# Pregnancy Stress Markers and Environmental Enteric Dysfunction (EED) Biomarkers

## Analysis of Stress Hormones and EED Outcomes

### Table 1: Maternal Cortisol and Child EED Biomarkers

| **Exposure** | **Outcome** | **Estimate (95% CI)** | **P-value** | **FDR-adjusted P-value** |
| --- | --- | --- | --- | --- |
| Ln Cortisol (ug/dL) | Ln AAT Age 14 months(mg/g) | **-0.165 (-0.314, 0.017)\*** | 0.030 | 0.240 |
| Ln Cortisol (ug/dL) | Ln AAT Age 28 months(mg/g) | 0.006 (-0.165, 0.188) | 0.795 | 0.960 |
| Ln Cortisol (ug/dL) | Ln AAT Age 3 months(mg/g) | 0.098 (-0.175, 0.355) | 0.290 | 0.580 |
| Ln Cortisol (ug/dL) | Ln Lactulose 28 months (mmol/L) | -0.025 (-0.209, 0.171) | 0.800 | 0.960 |
| Ln Cortisol (ug/dL) | Ln Lactulose Age 14 months (mmol/L) | -0.129 (-0.389, 0.146) | 0.275 | 0.580 |
| Ln Cortisol (ug/dL) | Ln Lactulose Age 3 months (mmol/L) | 0.230 (-0.040, 0.466)† | 0.065 | 0.280 |
| Ln Cortisol (ug/dL) | Ln MPO Age 14 months (ng/mL) | -0.049 (-0.257, 0.209) | 0.700 | 0.960 |
| Ln Cortisol (ug/dL) | Ln MPO Age 28 months (ng/mL) | **0.235 (0.032, 0.467)\*** | 0.030 | 0.240 |
| Ln Cortisol (ug/dL) | Ln MPO Age 3 months (ng/mL) | -0.060 (-0.318, 0.226) | 0.790 | 0.960 |
| Ln Cortisol (ug/dL) | Ln Mannitol Age 14 months (mmol/L) | -0.012 (-0.222, 0.209) | 0.980 | 0.980 |
| Ln Cortisol (ug/dL) | Ln Mannitol Age 28 months (mmol/L) | -0.007 (-0.166, 0.166) | 0.980 | 0.980 |
| Ln Cortisol (ug/dL) | Ln Mannitol Age 3 months (mmol/L) | 0.190 (-0.062, 0.394)† | 0.095 | 0.304 |
| Ln Cortisol (ug/dL) | Ln NEO Age 14 months (nmol/L) | -0.098 (-0.269, 0.043) | 0.240 | 0.580 |
| Ln Cortisol (ug/dL) | Ln NEO Age 28 months (nmol/L) | -0.170 (-0.376, 0.033)† | 0.070 | 0.280 |
| Ln Cortisol (ug/dL) | Ln NEO Age 3 months (nmol/L) | 0.007 (-0.184, 0.189) | 0.840 | 0.960 |
| Ln Cortisol (ug/dL) | Ln REG1β Age 14 months (µg/mL) | 0.059 (-0.133, 0.279) | 0.500 | 0.889 |

