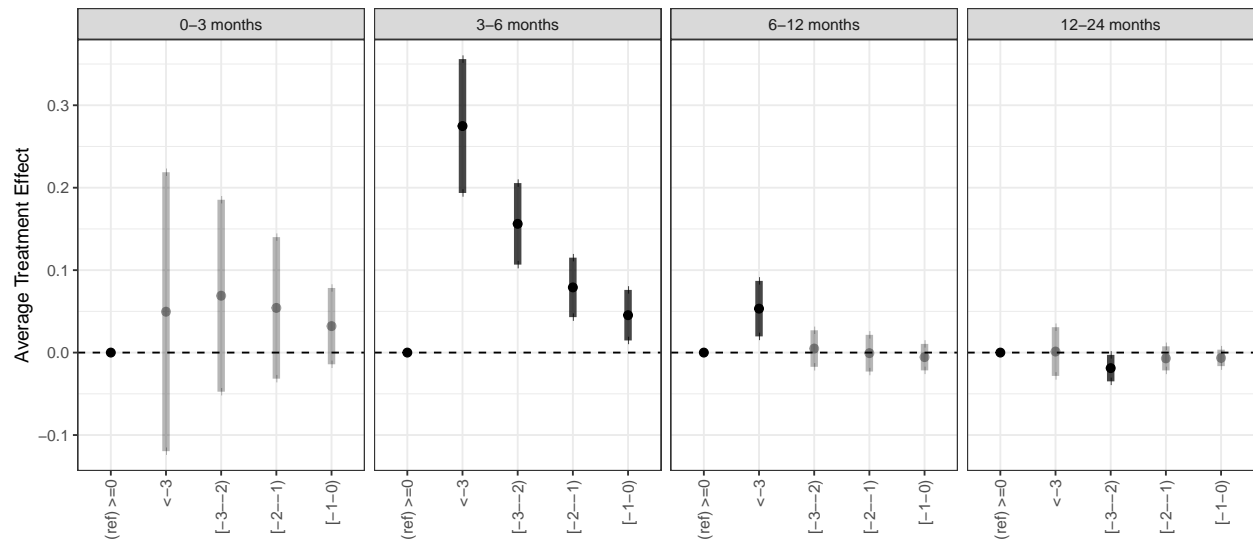
Any wasting in first 6 months
Estimates from 15 cohorts in Asia, Latin America, Africa



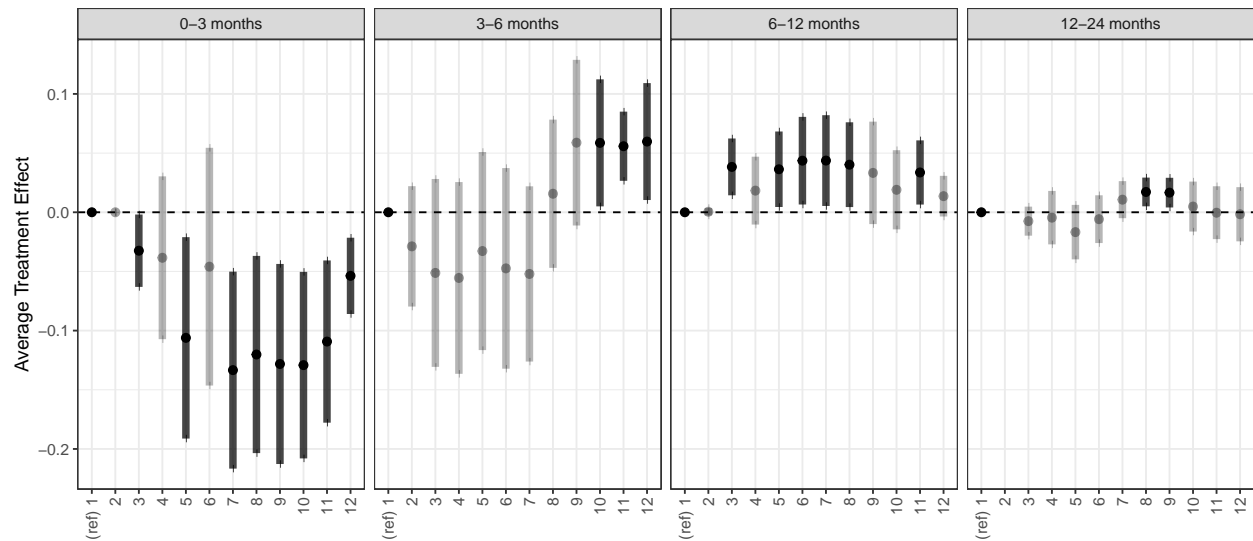
Birth length
Estimates from 15 cohorts in Latin America, Asia, Africa, Europe



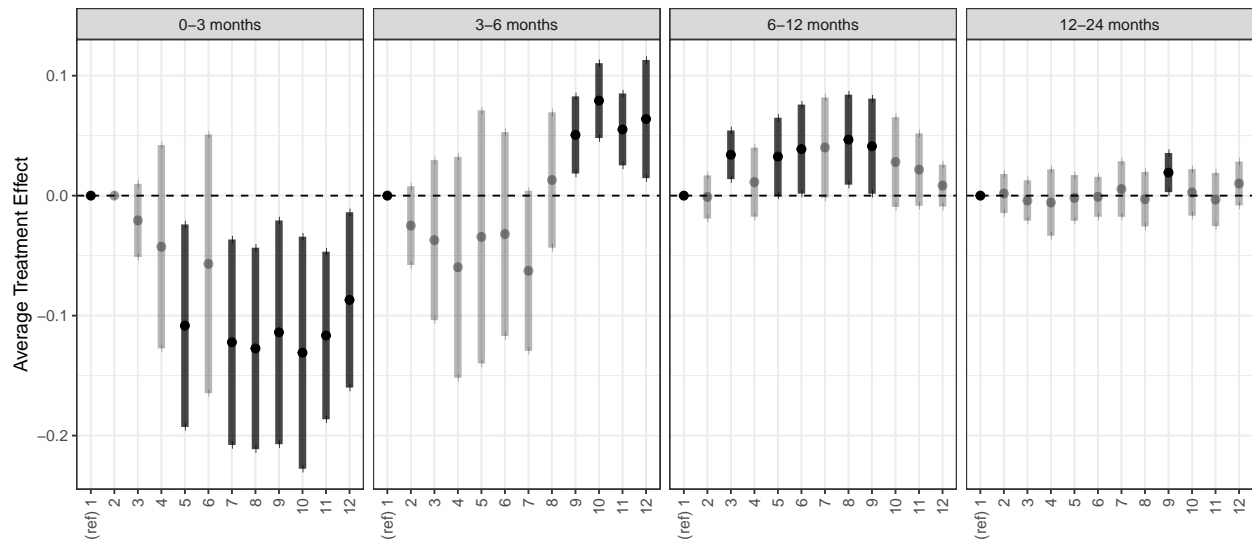
Birthweight
Estimates from 15 cohorts in Asia, Latin America, Africa, Europe



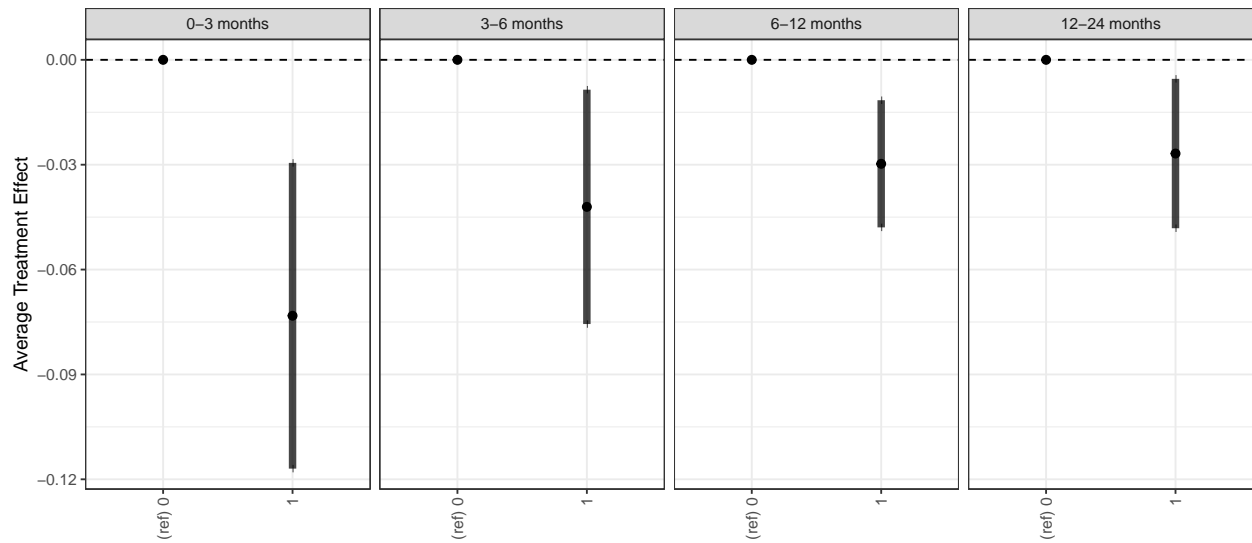
Calendar month of birth
Estimates from 19 cohorts in Asia, Latin America, Africa, Europe



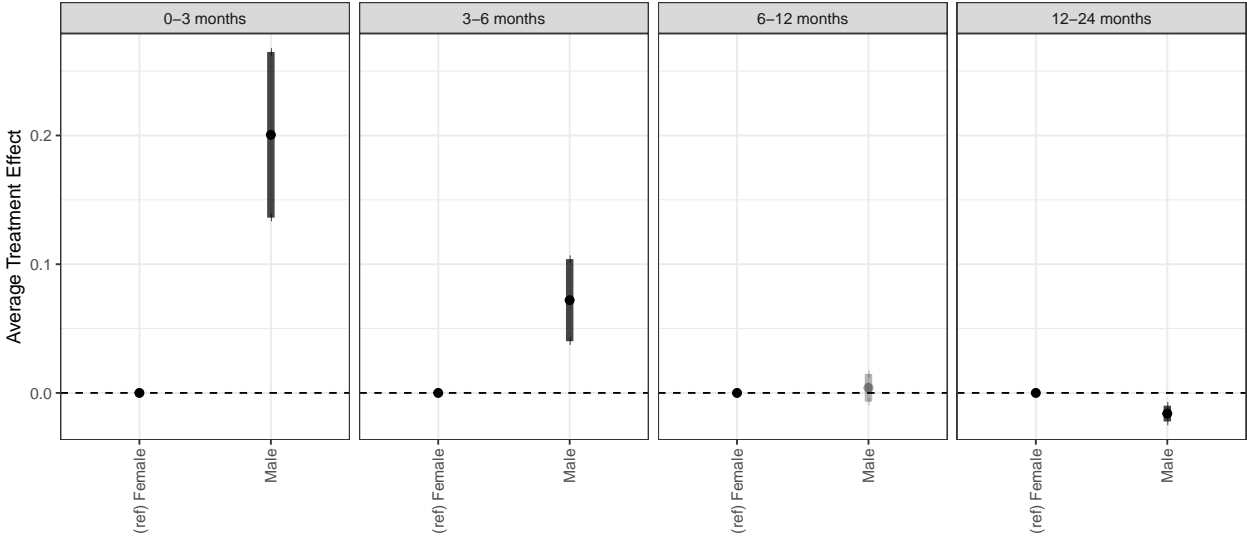
Calendar month of measurement
Estimates from 19 cohorts in Asia, Latin America, Africa, Europe



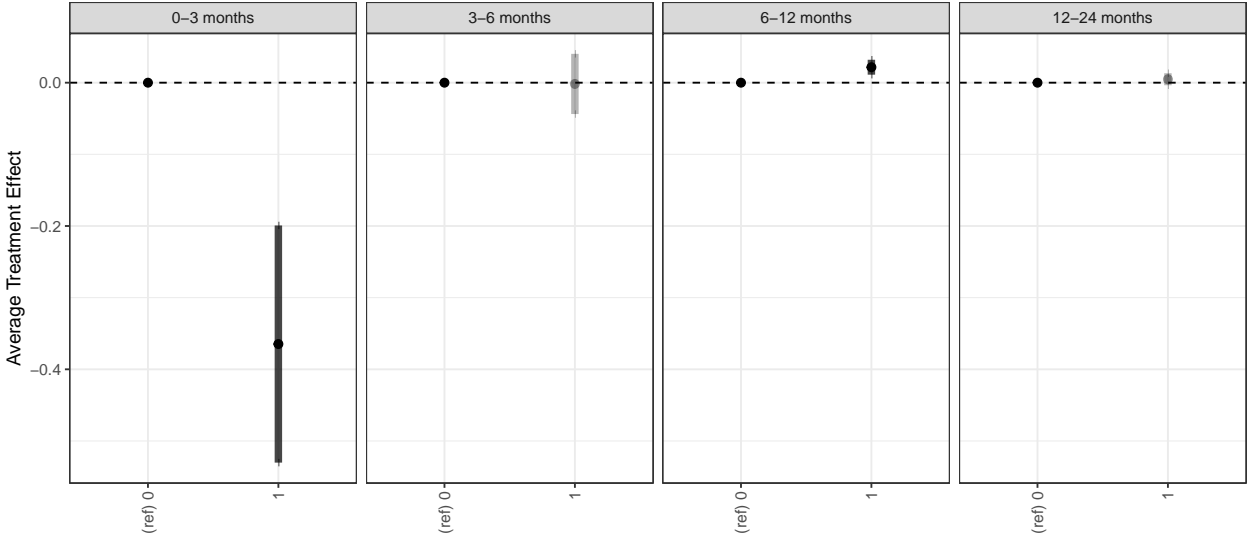
Child delivered at home
Estimates from 11 cohorts in Asia, Africa



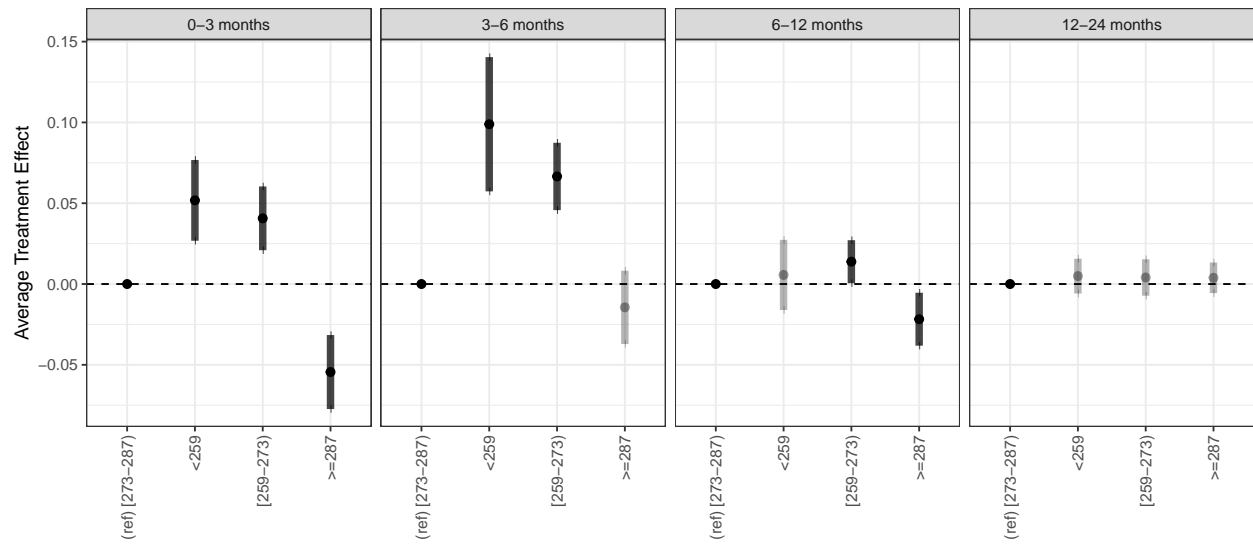
Child's sex
Estimates from 27 cohorts in Asia, Latin America, Africa, Europe



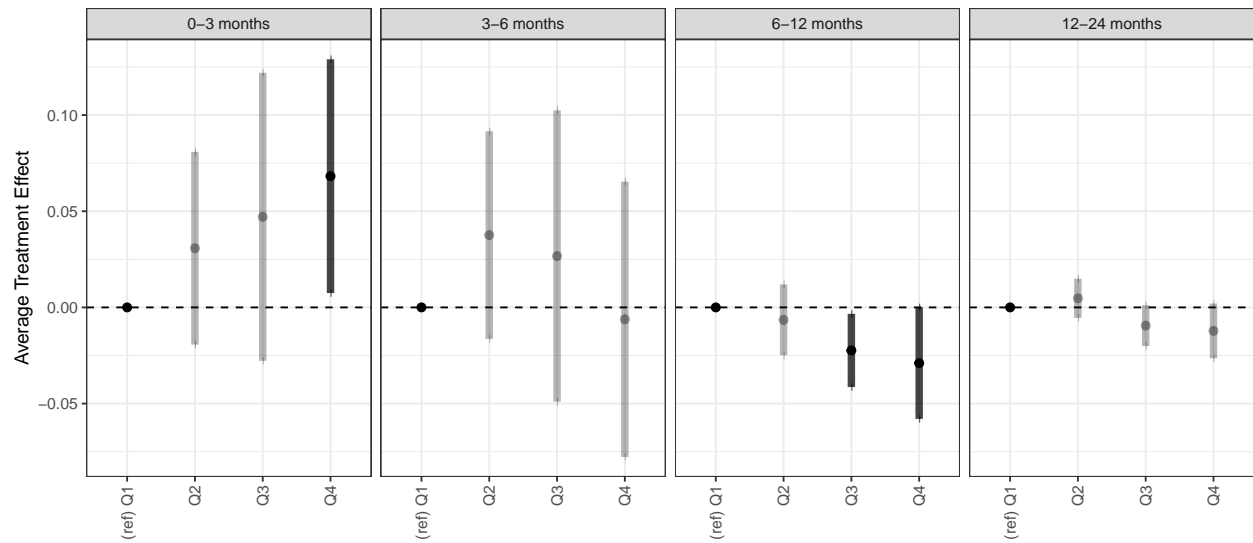
Enrolled wasted
Estimates from 19 cohorts in Asia, Latin America, Africa, Europe



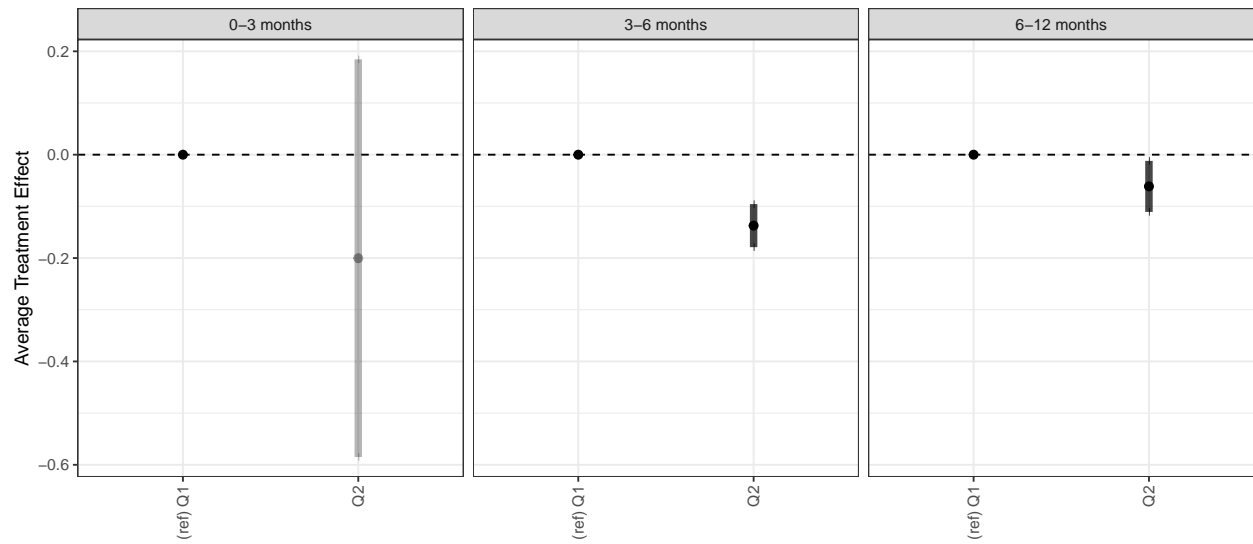
Gestational age at birth in days
Estimates from 8 cohorts in Asia, Latin America, Africa, Europe



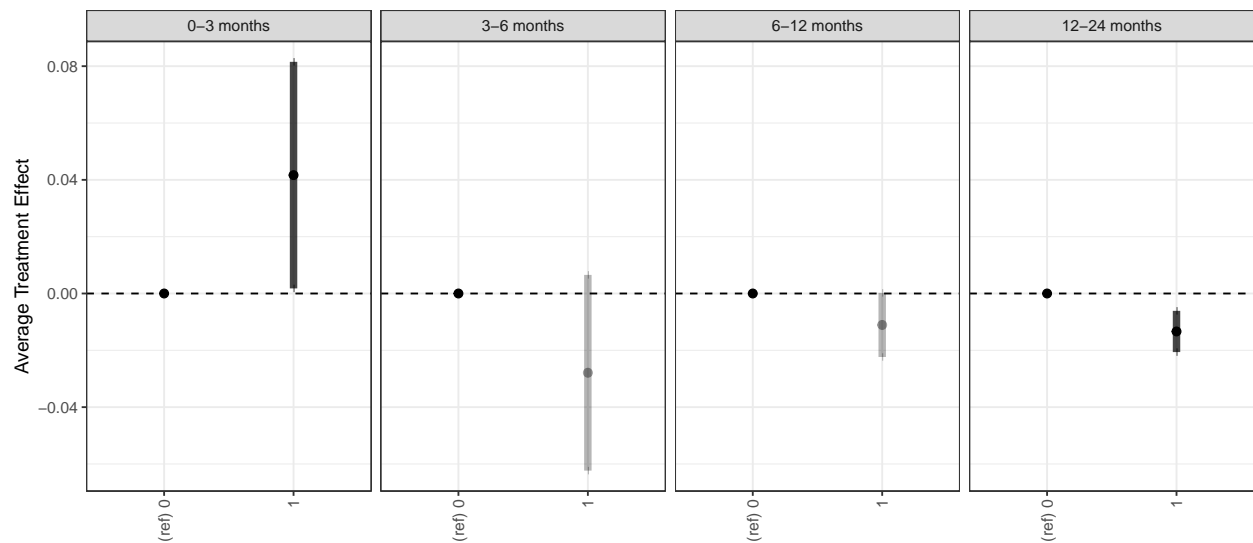
Percent diarrhea in first 24 months
Estimates from 12 cohorts in Latin America, Asia, Africa



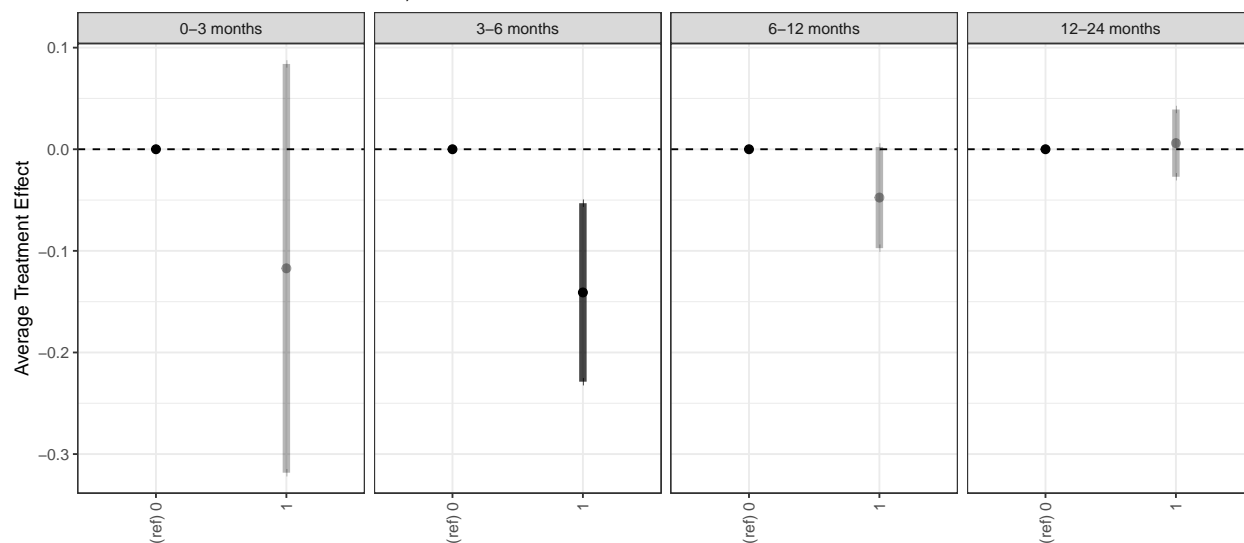
Percent diarrhea in first 6 months
Estimates from 3 cohorts in Africa, Asia



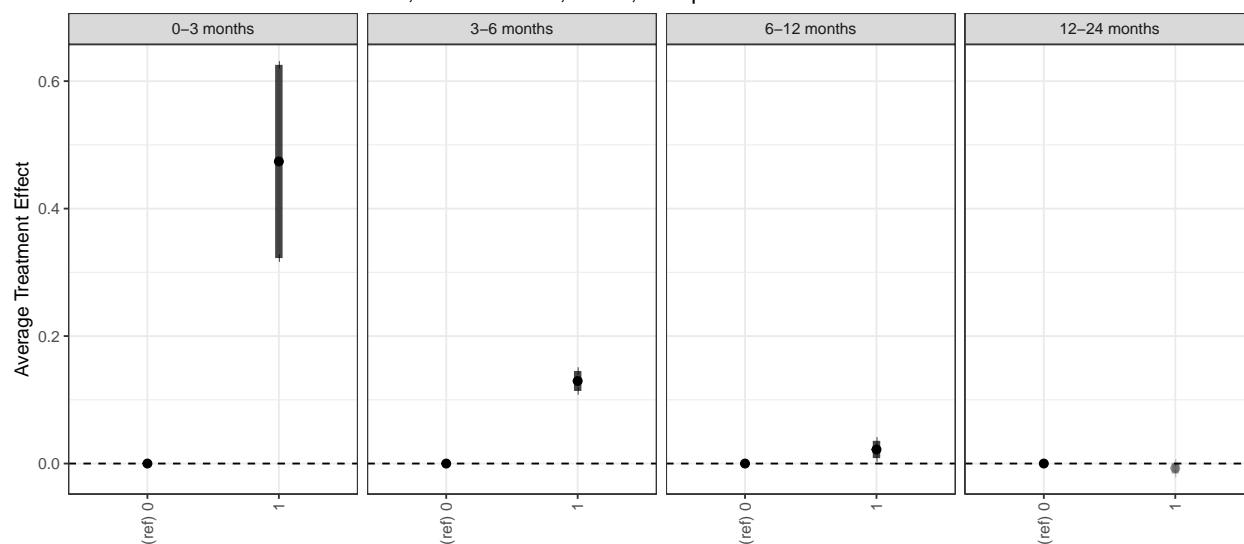
Percent exclusive breastfeeding
Estimates from 11 cohorts in Asia, Africa, Latin America



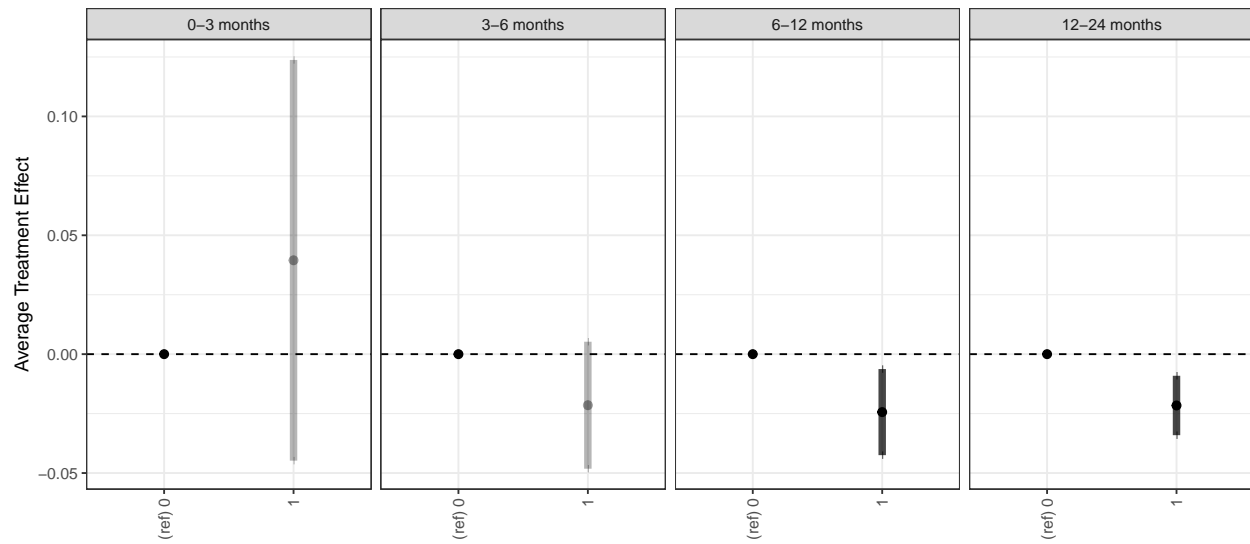
Persistent wasting in first 6 months
Estimates from 8 cohorts in Asia, Africa



Stunted at enrollment
Estimates from 20 cohorts in Asia, Latin America, Africa, Europe

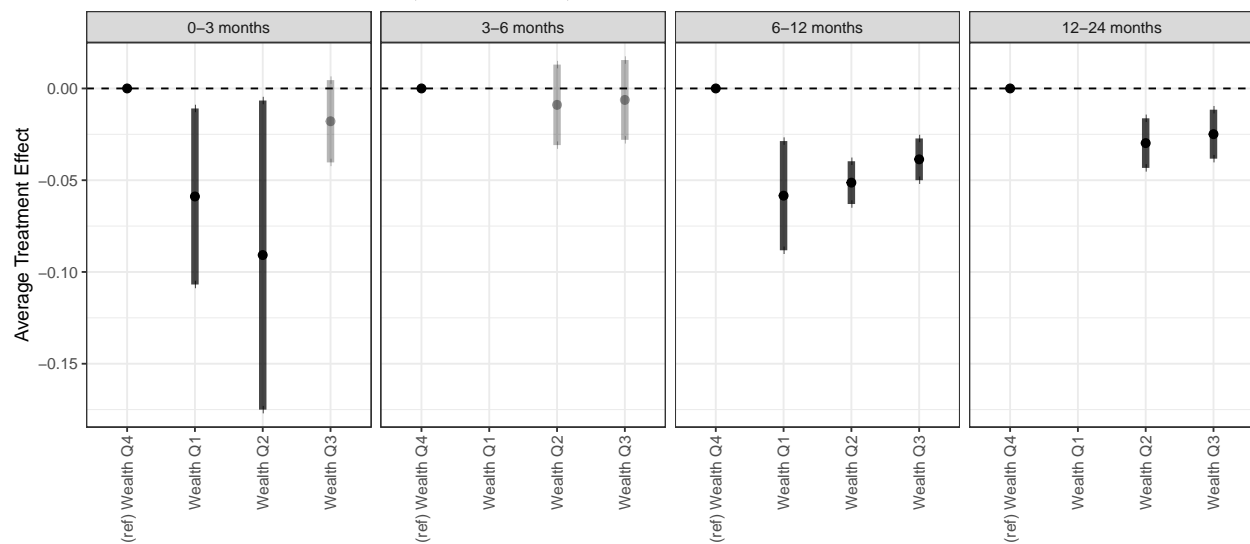


Vaginal delivery
Estimates from 8 cohorts in Asia, Europe, Africa

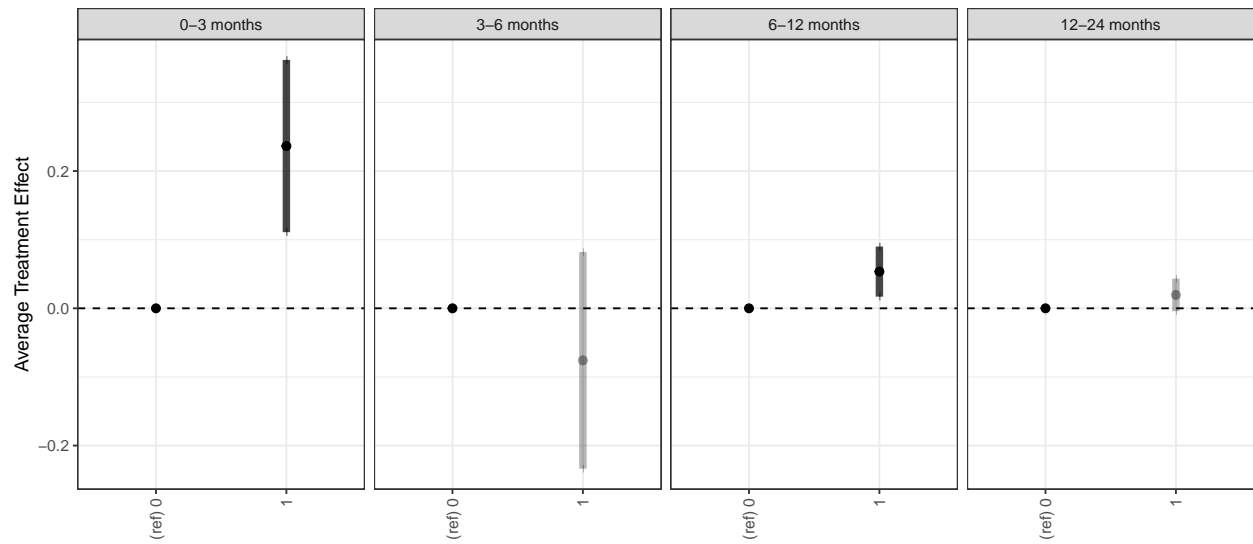


Household characteristics

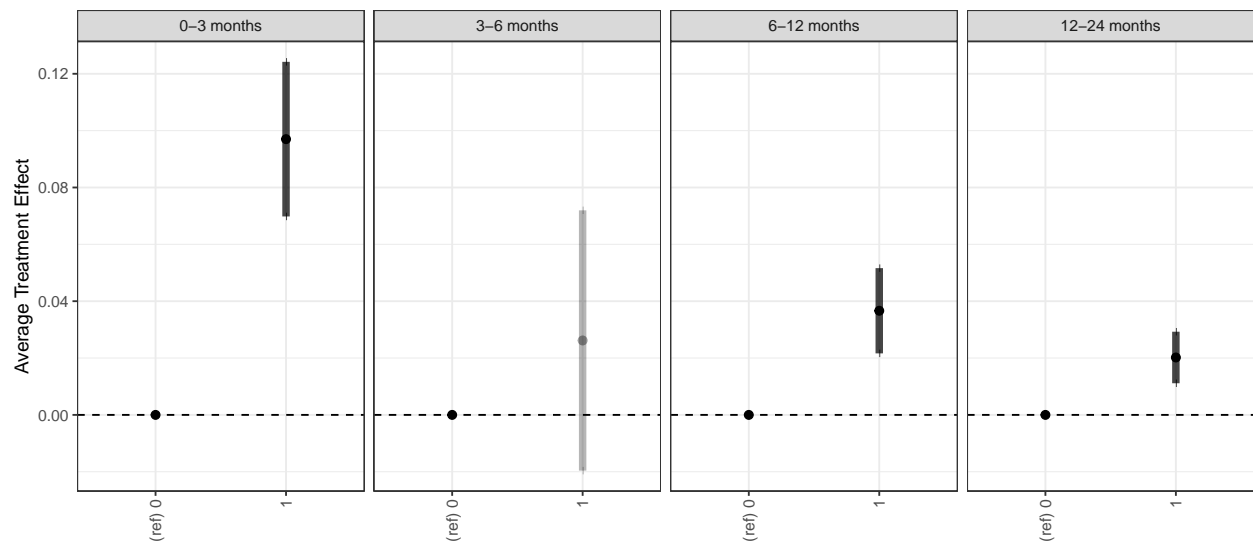
Asset based wealth index
Estimates from 8 cohorts in Asia, Latin America, Africa



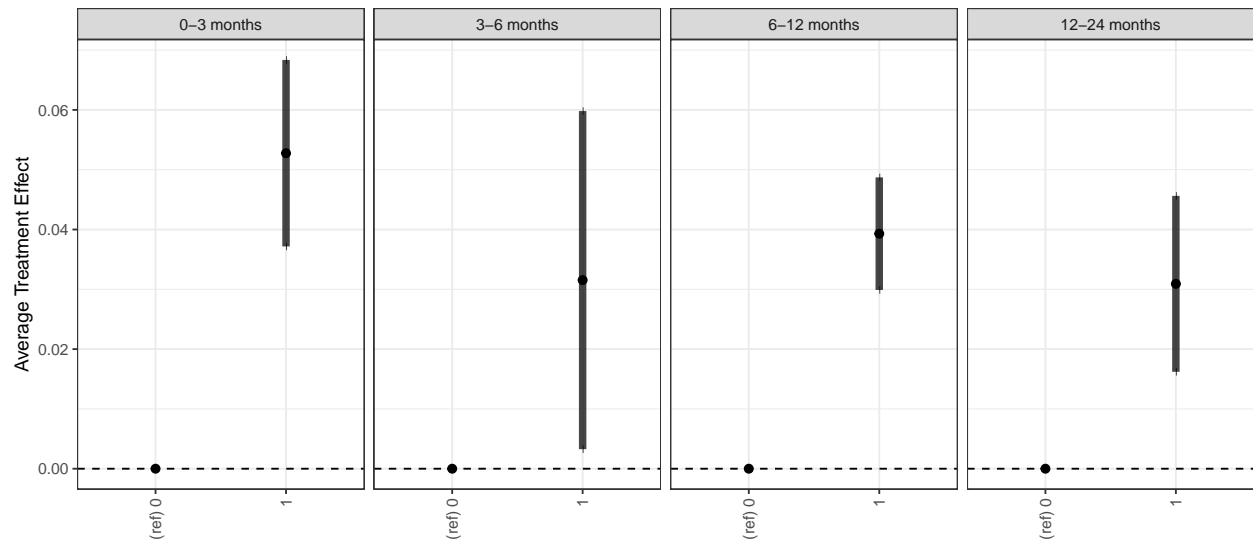
Clean cook
Estimates from 4 cohorts in Asia



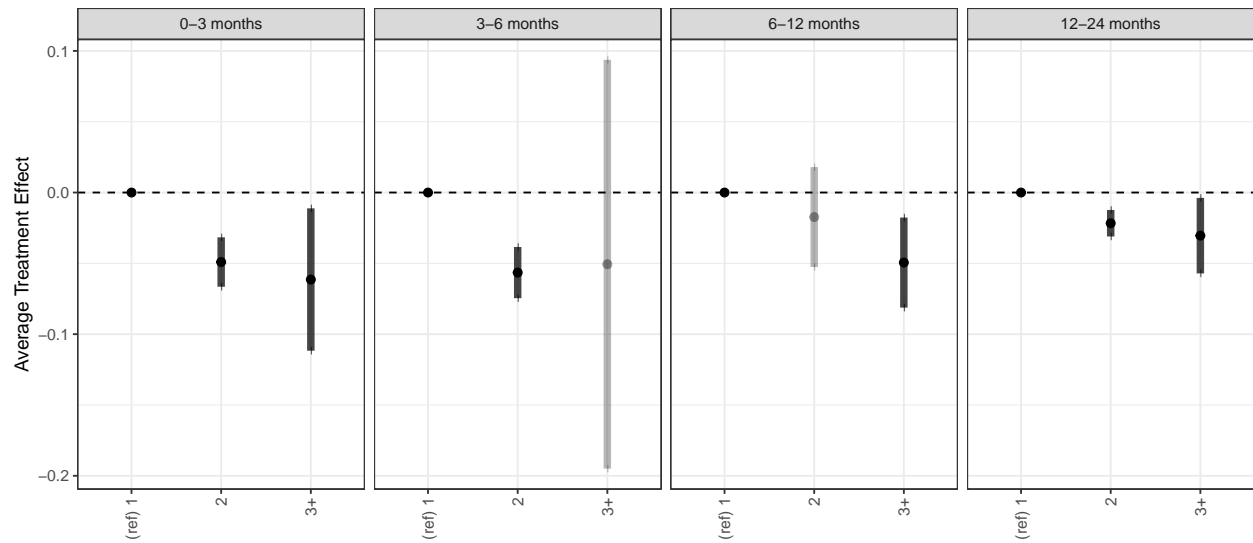
Improved floor
Estimates from 13 cohorts in Latin America, Asia, Africa



