# Supplementary Material

## Directed Acyclic Graphs

dag {  
age\_child  
biomarker  
breastfeeding  
bw  
characteristics\_child  
chemical [exposure]  
child\_diet  
child\_smoking  
cohort  
creatinine  
envFactors\_visit  
ethnicity\_child  
ethnicity\_mother  
familySEP  
gestational\_age  
maternalAlcohol\_preg  
maternalDiet\_preg  
maternalSEP\_preg  
maternalSmoking\_preg  
neuropsychologicalDiagnosis\_child  
outcome [outcome]  
paternalSEP\_preg  
season\_visit  
sex\_child  
time\_lastMeal  
type\_sample  
age\_child -> biomarker  
age\_child -> characteristics\_child  
age\_child -> creatinine  
age\_child -> outcome  
age\_child -> type\_sample  
biomarker -> outcome  
breastfeeding -> neuropsychologicalDiagnosis\_child  
breastfeeding -> outcome  
bw -> characteristics\_child  
bw -> neuropsychologicalDiagnosis\_child  
characteristics\_child -> biomarker  
characteristics\_child -> chemical  
characteristics\_child -> creatinine  
characteristics\_child -> outcome  
chemical -> biomarker  
chemical -> outcome  
child\_diet -> biomarker  
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child\_diet -> chemical  
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child\_smoking -> biomarker  
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child\_smoking -> creatinine  
child\_smoking -> outcome  
cohort -> biomarker  
cohort -> bw  
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cohort -> child\_diet  
cohort -> creatinine  
cohort -> outcome  
creatinine -> biomarker  
creatinine -> chemical  
creatinine -> outcome  
envFactors\_visit -> outcome  
ethnicity\_child -> biomarker  
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ethnicity\_child -> creatinine  
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ethnicity\_child -> outcome  
ethnicity\_mother -> biomarker  
ethnicity\_mother -> breastfeeding  
ethnicity\_mother -> bw  
ethnicity\_mother -> characteristics\_child  
ethnicity\_mother -> child\_diet  
ethnicity\_mother -> familySEP  
ethnicity\_mother -> maternalAlcohol\_preg  
ethnicity\_mother -> maternalDiet\_preg  
ethnicity\_mother -> maternalSEP\_preg  
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ethnicity\_mother -> neuropsychologicalDiagnosis\_child  
ethnicity\_mother -> outcome  
familySEP -> biomarker  
familySEP -> characteristics\_child  
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familySEP -> child\_diet  
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gestational\_age -> bw  
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gestational\_age -> neuropsychologicalDiagnosis\_child  
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maternalSmoking\_preg -> outcome  
neuropsychologicalDiagnosis\_child -> outcome  
paternalSEP\_preg -> breastfeeding  
paternalSEP\_preg -> bw  
paternalSEP\_preg -> characteristics\_child  
paternalSEP\_preg -> familySEP  
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paternalSEP\_preg -> neuropsychologicalDiagnosis\_child  
paternalSEP\_preg -> outcome  
season\_visit -> biomarker  
season\_visit -> chemical  
sex\_child -> biomarker  
sex\_child -> characteristics\_child  
sex\_child -> chemical  
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sex\_child -> creatinine  
sex\_child -> neuropsychologicalDiagnosis\_child  