### Table 2: Maternal Stress Markers and Child EED Biomarkers

| **Exposure** | **Outcome** | **Estimate (95% CI)** | **P-value** | **FDR-adjusted P-value** |
| --- | --- | --- | --- | --- |
| Ln CRP | Ln AAT Age 14 months(mg/g) | -0.030 (-0.138, 0.061) | 0.520 | 0.995 |
| LN AGP | Ln AAT Age 14 months(mg/g) | -0.011 (-0.212, 0.198) | 0.945 | 0.995 |
| Sum score (Z-scored) | Ln AAT Age 14 months(mg/g) | 0.002 (-0.097, 0.085) | 0.985 | 0.995 |
| Ln CRP | Ln AAT Age 28 months(mg/g) | -0.002 (-0.083, 0.076) | 0.895 | 0.995 |
| LN AGP | Ln AAT Age 28 months(mg/g) | -0.018 (-0.208, 0.151) | 0.965 | 0.995 |
| Sum score (Z-scored) | Ln AAT Age 28 months(mg/g) | 0.045 (-0.034, 0.127) | 0.345 | 0.995 |
| Ln CRP | Ln AAT Age 3 months(mg/g) | 0.004 (-0.088, 0.094) | 0.875 | 0.995 |
| LN AGP | Ln AAT Age 3 months(mg/g) | -0.009 (-0.247, 0.247) | 0.905 | 0.995 |
| Sum score (Z-scored) | Ln AAT Age 3 months(mg/g) | 0.052 (-0.078, 0.181) | 0.380 | 0.995 |
| Ln CRP | Ln Lactulose 28 months (mmol/L) | 0.037 (-0.049, 0.125) | 0.435 | 0.995 |
| LN AGP | Ln Lactulose 28 months (mmol/L) | 0.050 (-0.200, 0.273) | 0.705 | 0.995 |
| Sum score (Z-scored) | Ln Lactulose 28 months (mmol/L) | 0.015 (-0.103, 0.125) | 0.845 | 0.995 |
| Ln CRP | Ln Lactulose Age 14 months (mmol/L) | 0.066 (-0.027, 0.164) | 0.160 | 0.995 |
| LN AGP | Ln Lactulose Age 14 months (mmol/L) | 0.107 (-0.155, 0.316) | 0.385 | 0.995 |
| Sum score (Z-scored) | Ln Lactulose Age 14 months (mmol/L) | 0.003 (-0.150, 0.124) | 0.980 | 0.995 |
| Ln CRP | Ln Lactulose Age 3 months (mmol/L) | -0.025 (-0.116, 0.064) | 0.490 | 0.995 |
| LN AGP | Ln Lactulose Age 3 months (mmol/L) | 0.051 (-0.218, 0.321) | 0.745 | 0.995 |
| Sum score (Z-scored) | Ln Lactulose Age 3 months (mmol/L) | -0.017 (-0.164, 0.136) | 0.875 | 0.995 |
| Ln CRP | Ln MPO Age 14 months (ng/mL) | -0.035 (-0.118, 0.054) | 0.475 | 0.995 |
| LN AGP | Ln MPO Age 14 months (ng/mL) | -0.055 (-0.252, 0.174) | 0.850 | 0.995 |
| Sum score (Z-scored) | Ln MPO Age 14 months (ng/mL) | 0.027 (-0.079, 0.147) | 0.615 | 0.995 |
| Ln CRP | Ln MPO Age 28 months (ng/mL) | 0.031 (-0.096, 0.125) | 0.525 | 0.995 |
| LN AGP | Ln MPO Age 28 months (ng/mL) | 0.029 (-0.202, 0.251) | 0.595 | 0.995 |
| Sum score (Z-scored) | Ln MPO Age 28 months (ng/mL) | 0.051 (-0.026, 0.131) | 0.165 | 0.995 |
| Ln CRP | Ln MPO Age 3 months (ng/mL) | -0.034 (-0.132, 0.060) | 0.440 | 0.995 |
| LN AGP | Ln MPO Age 3 months (ng/mL) | 0.062 (-0.210, 0.363) | 0.725 | 0.995 |
| Sum score (Z-scored) | Ln MPO Age 3 months (ng/mL) | -0.062 (-0.211, 0.080) | 0.320 | 0.995 |
| Ln CRP | Ln Mannitol Age 14 months (mmol/L) | **0.124 (0.025, 0.224)\*** | 0.015 | 0.720 |
| LN AGP | Ln Mannitol Age 14 months (mmol/L) | 0.127 (-0.091, 0.337) | 0.190 | 0.995 |
| Sum score (Z-scored) | Ln Mannitol Age 14 months (mmol/L) | 0.023 (-0.101, 0.150) | 0.690 | 0.995 |
| Ln CRP | Ln Mannitol Age 28 months (mmol/L) | 0.026 (-0.046, 0.086) | 0.450 | 0.995 |
| LN AGP | Ln Mannitol Age 28 months (mmol/L) | 0.047 (-0.149, 0.250) | 0.620 | 0.995 |
| Sum score (Z-scored) | Ln Mannitol Age 28 months (mmol/L) | -0.017 (-0.128, 0.088) | 0.675 | 0.995 |
| Ln CRP | Ln Mannitol Age 3 months (mmol/L) | 0.010 (-0.079, 0.099) | 0.935 | 0.995 |
| LN AGP | Ln Mannitol Age 3 months (mmol/L) | 0.108 (-0.106, 0.331) | 0.285 | 0.995 |
| Sum score (Z-scored) | Ln Mannitol Age 3 months (mmol/L) | -0.008 (-0.140, 0.120) | 0.980 | 0.995 |
| Ln CRP | Ln NEO Age 14 months (nmol/L) | -0.042 (-0.104, 0.024) | 0.240 | 0.995 |
| LN AGP | Ln NEO Age 14 months (nmol/L) | -0.020 (-0.228, 0.178) | 0.830 | 0.995 |
| Sum score (Z-scored) | Ln NEO Age 14 months (nmol/L) | -0.025 (-0.096, 0.038) | 0.480 | 0.995 |
| Ln CRP | Ln NEO Age 28 months (nmol/L) | -0.056 (-0.142, 0.027) | 0.195 | 0.995 |
| LN AGP | Ln NEO Age 28 months (nmol/L) | -0.164 (-0.412, 0.061) | 0.160 | 0.995 |
| Sum score (Z-scored) | Ln NEO Age 28 months (nmol/L) | 0.009 (-0.104, 0.135) | 0.995 | 0.995 |
| Ln CRP | Ln NEO Age 3 months (nmol/L) | 0.037 (-0.043, 0.112) | 0.180 | 0.995 |
| LN AGP | Ln NEO Age 3 months (nmol/L) | -0.018 (-0.215, 0.219) | 0.945 | 0.995 |
| Sum score (Z-scored) | Ln NEO Age 3 months (nmol/L) | 0.034 (-0.072, 0.138) | 0.460 | 0.995 |
| Ln CRP | Ln REG1β Age 14 months (µg/mL) | 0.036 (-0.099, 0.131) | 0.630 | 0.995 |
| LN AGP | Ln REG1β Age 14 months (µg/mL) | -0.130 (-0.472, 0.126) | 0.280 | 0.995 |
| Sum score (Z-scored) | Ln REG1β Age 14 months (µg/mL) | 0.021 (-0.069, 0.140) | 0.680 | 0.995 |