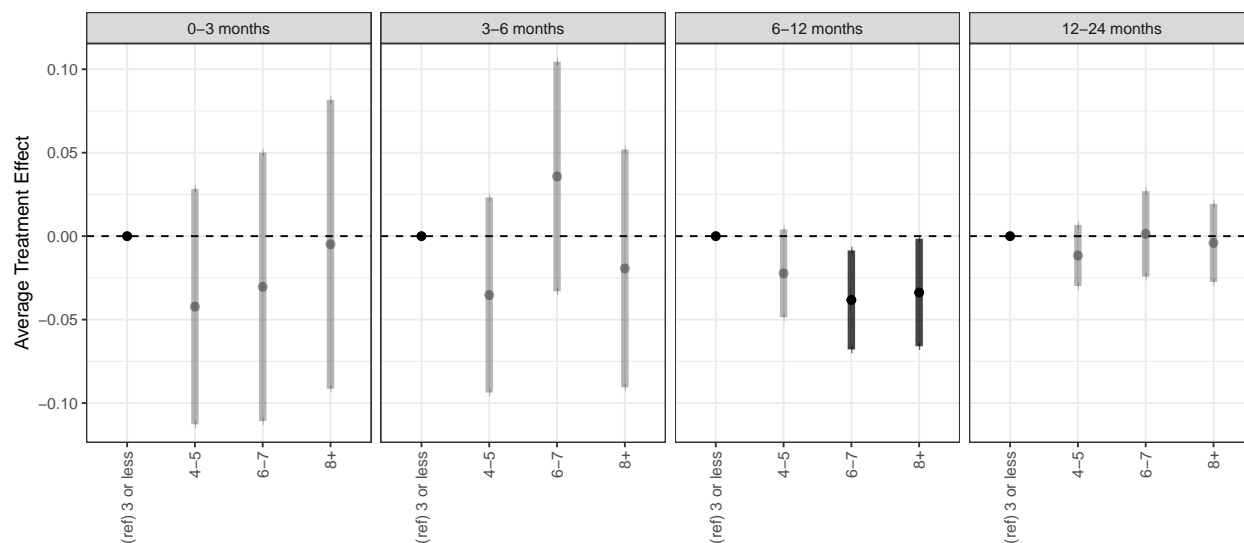
Improved sanitation
Estimates from 10 cohorts in Latin America, Asia



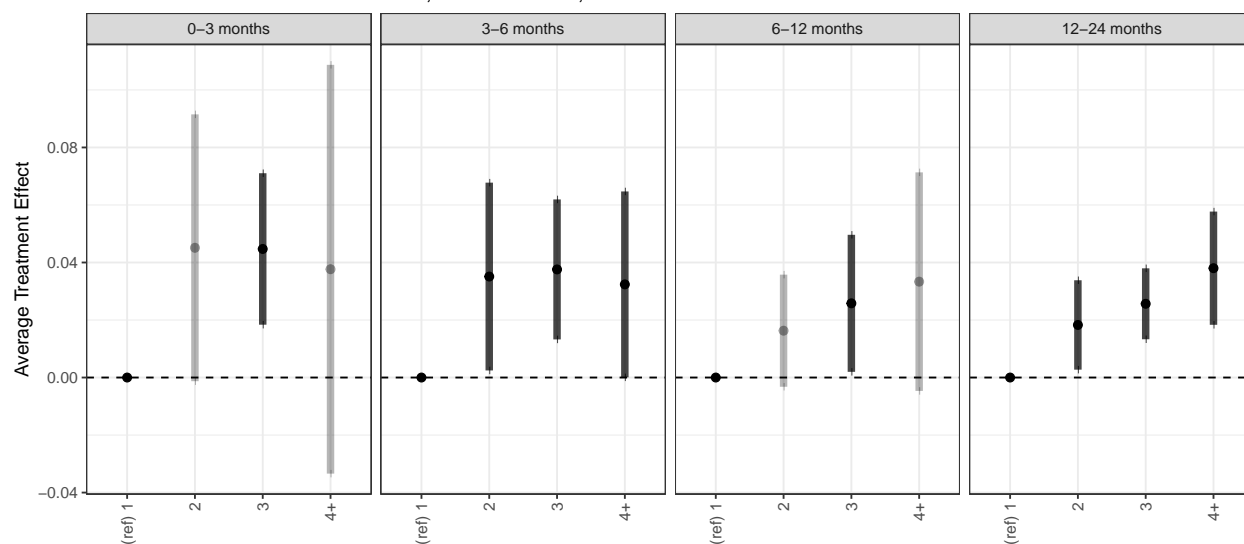
Number of children in the household under 5 years
Estimates from 4 cohorts in Asia



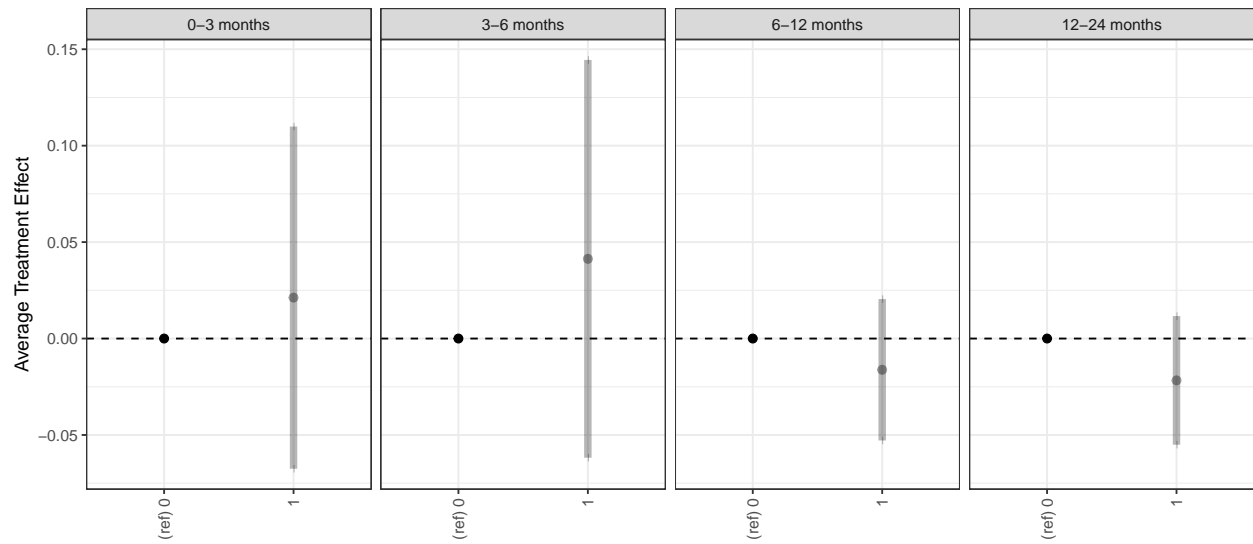
Number of people in the household
Estimates from 4 cohorts in Asia



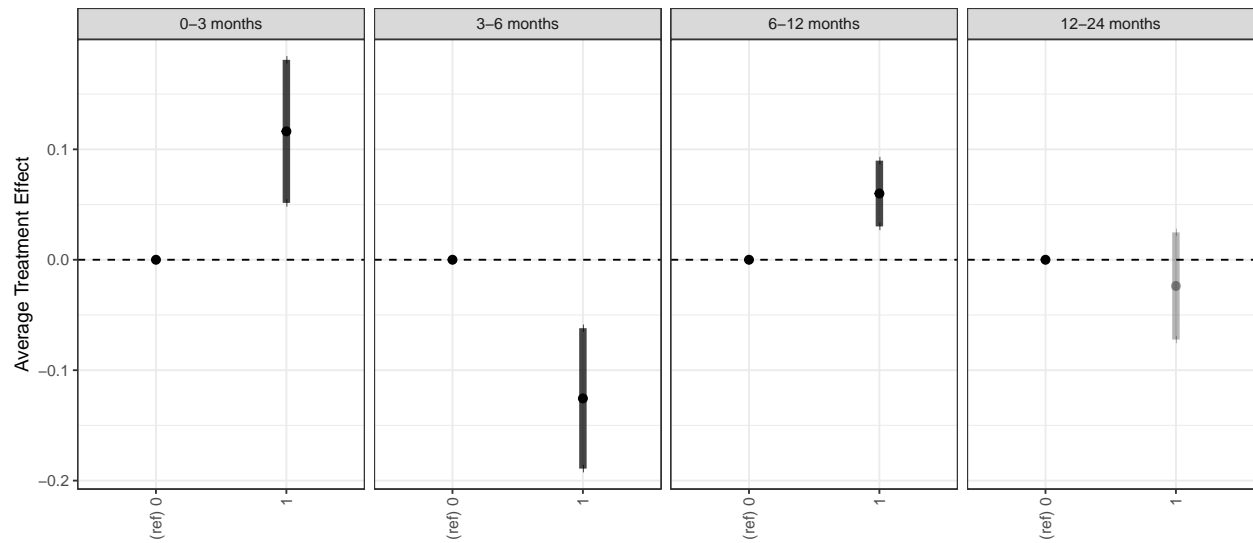
Number of rooms in household
Estimates from 15 cohorts in Asia, Latin America, Africa



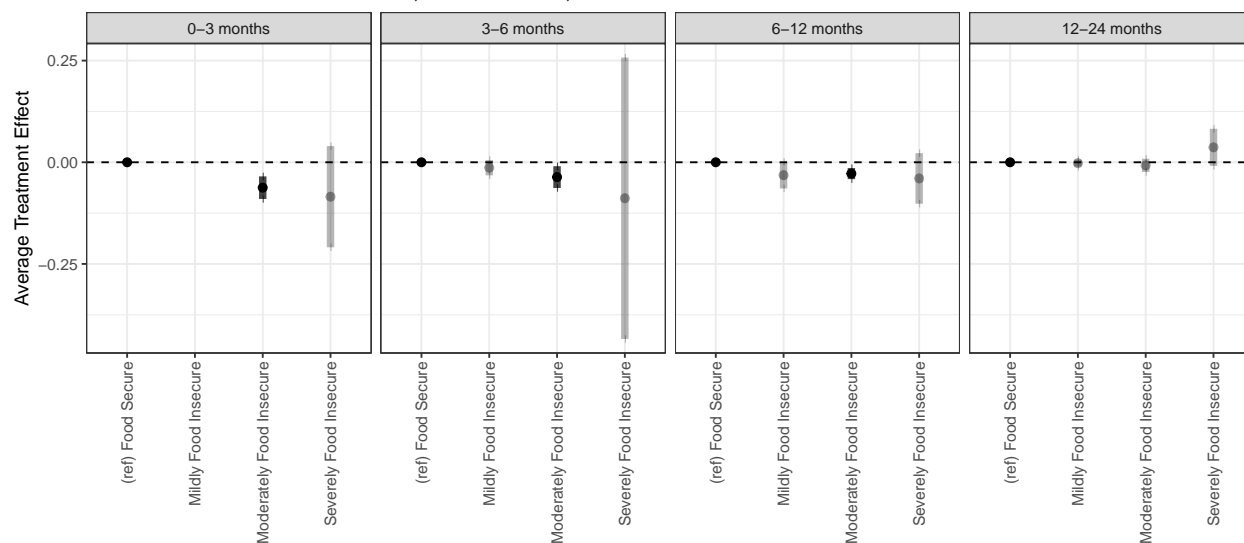
Safe water
Estimates from 4 cohorts in Asia, Latin America, Africa



Treats water
Estimates from 6 cohorts in Latin America, Asia, Africa

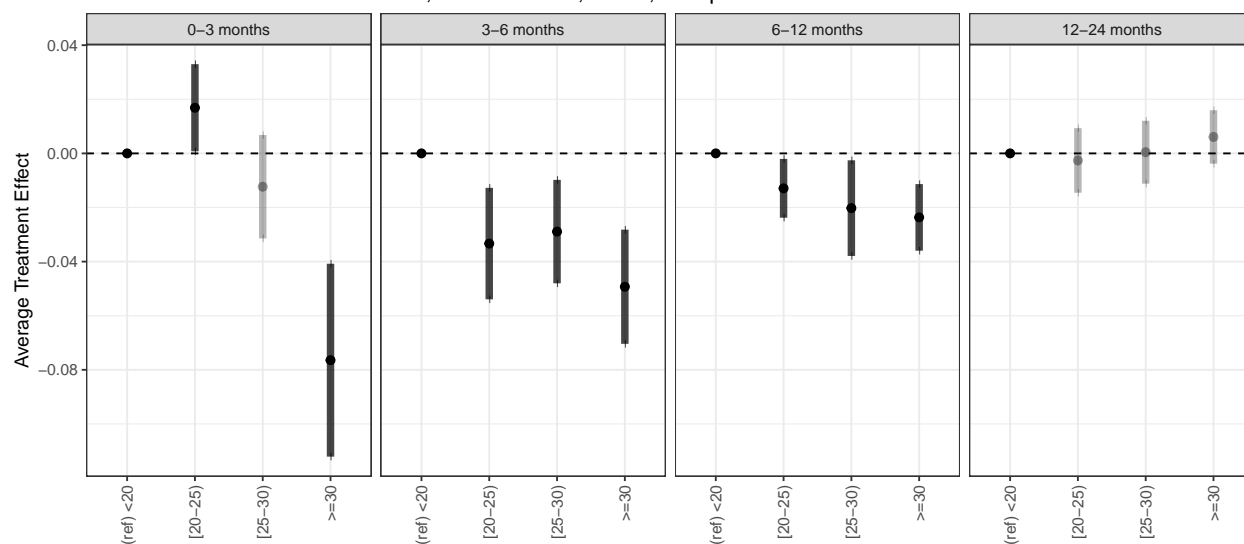


USAID Household Food Insecurity Access Scale (HFIAS) category
Estimates from 6 cohorts in Asia, Latin America, Africa

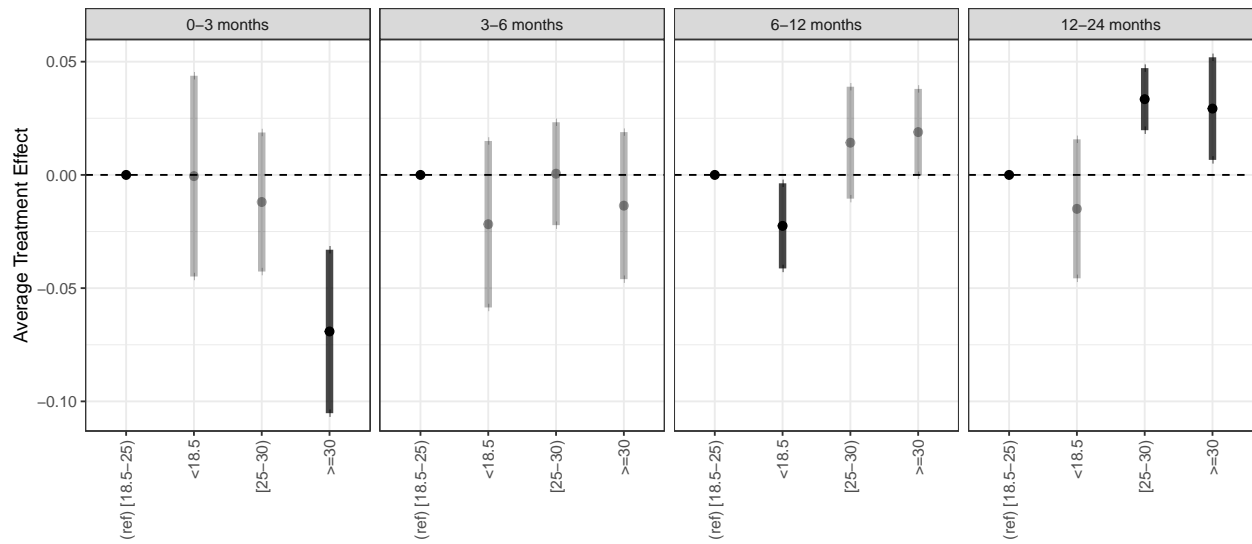


Maternal characteristics

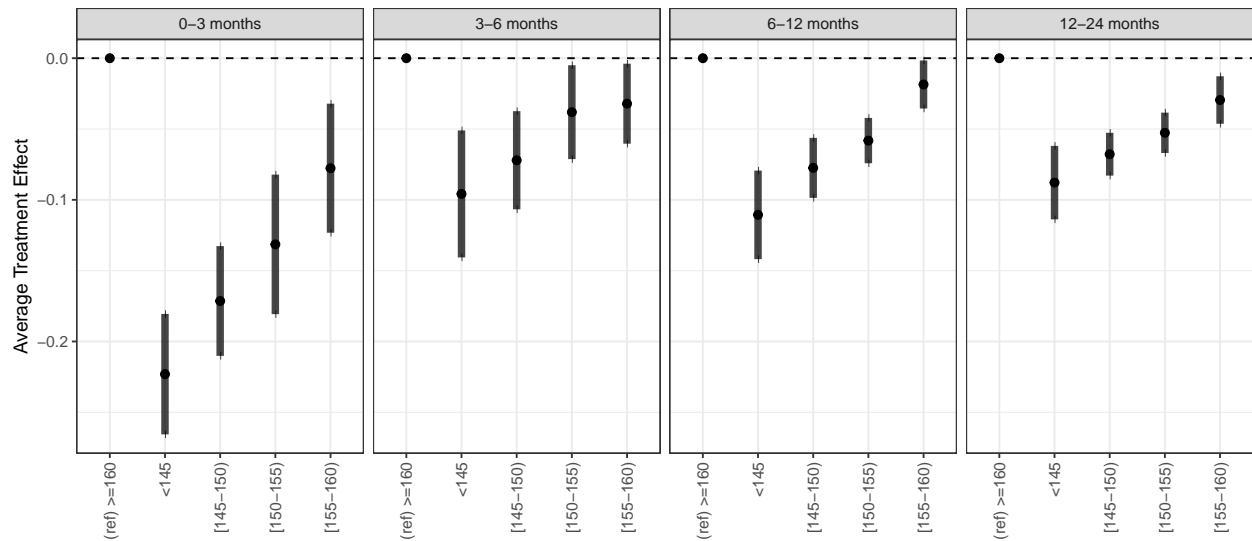
Maternal age
Estimates from 21 cohorts in Asia, Latin America, Africa, Europe



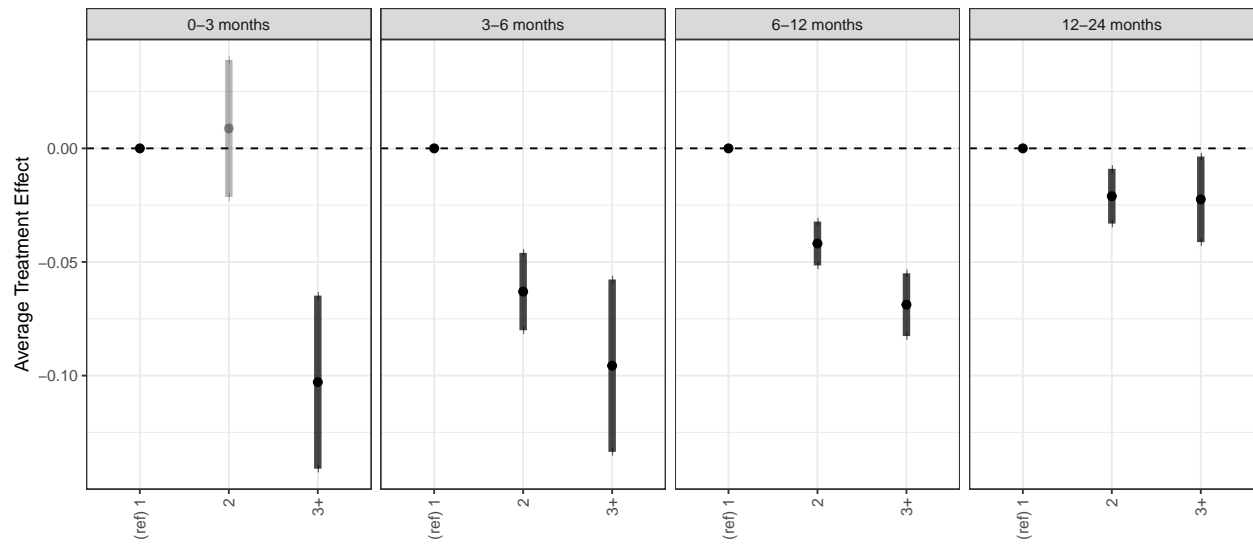
Maternal BMI
Estimates from 11 cohorts in Asia, Latin America, Africa, Europe



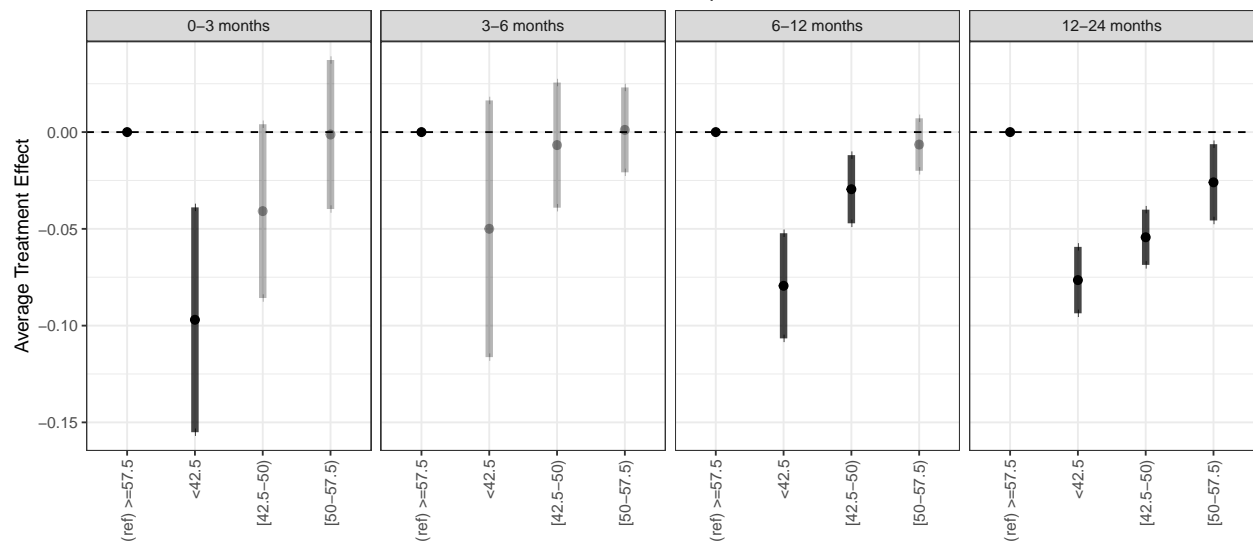
Maternal height
Estimates from 13 cohorts in Latin America, Asia, Africa



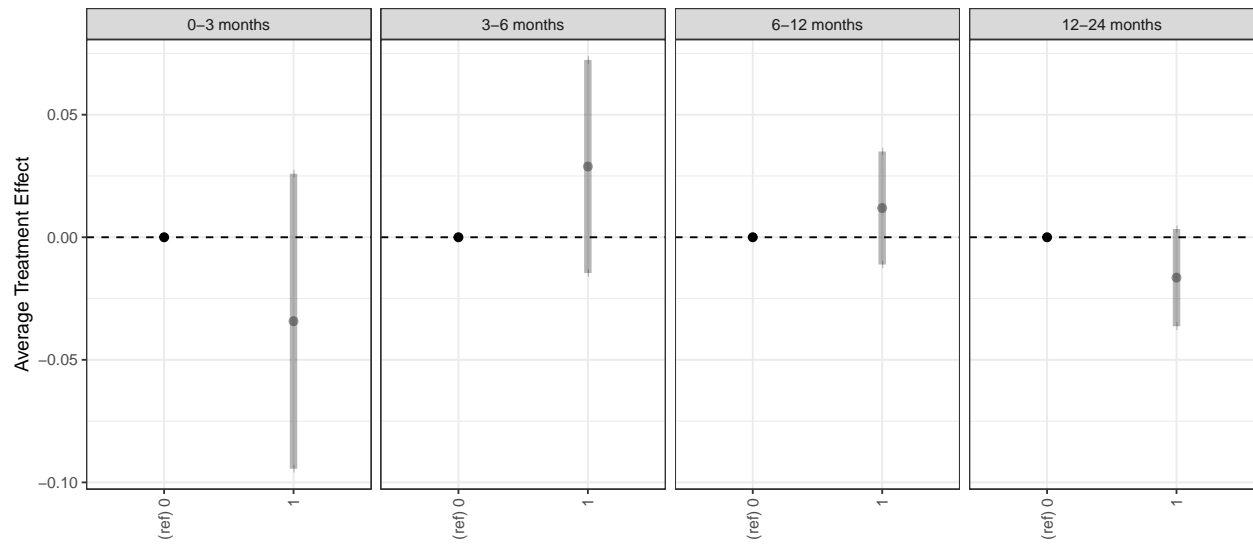
Maternal parity
Estimates from 7 cohorts in Latin America, Asia, Africa



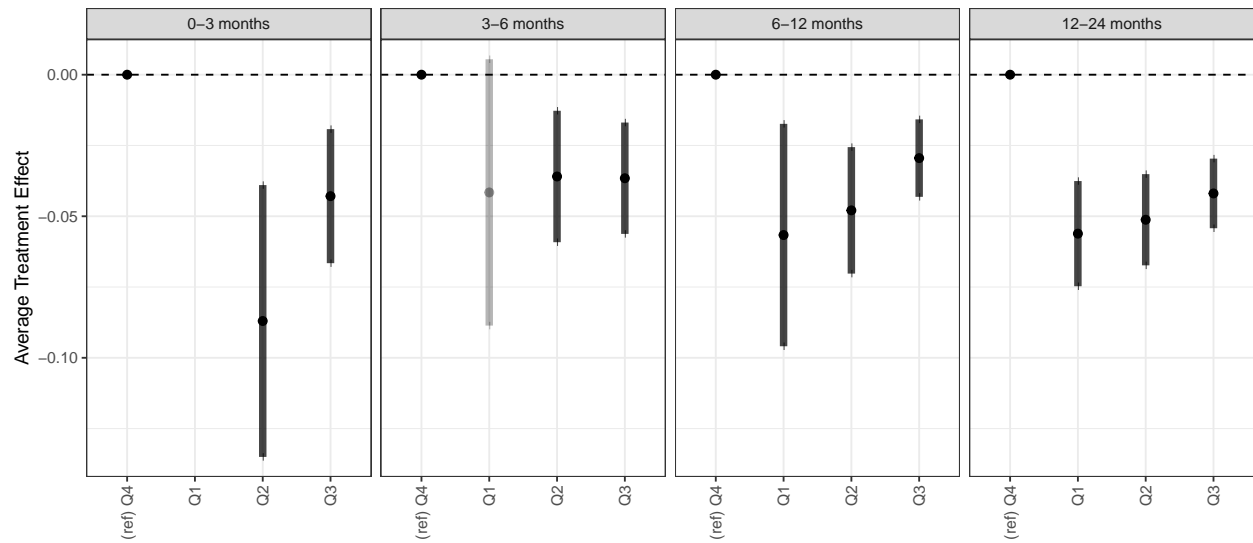
Maternal weight
Estimates from 13 cohorts in Africa, Asia, Latin America, Europe



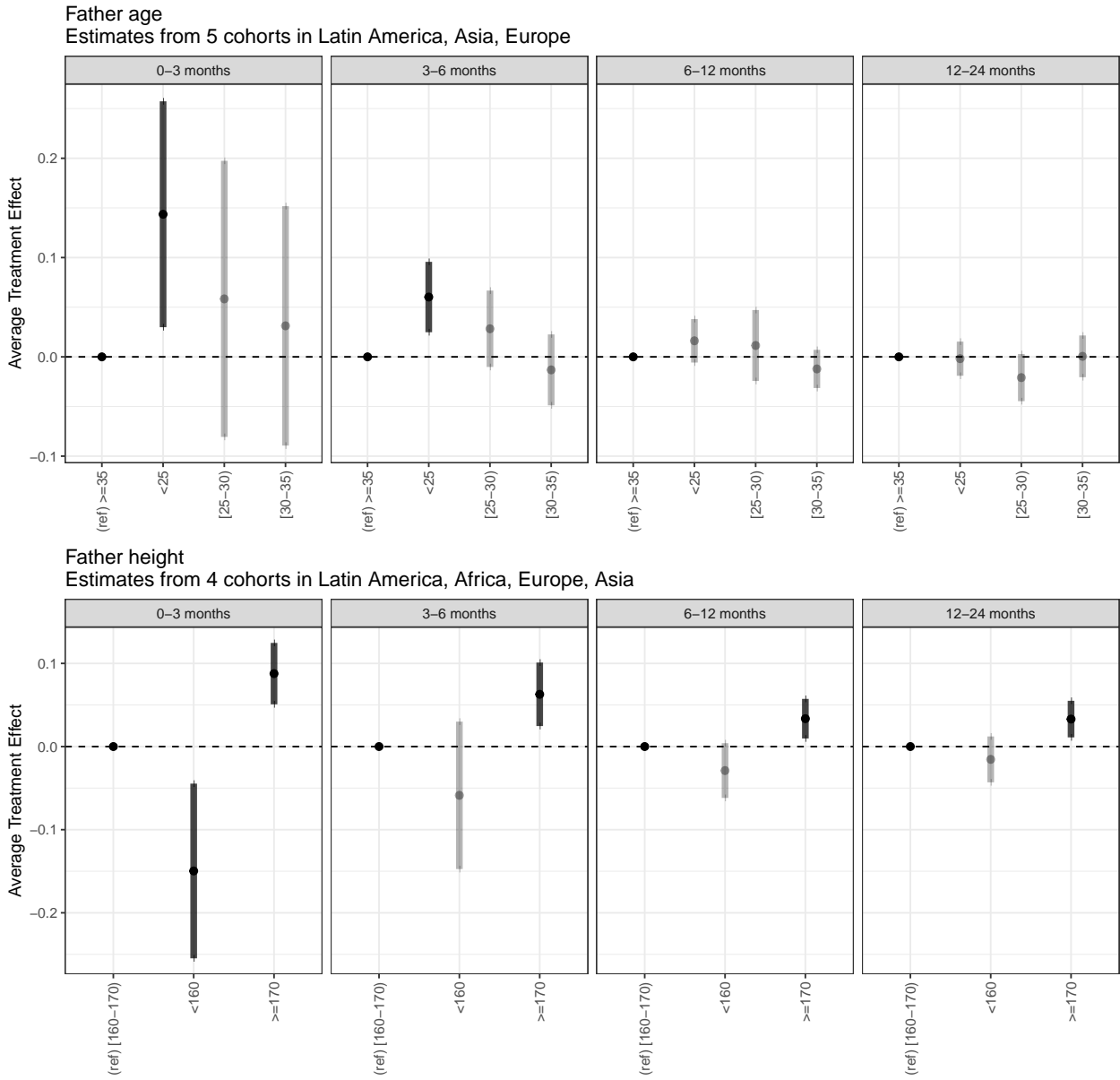
Mother is unmarried
Estimates from 8 cohorts in Latin America, Asia, Africa, Europe



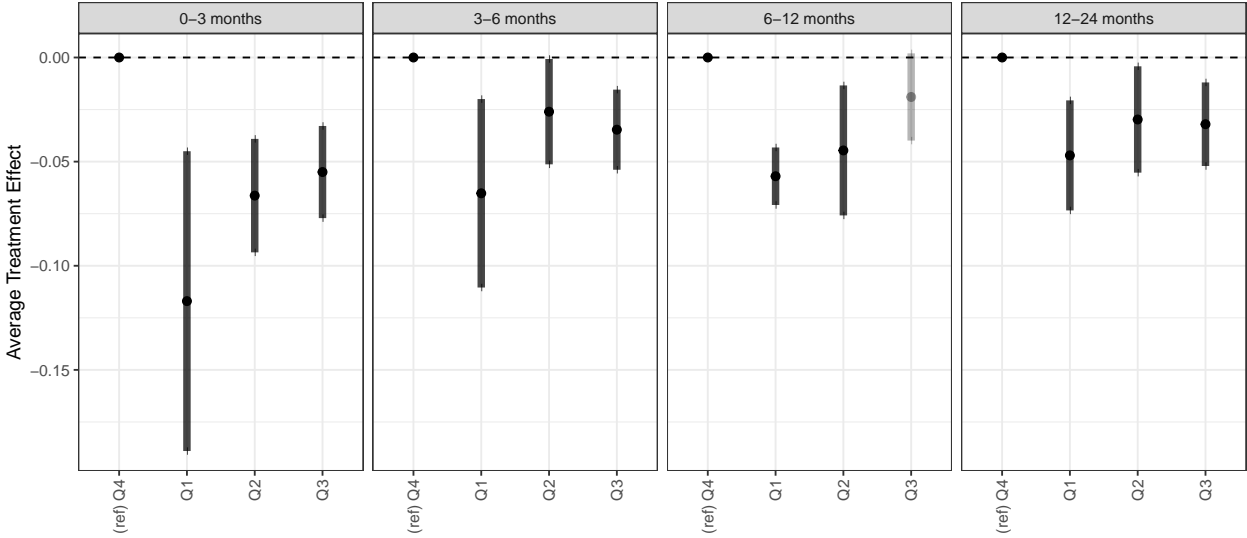
Mother's education
Estimates from 16 cohorts in Asia, Latin America, Africa, Europe



Paternal characteristics



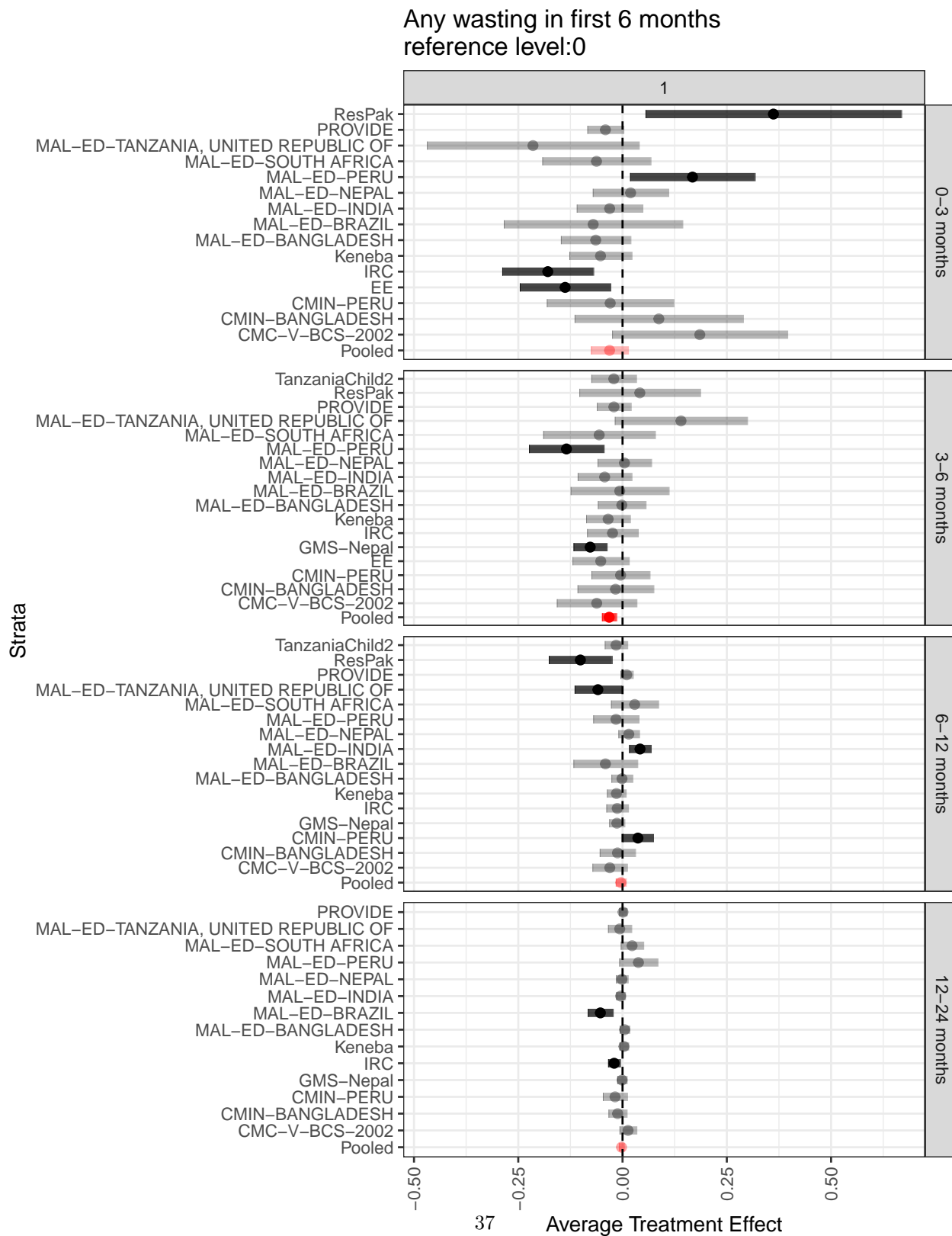
Father's education
Estimates from 14 cohorts in Asia, Latin America, Africa, Europe



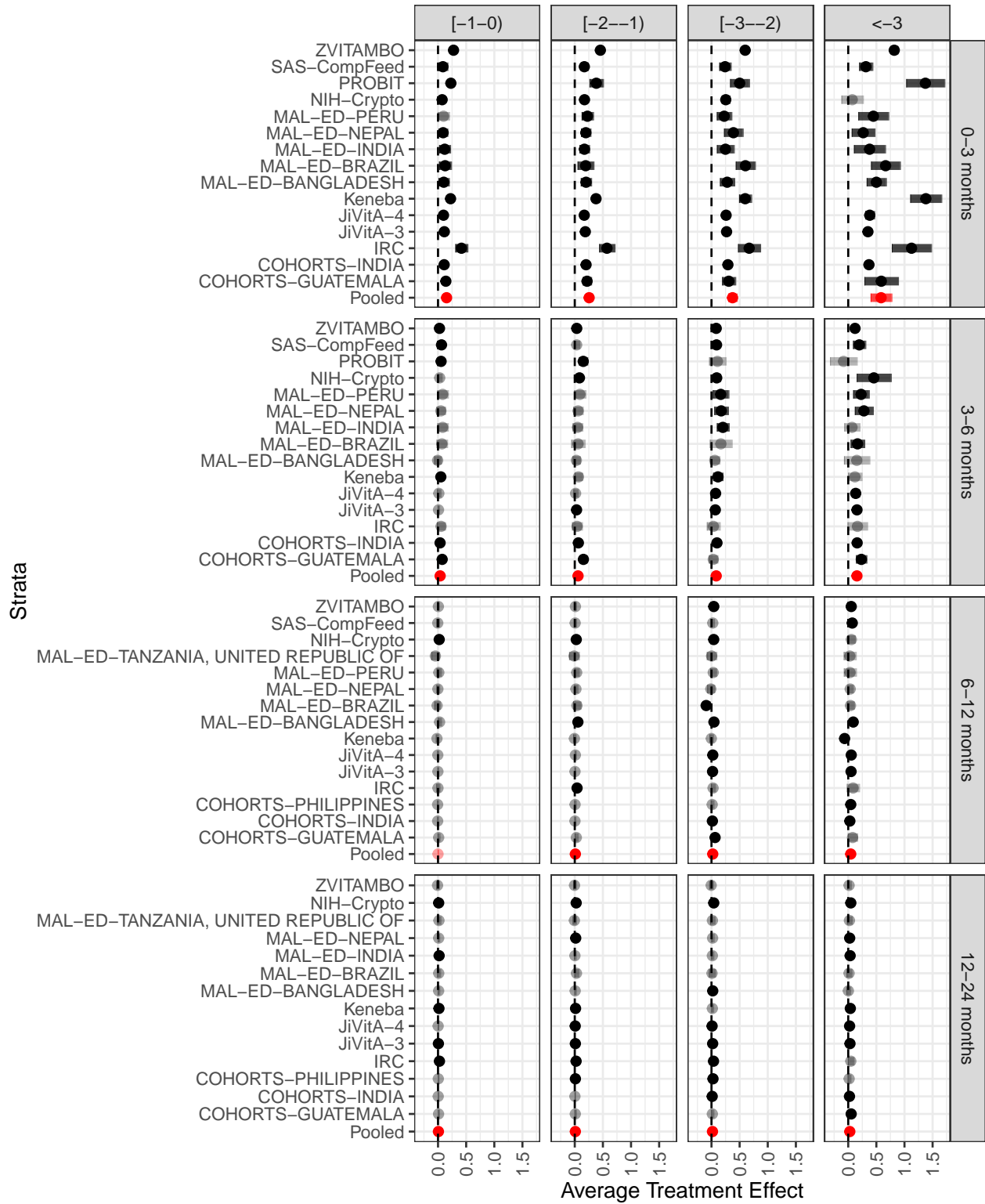
Appendix 1 - Average treatment effect stratified by cohort