sex\_child -> outcome  
sex\_child -> type\_sample  
time\_lastMeal -> biomarker  
time\_lastMeal -> chemical  
type\_sample -> chemical  
type\_sample -> creatinine  
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dag {  
age\_child  
biomarker [outcome]  
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characteristics\_child -> creatinine  
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chemical -> biomarker  
chemical -> outcome  
child\_diet -> biomarker  
child\_diet -> characteristics\_child  
child\_diet -> chemical  
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child\_smoking -> biomarker  
child\_smoking -> characteristics\_child  
child\_smoking -> creatinine  
child\_smoking -> outcome  
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neuropsychologicalDiagnosis\_child -> outcome  
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season\_visit -> biomarker  
season\_visit -> chemical  
sex\_child -> biomarker  
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characteristics\_child -> outcome  
chemical -> biomarker  
chemical -> outcome  
child\_diet -> biomarker  
child\_diet -> characteristics\_child  
child\_diet -> chemical  
child\_diet -> outcome  
child\_smoking -> biomarker  
child\_smoking -> characteristics\_child  
child\_smoking -> creatinine  
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cohort -> chemical  
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cohort -> creatinine  
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creatinine -> biomarker  
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creatinine -> outcome  
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paternalSEP\_preg -> characteristics\_child  
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paternalSEP\_preg -> maternalAlcohol\_preg  
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season\_visit -> chemical  
sex\_child -> biomarker  
sex\_child -> characteristics\_child  
sex\_child -> chemical  
sex\_child -> child\_diet  
sex\_child -> child\_smoking  
sex\_child -> creatinine  
sex\_child -> neuropsychologicalDiagnosis\_child  
sex\_child -> outcome  
sex\_child -> type\_sample  
time\_lastMeal -> biomarker  
time\_lastMeal -> chemical  
type\_sample -> chemical  
type\_sample -> creatinine  
}

# Supplementary tables

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| |  |  |  |  |  | | --- | --- | --- | --- | --- | | Compound | Symbol | Variable name | PubChem CID | Parental compound | | **OP pesticide metabolites** | | | | | | diethyl dithiophosphate | DEDTP | dedtp | 9274 |  | | diethyl phosphate | DEP | dep | 654 |  | | diethyl thiophosphate | DETP | detp | 3683036 |  | | dimethyl dithiophosphate | DMDTP | dmdtp | 36158 |  | | dimethyl phosphate | DMP | dmp | 13134 |  | | dimethyl thiophosphate | DMTP | dmtp | 168140 |  | | **Phenols** | | | | | | bisphenol A | BPA | bpa | 6623 |  | | n‑butyl‑paraben | BUPA | bupa | 7184 |  | | ethyl-paraben | ETPA | etpa | 8434 |  | | methyl-paraben | MEPA | mepa | 7456 |  | | oxybenzone | OXBE | oxbe | 4632 |  | | propyl-paraben | PRPA | prpa | 7175 |  | | triclosan | TRCS | trcs | 5564 |  | | **Phthalate metabolites** | | | | | | mono benzyl phthalate | MBzP | mbzp | 31736 | BBzP | | mono‑2‑ethyl 5‑carboxypentyl phthalate | MECPP | mecpp | 148386 | DEHP | | mono‑2‑ethyl‑5‑hydroxyhexyl phthalate | MEHHP | mehhp | 170295 | DEHP | | mono‑2‑ethylhexyl phthalate | MEHP | mehp | 21924291 | DEHP | | mono‑2‑ethyl‑5‑oxohexyl phthalate | MEOHP | meohp | 119096 | DEHP | | monoethyl phthalate | MEP | mep | 75318 | DEP | | mono‑iso‑butyl phthalate | MiBP | mibp | 92272 | DiBP | | mono‑n‑butyl phthalate | MnBP | mnbp | 8575 | DnBP | | mono‑4‑methyl‑7‑hydroxyoctyl phthalate | oh-MiNP | ohminp | 102401880 | MiNP | | mono‑4‑methyl‑7‑oxooctyl phthalate | oxo-MiNP | oxominp | 102401881 | MiNP |   Supplementary Table 1. **Information about non-persistent endocrine disrupting chemicals (EDCs), including the full compound name, the standard symbol, the used variable name, the identifier from PubChem, and the parental compound.** |

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| |  |  |  |  | | --- | --- | --- | --- | | Metabolite | Symbol | HMDB ID | CAS number | | **Androgen** | | | | | Androsternedione | AED | HMDB0000053 | 63-05-8 | | Testosterone | T | HMDB0000234 | 58-22-0 | | **Androgen metabolite** | | | | | Androsterone | Andros | HMDB0000031 | 53-41-8 | | Etiocholanolone | Etio | HMDB0000490 | 53-42-9 | | **Glucocorticosteroid** | | | | | 11-dehydrocorticosterone | A | HMDB0004029 | 72-23-1 | | Corticosterone | B | HMDB0001547 | 50-22-6 | | Cortisol | F | HMDB0000063 | 50-23-7 | | Cortisone | E | HMDB0002802 | 53-06-5 | | **Glucocorticosteroid metabolite** | | | | | 11β-hydroxyandrosterone | 11OHAndros | HMDB0002984 | 57-61-4 | | 17-deoxycortolone | 17-DO-cortolone | NA | NA | | 20α-dihydrocortisol | 20aDHF | NA | NA | | 20α-dihydrocortisone | 20aDHE | NA | NA | | 20β-dihydrocortisol | 20bDHF | NA | NA | | 20β-dihydrocortisone | 20bDHE | NA | NA | | 5α,20α-cortol | 5a20acortol | HMDB0003180 | 516-38-1 | | 5α,20β-cortol | 5a20bcortol | HMDB0005821 | 667-65-2 | | 5α-tetrahydrocorticosterone | 5aTHB | HMDB0000449 | 600-63-5 | | 5α-tetrahydrocortisol | 5aTHF | HMDB0000526 | 302-91-0 | | 5α-tetrahydrocortisone | 5aTHE | NA | NA | | 5β,20α-cortol | 5b20acortol | HMDB0003180 | 516-38-1 | | 5β,20α-cortolone | 5b20acortolone | HMDB0003128 | 516-42-7 | | 5β,20β-cortol | 5b20bcortol | HMDB0005821 | 667-65-2 | | 5β,20β-cortolone | 5b20bcortolone | NA | NA | | 5β-dihydrocortisol | 5bDHF | HMDB0003259 | 1482-50-4 | | 5β-tetrahydrocorticosterone | 5bTHB | HMDB0000268 | 68-42-8 | | 5β-tetrahydrocortisol | 5bTHF | HMDB0000949 | 1953-02-01 | | 5β-tetrahydrocortisone | 5bTHE | NA | NA | | 6β-hydroxycortisol | 6OHF | HMDB0247074 |  | | 6β-hydroxycortisone | 6OHE | NA | NA | | **Glucocorticosteroid precursor** | | | | | 17-hydroxyprogesterone | 17OHP | HMDB0000374 | 68-96-2 | | Cortexolone | S | HMDB0000015 | 152-58-9 | | Deoxycorticosterone | DOC | HMDB0000016 | 64-85-7 | | **Glucocorticosteroid precursor metabolite** | | | | | 17-hydroxypregnanolone | 17HP | HMDB0000363 | 387-79-1 | | 5β-dihydrocortexolone | 5bDHS | NA | NA | | 5β-tetrahydrocortexolone | 5bTHS | NA | NA | | Pregnantriol | PT | NA | 1098-45-9 | | Tetrahydrocortexolone | THS | HMDB0005972 | 68-60-0 | | Abbreviations: Human Metabolome Database (HMDB); Chemical Abstracts Service (CAS). | | | |   Supplementary Table 2. **Information about the glucocorticosteroids, including the full metabolite name, the standard symbol, the identifier from the HMDB, and the CAS number.** |