### Table 3: Maternal Estriol and Child EED Biomarkers

| **Exposure** | **Outcome** | **Estimate (95% CI)** | **P-value** | **FDR-adjusted P-value** |
| --- | --- | --- | --- | --- |
| Ln Estriol (ng/mL) | Ln AAT Age 14 months(mg/g) | 0.016 (-0.083, 0.171) | 0.715 | 0.763 |
| Ln Estriol (ng/mL) | Ln AAT Age 28 months(mg/g) | -0.029 (-0.163, 0.081) | 0.680 | 0.763 |
| Ln Estriol (ng/mL) | Ln AAT Age 3 months(mg/g) | 0.099 (-0.076, 0.322) | 0.235 | 0.627 |
| Ln Estriol (ng/mL) | Ln Lactulose 28 months (mmol/L) | 0.018 (-0.100, 0.166) | 0.685 | 0.763 |
| Ln Estriol (ng/mL) | Ln Lactulose Age 14 months (mmol/L) | -0.105 (-0.269, 0.025)† | 0.065 | 0.340 |
| Ln Estriol (ng/mL) | Ln Lactulose Age 3 months (mmol/L) | 0.039 (-0.135, 0.225) | 0.635 | 0.763 |
| Ln Estriol (ng/mL) | Ln MPO Age 14 months (ng/mL) | 0.037 (-0.115, 0.199) | 0.590 | 0.763 |
| Ln Estriol (ng/mL) | Ln MPO Age 28 months (ng/mL) | 0.033 (-0.122, 0.181) | 0.605 | 0.763 |
| Ln Estriol (ng/mL) | Ln MPO Age 3 months (ng/mL) | -0.025 (-0.184, 0.125) | 0.940 | 0.940 |
| Ln Estriol (ng/mL) | Ln Mannitol Age 14 months (mmol/L) | -0.051 (-0.250, 0.133) | 0.420 | 0.763 |
| Ln Estriol (ng/mL) | Ln Mannitol Age 28 months (mmol/L) | 0.023 (-0.072, 0.138) | 0.520 | 0.763 |
| Ln Estriol (ng/mL) | Ln Mannitol Age 3 months (mmol/L) | 0.117 (-0.037, 0.294) | 0.170 | 0.544 |
| Ln Estriol (ng/mL) | Ln NEO Age 14 months (nmol/L) | **-0.128 (-0.229, -0.018)\*** | 0.010 | 0.160 |
| Ln Estriol (ng/mL) | Ln NEO Age 28 months (nmol/L) | **-0.145 (-0.274, -0.021)\*** | 0.025 | 0.200 |
| Ln Estriol (ng/mL) | Ln NEO Age 3 months (nmol/L) | 0.103 (-0.020, 0.248)† | 0.085 | 0.340 |
| Ln Estriol (ng/mL) | Ln REG1β Age 14 months (µg/mL) | 0.025 (-0.095, 0.163) | 0.515 | 0.763 |

Note: † p < 0.10, \* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001

FDR = False Discovery Rate