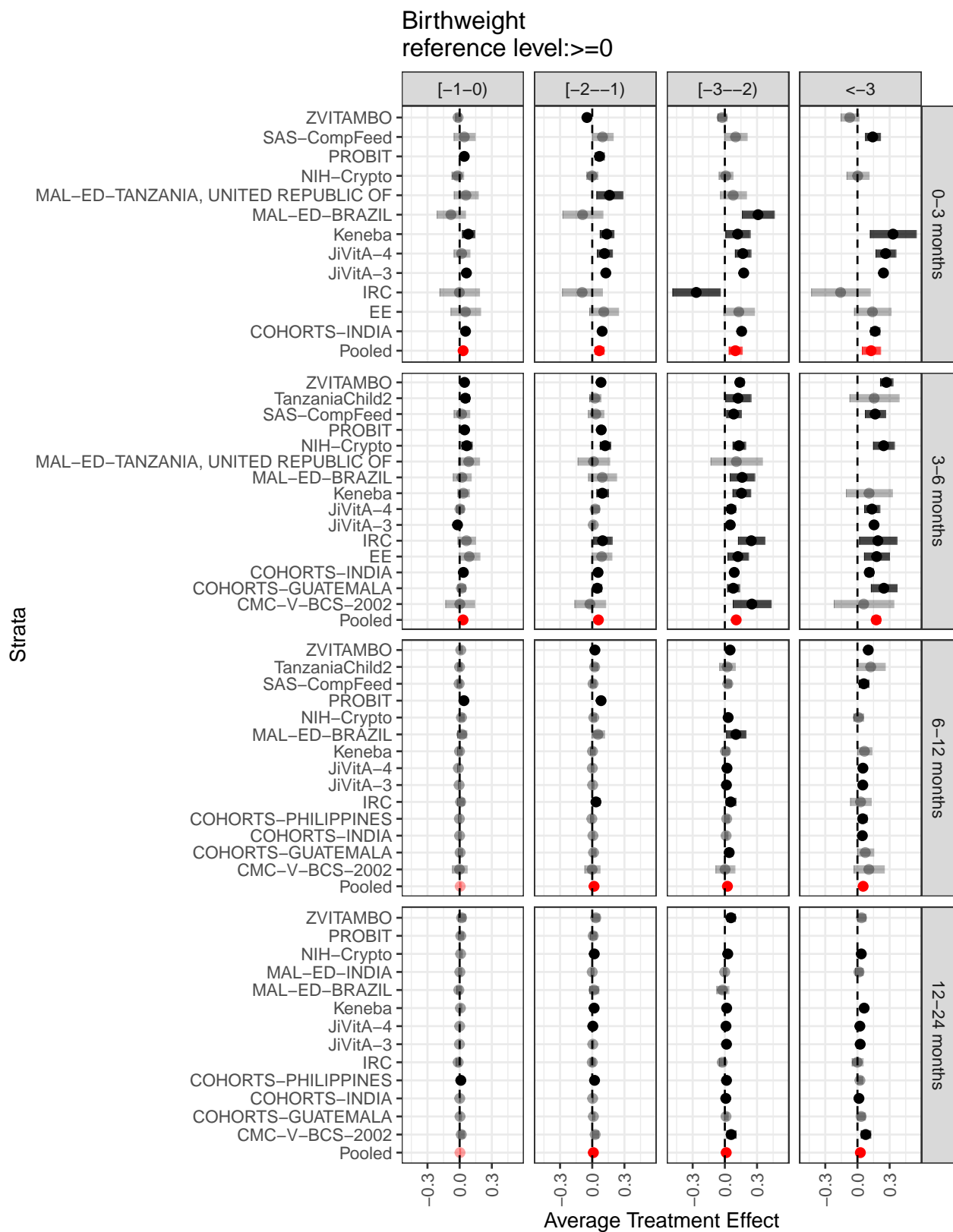
HAZ growth velocity

Child characteristics

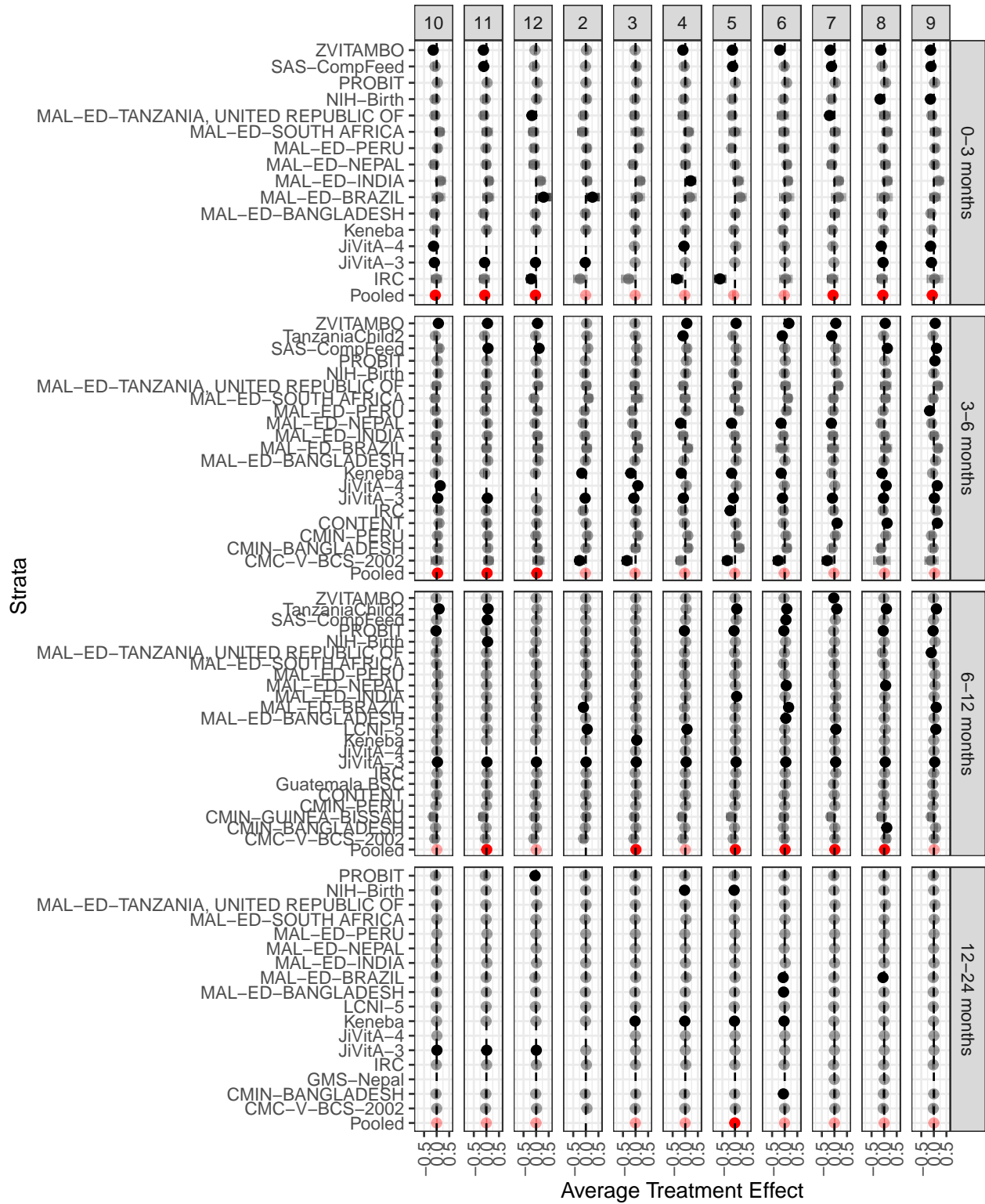


Birth length
reference level: ≥ 0

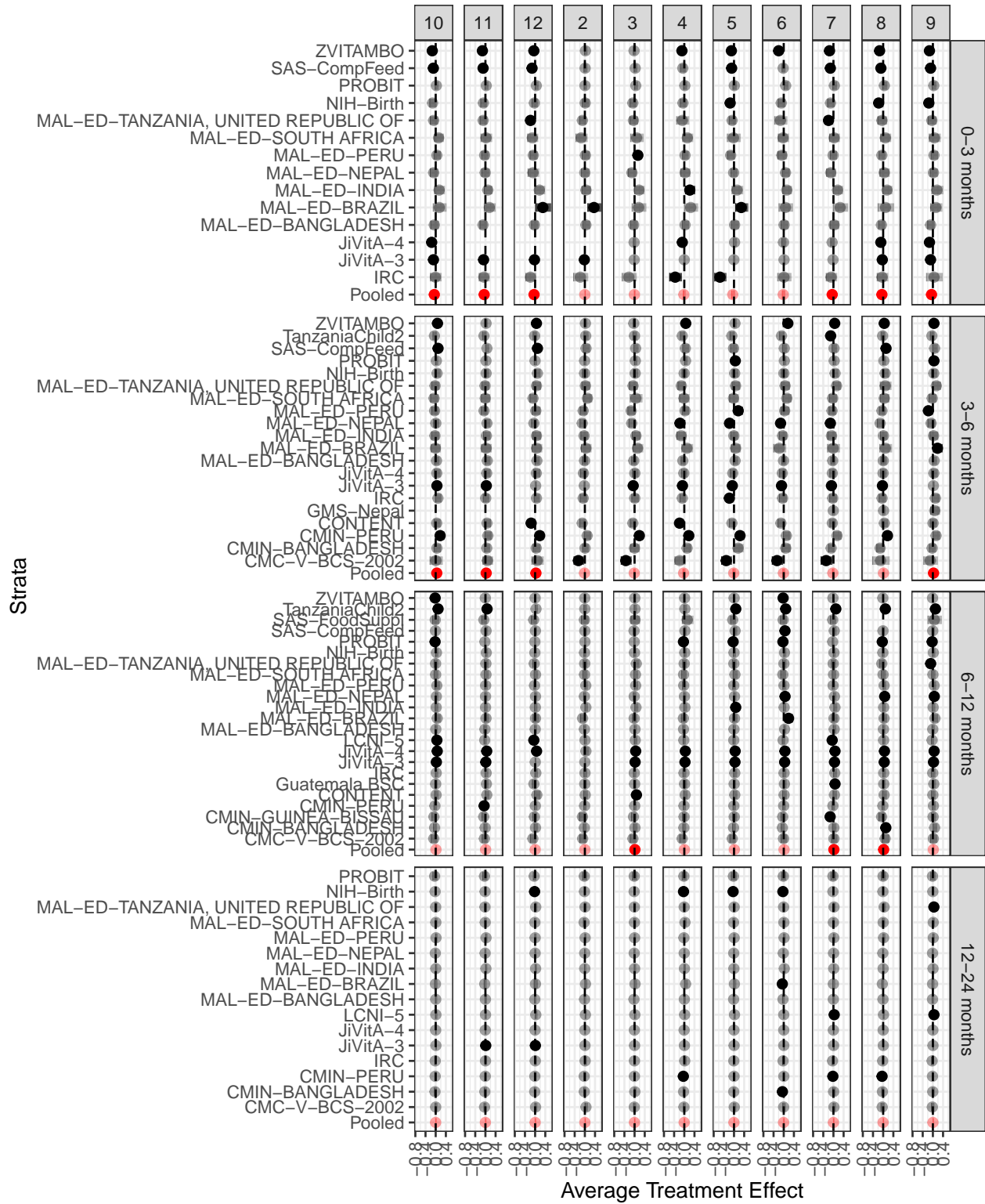




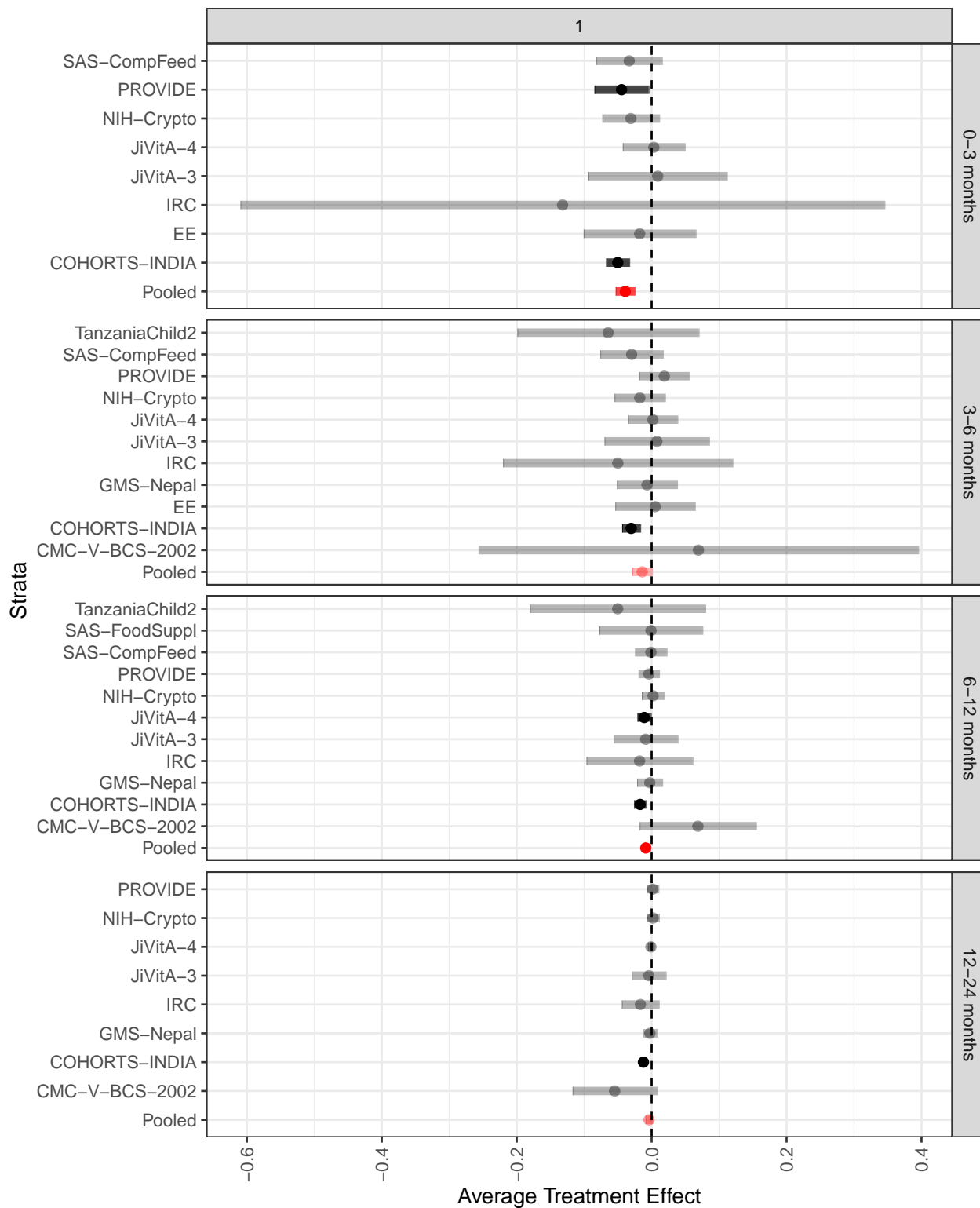
Calendar month of birth
reference level:1



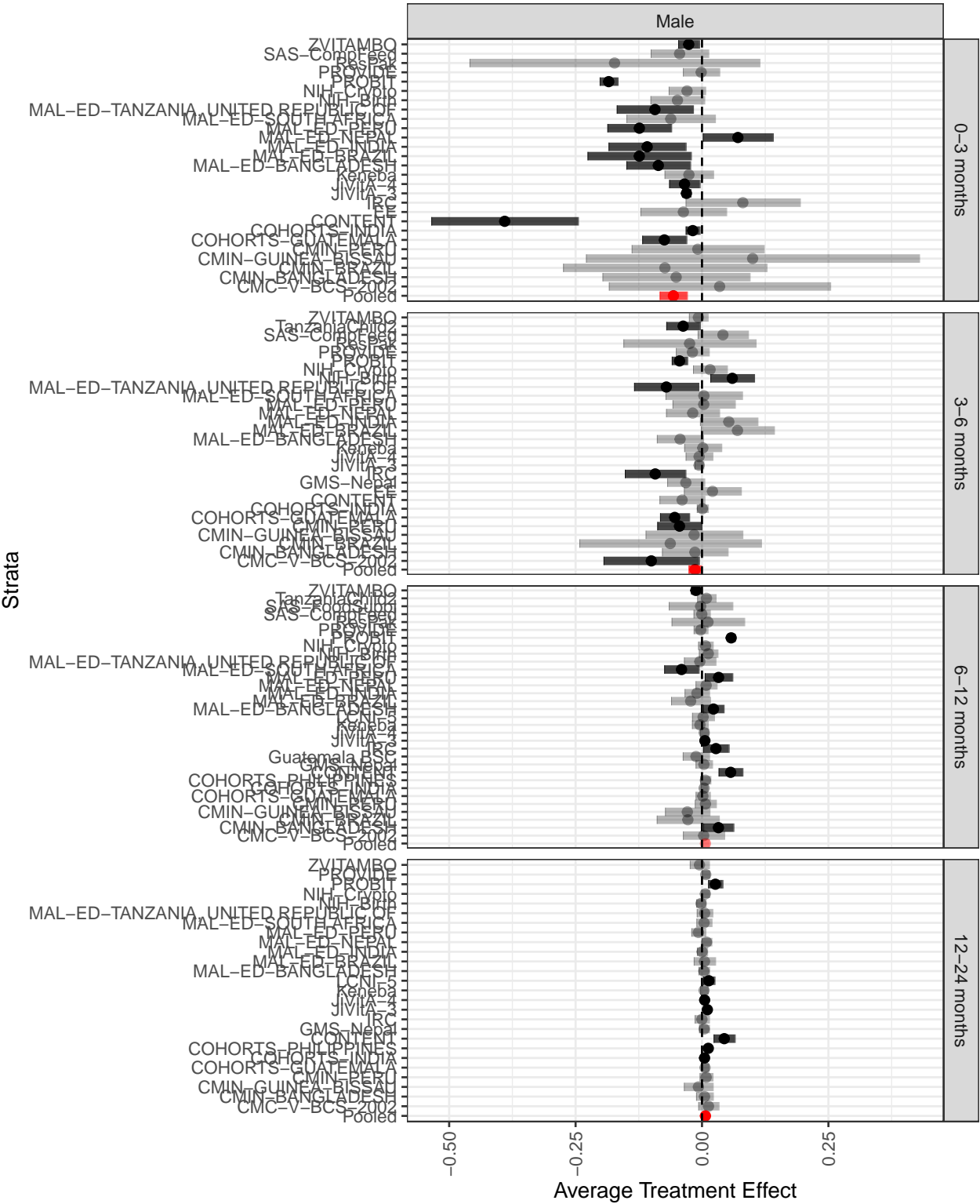
Calendar month of measurement
reference level:1



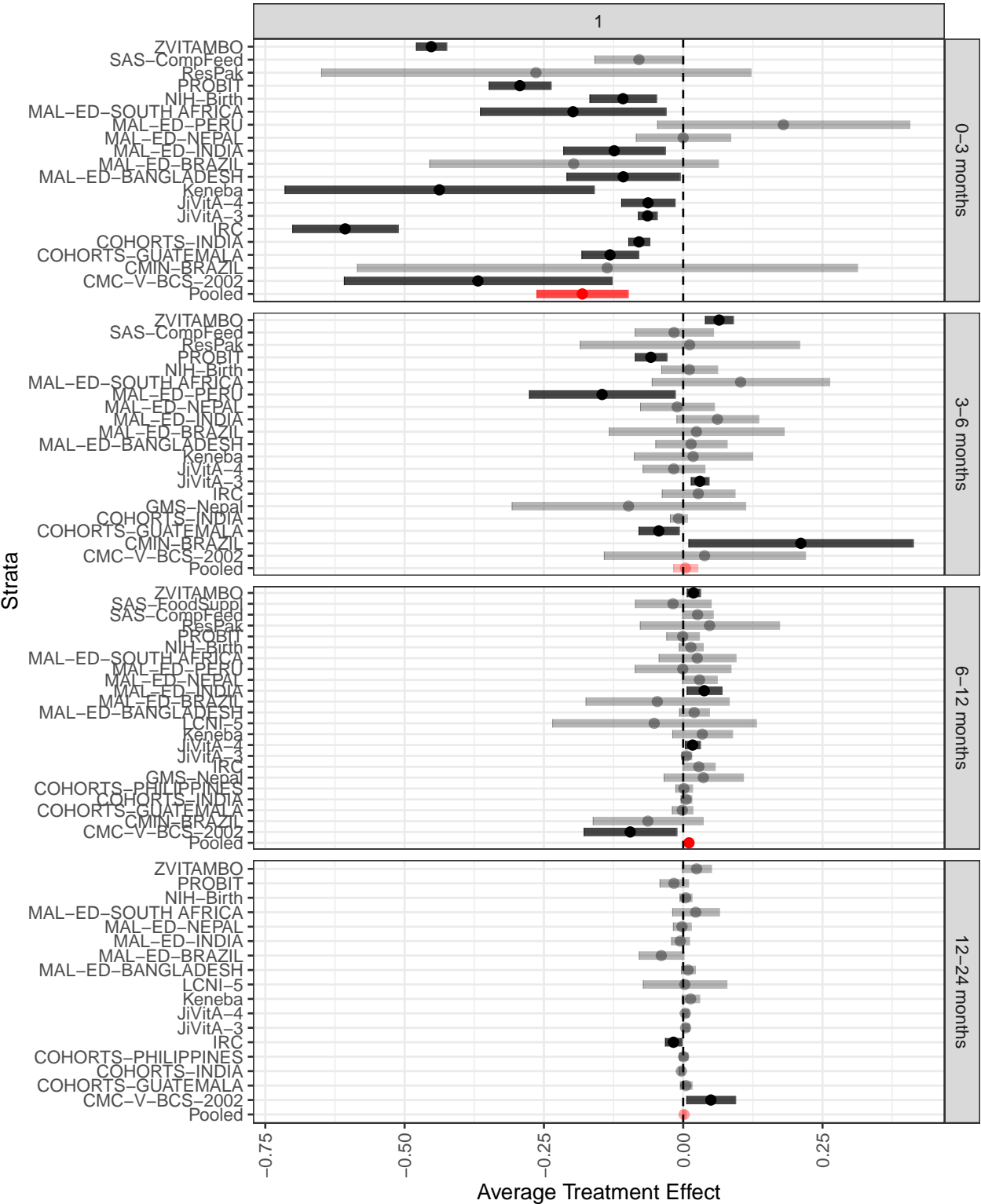
Child delivered at home
reference level:0



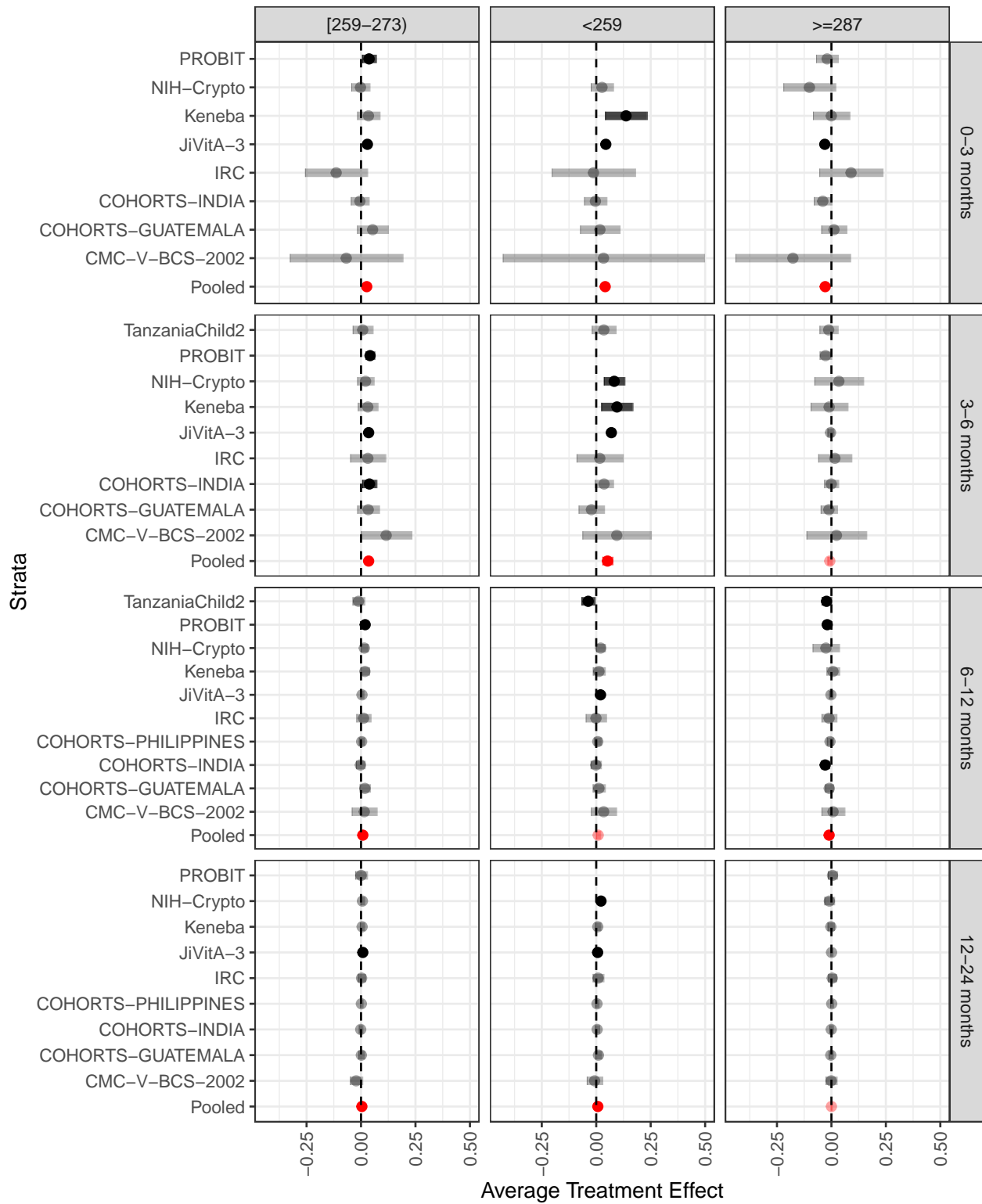
Child's sex
reference level:Female



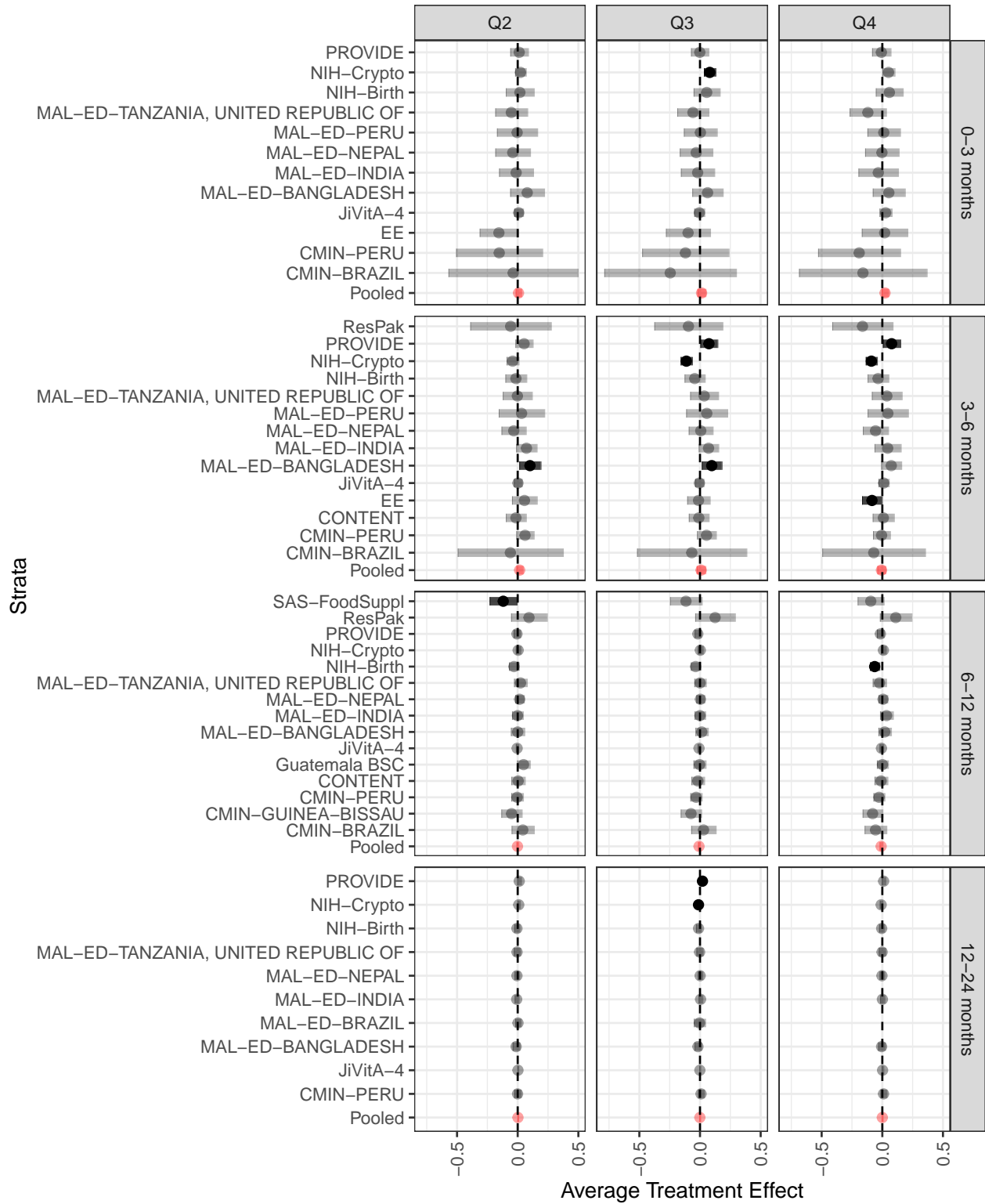
Enrolled wasted
reference level:0



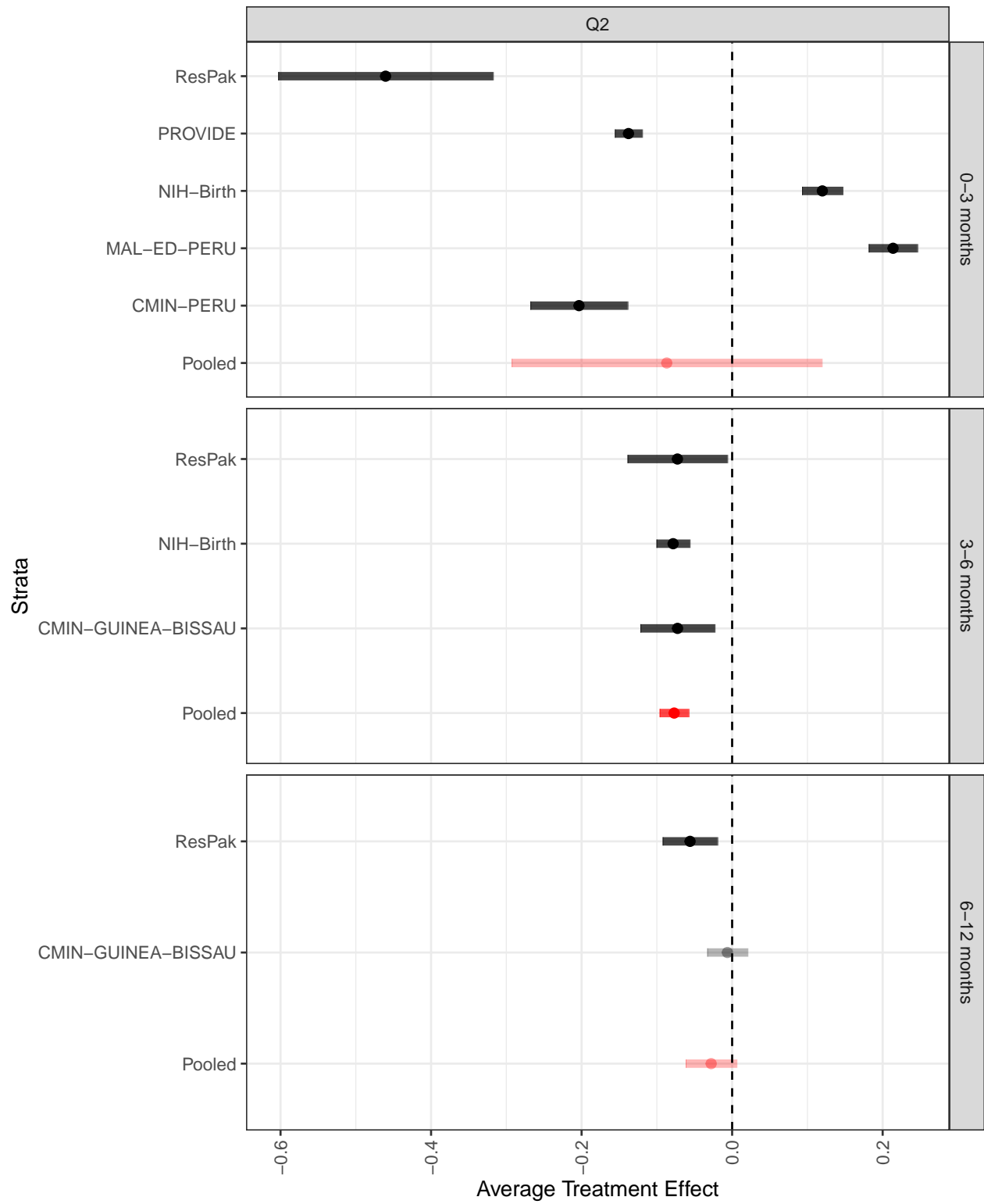
Gestational age at birth in days
reference level:[273–287)

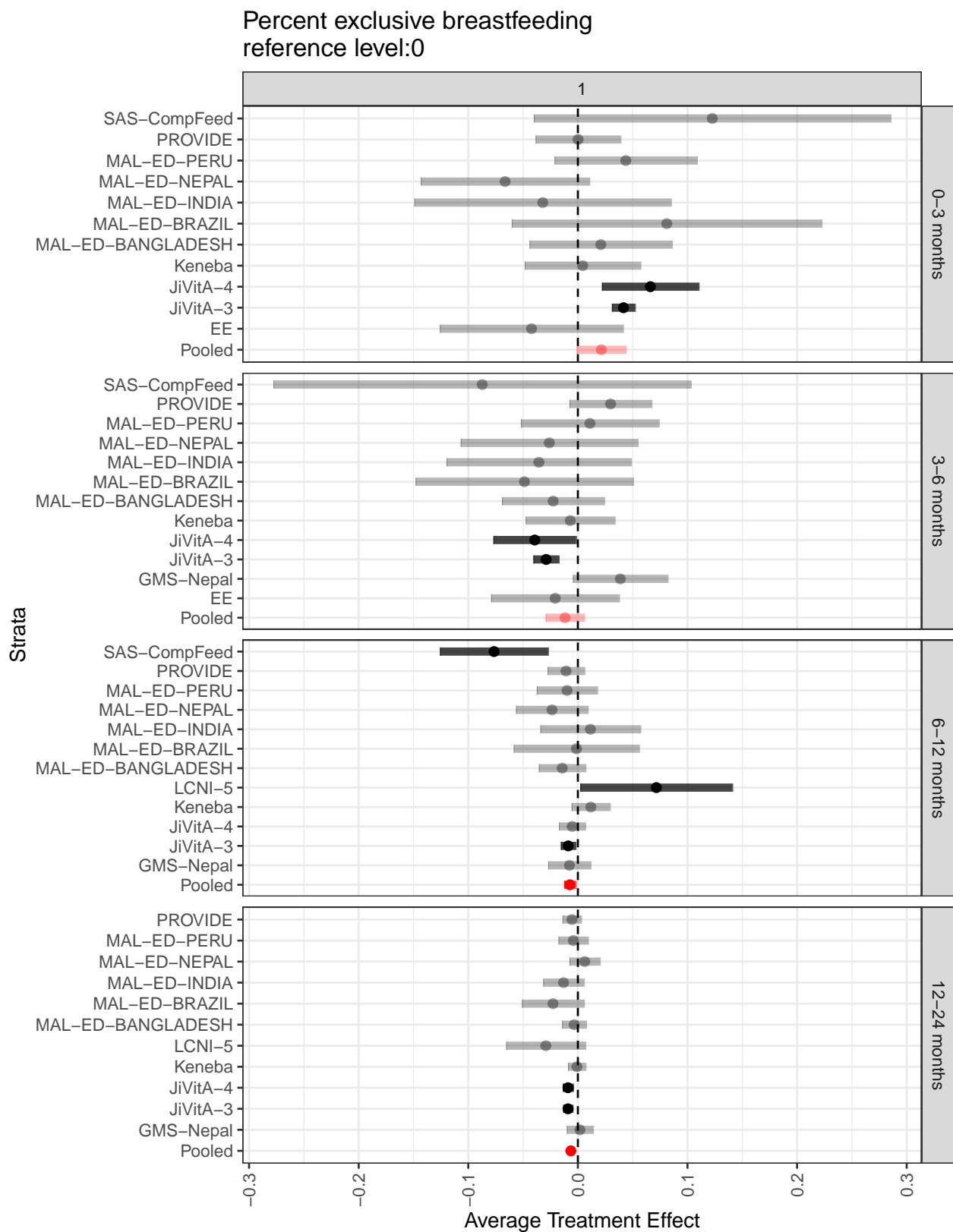


Percent diarrhea in first 24 months
reference level:Q1

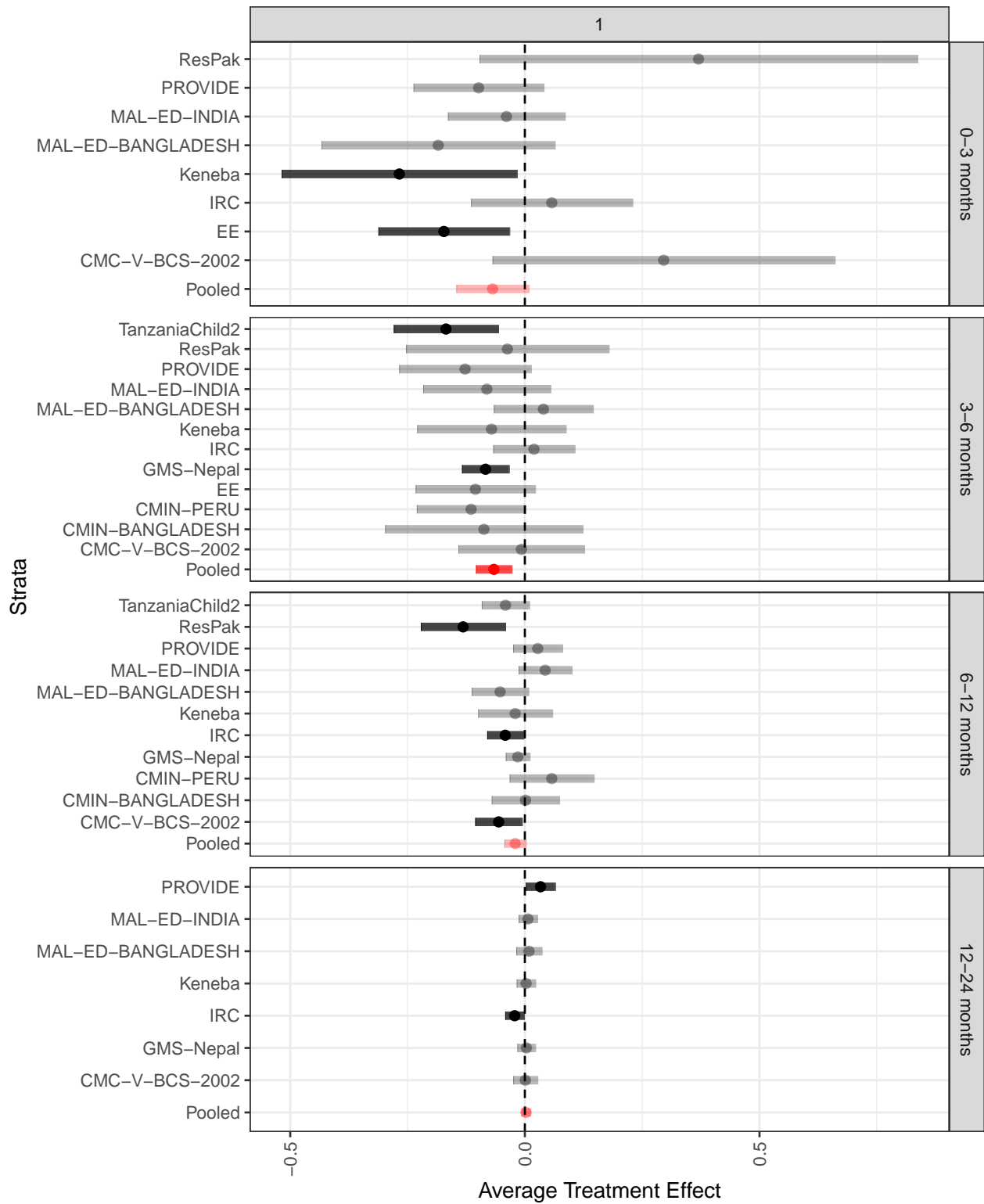


Percent diarrhea in first 6 months
reference level:Q1

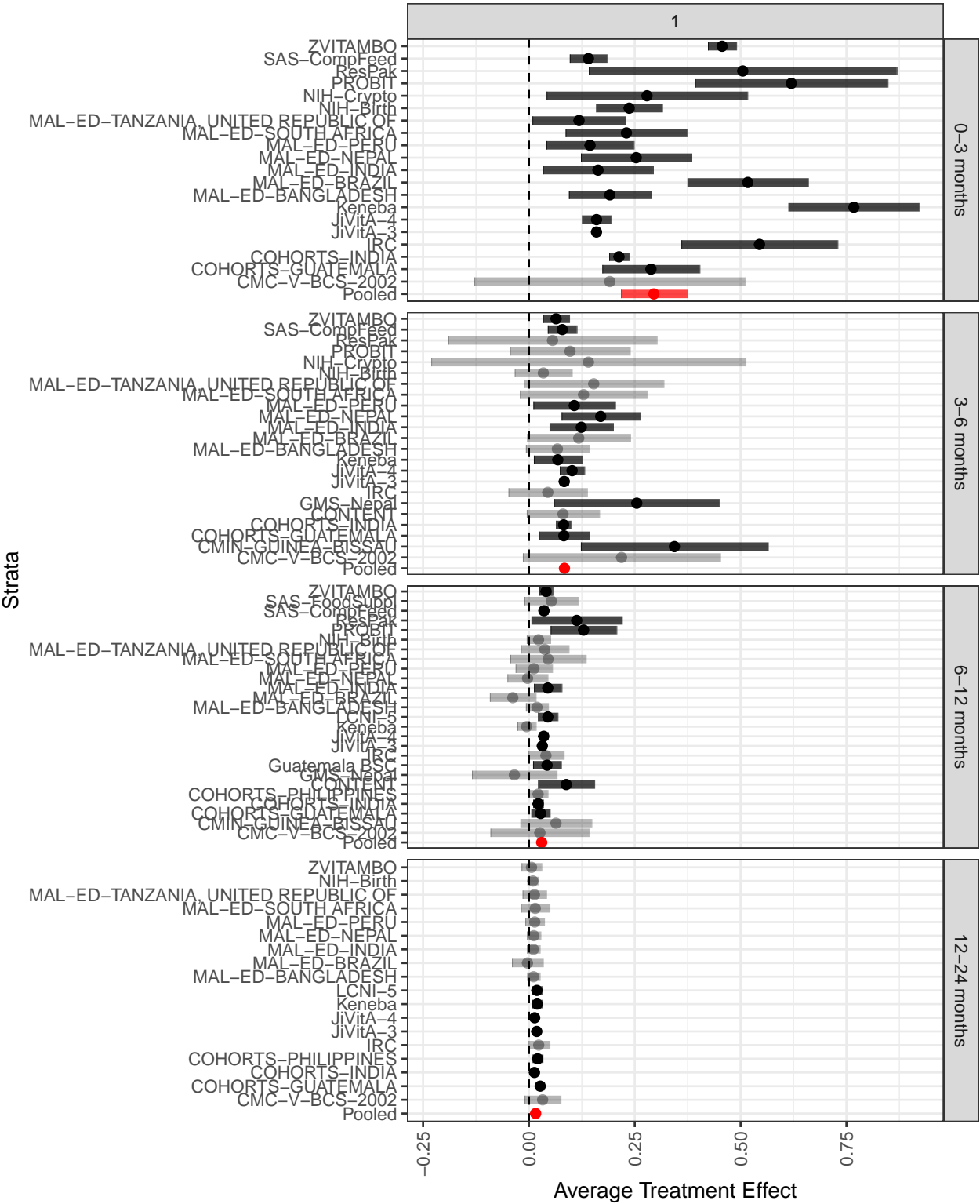




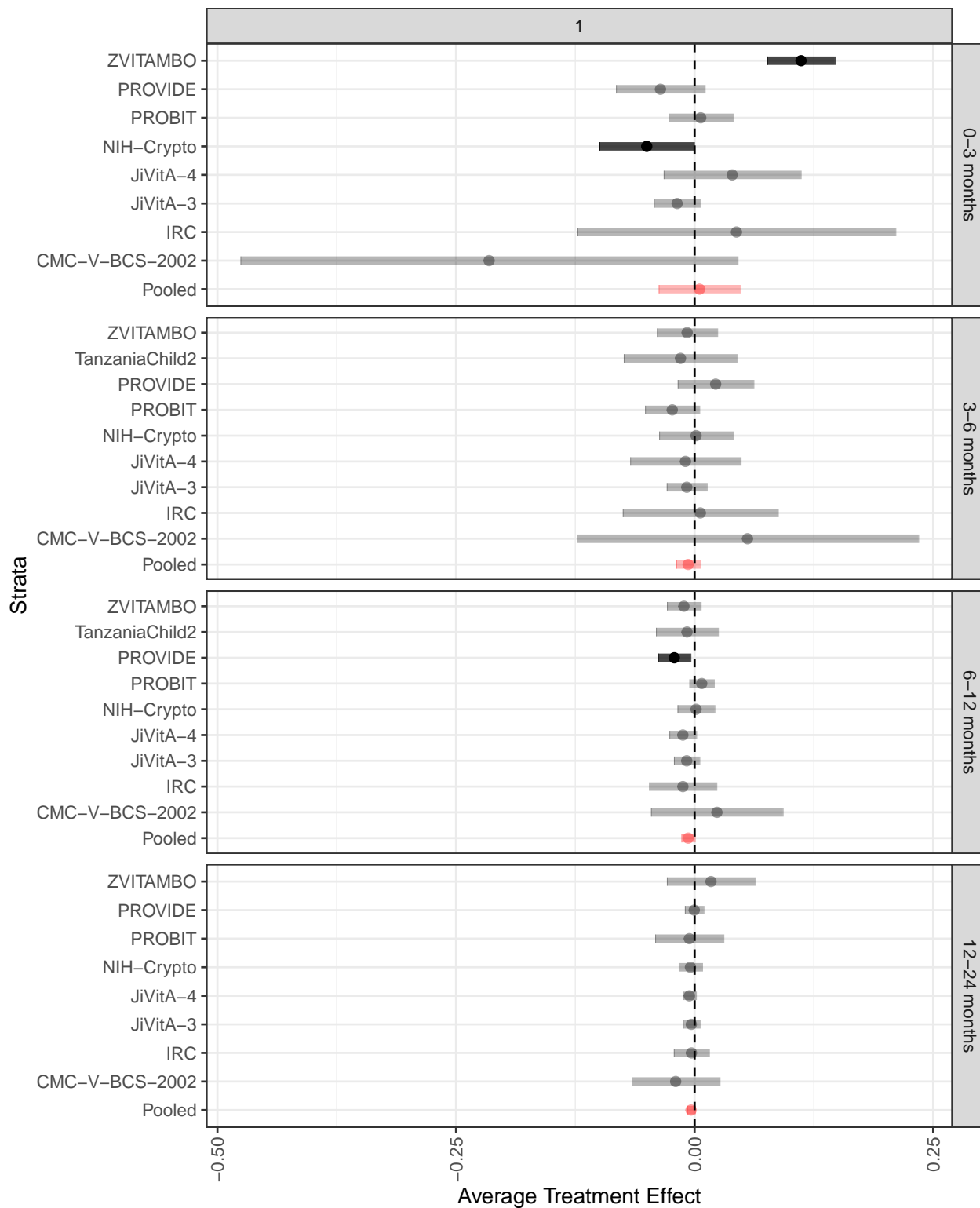
Persistent wasting in first 6 months
reference level:0