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| |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |  | type | description | coding | labels | remarks | comments | assessment | q1 | q2 | q3 | | **age\_child** | | | | | | | | | | | | hs\_age\_years | numerical | Child age |  |  |  | years | postnatal | Yes | Yes | Yes | | **breastfeeding** | | | | | | | | | | | | hs\_bf | categorical | Child breastfeeding | 0,1 | No, Yes |  |  | prenatal | Yes | No | Yes | | **characteristics\_child** | | | | | | | | | | | | hs\_c\_height | numerical | Child height |  |  |  | m | postnatal | Yes | Yes | Yes | | hs\_c\_weight | numerical | Child weight |  |  |  | kg | postnatal | Yes | Yes | Yes | | hs\_head\_circ | numerical | Child head circumference |  |  |  | cm | postnatal | Yes | Yes | Yes | | **child\_diet** | | | | | | | | | | | | hs\_fastfood | numerical | Fast food/take away |  |  |  | Times / week | postnatal | Yes | Yes | Yes | | hs\_org\_food | numerical | Organic food |  |  |  | Times / week | postnatal | Yes | Yes | Yes | | hs\_total\_fish | numerical | Fish and seafood |  |  |  | Times / week | postnatal | Yes | Yes | Yes | | hs\_total\_fruits | numerical | Fruits |  |  |  | Times / week | postnatal | Yes | Yes | Yes | | hs\_total\_veg | numerical | Vegetables |  |  |  | Times / week | postnatal | Yes | Yes | Yes | | **child\_smoking** | | | | | | | | | | | | hs\_tob | categorical | Maternal tobacco consumption | 1,2,3,4,5 | Non-smoker and has never smoked, Non-smoker but previously smoked although not daily, Non-smoker but previously smoked daily, Smoker but not daily, Daily smoker |  |  | postnatal | Yes | Yes | Yes | | **cohort** | | | | | | | | | | | | cohort | character | Cohort | SAB,EDEN,BIB,RHEA,KANC,MOBA | SAB, EDEN, BIB, RHEA, KANC, MOBA |  |  |  | Yes | Yes | Yes | | **creatinine** | | | | | | | | | | | | hs\_creatinine\_cg | numerical | Creatinine pooled sample |  |  | Values below the limit of detection imputed | G / L | postnatal | Yes | Yes | No | | creatinine\_to\_helix | numerical | Creatinine night sample |  |  |  | G / L | postnatal | No | Yes | Yes | | **envFactors\_visit** | | | | | | | | | | | | hs\_mood | categorical | Chiod mood before assessment | 1,2 | Usual, Not usual |  |  | postnatal | Yes | No | Yes | | hs\_rest\_nth | categorical | Child rest before assessment | 1,2 | Yes, Not as well as usual |  |  | postnatal | Yes | No | Yes | | **ethnicity\_child** | | | | | | | | | | | | h\_ethnicity\_c | character | Child ethnicity | 1,2,3,4,5,6,7 | African, Asian, Caucasian, Native American, Other, Pakistani, White non European |  |  | postnatal | Yes | Yes | Yes | | **ethnicity\_mother** | | | | | | | | | | | | h\_ethnicity\_m | integer | Mother ethnicity | 1,2,3,4,5,6,7 | White European, Pakistani, Asian, African, Other, Native American, White non European |  |  | postnatal | No | No | No | | **familySEP** | | | | | | | | | | | | FAS\_score | numerical | Family Affluence Scale |  |  |  |  | postnatal | Yes | Yes | Yes | | hs\_finance | categorical | Financial situation of the parents | 1,2,3,4,5,6 | Living comfortably, Doing alright, Getting by, Finding it quite difficult, Finding it very difficult, Does not wish to answer |  |  | postnatal | Yes | Yes | Yes | | **maternalAlcohol\_preg** | | | | | | | | | | | | e3\_alcpreg\_g | numerical | Alcool during pregnancy |  |  |  | Glasses / week | prenatal | No | No | No | | **maternalDiet\_preg** | | | | | | | | | | | | h\_cereal\_preg | numerical | Cereal consumption during pregnancy |  |  |  | Times / week | prenatal | No | No | No | | h\_dairy\_preg | numerical | Dairy consumption during pregnancy |  |  |  | Times / week | prenatal | No | No | No | | h\_fastfood\_preg | numerical | Fast food consumption during pregnancy |  |  |  | Times / week | prenatal | No | No | No | | h\_fish\_preg | numerical | Fish consumption during pregnancy |  |  |  | Times / week | prenatal | No | No | No | | h\_fruit\_preg | numerical | Fruit consumption during pregnancy |  |  |  | Times / week | prenatal | No | No | No | | h\_legume\_preg | numerical | Legume consumption during pregnancy |  |  |  | Times / week | prenatal | No | No | No | | h\_meat\_preg | numerical | Meat consumption during pregnancy |  |  |  | Times / week | prenatal | No | No | No | | h\_veg\_preg | numerical | Vegetables consumption during pregnancy |  |  |  | Times / week | prenatal | No | No | No | | **maternalSEP\_preg** | | | | | | | | | | | | e3\_edum | categorical | Maternal education | 0,1,2 | Primary school, Secondary school, University degree or higher |  |  | prenatal | No | No | No | | e3\_marital | categorical | Marital status | 0,1,2 | Living with the father, Living alone, Other situation |  |  | prenatal | Yes | No | Yes | | e3\_ses | categorical | Socioeconomic status of the parents | 1,2,3 | Low income, Medium income, High income |  |  | prenatal | No | No | No | | **maternalSmoking\_preg** | | | | | | | | | | | | e3\_asmokyn\_p | categorical | Pregnancy maternal active smoking | 0,1 | No, Yes |  |  | prenatal | Yes | No | Yes | | e3\_psmokanyt | categorical | Pregnancy maternal passive smoking | 0,1 | No, Yes |  |  | prenatal | Yes | No | Yes | | **neuropsychologicalDiagnosis\_child** | | | | | | | | | | | | hs\_neuro\_diag | categorical | Child neuropsychological diagnosis | 1,2 | No, Yes |  |  | postnatal | Yes | No | Yes | | **paternalSEP\_preg** | | | | | | | | | | | | e3\_eduf | categorical | Paternal education | 0,1,2 | Primary school, Secondary school, University degree or higher |  |  | prenatal | No | No | No | | **season\_visit** | | | | | | | | | | | | hs\_date\_neu | date | Date of test |  |  |  | season | postnatal | Yes | Yes | No | | **sex\_child** | | | | | | | | | | | | e3\_sex | categorical | Child sex | 0,1 | Male, Female |  |  | postnatal | Yes | Yes | Yes | | **time\_lastMeal** | | | | | | | | | | | | hs\_dift\_mealblood\_imp | numerical | Fasting time before visit |  |  |  | hours | postnatal | Yes | Yes | No | | **chemical** | | | | | | | | | | | | hs\_bpa\_c | numerical | Bisphenol A (BPA) |  |  | Values below the limit of detection imputed | microg / L | postnatal | No | No | Yes | | hs\_bupa\_c | numerical | N-Butyl paraben (BUPA) |  |  | Values below the limit of detection imputed | microg / L | postnatal | No | No | Yes | | hs\_dedtp\_cadj | numerical | Diethyl dithiophosphate (DEDTP) adjusted for creatinine |  |  | Values below the limit of detection imputed | microg / g | postnatal | No | No | No | | hs\_dep\_c | numerical | Diethyl phosphate (DEP) |  |  | Values below