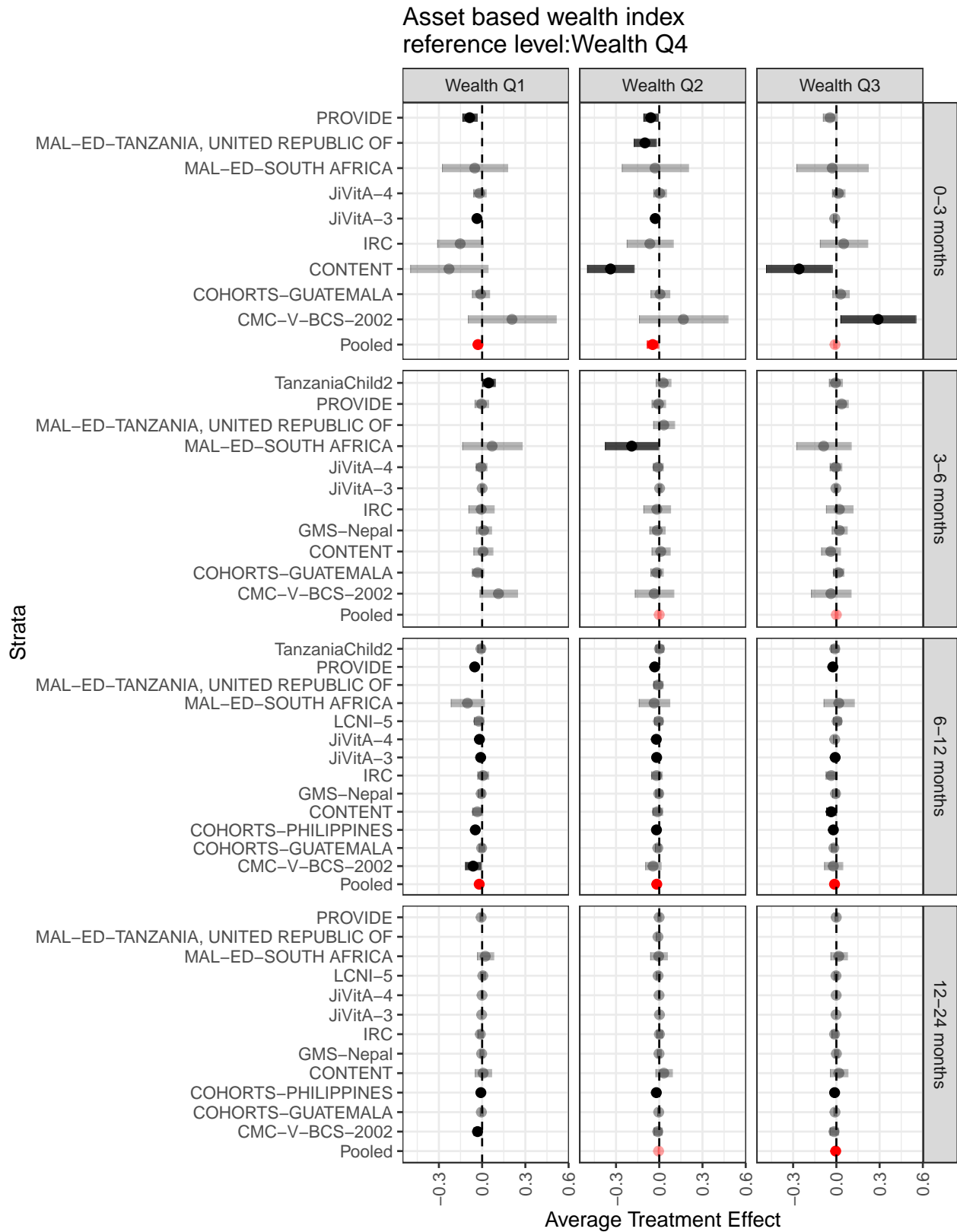
Stunted at enrollment
reference level:0



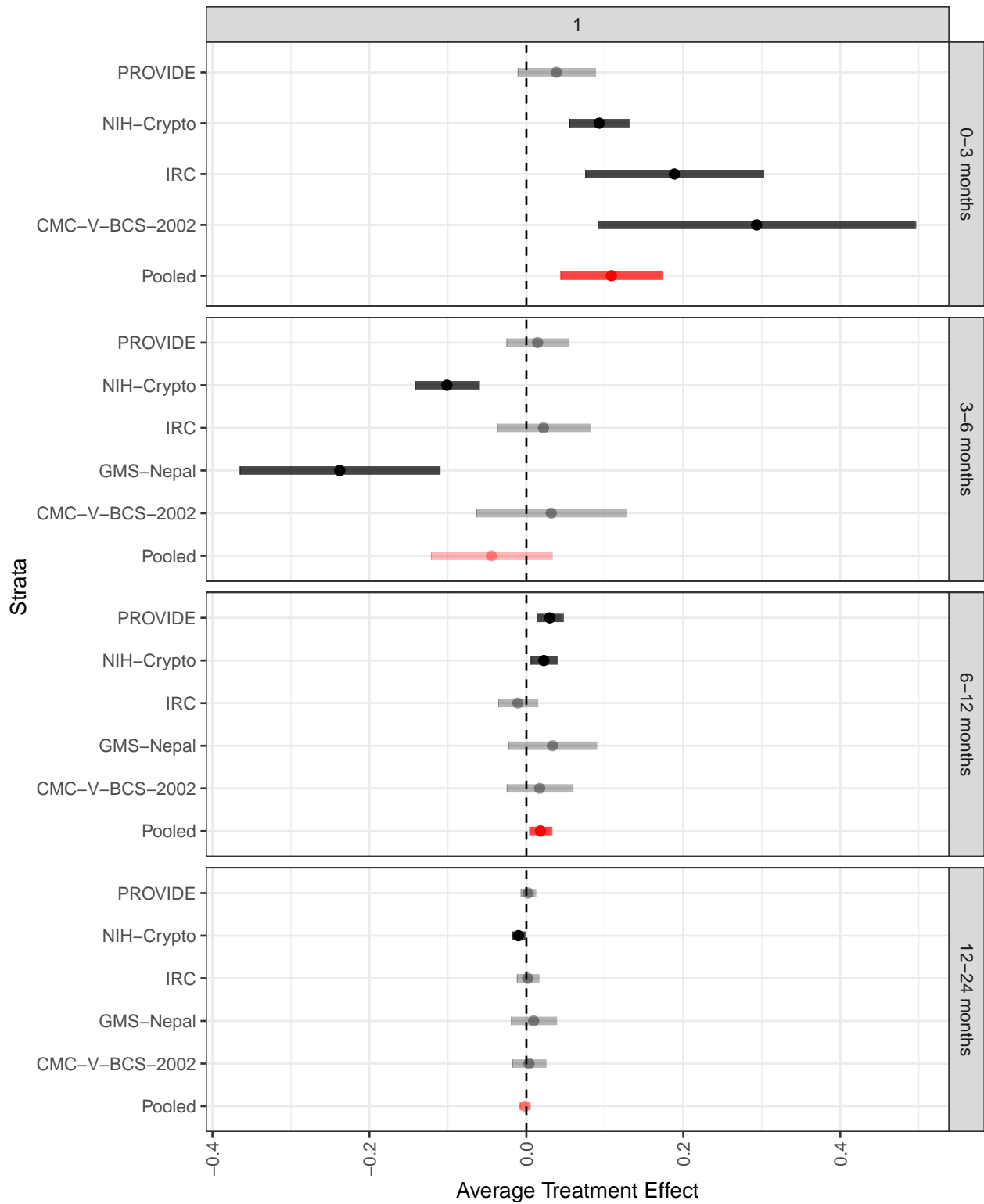
Vaginal delivery
reference level:0



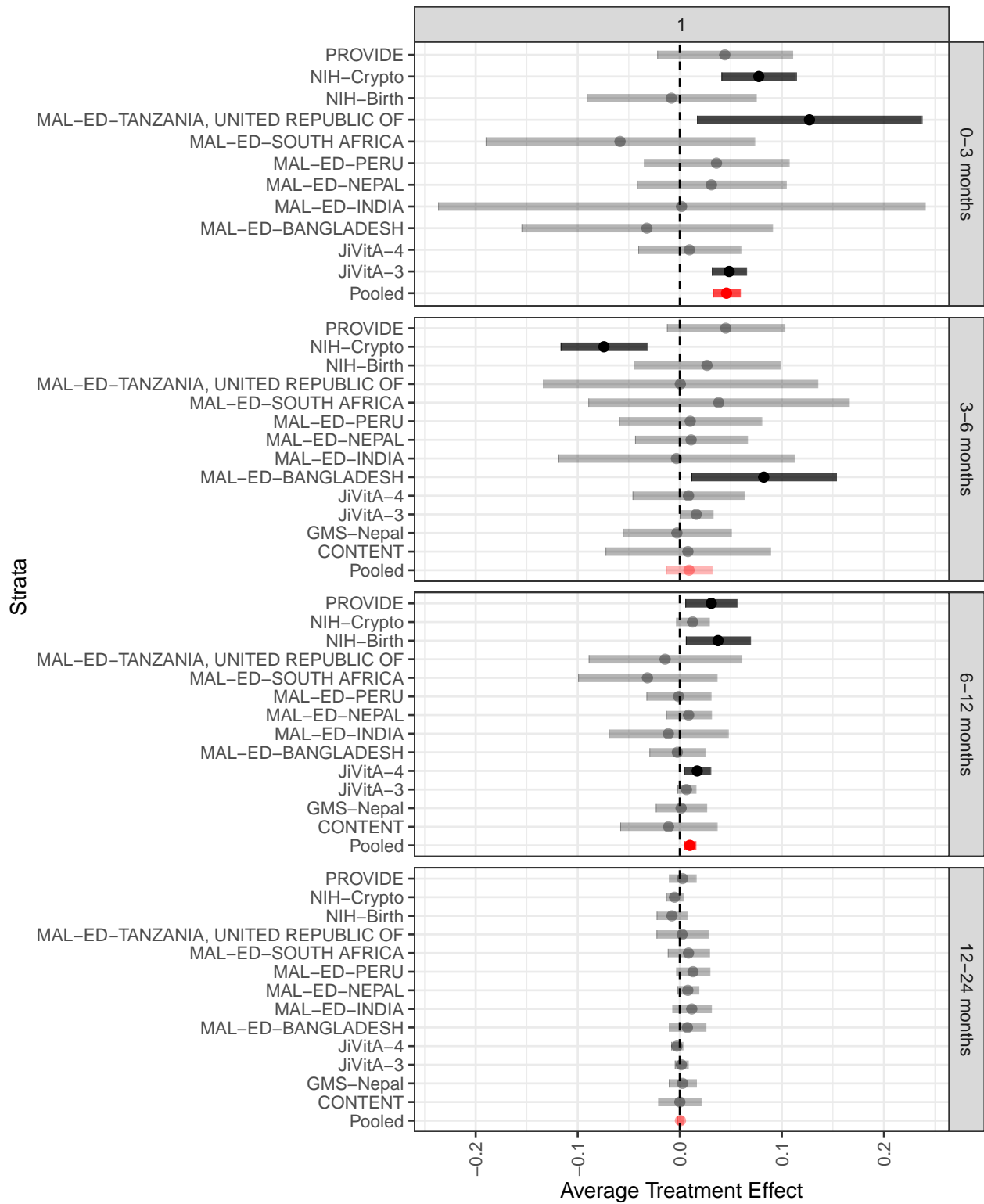
Household characteristics

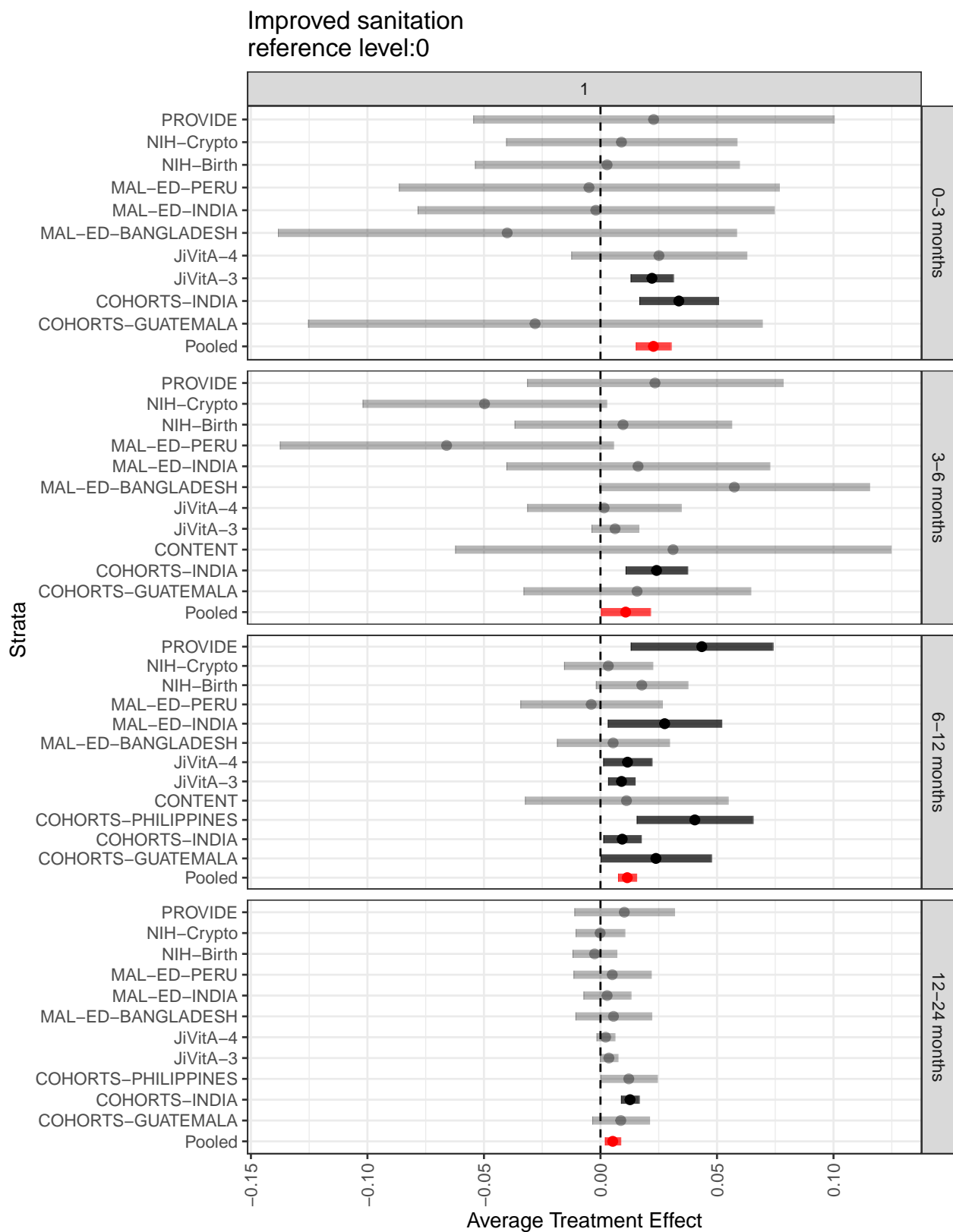


Clean cook
reference level:0

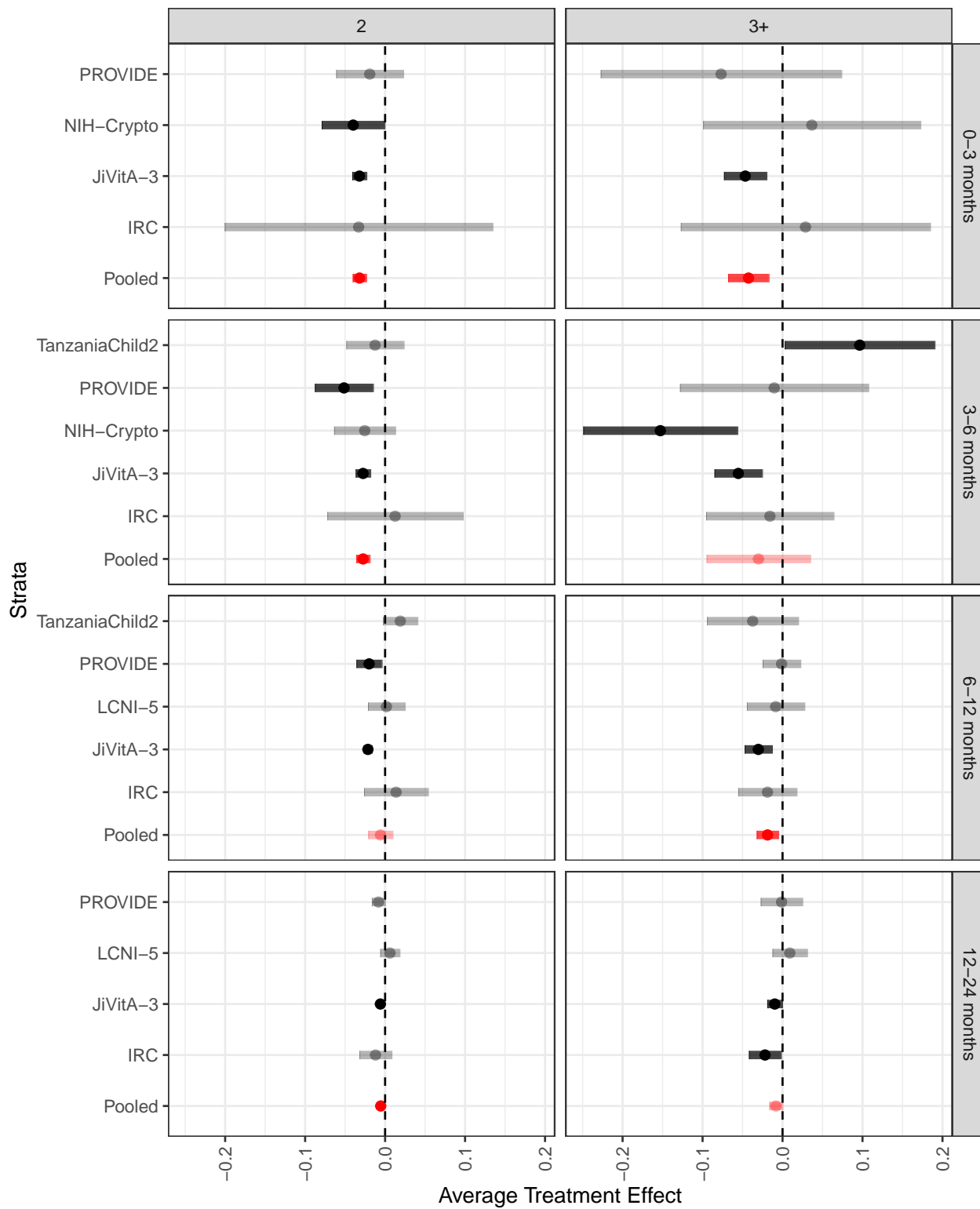


Improved floor
reference level:0

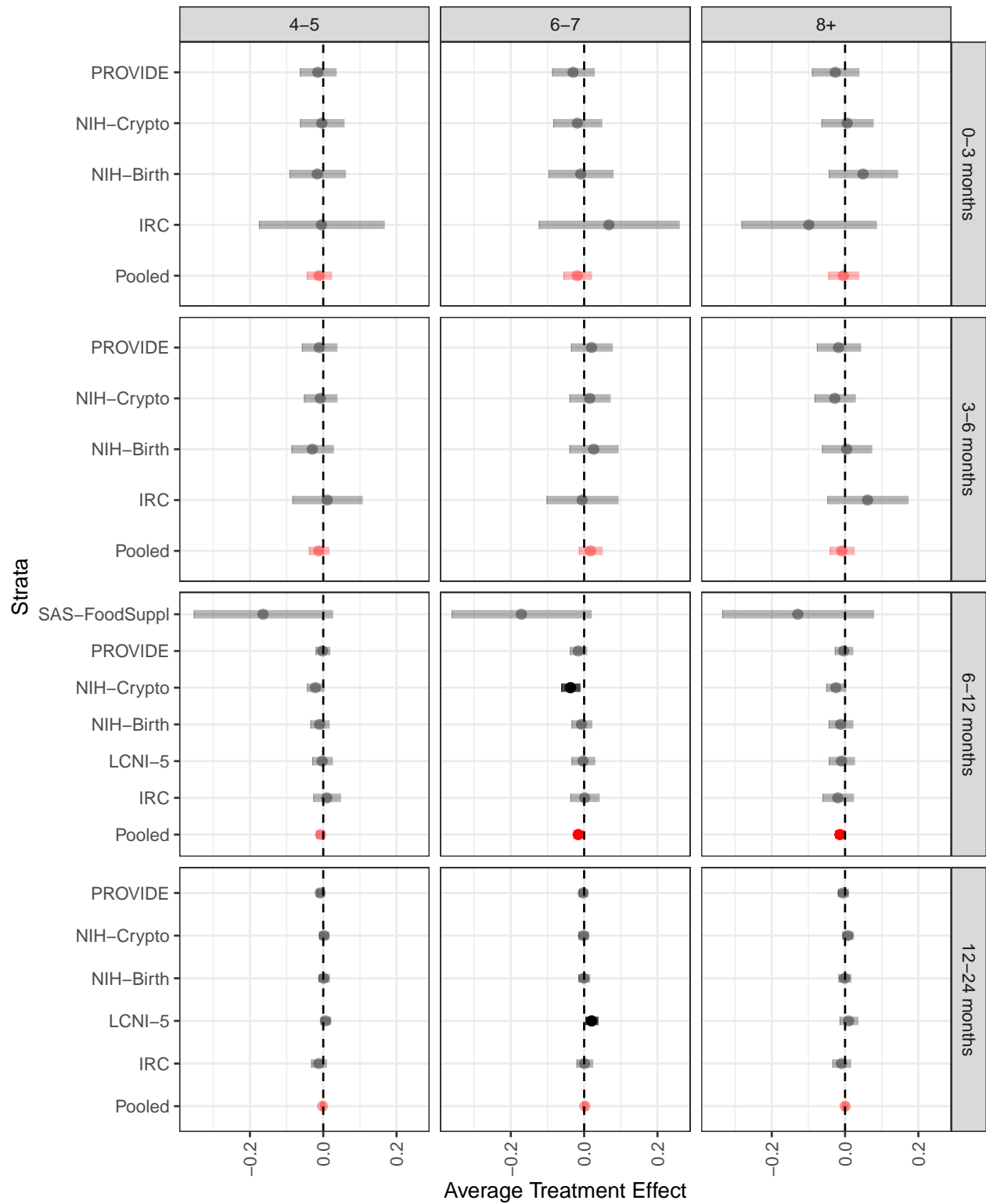




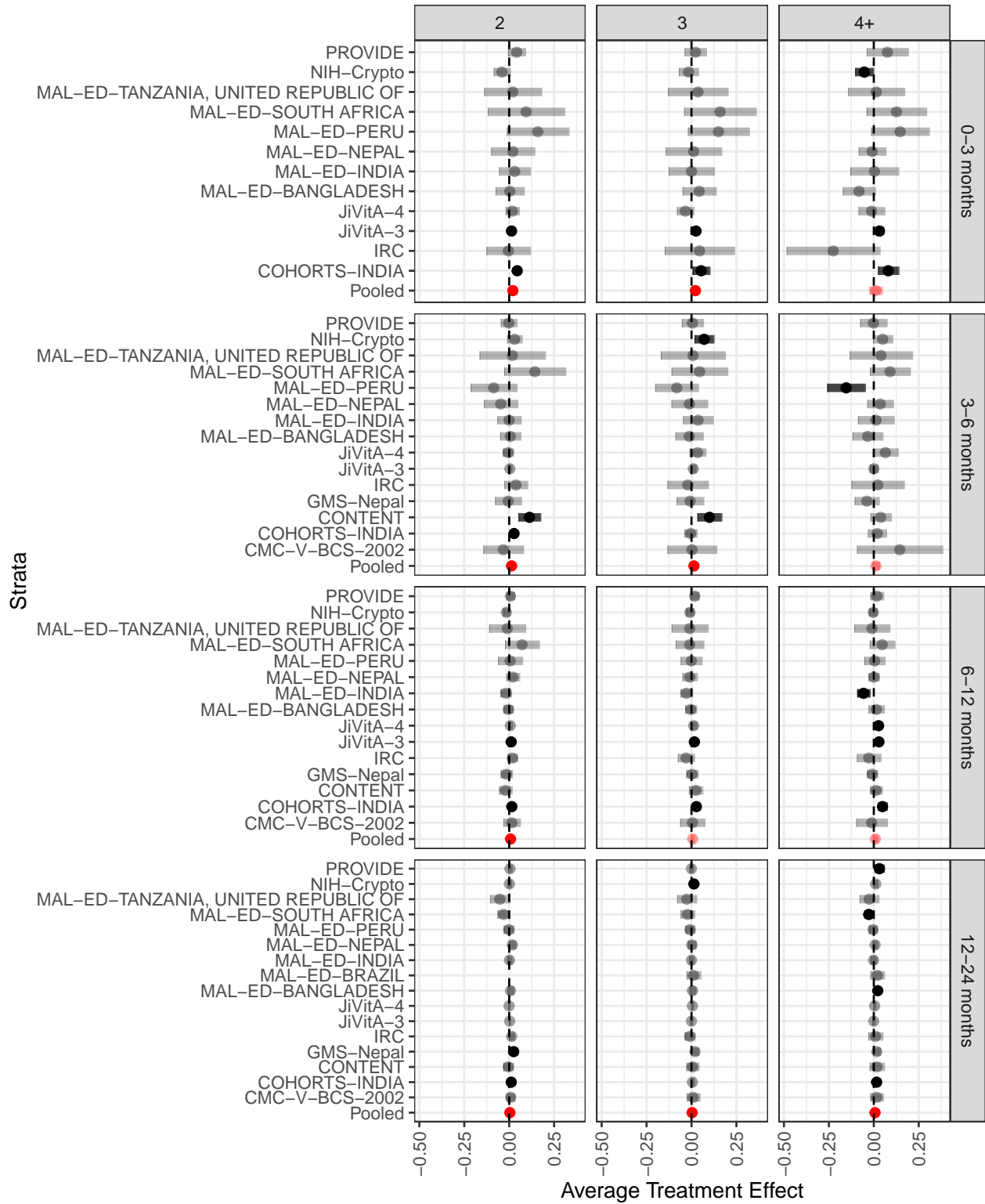
Number of children in the household under 5 years
reference level:1



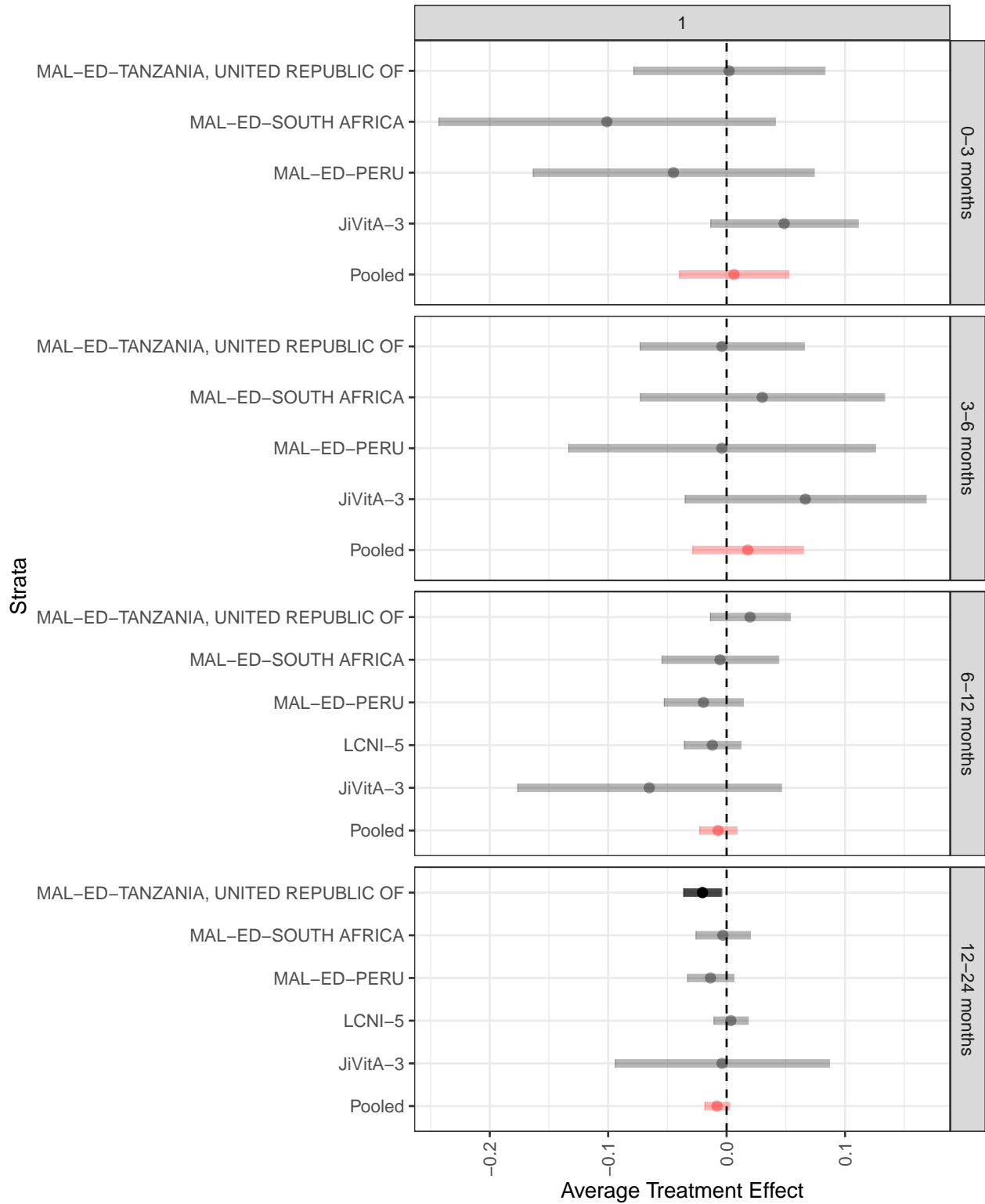
Number of people in the household
reference level:3 or less

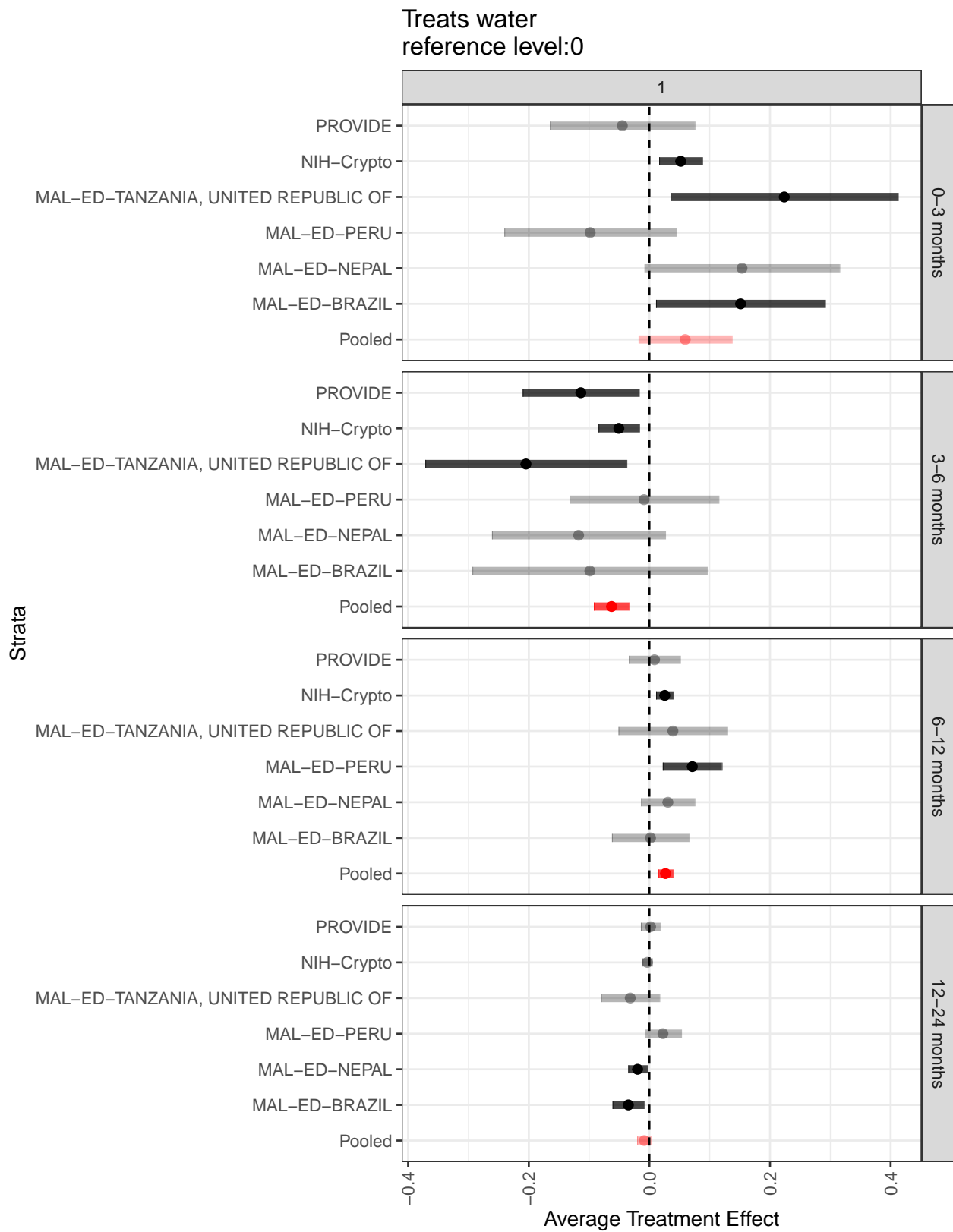


Number of rooms in household
reference level:1

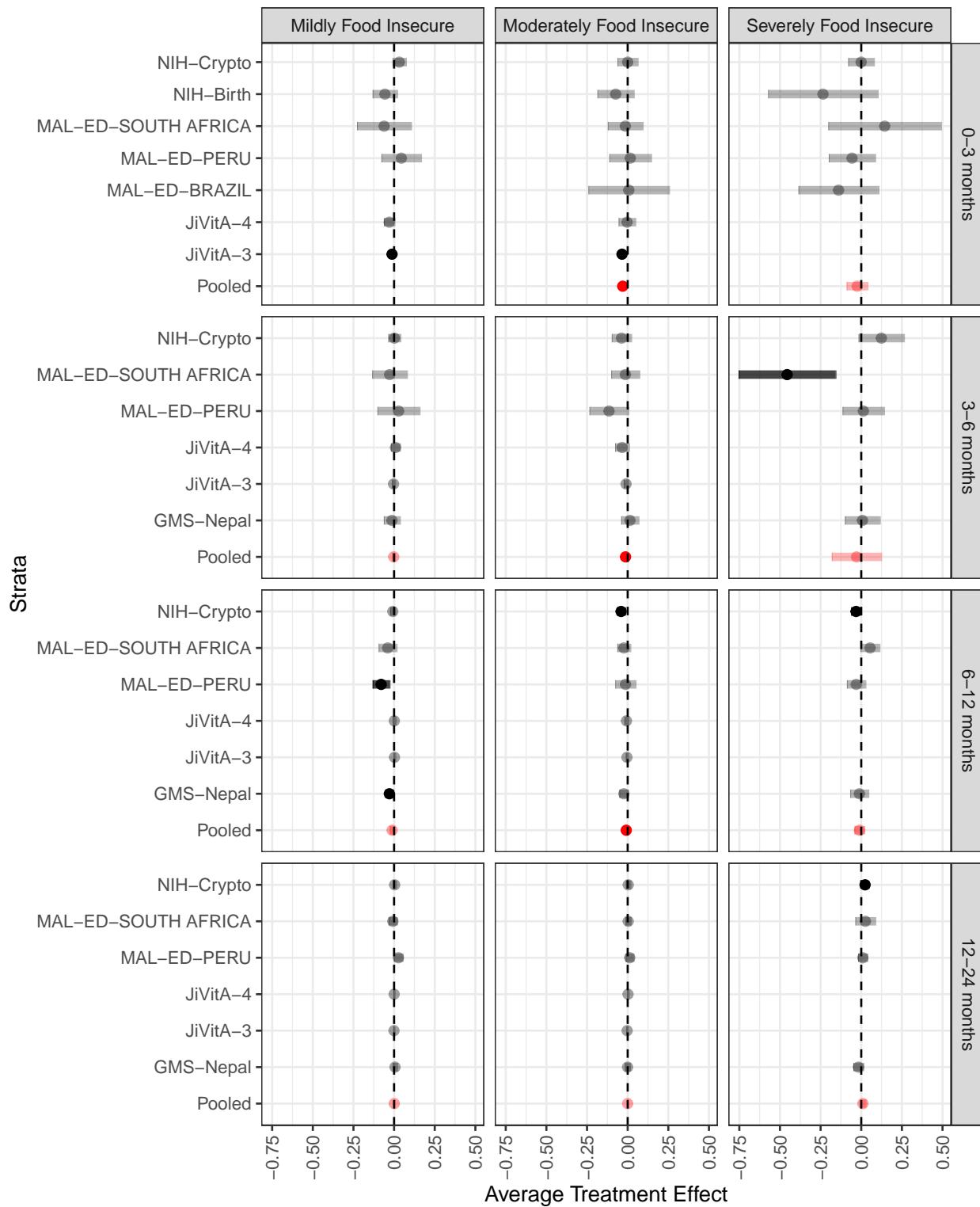


Safe water
reference level:0

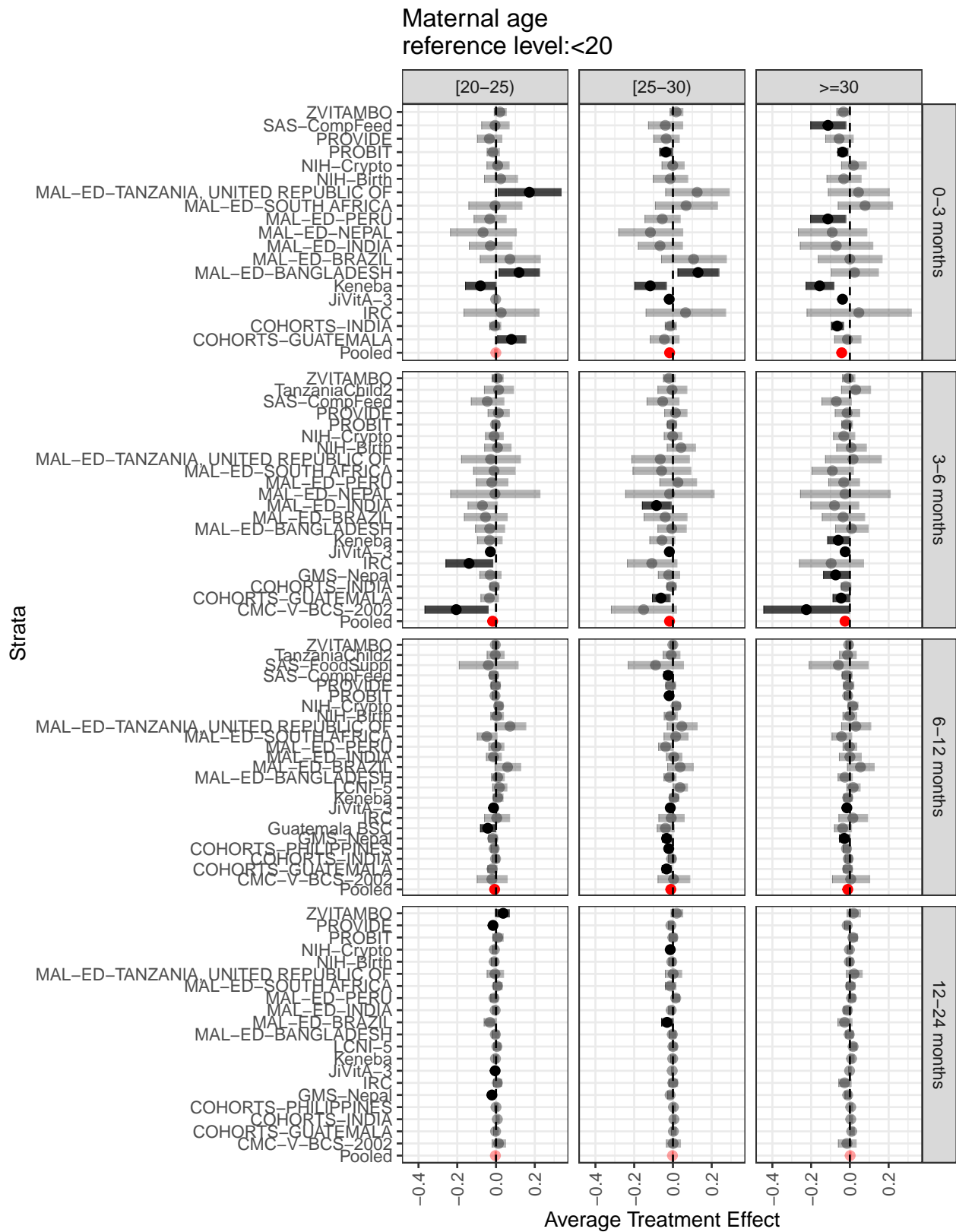




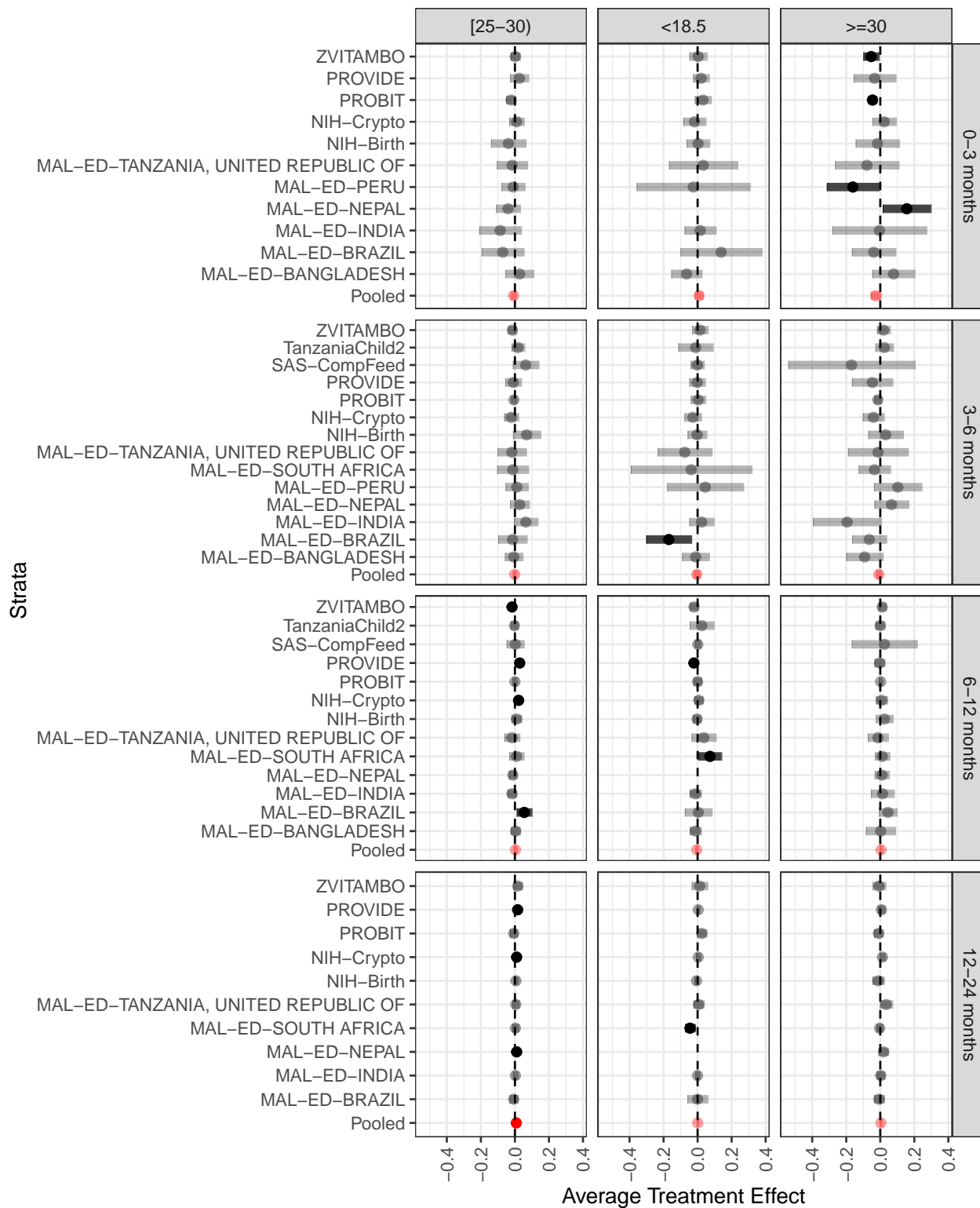
USAID Household Food Insecurity Access Scale (HFIAS) category
reference level: Food Secure



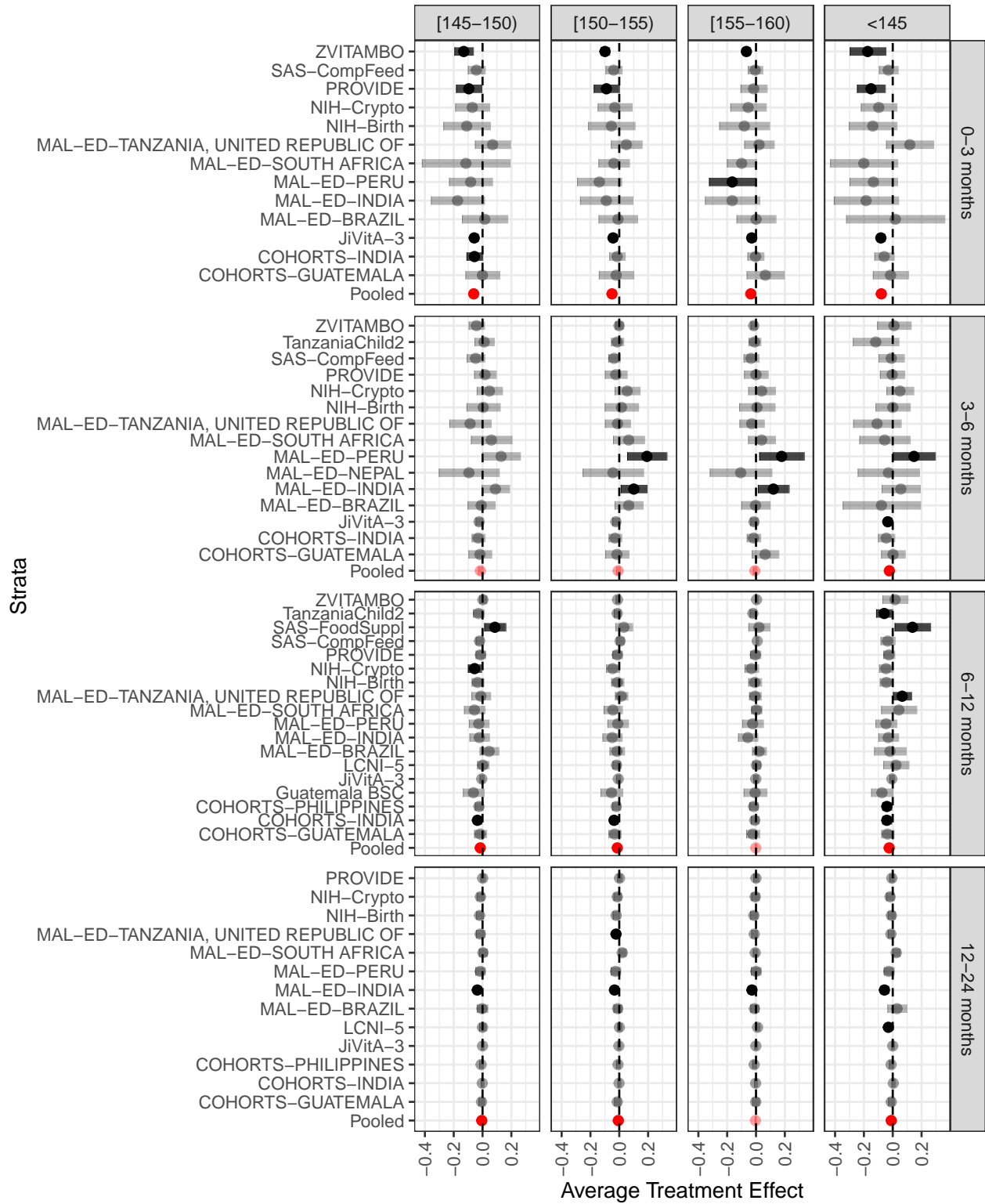
Maternal characteristics



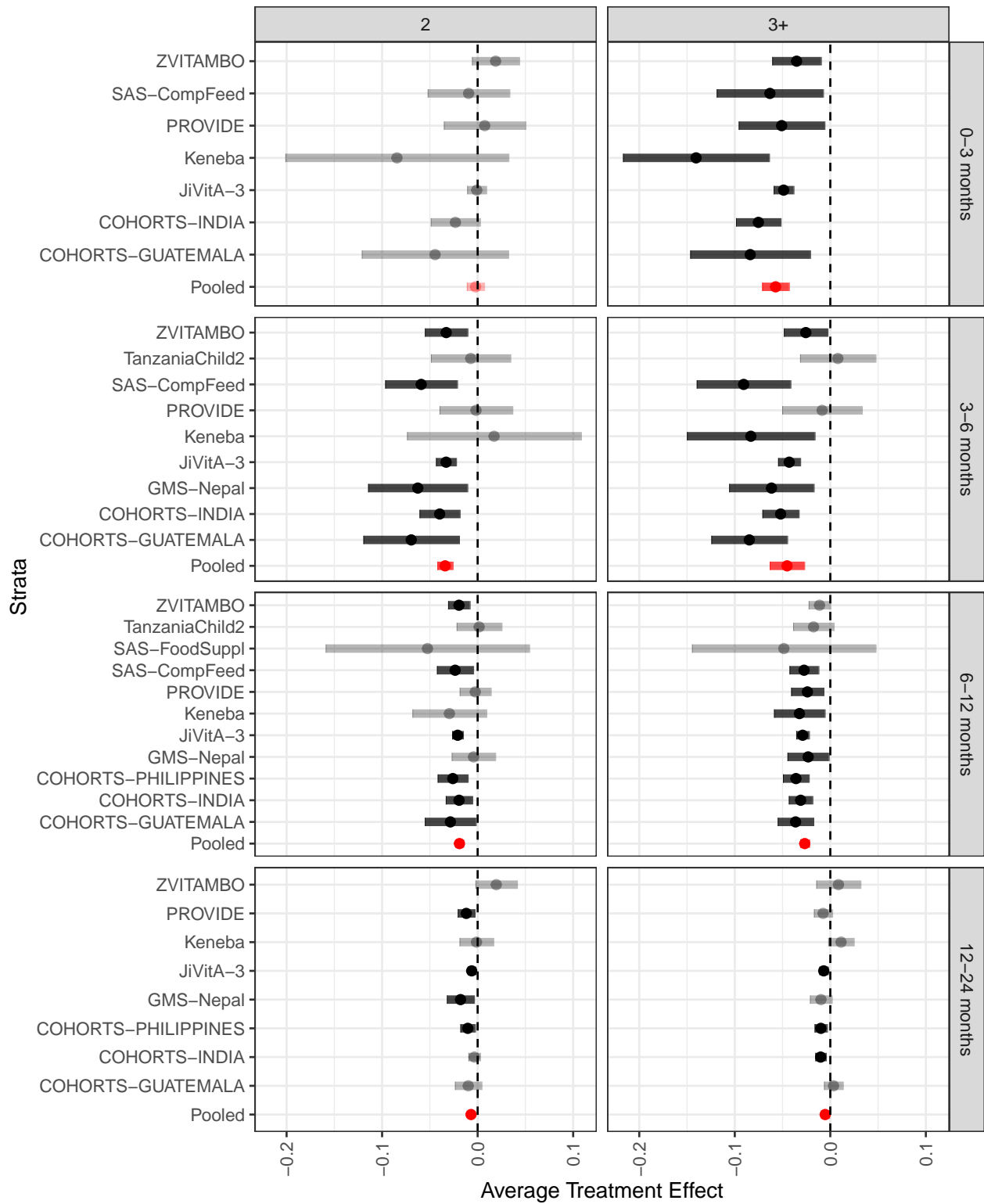
Maternal BMI
reference level:[18.5–25)



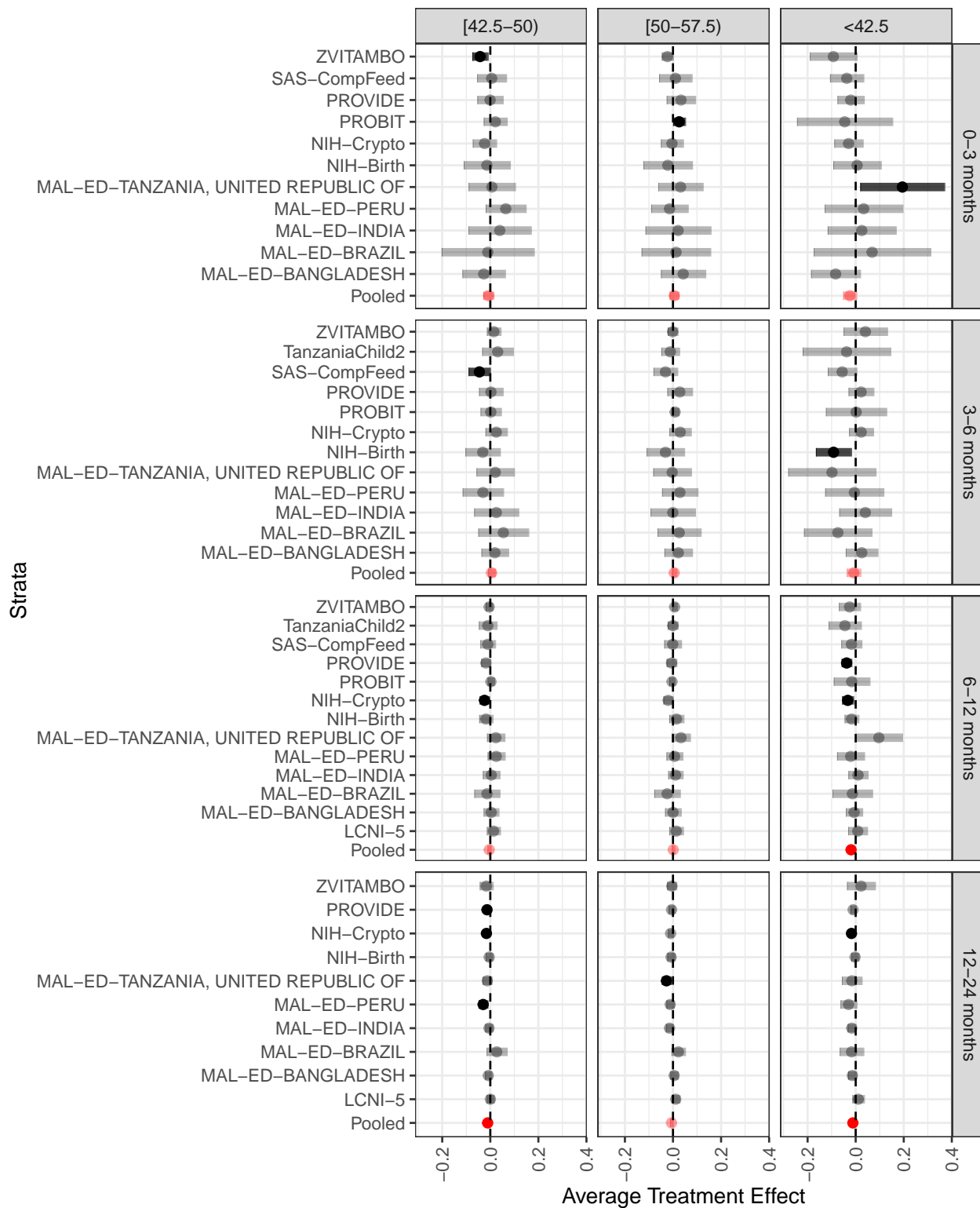
Maternal height
reference level: ≥ 160



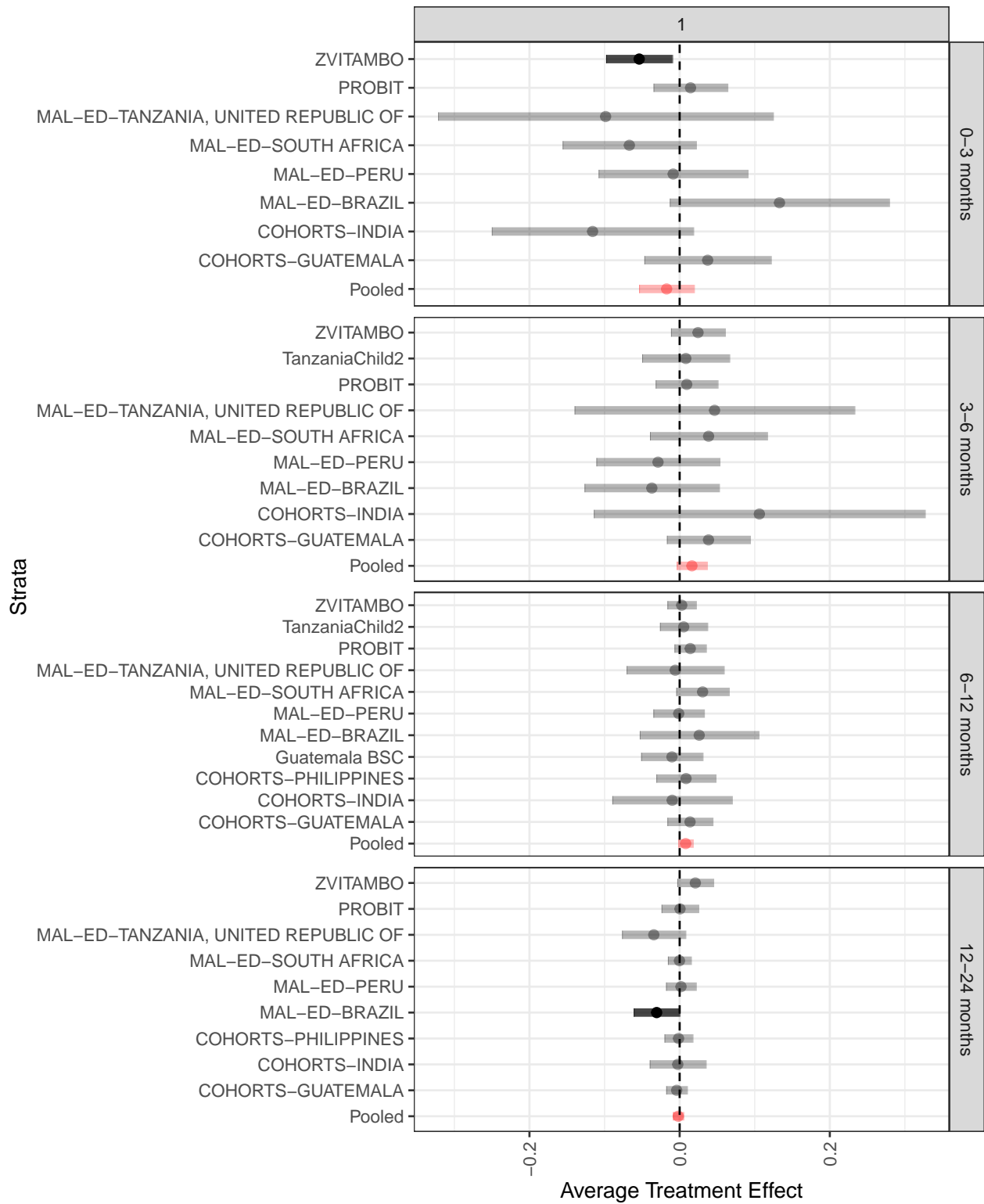
Maternal parity
reference level:1



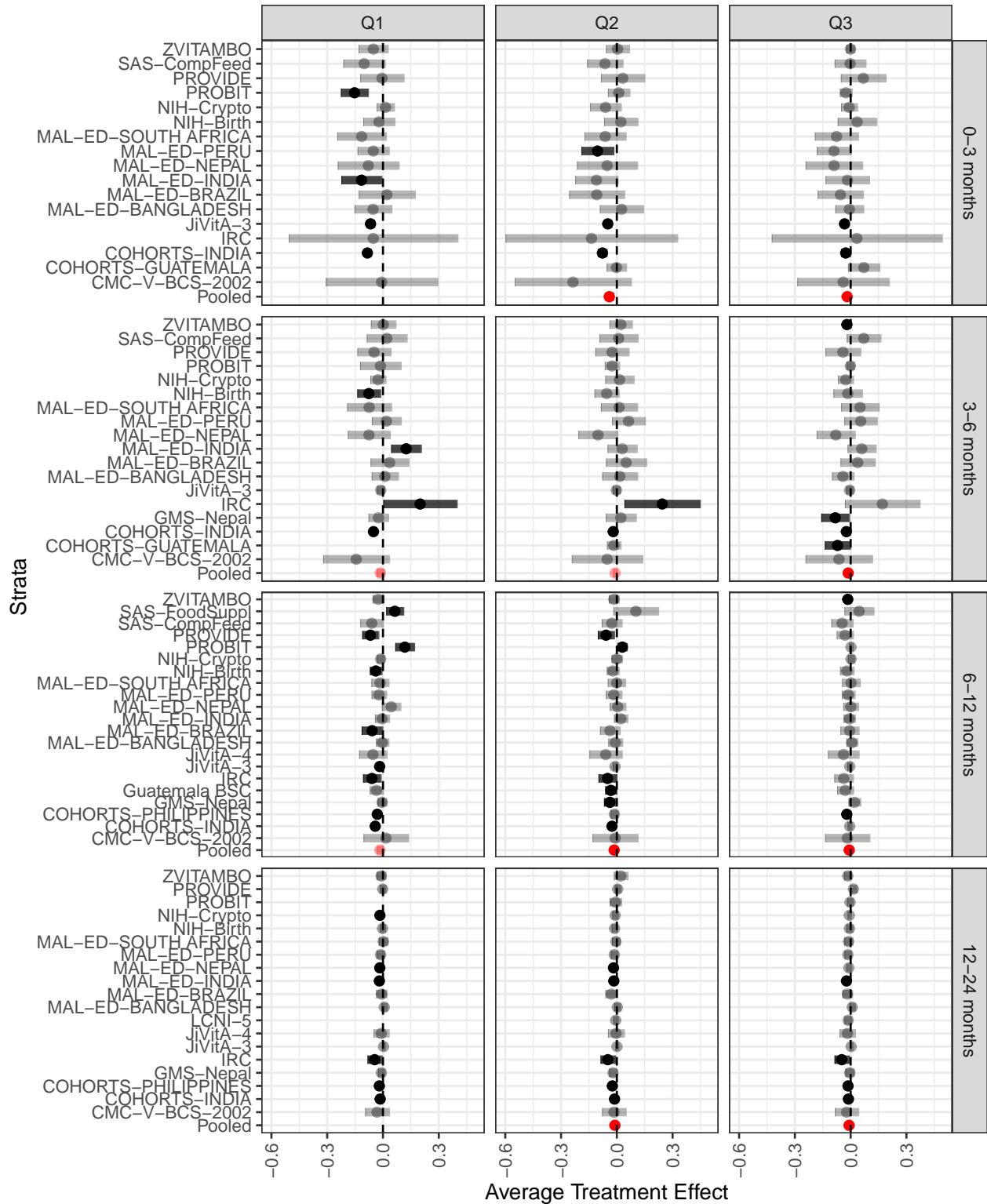
Maternal weight
reference level: ≥ 57.5



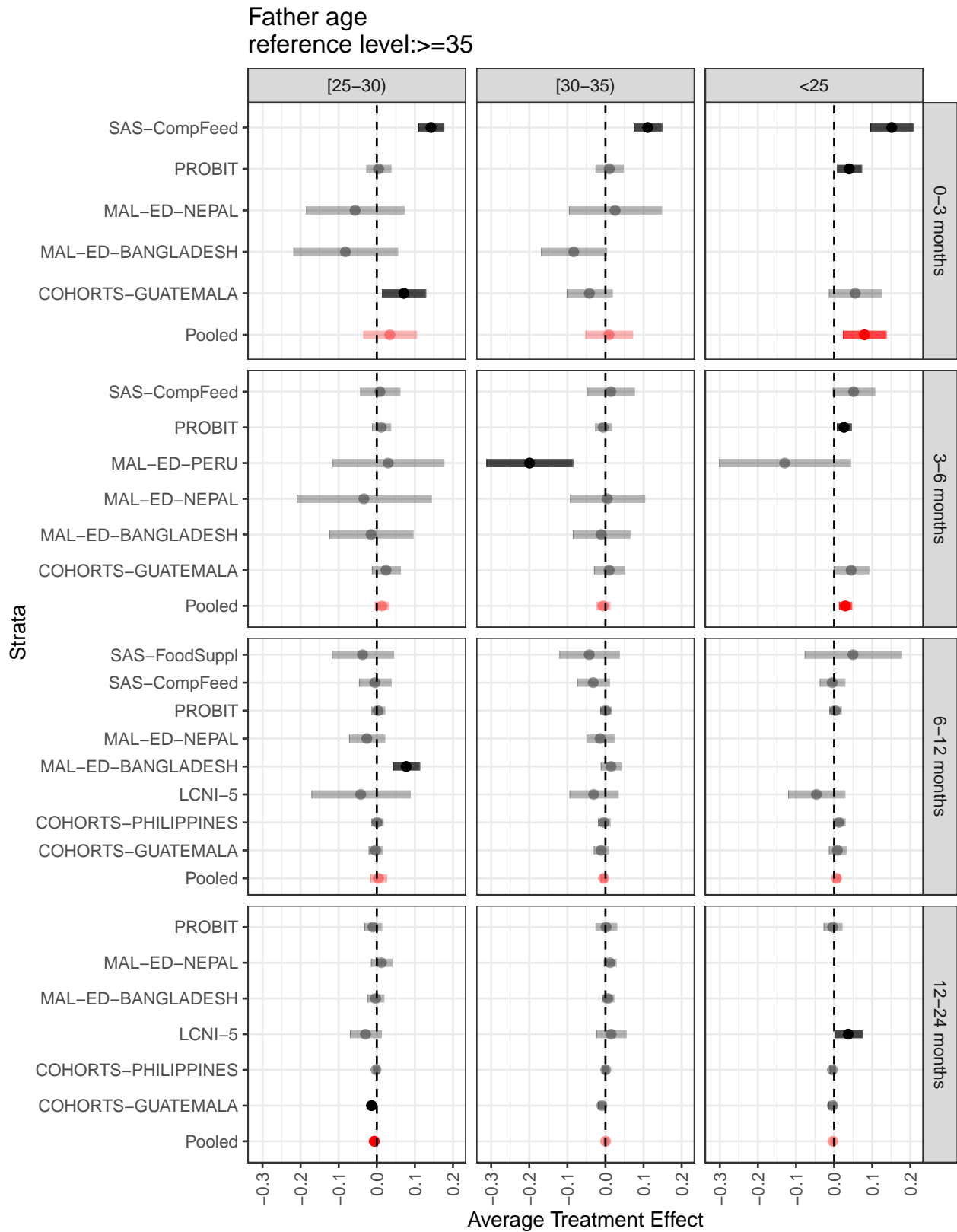
Mother is unmarried
reference level:0



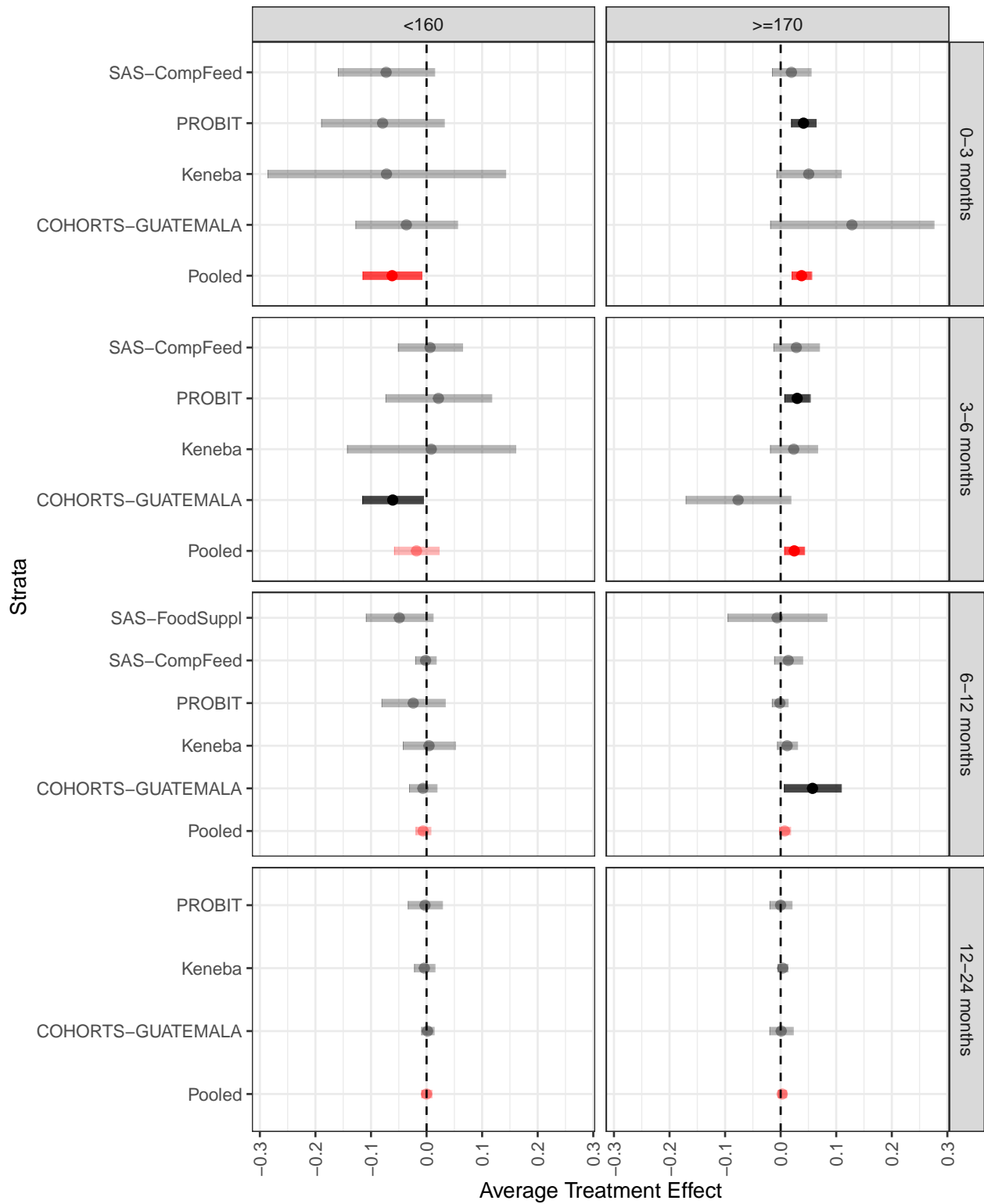
Mother's education
reference level:Q4



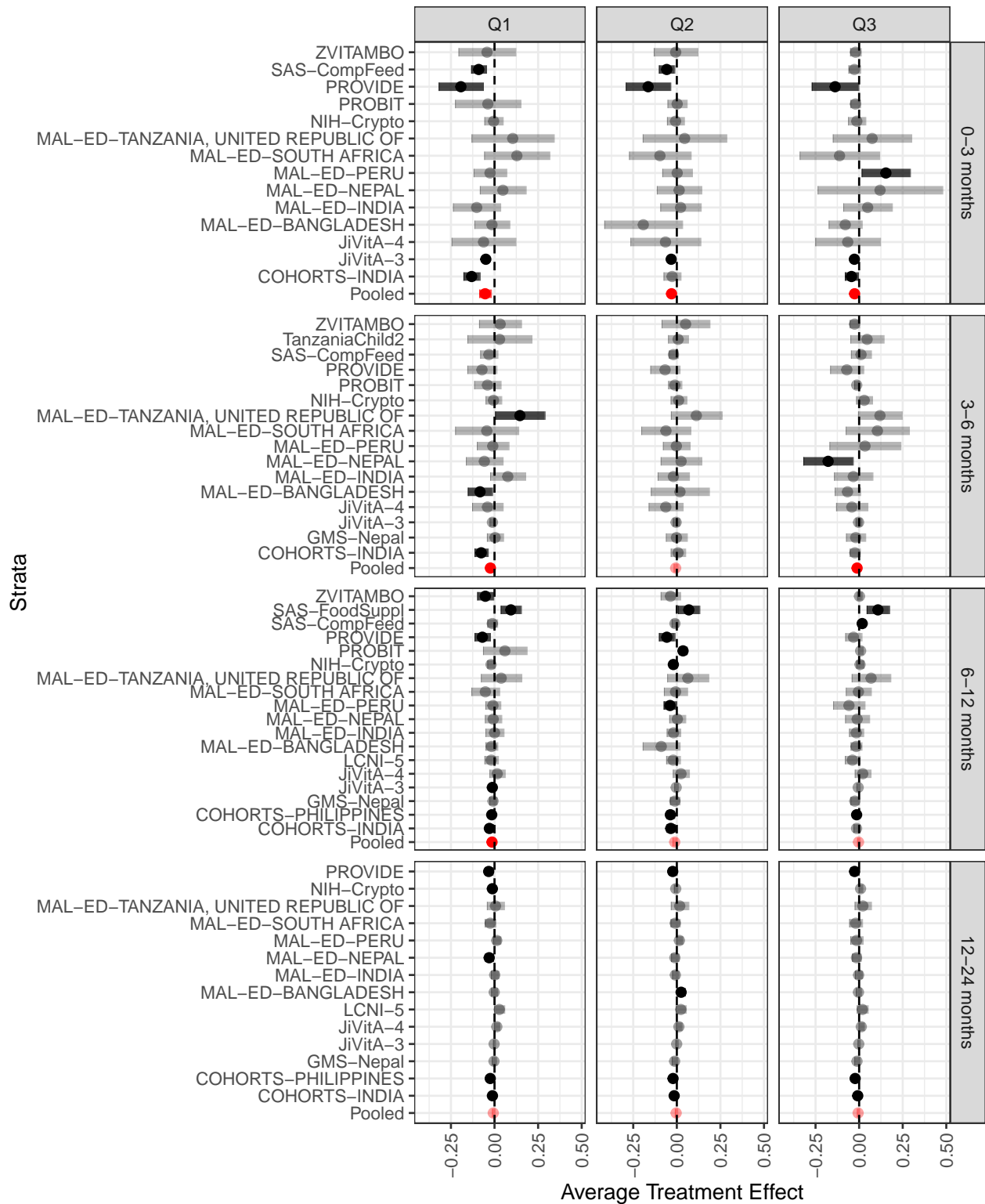
Paternal characteristics



Father height
reference level:[160–170)



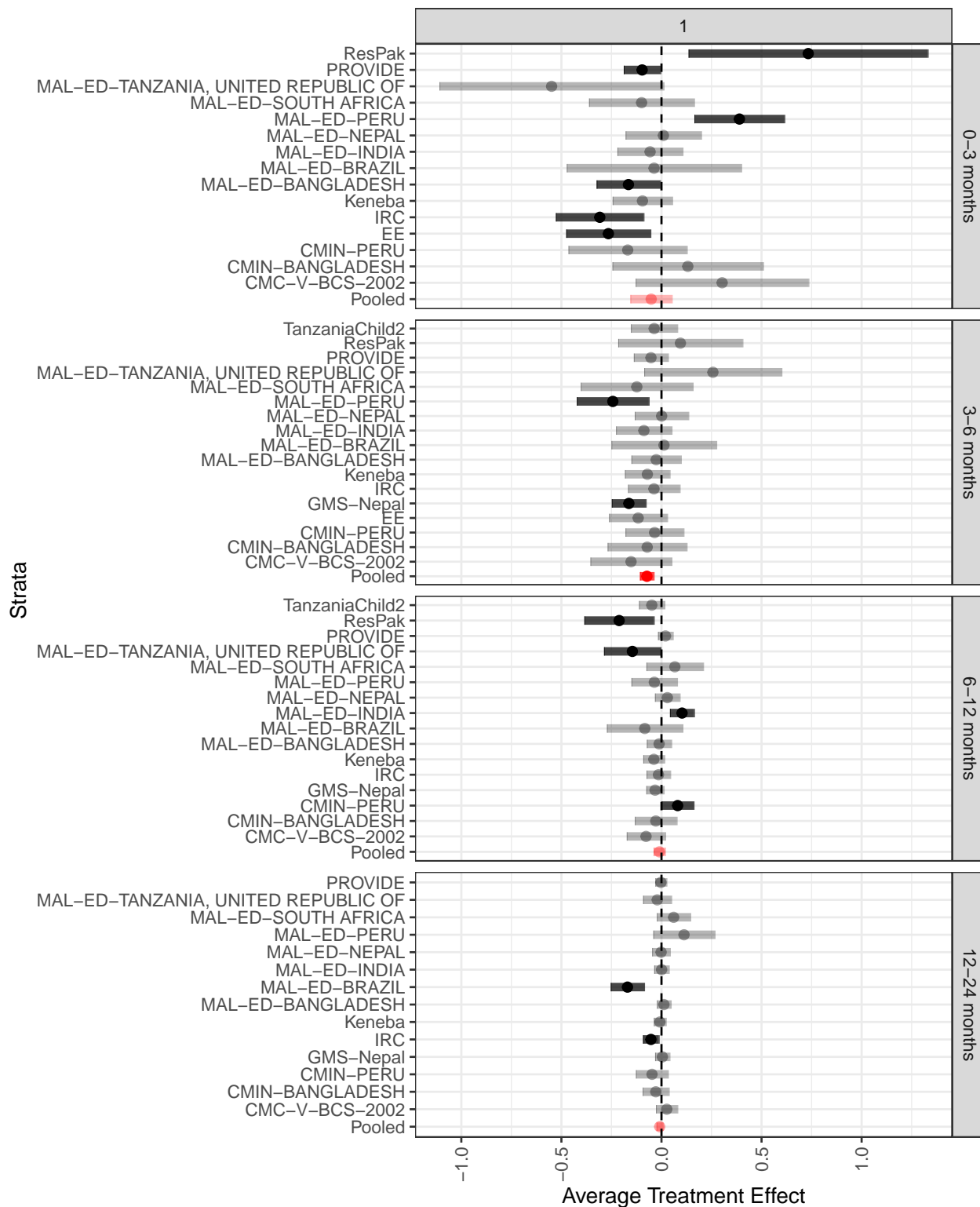
Father's education
reference level:Q4



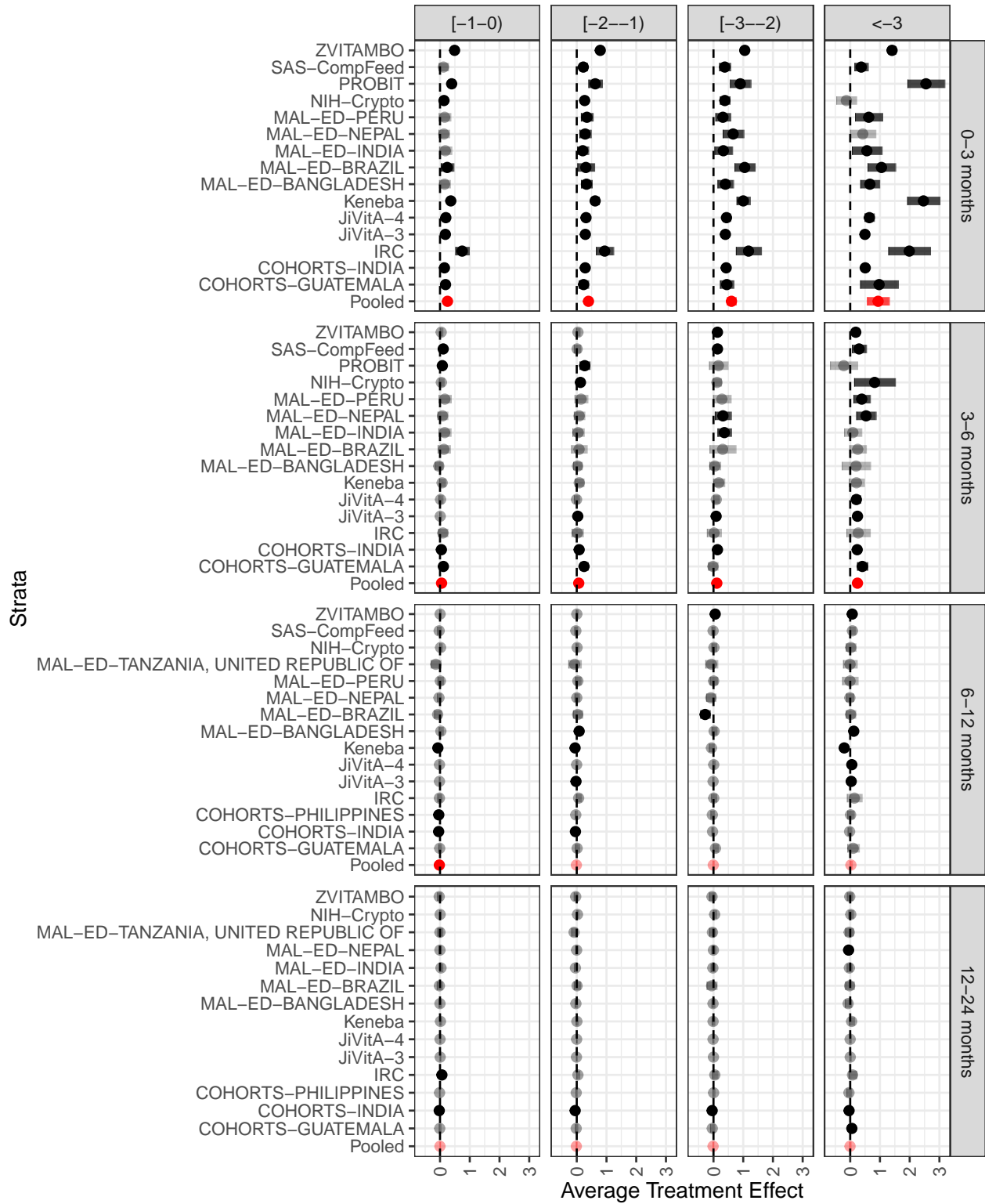
Length growth velocity

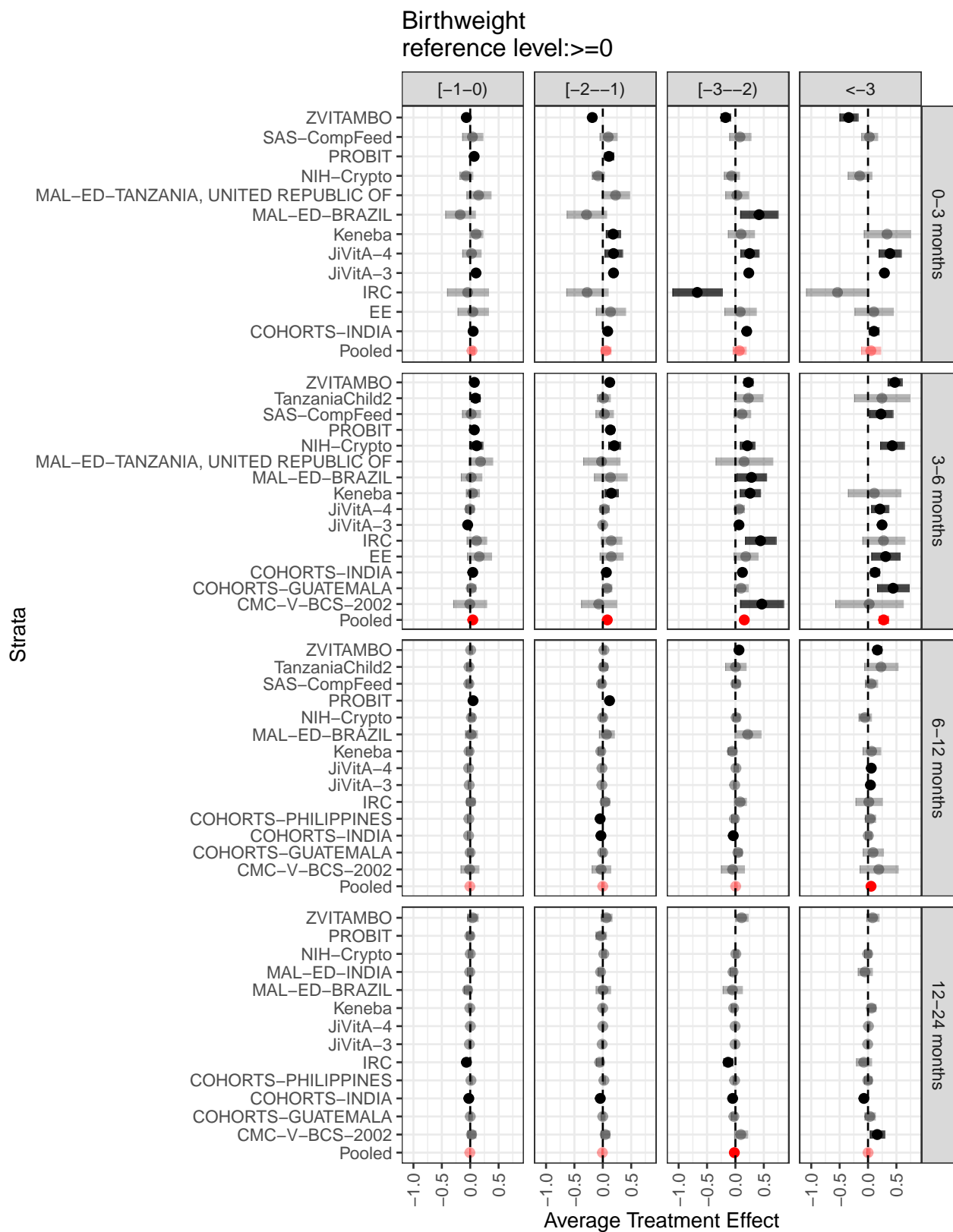
Child characteristics

Any wasting in first 6 months
reference level:0

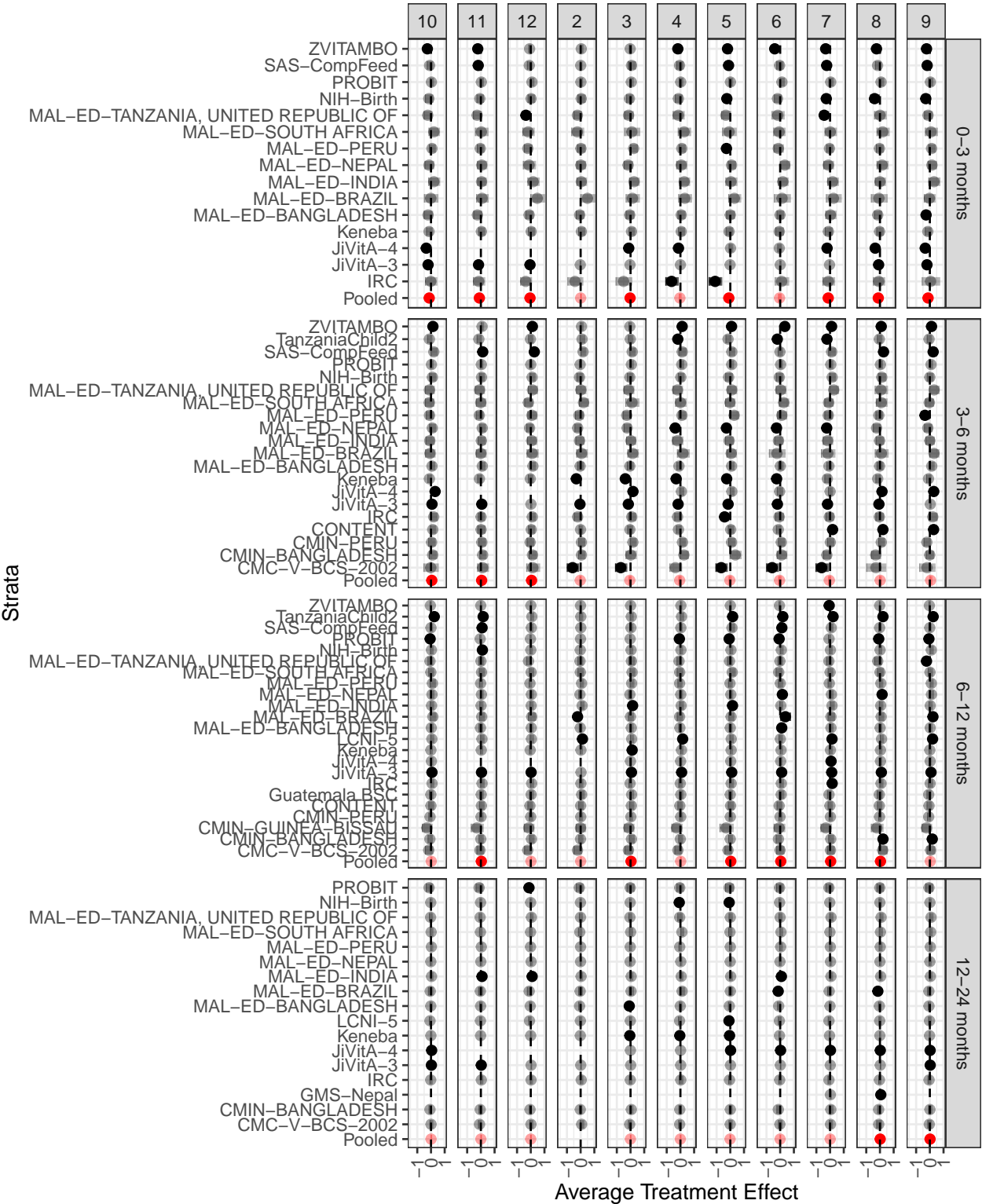


Birth length
reference level: ≥ 0

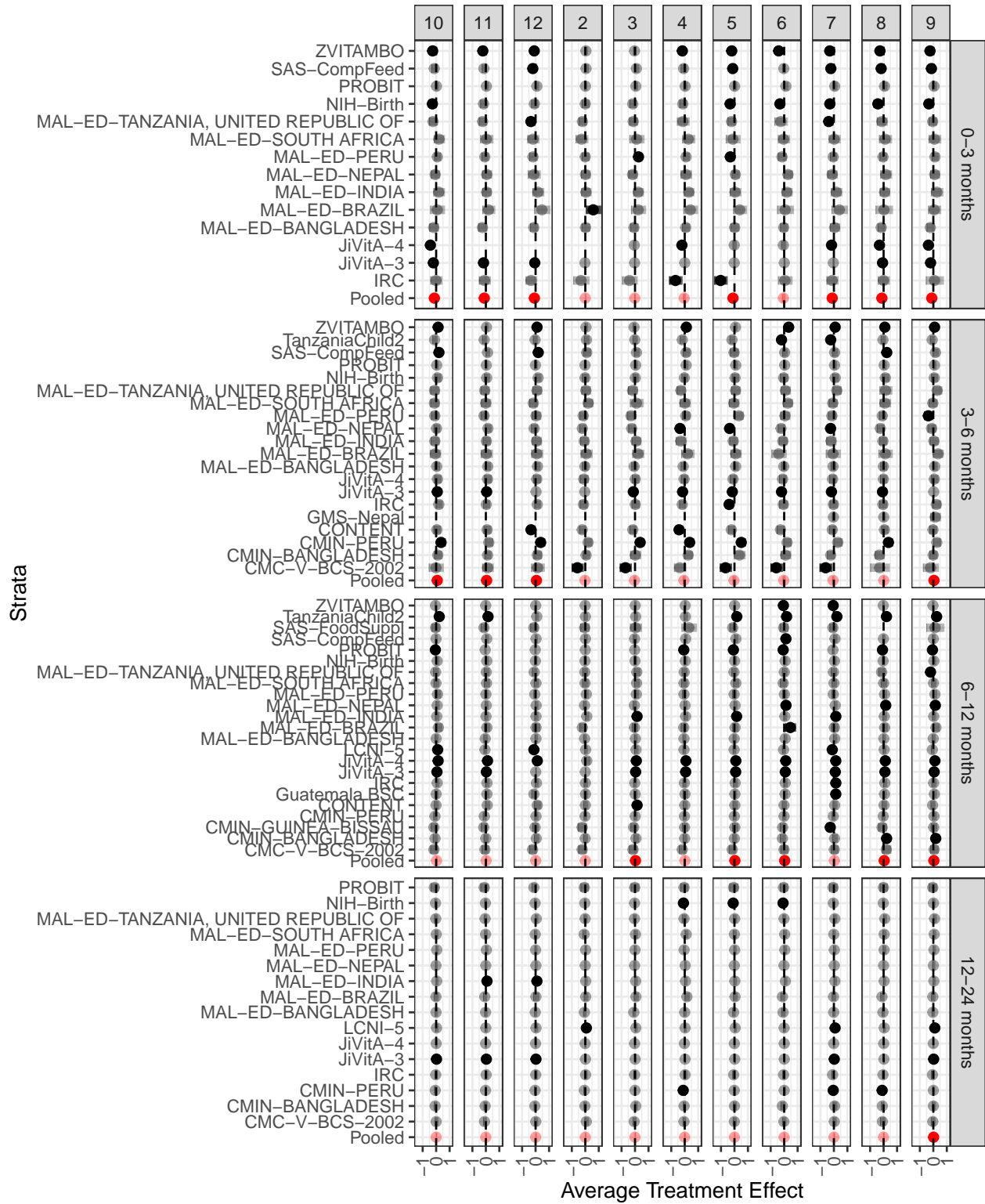




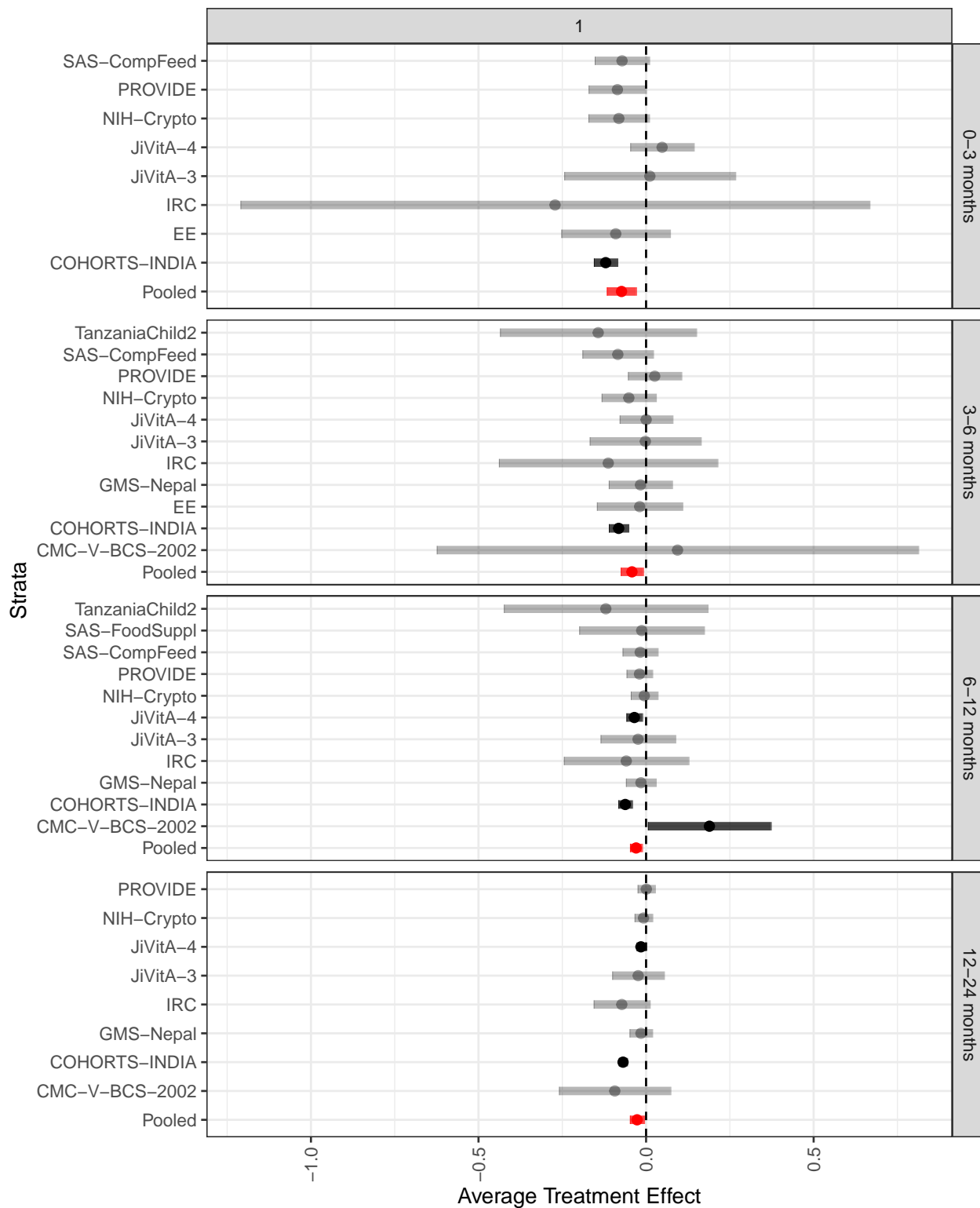
Calendar month of birth
reference level:1



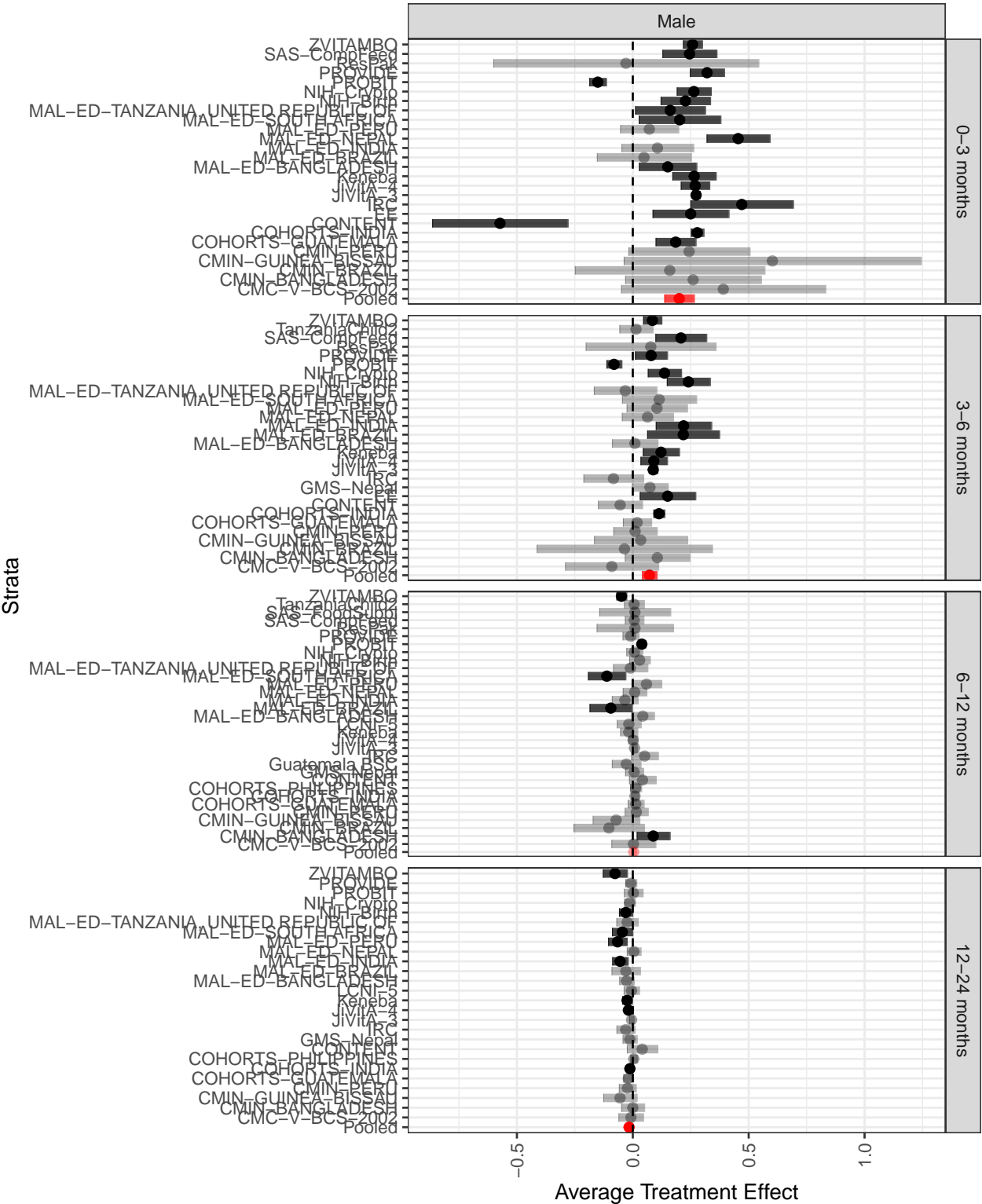
Calendar month of measurement
reference level:1



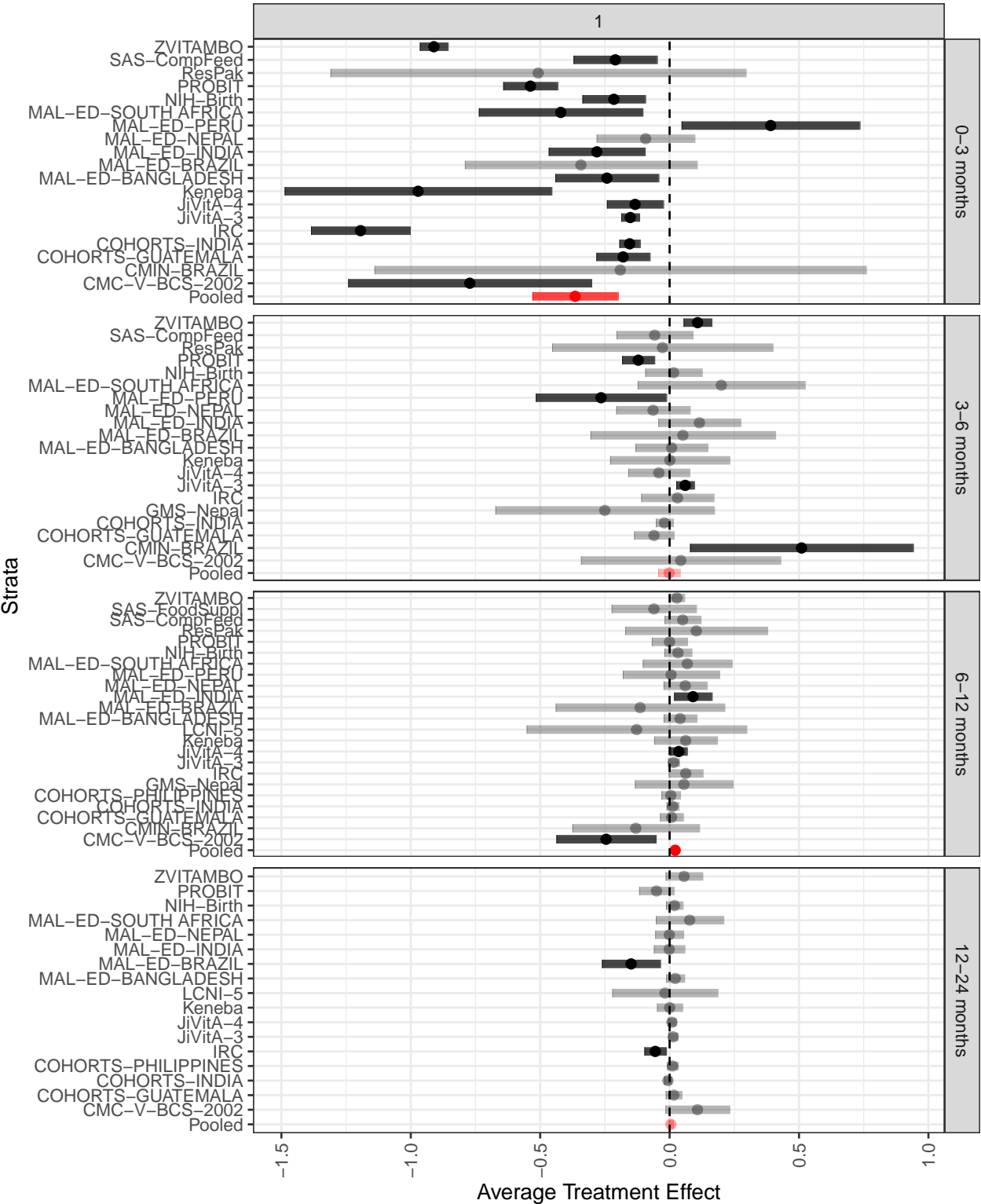
Child delivered at home
reference level:0



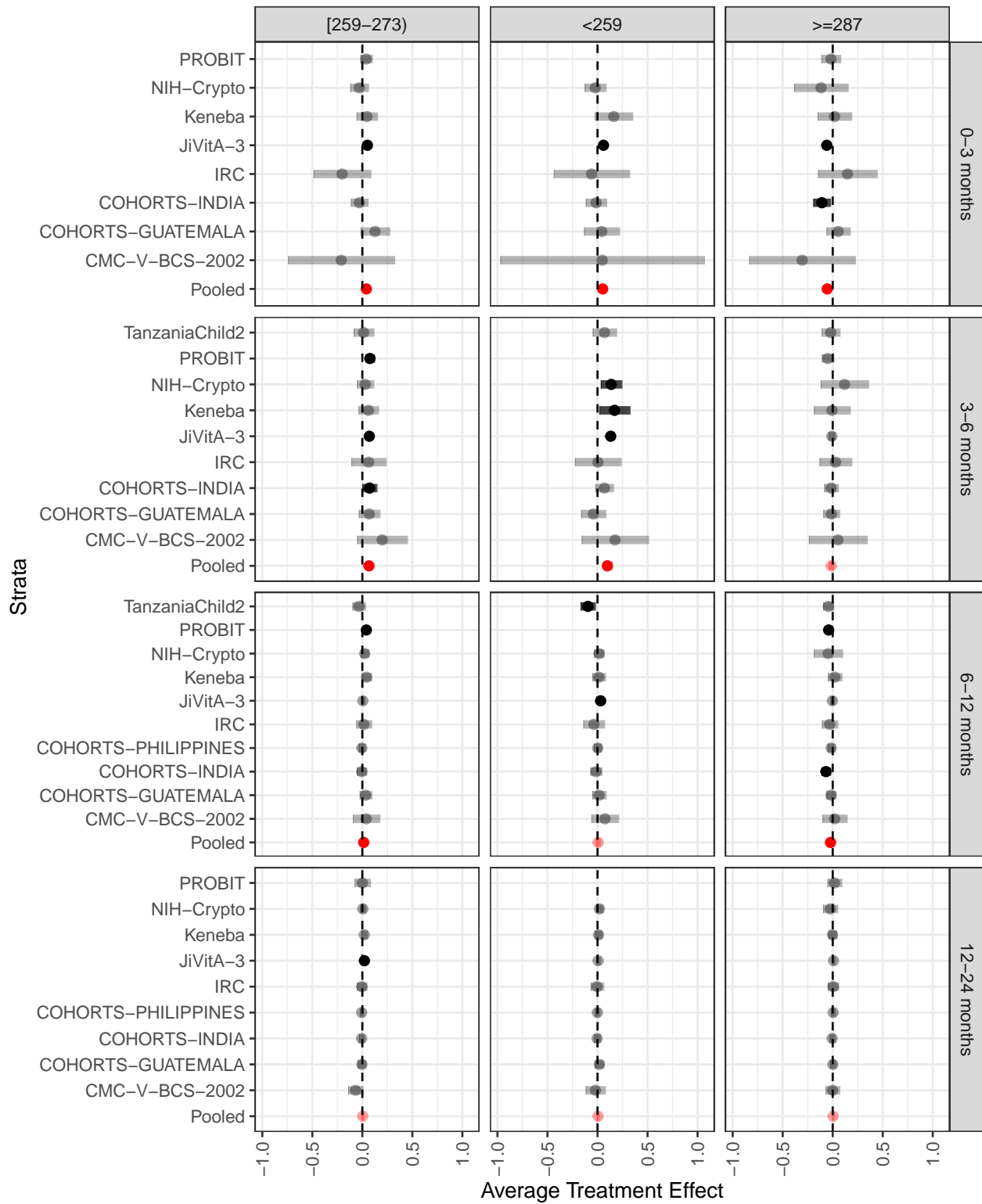
Child's sex
reference level:Female



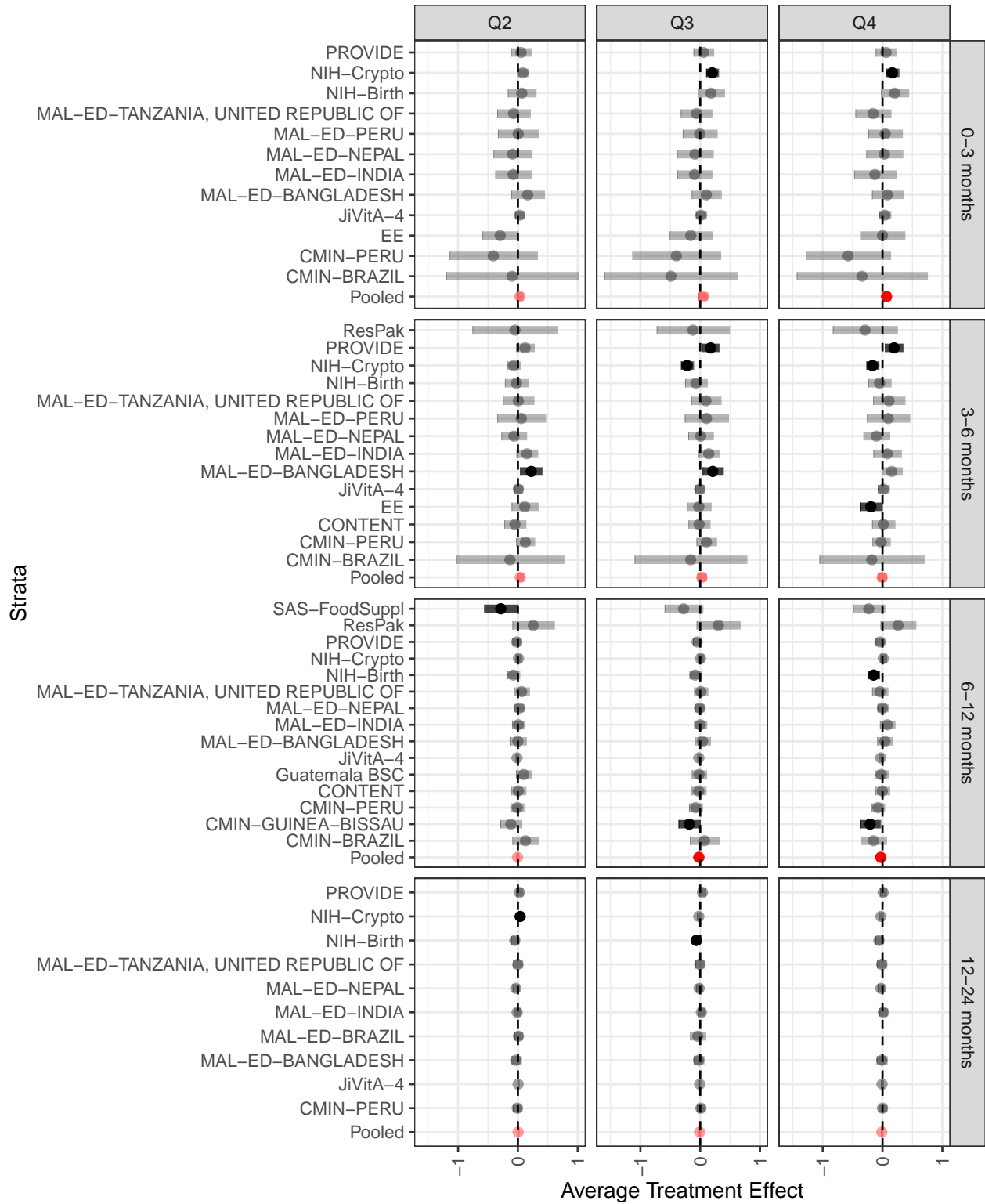
Enrolled wasted
reference level:0



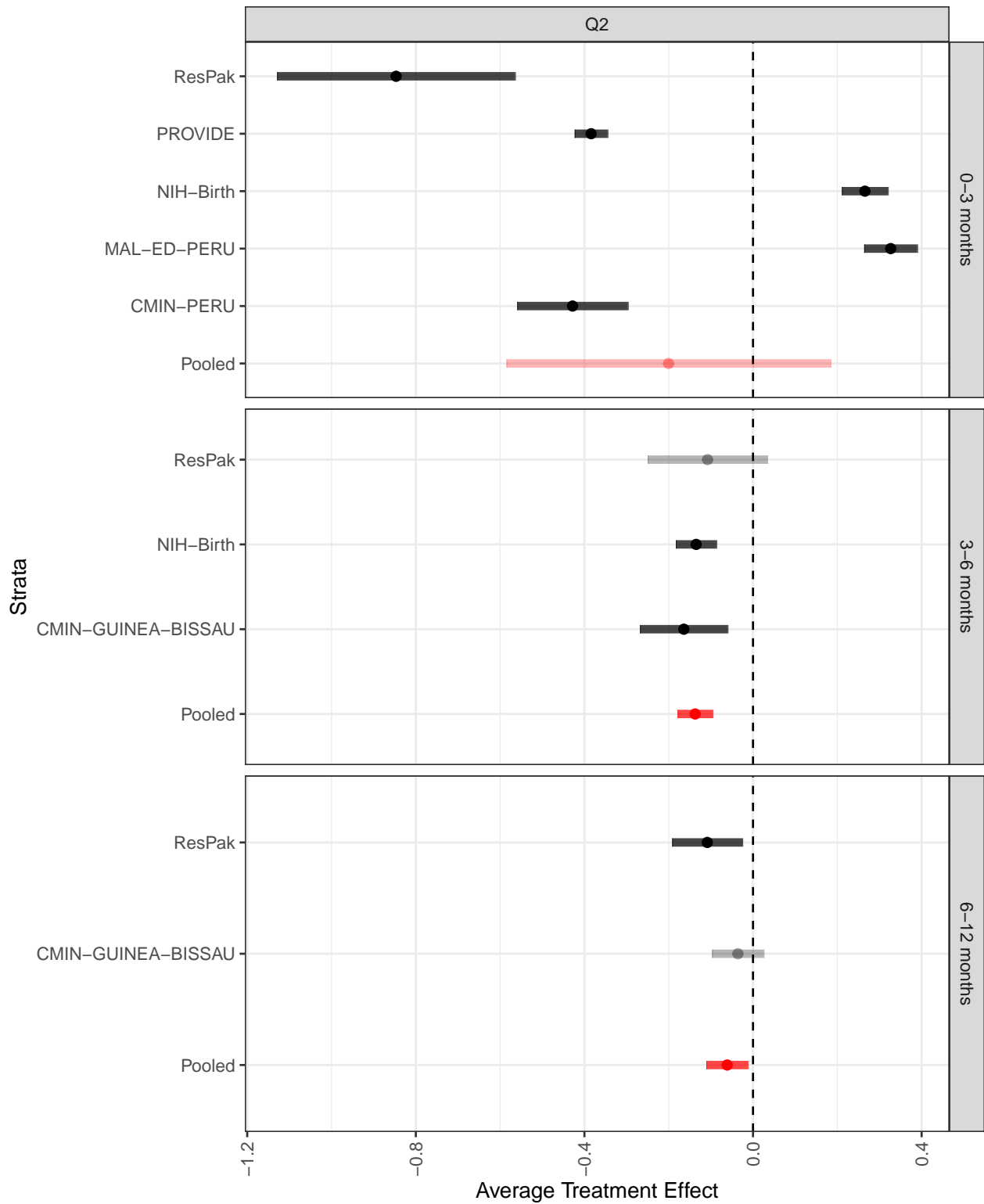
Gestational age at birth in days
reference level:[273–287)



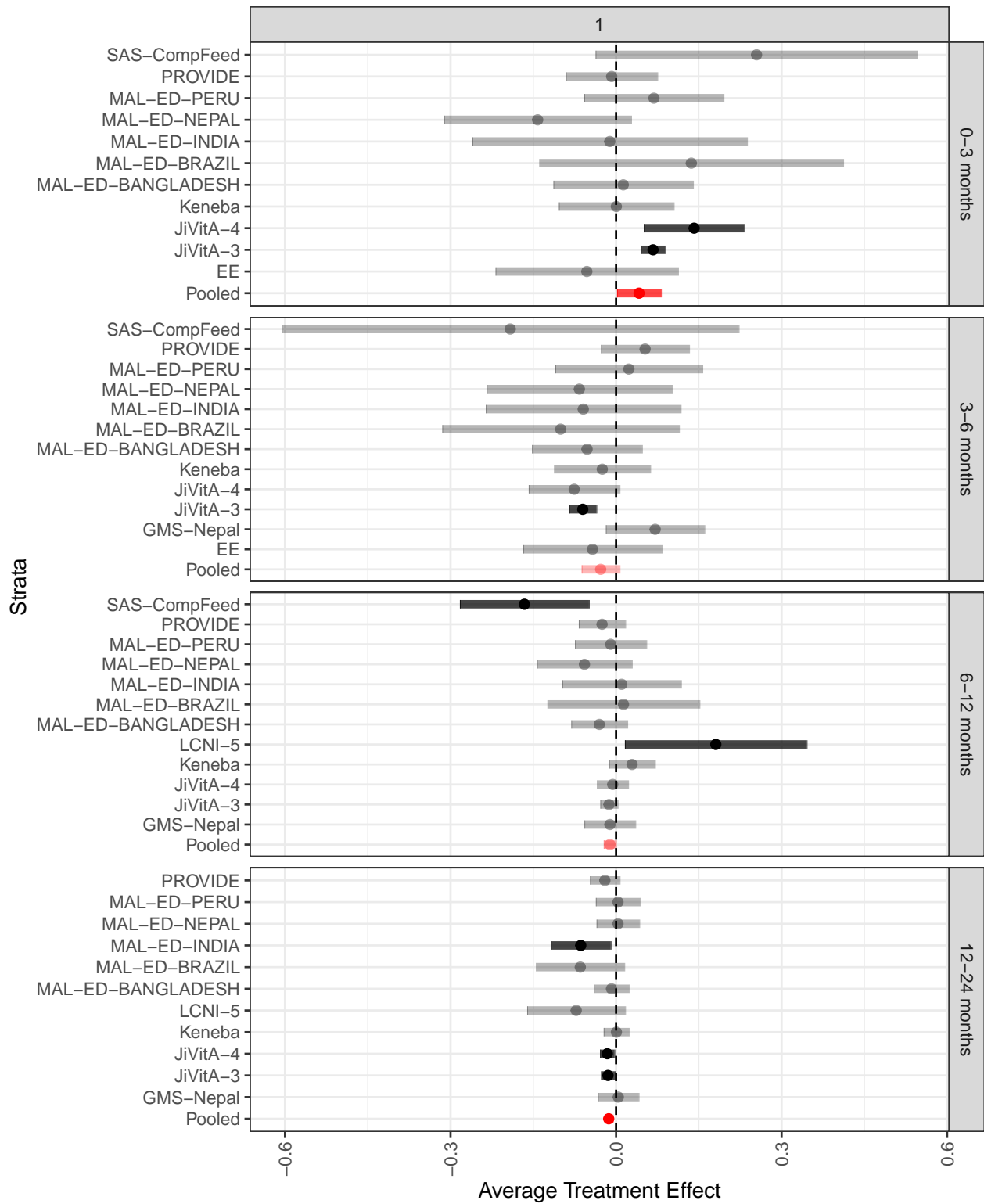
Percent diarrhea in first 24 months
reference level:Q1



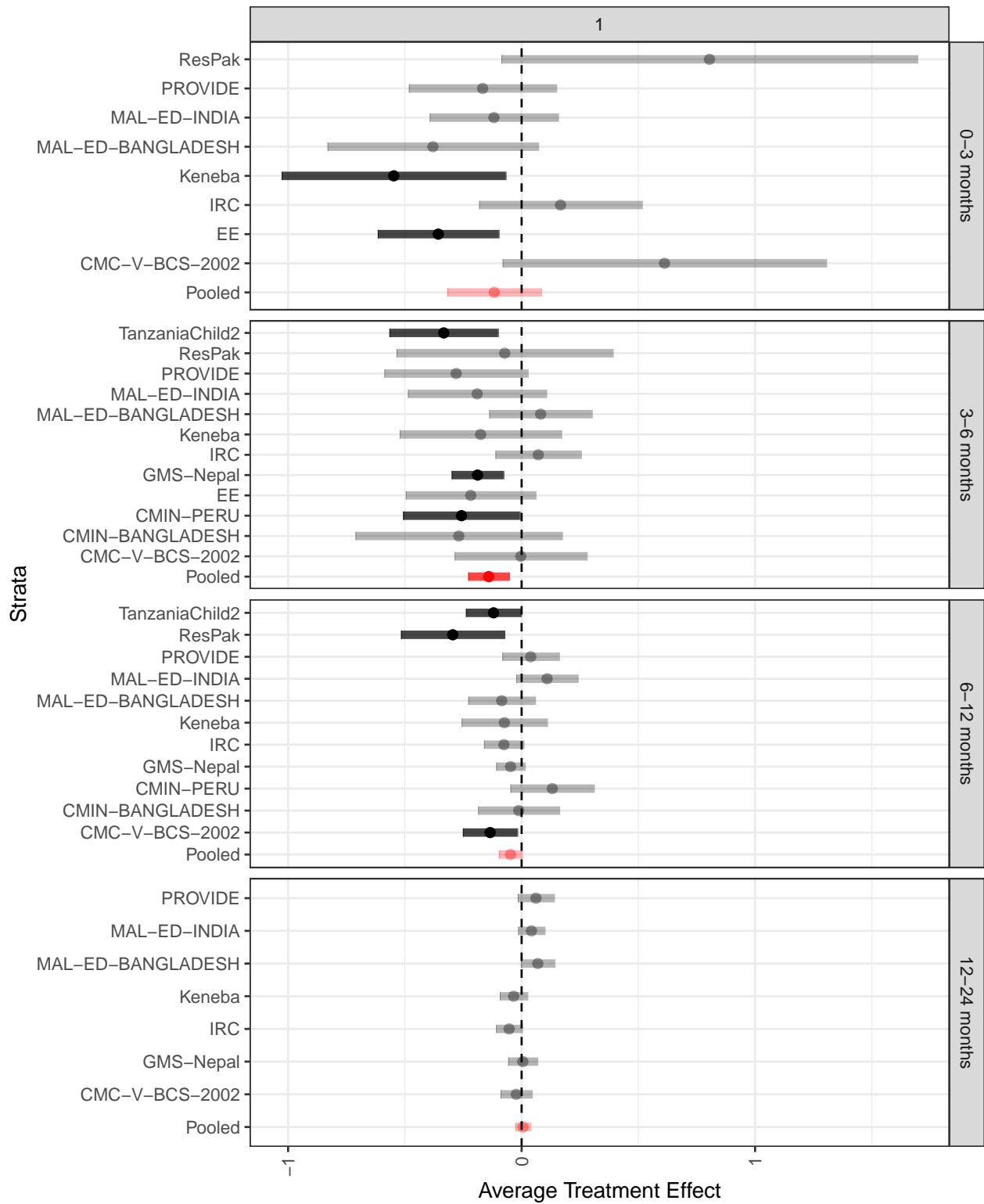
Percent diarrhea in first 6 months
reference level:Q1



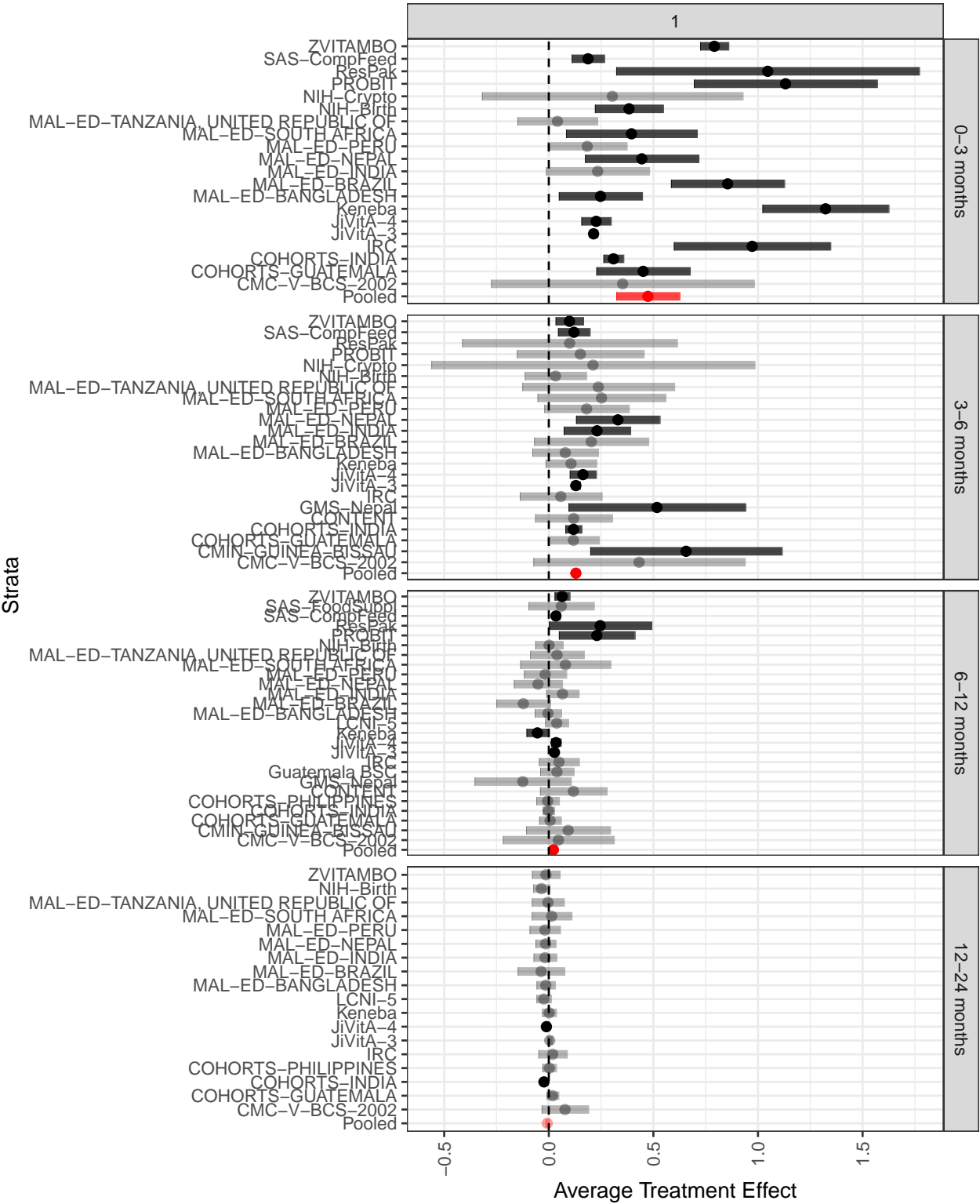
Percent exclusive breastfeeding
reference level:0



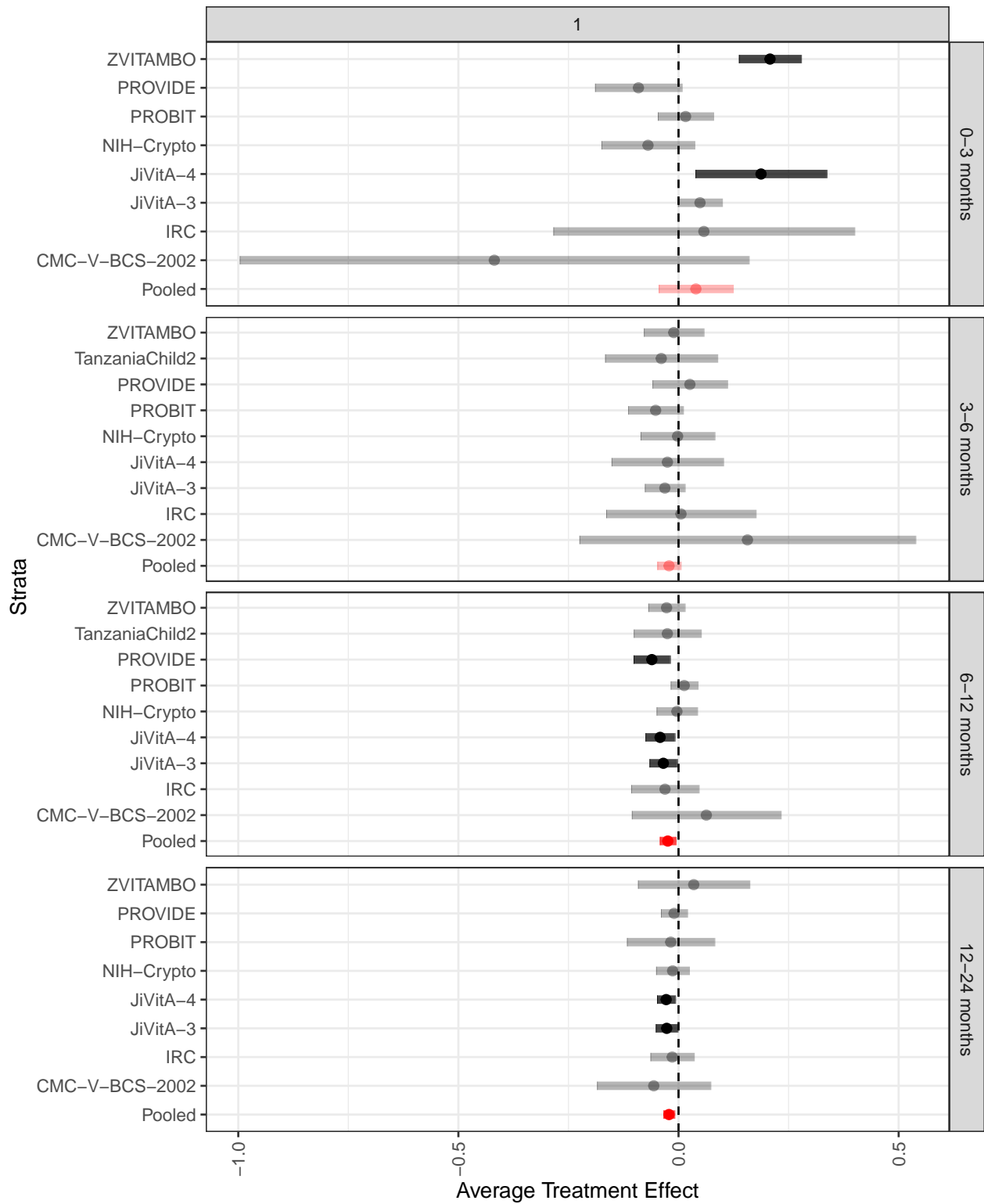
Persistent wasting in first 6 months
reference level:0



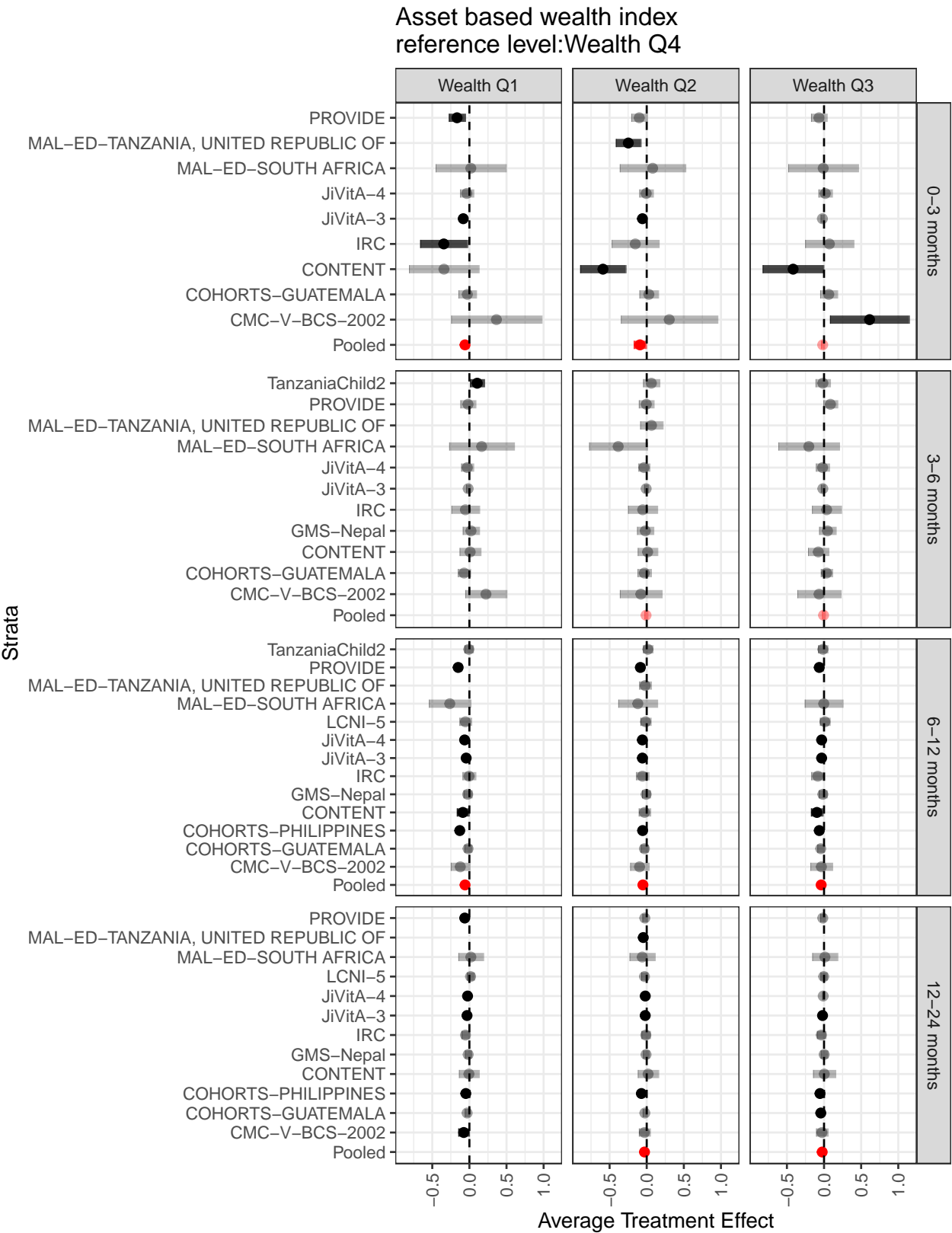
Stunted at enrollment
reference level:0



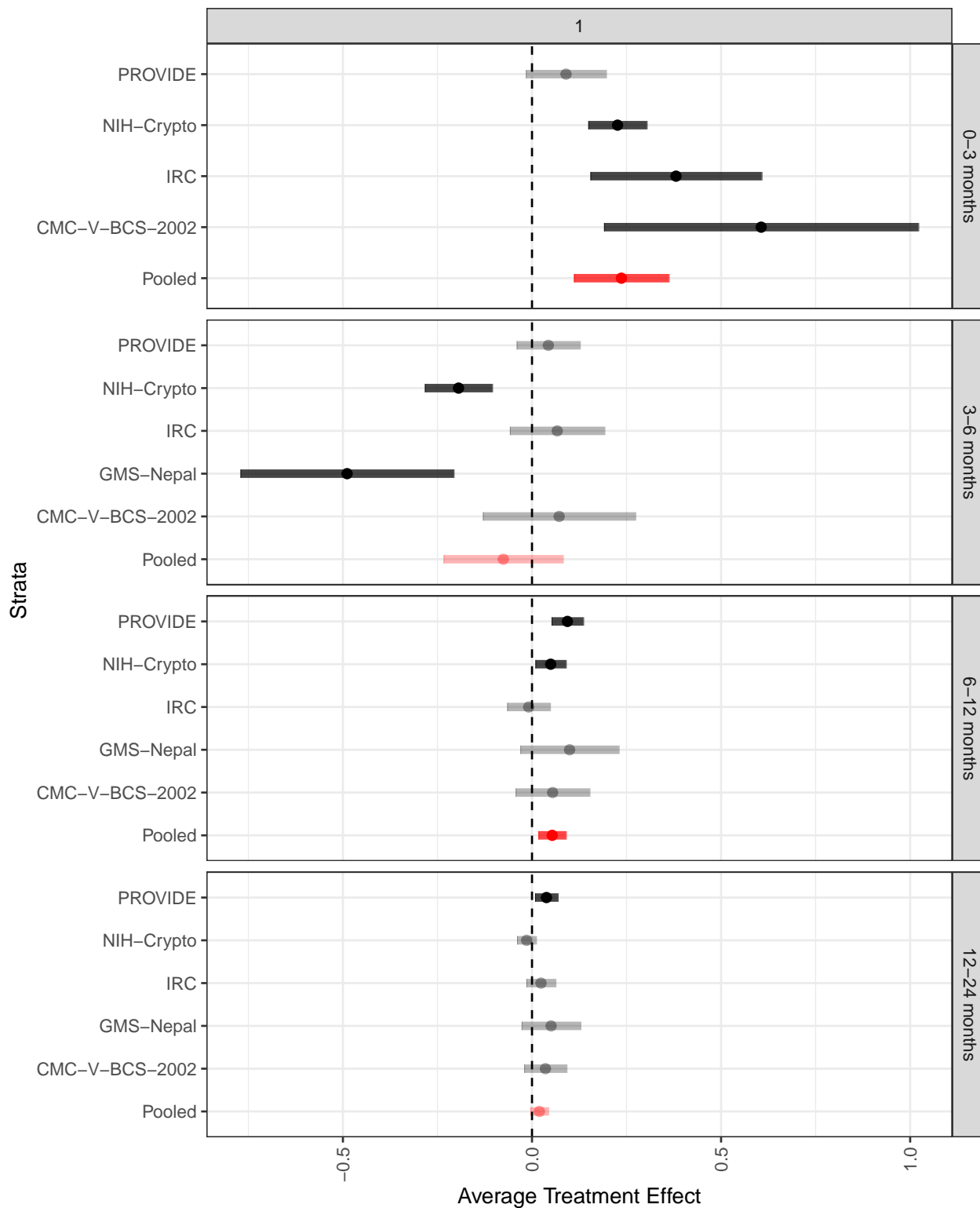
Vaginal delivery
reference level:0



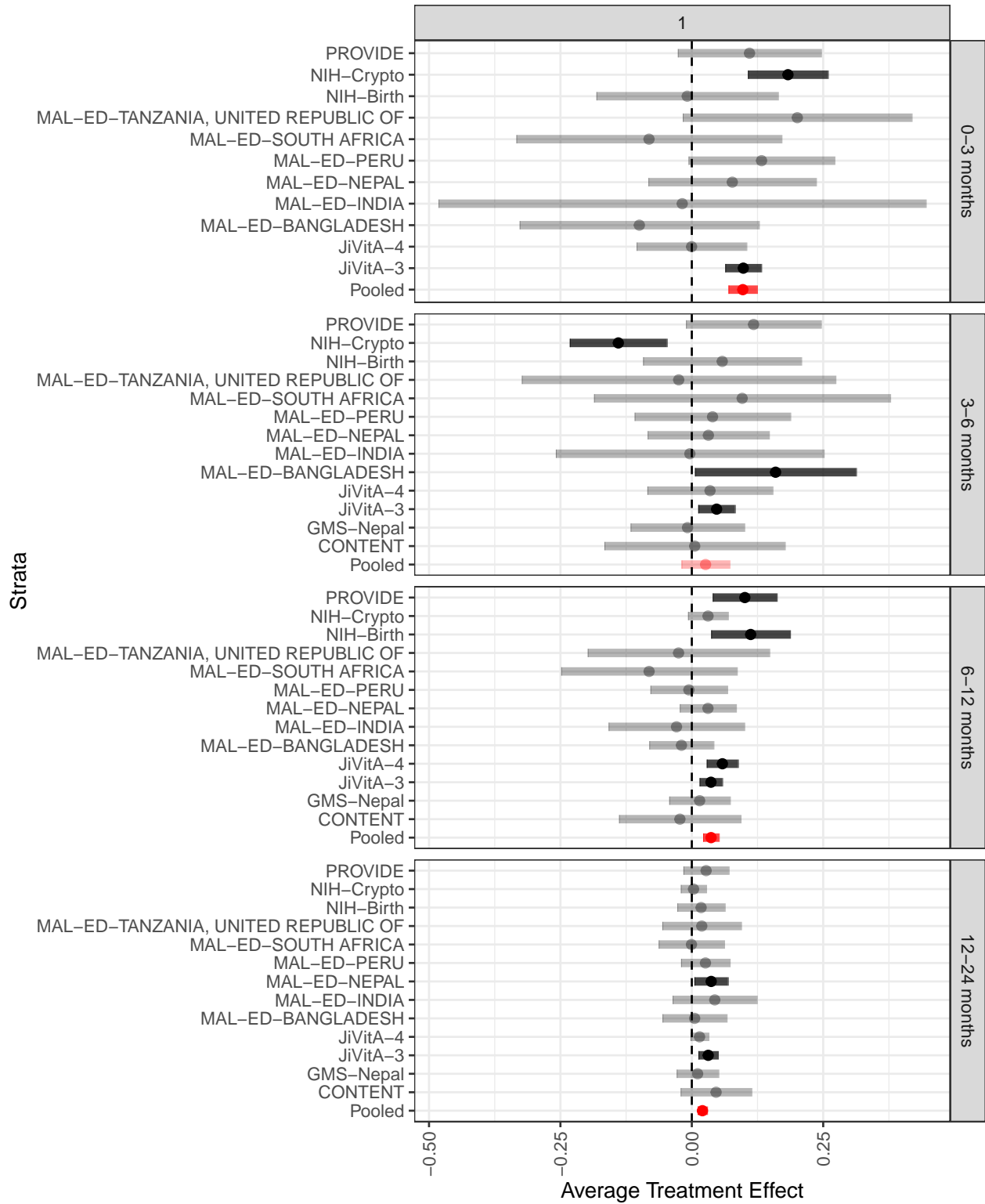
Household characteristics

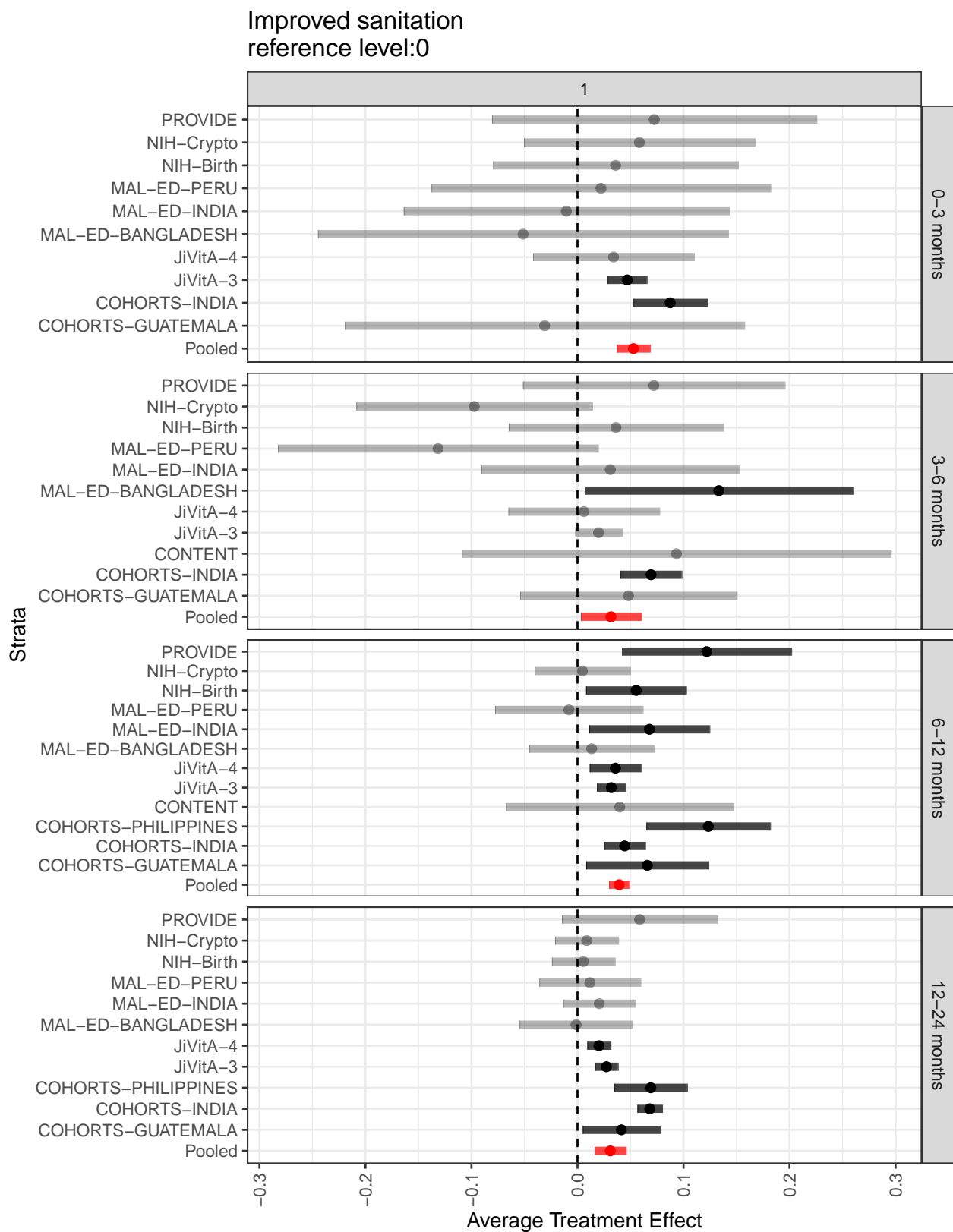


Clean cook
reference level:0

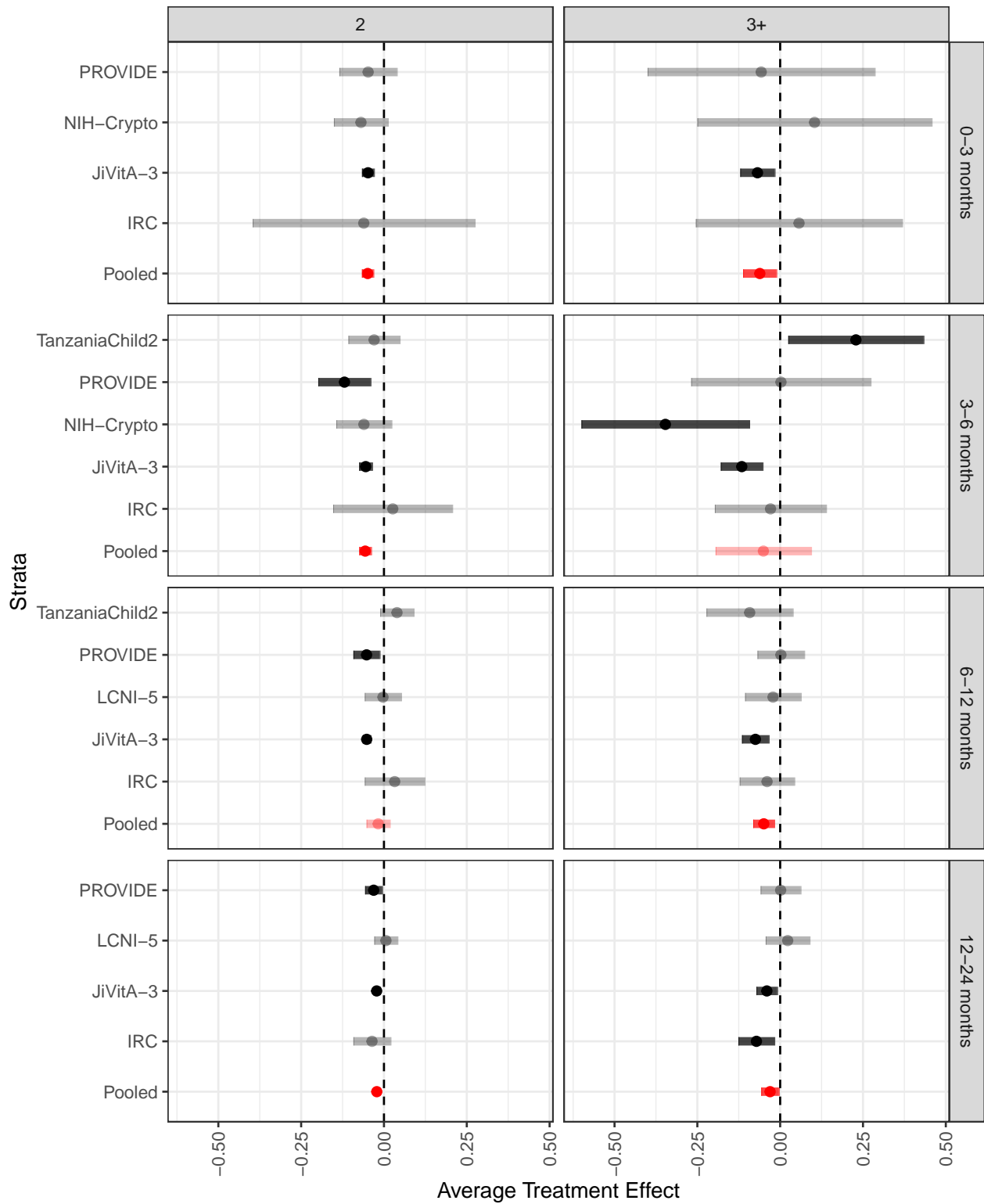


Improved floor
reference level:0

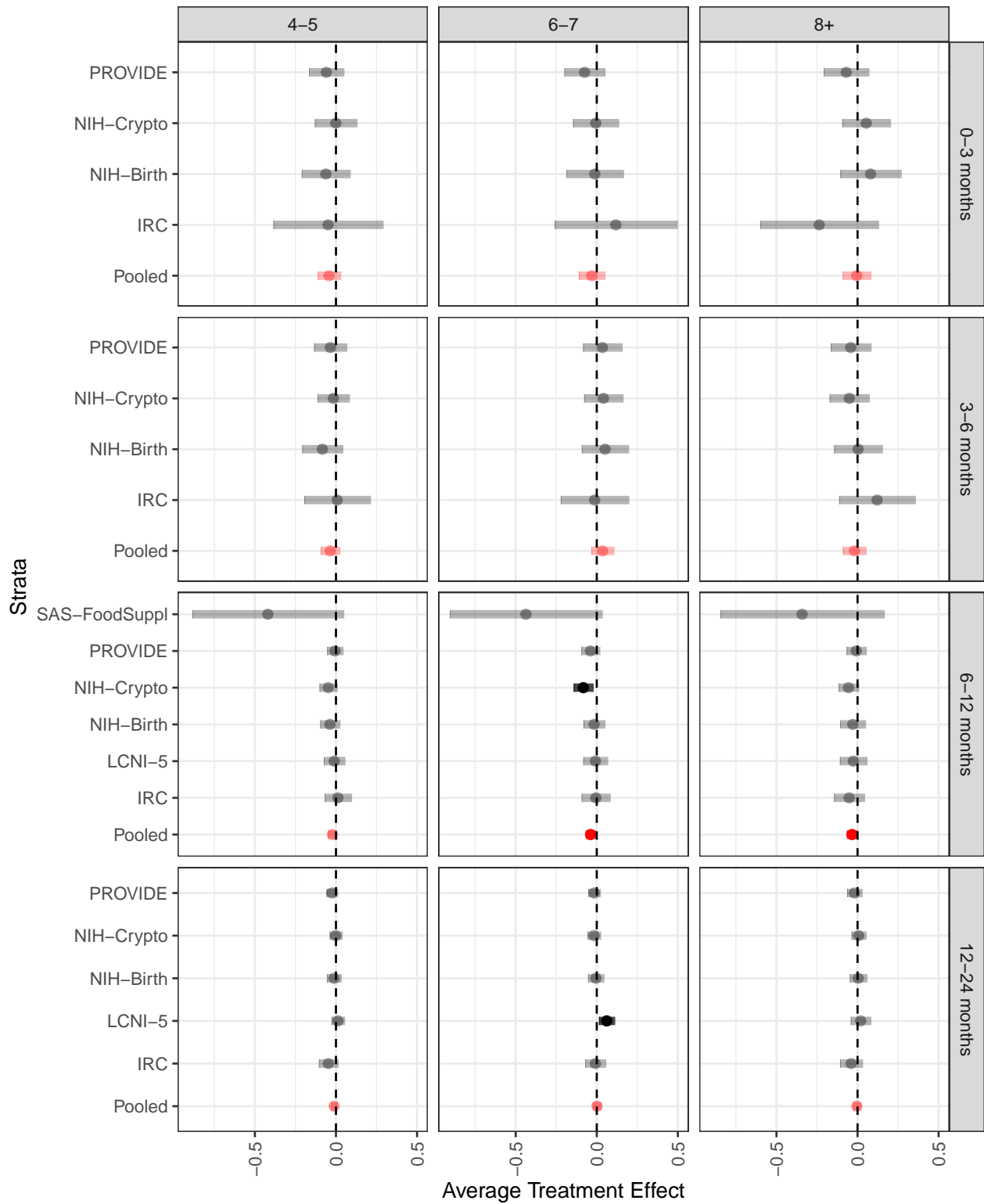




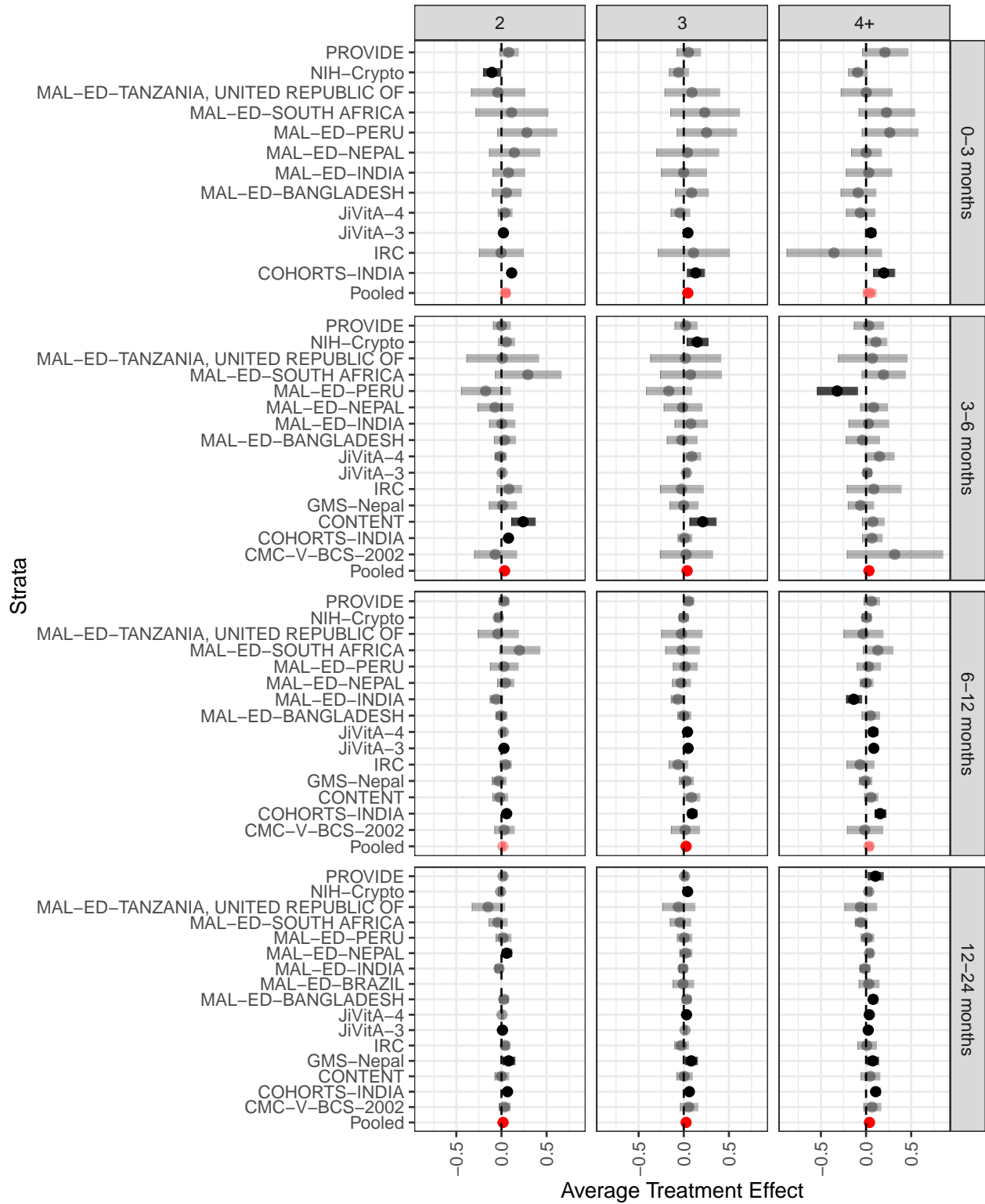
Number of children in the household under 5 years
reference level:1



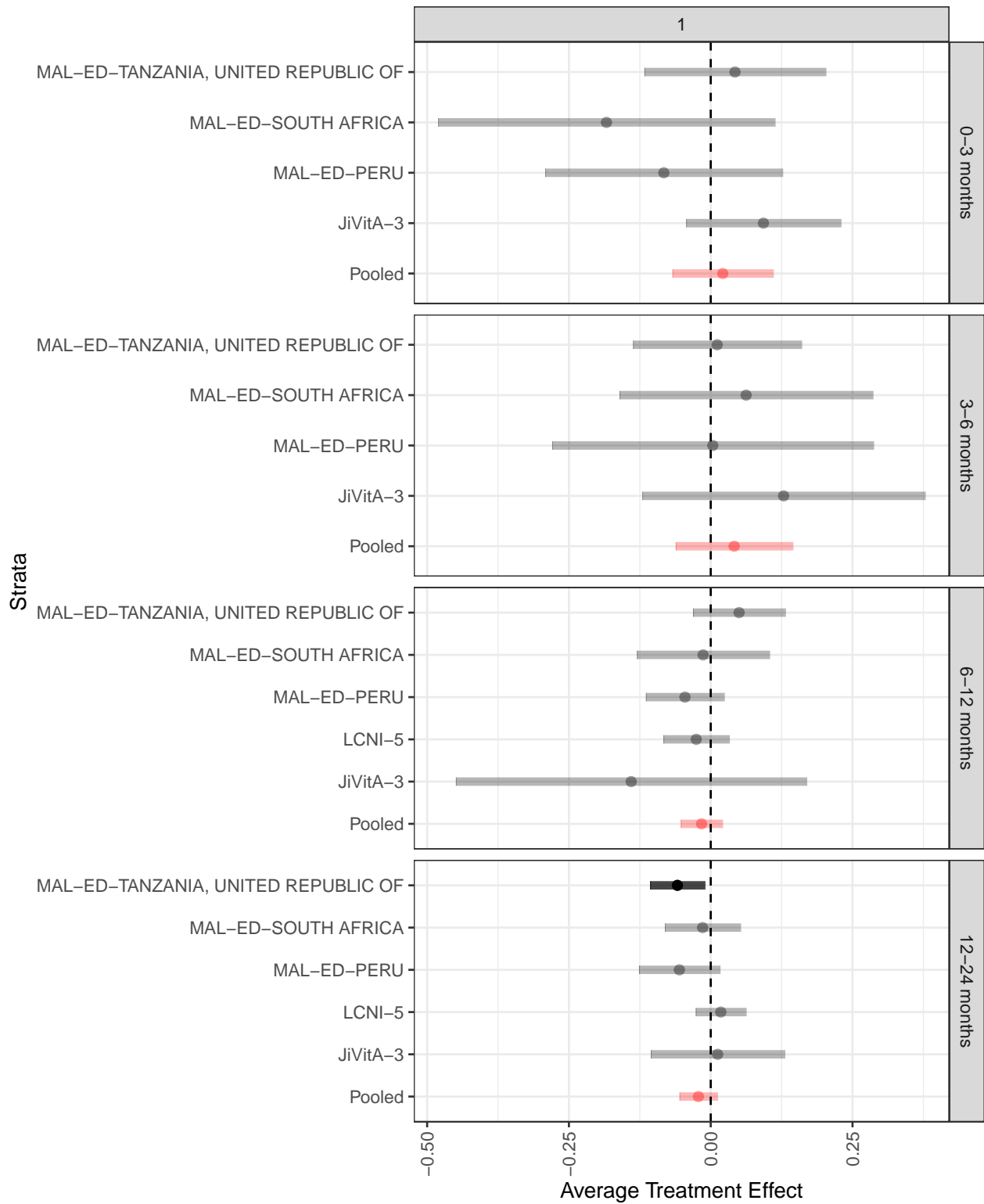
Number of people in the household
reference level:3 or less

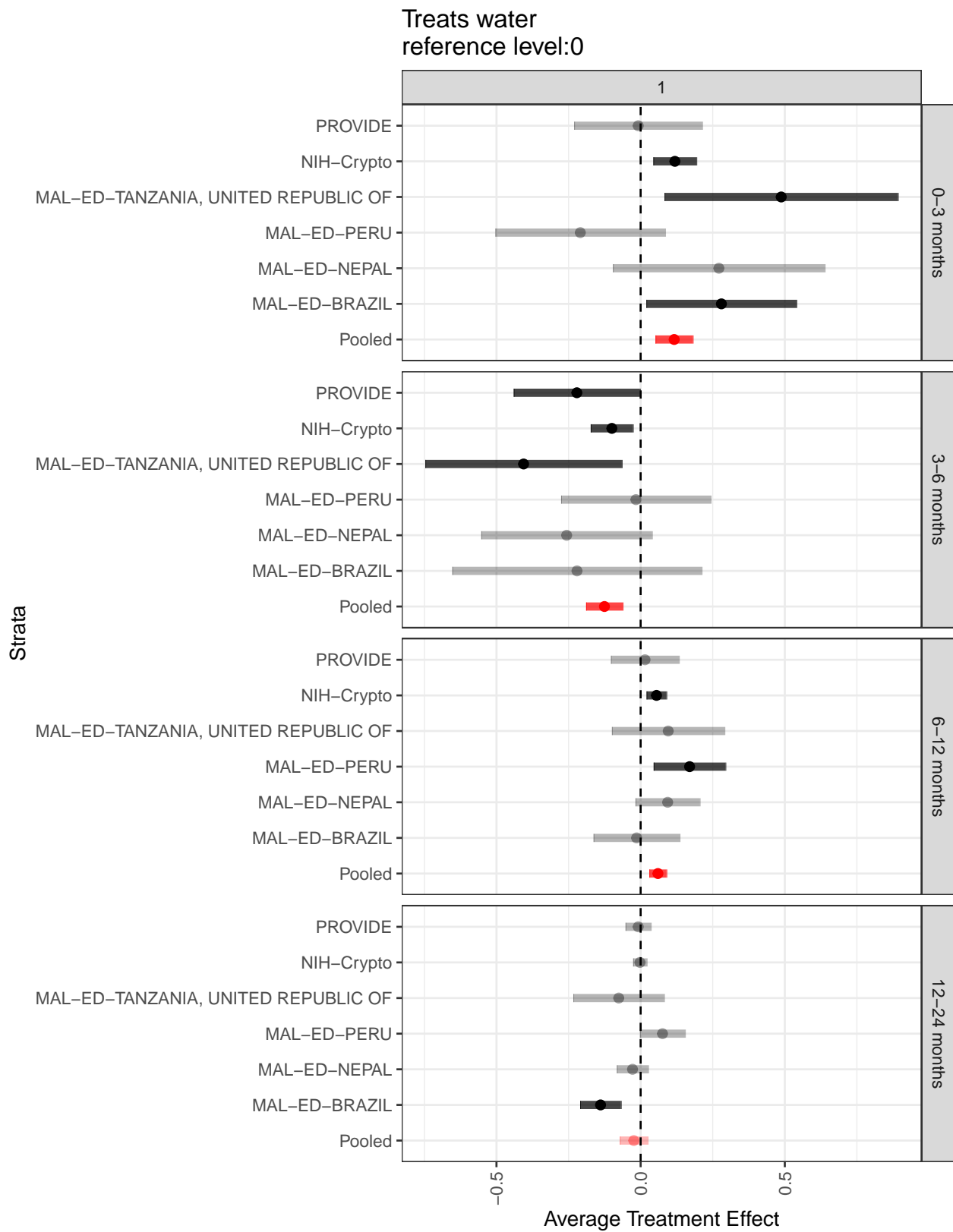


Number of rooms in household
reference level:1

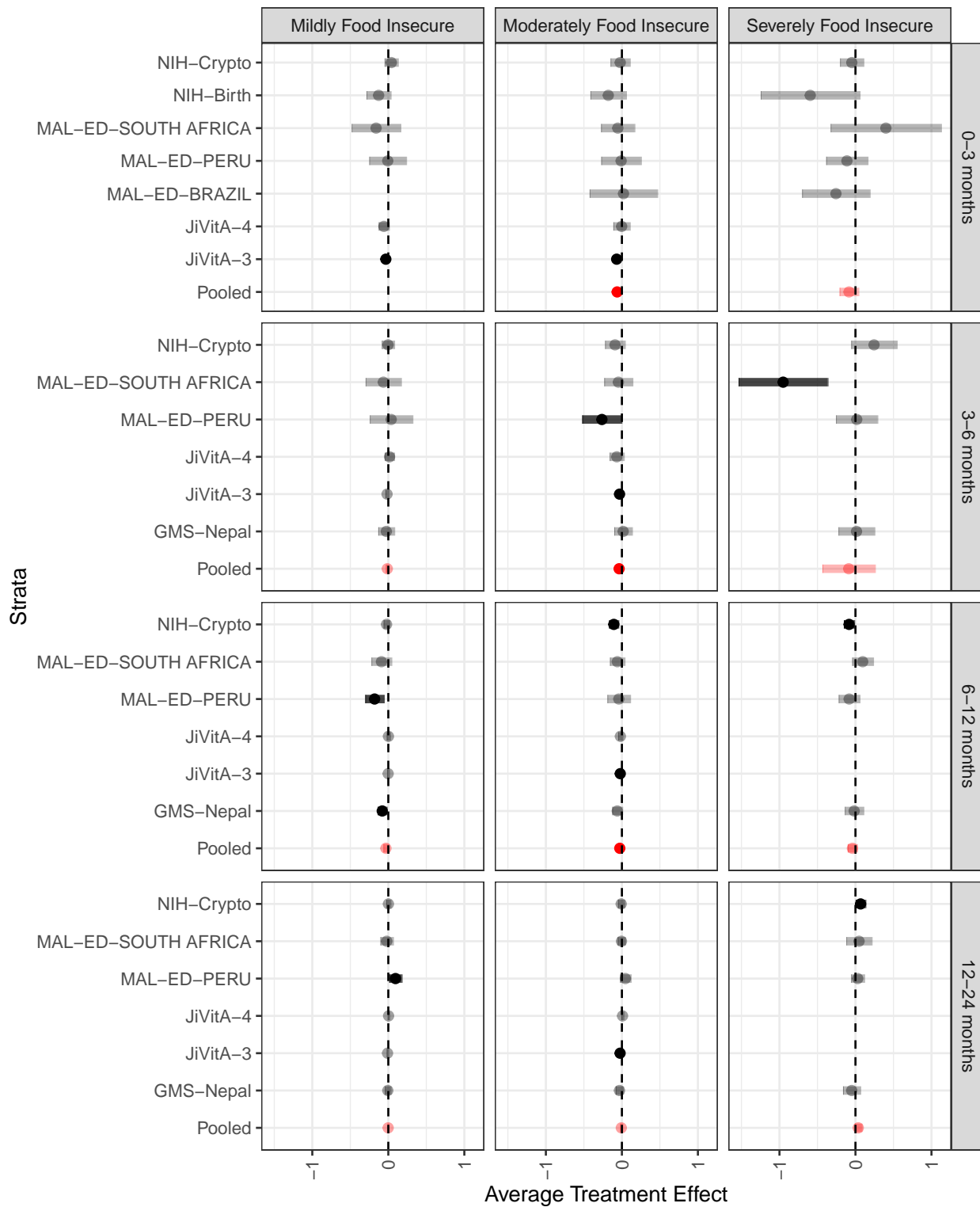


Safe water
reference level:0

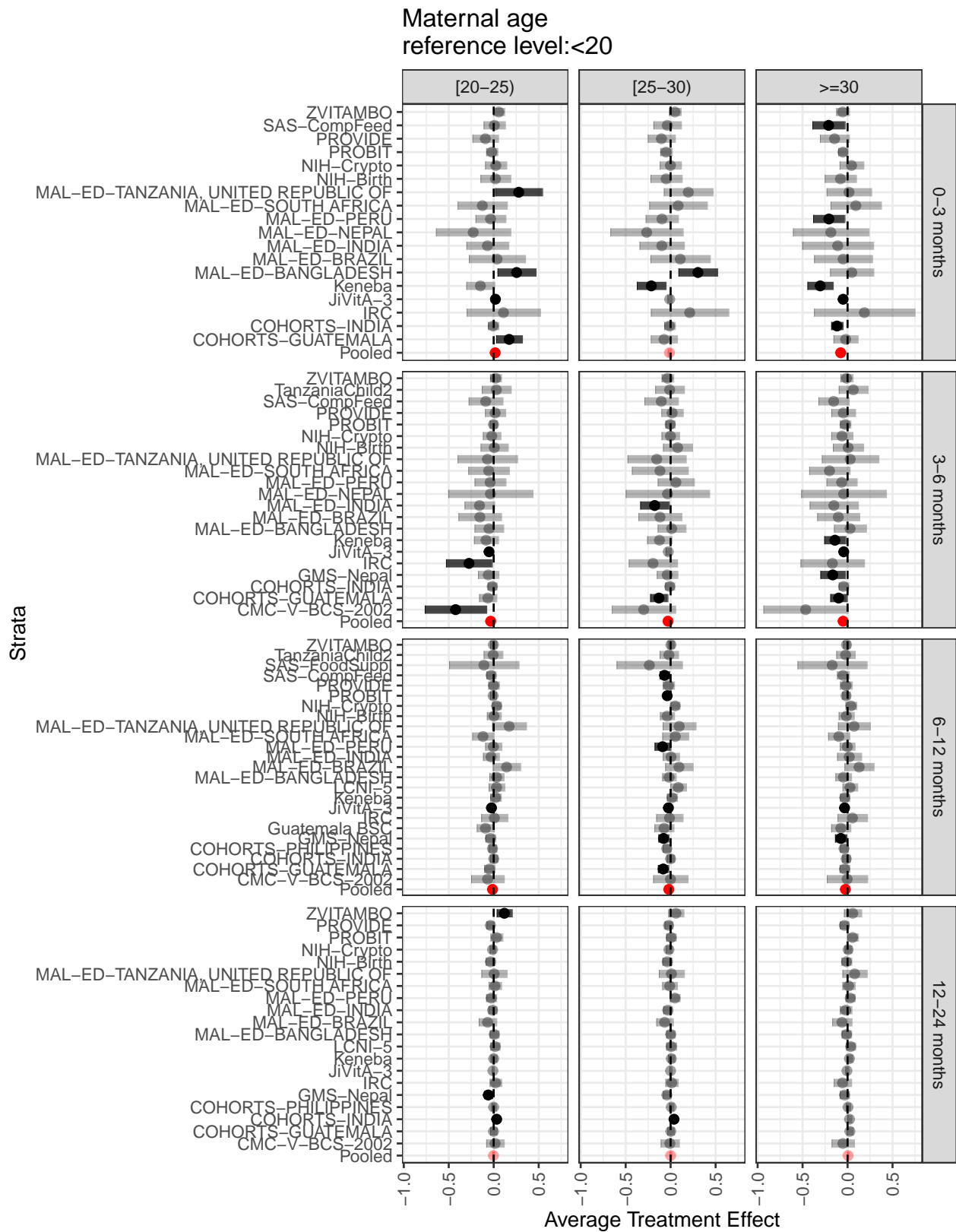




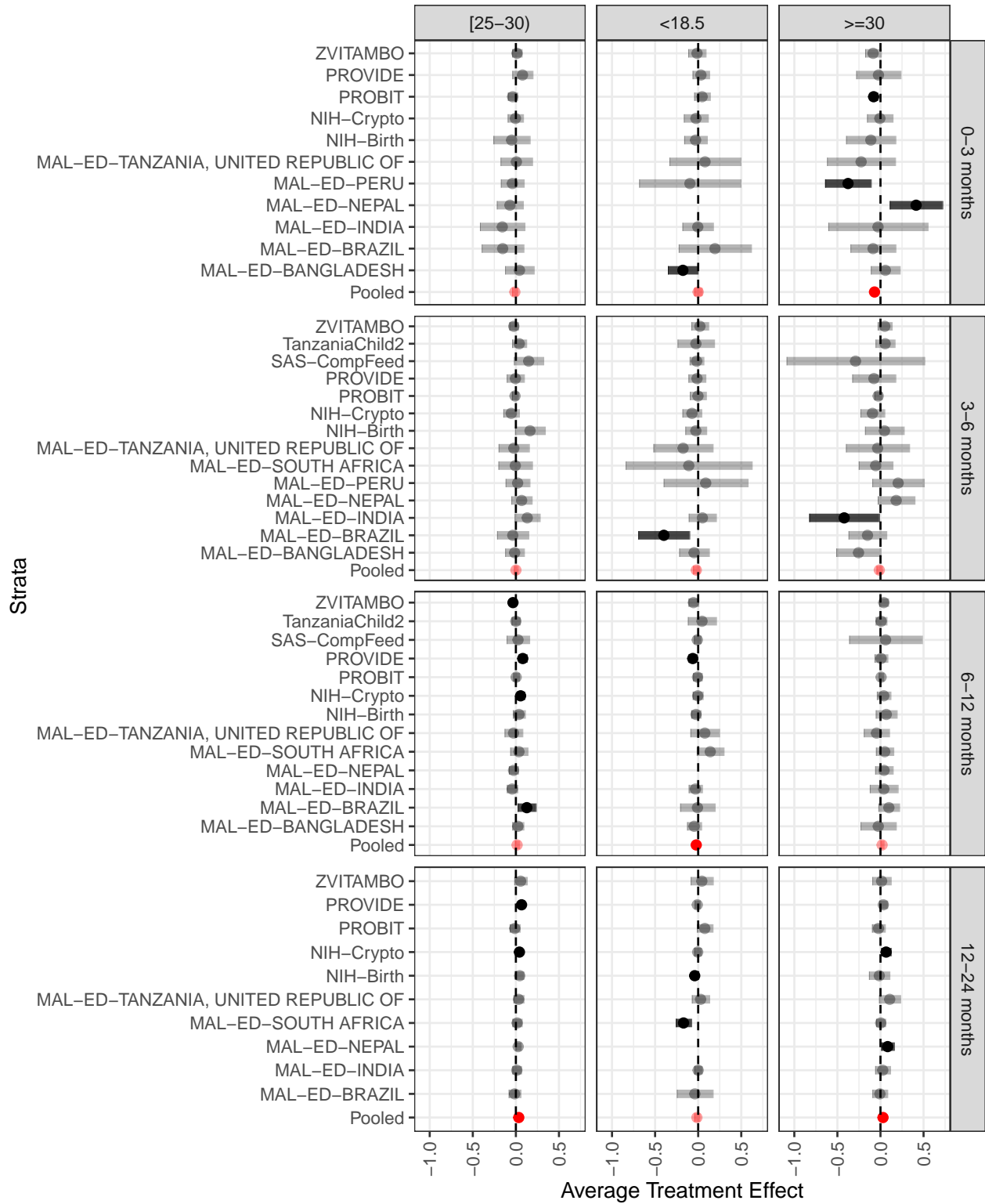
USAID Household Food Insecurity Access Scale (HFIAS) category reference level: Food Secure



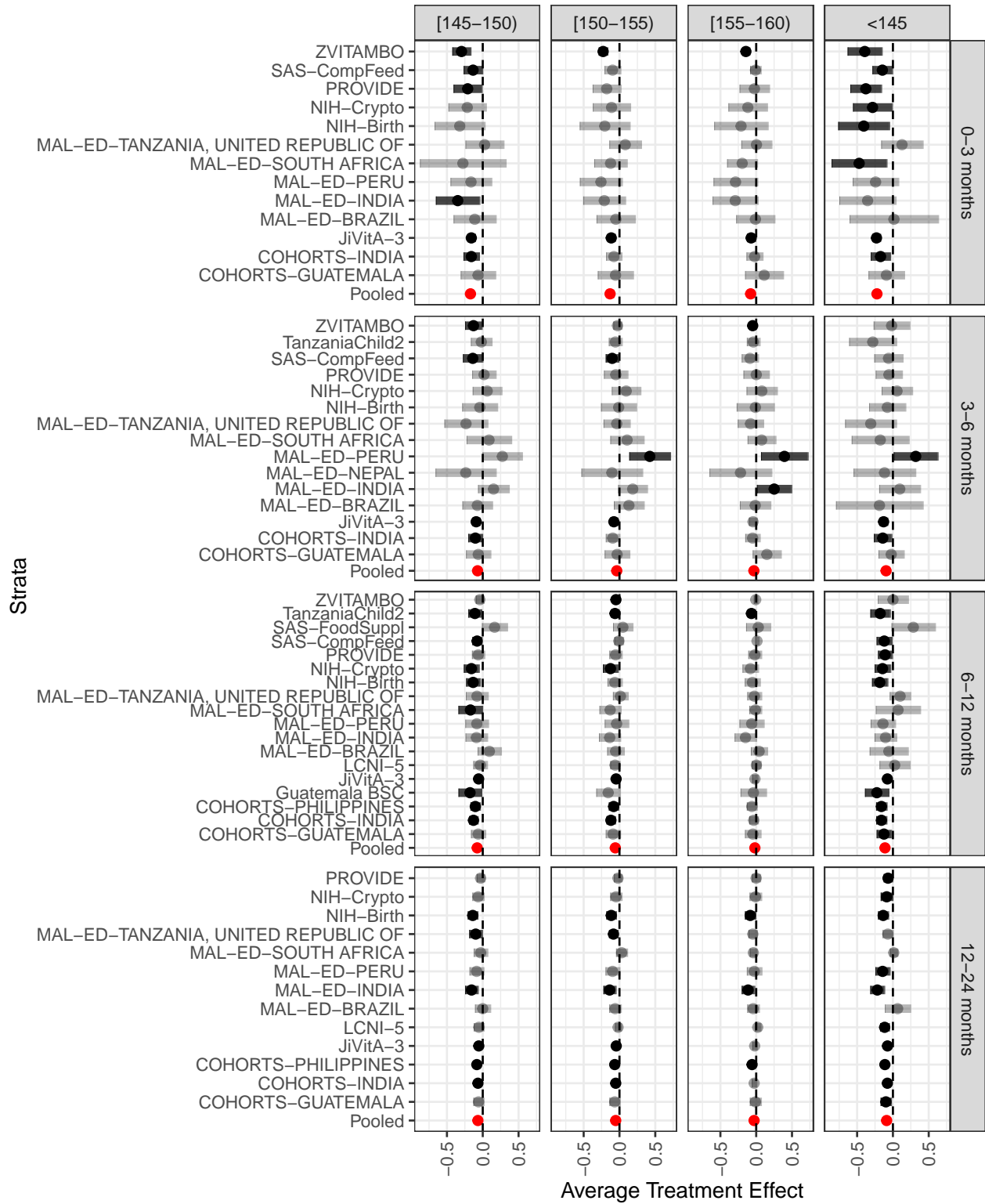
Maternal characteristics



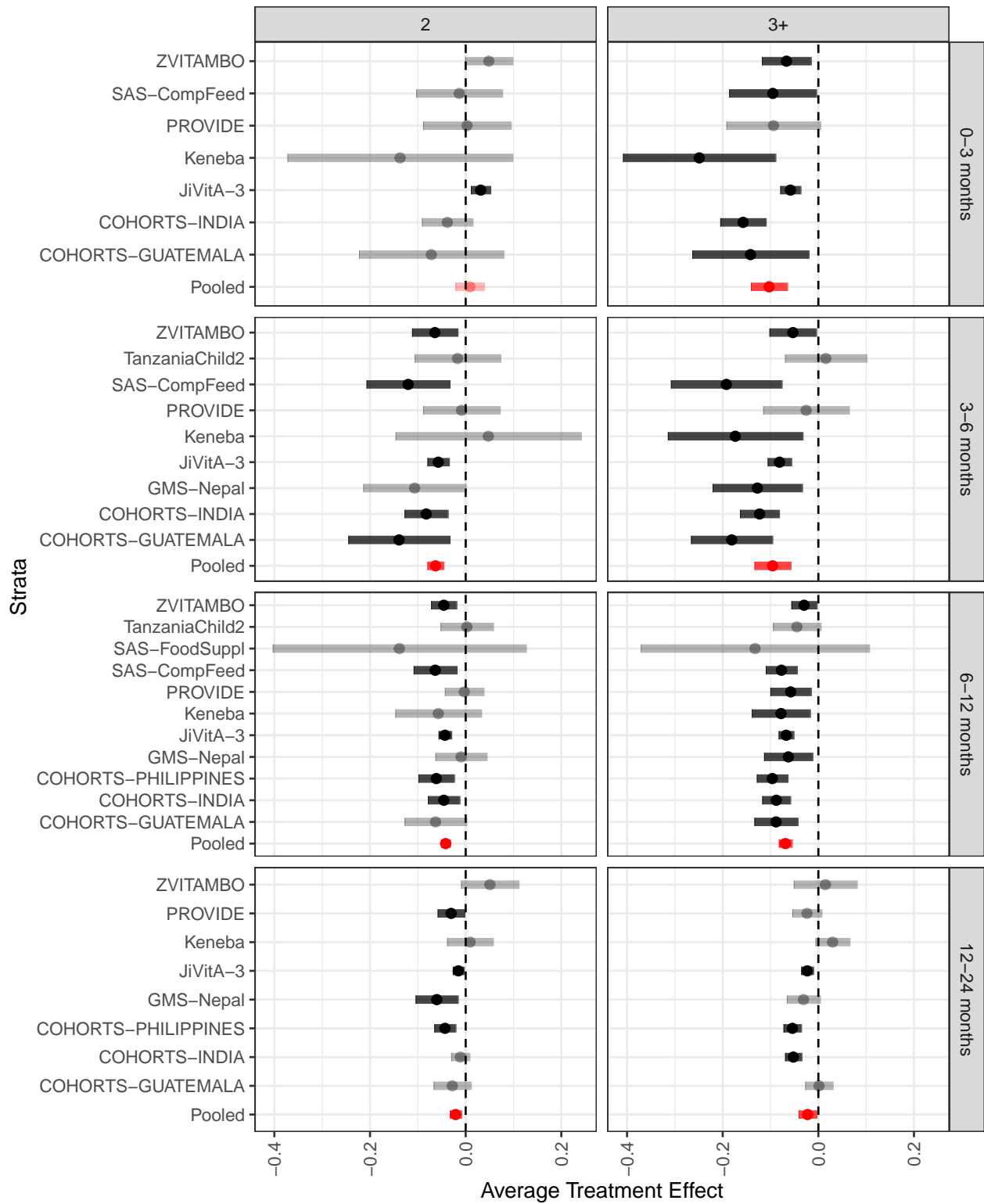
Maternal BMI
reference level:[18.5–25)



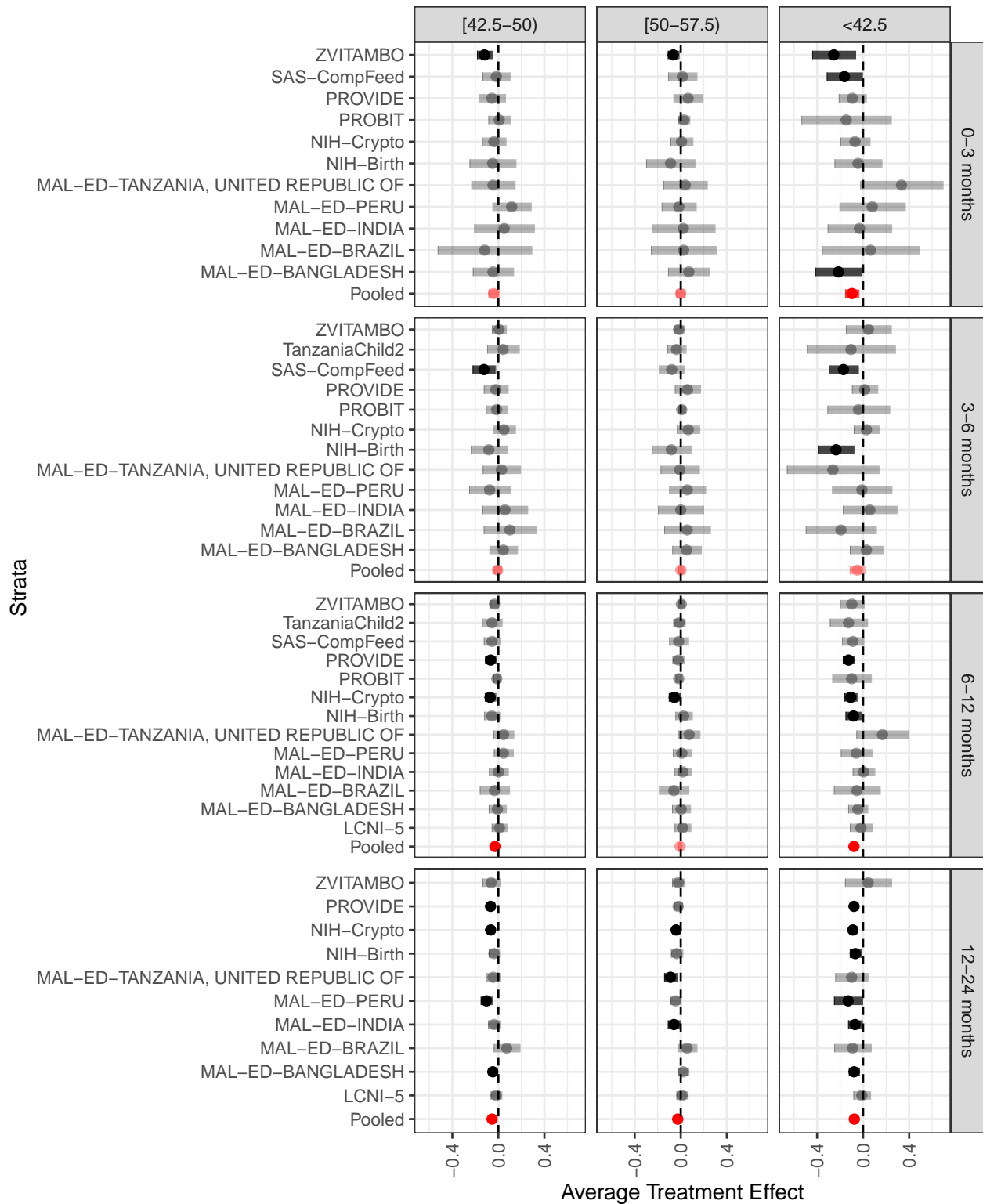
Maternal height
reference level: ≥ 160



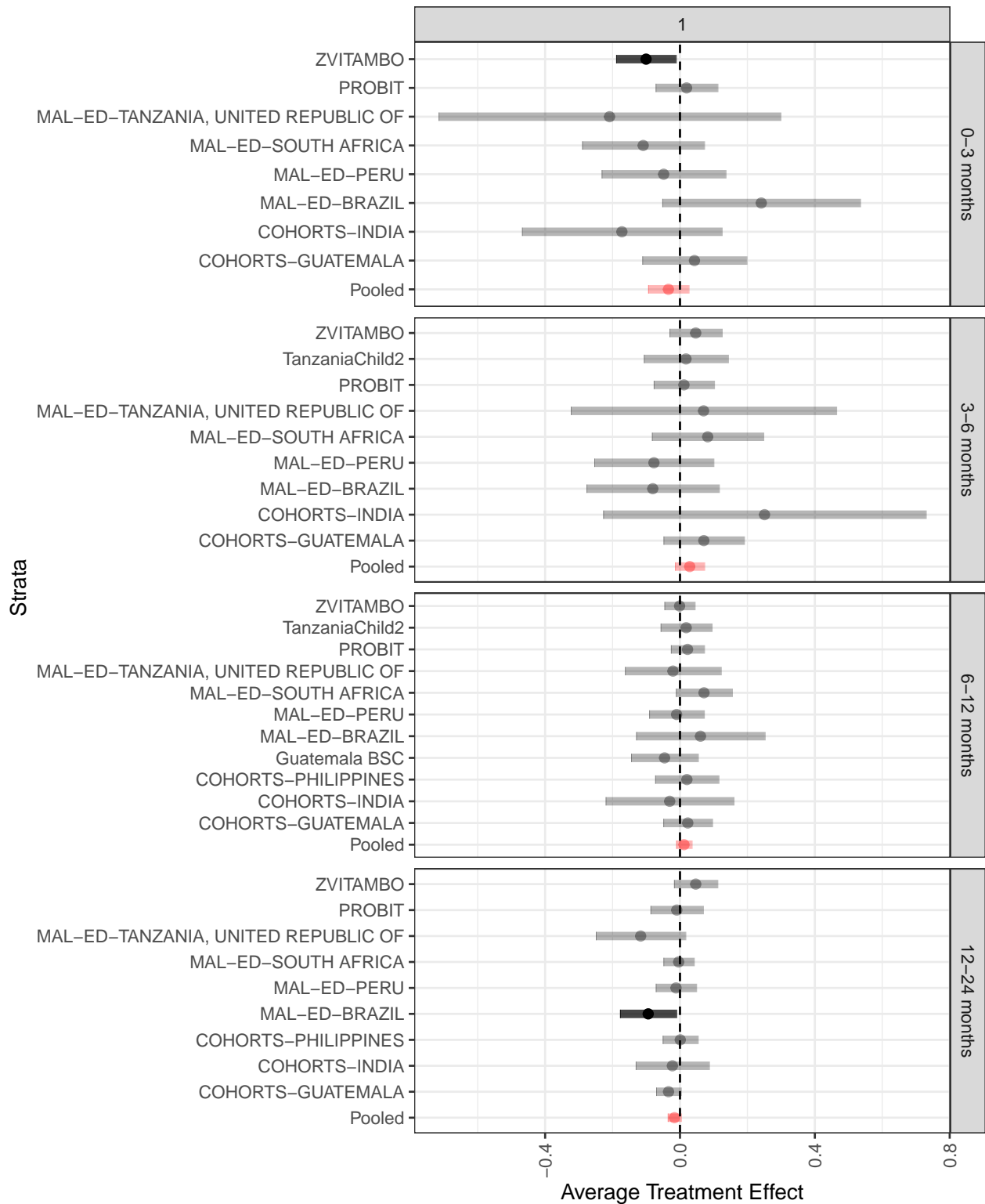
Maternal parity
reference level:1



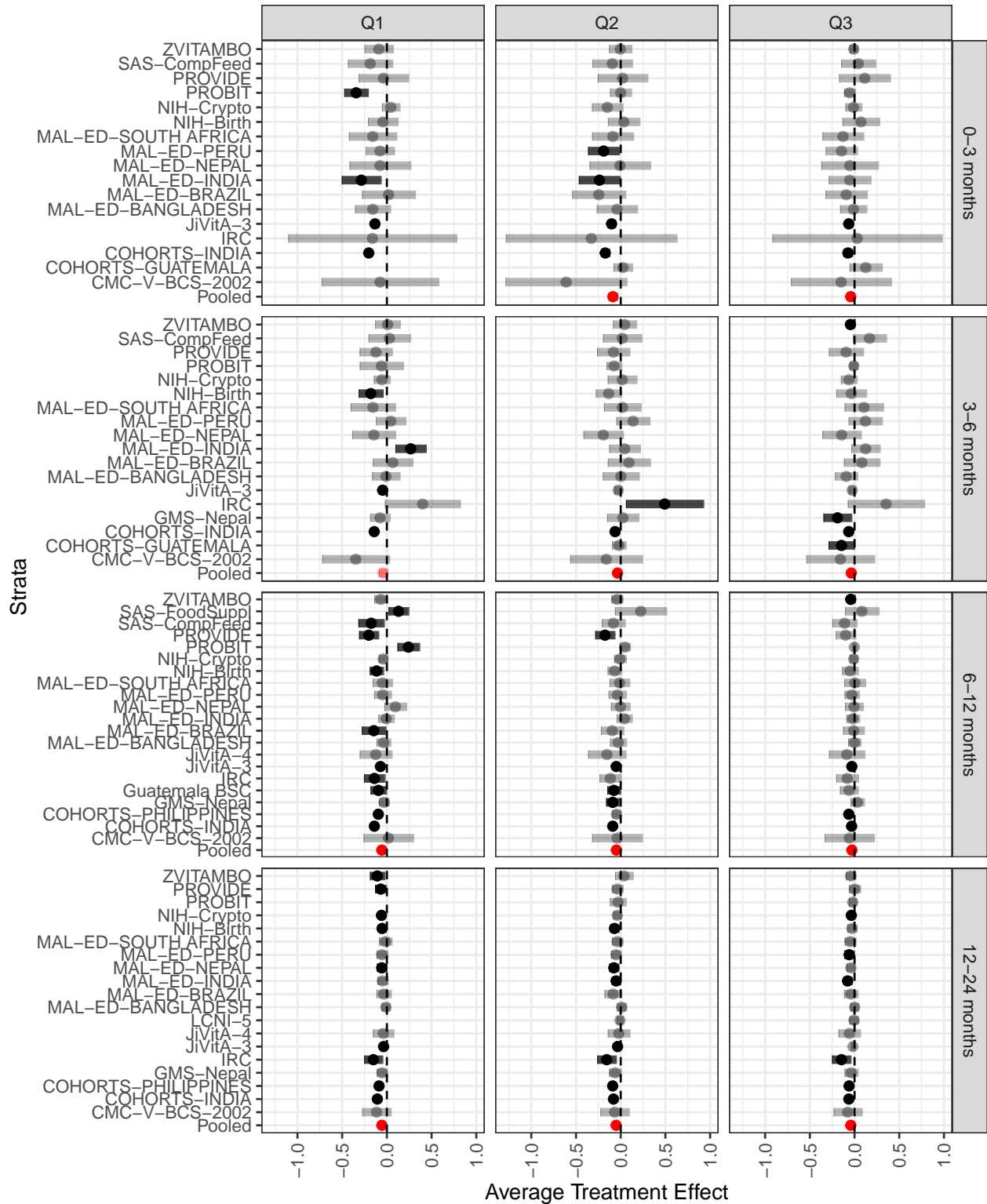
Maternal weight
reference level: ≥ 57.5



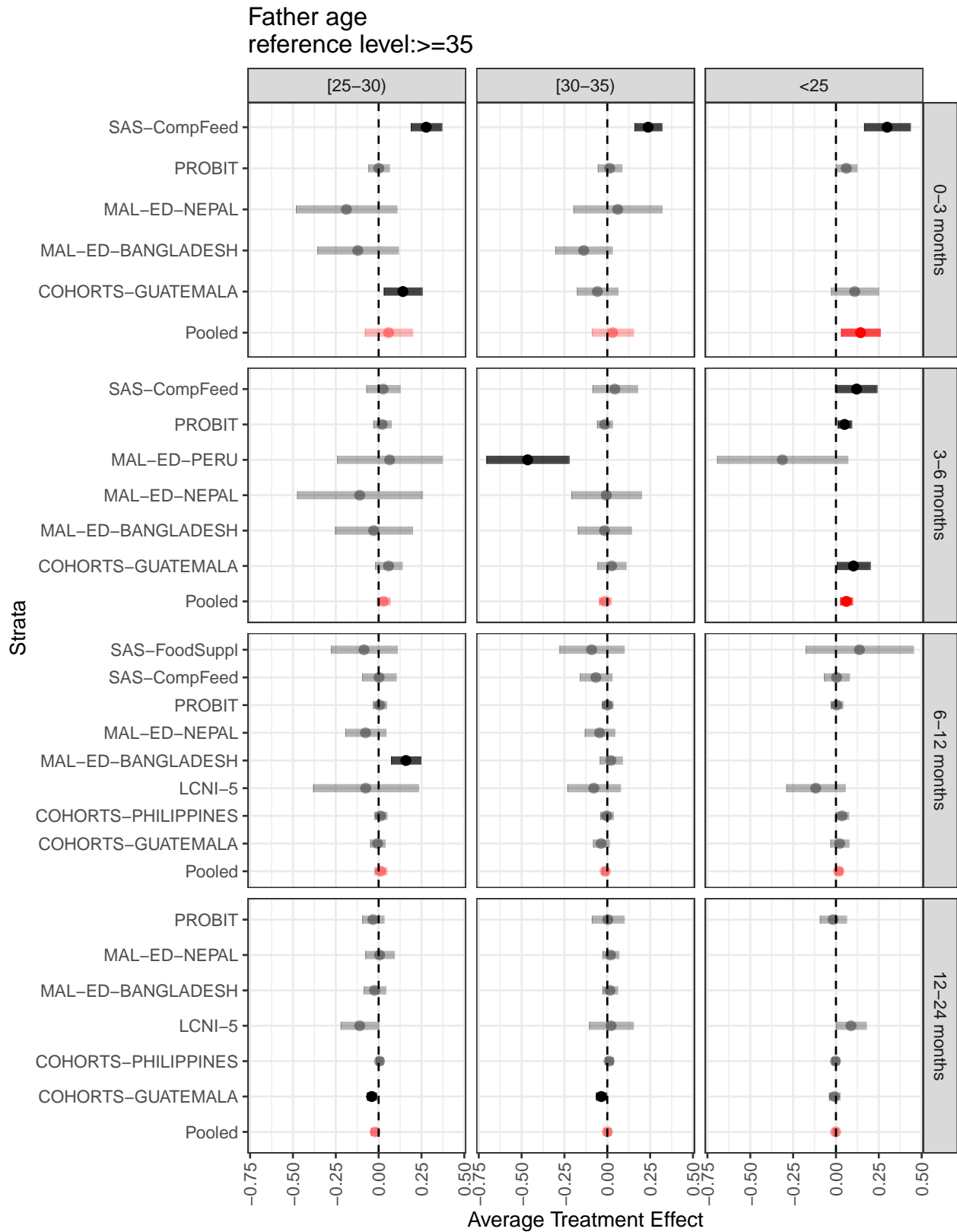
Mother is unmarried
reference level:0



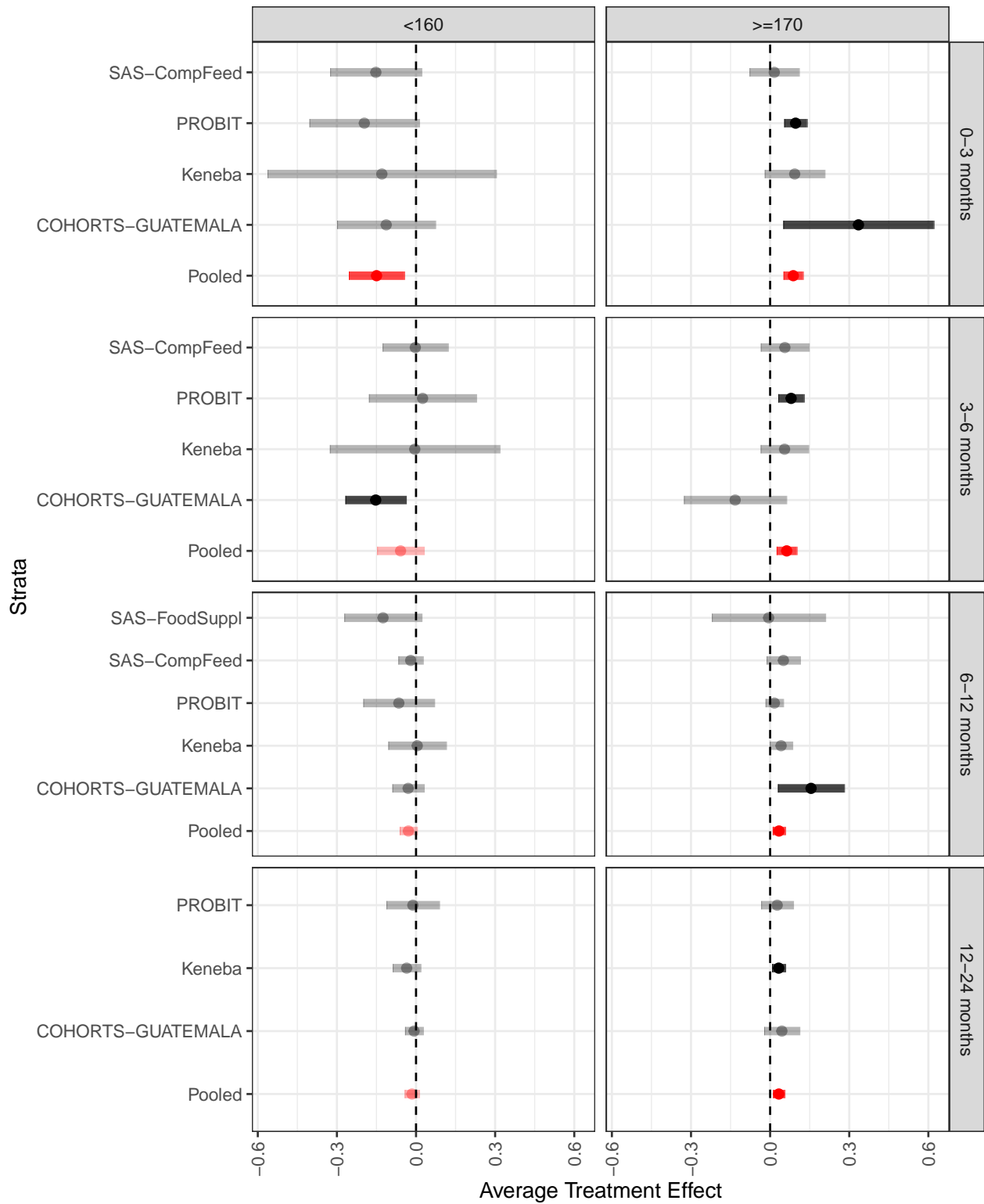
Mother's education
reference level:Q4



Paternal characteristics



Father height
reference level:[160–170)



Father's education
reference level:Q4