the limit of detection imputed | microg / L | postnatal | No | No | Yes | | hs\_detp\_c | numerical | Diethyl thiophosphate (DETP) |  |  | Values below the limit of detection imputed | microg / L | postnatal | No | No | Yes | | hs\_dmdtp\_craw | numerical | Dimethyl dithiophosphate (DMDTP) |  |  | Values below the limit of detection imputed | microg / L | postnatal | No | No | No | | hs\_dmp\_c | numerical | Dimethyl phosphate (DMP) |  |  | Values below the limit of detection imputed | microg / L | postnatal | No | No | Yes | | hs\_dmtp\_c | numerical | Dimethyl thiophosphate (DMTP) |  |  | Values below the limit of detection imputed | microg / L | postnatal | No | No | Yes | | hs\_etpa\_c | numerical | Ethyl paraben (ETPA) |  |  | Values below the limit of detection imputed | microg / L | postnatal | No | No | Yes | | hs\_mbzp\_c | numerical | Mono benzyl phthalate (MbzP) |  |  | Values below the limit of detection imputed | microg / L | postnatal | No | No | Yes | | hs\_mecpp\_c | numerical | Mono-2-ethyl 5-carboxypentyl phthalate (MECPP) |  |  | Values below the limit of detection imputed | microg / L | postnatal | No | No | Yes | | hs\_mehhp\_c | numerical | Mono-2-ethyl-5-hydroxyhexyl phthalate (MEHHP) |  |  | Values below the limit of detection imputed | microg / L | postnatal | No | No | Yes | | hs\_mehp\_c | numerical | Mono-2-ethylhexyl phthalate (MEHP) |  |  | Values below the limit of detection imputed | microg / L | postnatal | No | No | Yes | | hs\_meohp\_c | numerical | Mono-2-ethyl-5-oxohexyl phthalate (MEOHP) |  |  | Values below the limit of detection imputed | microg / L | postnatal | No | No | Yes | | hs\_mep\_c | numerical | Monoethyl phthalate (MEP) |  |  | Values below the limit of detection imputed | microg / L | postnatal | No | No | Yes | | hs\_mepa\_c | numerical | Methyl paraben (MEPA) |  |  | Values below the limit of detection imputed | microg / L | postnatal | No | No | Yes | | hs\_mibp\_c | numerical | Mono-iso-butyl phthalate (MiBP) |  |  | Values below the limit of detection imputed | microg / L | postnatal | No | No | Yes | | hs\_mnbp\_c | numerical | Mono-n-butyl phthalate (MnBP) |  |  | Values below the limit of detection imputed | microg / L | postnatal | No | No | Yes | | hs\_ohminp\_c | numerical | Mono-4-methyl-7-hydroxyoctyl phthalate (OHMiNP) |  |  | Values below the limit of detection imputed | microg / L | postnatal | No | No | Yes | | hs\_oxbe\_c | numerical | Oxybenzone (OXBE) |  |  | Values below the limit of detection imputed | microg / L | postnatal | No | No | Yes | | hs\_oxominp\_c | numerical | Mono-4-methyl-7-oxooctyl phthalate (OXOMiNP) |  |  | Values below the limit of detection imputed | microg / L | postnatal | No | No | Yes | | hs\_prpa\_c | numerical | Propyl paraben (PRPA) |  |  | Values below the limit of detection imputed | microg / L | postnatal | No | No | Yes | | hs\_trcs\_c | numerical | Triclosan (TRCS) |  |  | Values below the limit of detection imputed | microg / L | postnatal | No | No | Yes |   Supplementary Table 3. **Codebook for the covariates used in the estimation of the marginal comparisons of endocrine disrupting chemicals (EDCs) on hit reaction time standard error (HRT-SE) (q1), endocrine disrupting chemicals (EDCs) on the glucocorticosteroids (q2), and glucocorticosteroids on hit reaction time standard error (HRT-SE) (q3).** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | Metabolite | LLOQ | | 5aTHF | 5.00 | | 5bTHE | 5.00 | | 5b20acortolone | 5.00 | | 5b20bcortolone | 5.00 | | 5a20acortol | 2.50 | | 5a20bcortol | 2.50 | | 5b20acortol | 2.50 | | 5b20bcortol | 2.50 | | 11OHAndros | 2.00 | | 17HP | 2.00 | | PT | 2.00 | | 20bDHF | 0.50 | | 5bTHF | 0.50 | | 6OHF | 0.50 | | E | 0.50 | | 20aDHE | 0.50 | | 20bDHE | 0.50 | | 5aTHE | 0.50 | | 6OHE | 0.50 | | 5aTHB | 0.50 | | 5bTHB | 0.50 | | 17DOcortolone | 0.50 | | 5bTHS | 0.50 | | Andros | 0.50 | | Etio | 0.50 | | F | 0.25 | | 20aDHF | 0.25 | | 5bDHF | 0.10 | | A | 0.10 | | S | 0.10 | | 5bDHS | 0.10 | | T | 0.10 | | AED | 0.10 | | Abbreviations: lower limit of quantification (LLOQ). | |   Supplementary Table 4. **Lower limits of quantification expressed in ng/ml for the glucocorticosteroids (HELIX subcohort; 2013-2016).** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **Characteristic** | **Overall**, N = 1,297*a* | **BIB**, N = 204*a* | **EDEN**, N = 198*a* | **INMA**, N = 221*a* | **KANC**, N = 203*a* | **MOBA**, N = 272*a* | **RHEA**, N = 199*a* | | Child age (years) | 8.1 (6.5, 8.9) | 6.6 (6.5, 6.8) | 10.9 (10.4, 11.2) | 8.8 (8.4, 9.3) | 6.4 (6.1, 6.9) | 8.5 (8.2, 8.8) | 6.5 (6.4, 6.6) | | Child breastfeeding | 1,093.0 (84.7%) | 147.0 (72.4%) | 128.0 (65.0%) | 195.0 (88.6%) | 187.0 (92.6%) | 260.0 (96.3%) | 176.0 (88.4%) | | Unknown | 6 | 1 | 1 | 1 | 1 | 2 | 0 | | Child ethnicity |  |  |  |  |  |  |  | | Caucasian | 1,157.0 (90.0%) | 87.0 (42.6%) | 196.0 (99.5%) | 221.0 (100.0%) | 200.0 (100.0%) | 254.0 (95.8%) | 199.0 (100.0%) | | Pakistani | 80.0 (6.2%) | 80.0 (39.2%) | 0.0 (0.0%) | 0.0 (0.0%) | 0.0 (0.0%) | 0.0 (0.0%) | 0.0 (0.0%) | | Asian | 21.0 (1.6%) | 13.0 (6.4%) | 1.0 (0.5%) | 0.0 (0.0%) | 0.0 (0.0%) | 7.0 (2.6%) | 0.0 (0.0%) | | Other | 19.0 (1.5%) | 17.0 (8.3%) | 0.0 (0.0%) | 0.0 (0.0%) | 0.0 (0.0%) | 2.0 (0.8%) | 0.0 (0.0%) | | African | 7.0 (0.5%) | 7.0 (3.4%) | 0.0 (0.0%) | 0.0 (0.0%) | 0.0 (0.0%) | 0.0 (0.0%) | 0.0 (0.0%) | | Native American | 2.0 (0.2%) | 0.0 (0.0%) | 0.0 (0.0%) | 0.0 (0.0%) | 0.0 (0.0%) | 2.0 (0.8%) | 0.0 (0.0%) | | White non European | 0.0 (0.0%) | 0.0 (0.0%) | 0.0 (0.0%) | 0.0 (0.0%) | 0.0 (0.0%) | 0.0 (0.0%) | 0.0 (0.0%) | | Unknown | 11 | 0 | 1 | 0 | 3 | 7 | 0 | | Child head circumference (cm) | 51.8 (50.6, 52.9) | 51.4 (50.3, 52.3) | 50.5 (49.5, 52.0) | 52.3 (51.3, 53.3) | 52.0 (51.0, 53.0) | 52.5 (51.5, 53.6) | 51.2 (50.2, 52.0) | | Unknown | 3 | 0 | 0 | 0 | 0 | 0 | 3 | | Child height (m) | 1.3 (1.2, 1.4) | 1.2 (1.2, 1.2) | 1.4 (1.4, 1.5) | 1.3 (1.3, 1.4) | 1.2 (1.2, 1.3) | 1.3 (1.3, 1.4) | 1.2 (1.2, 1.2) | | Child neuropsychological diagnosis | 95.0 (7.3%) | 3.0 (1.5%) | 58.0 (29.3%) | 24.0 (10.9%) | 1.0 (0.5%) | 1.0 (0.4%) | 8.0 (4.0%) | | Child rest before assessment |  |  |  |  |  |  |  | | Yes | 1,209.0 (93.3%) | 192.0 (94.1%) | 170.0 (86.3%) | 206.0 (93.2%) | 200.0 (98.5%) | 259.0 (95.2%) | 182.0 (91.5%) | | Not as well as usual | 87.0 (6.7%) | 12.0 (5.9%) | 27.0 (13.7%) | 15.0 (6.8%) | 3.0 (1.5%) | 13.0 (4.8%) | 17.0 (8.5%) | | Unknown | 1 | 0 | 1 | 0 | 0 | 0 | 0 | | Child sex |  |  |  |  |  |  |  | | Male | 710.0 (54.7%) | 112.0 (54.9%) | 113.0 (57.1%) | 120.0 (54.3%) | 111.0 (54.7%) | 143.0 (52.6%) | 111.0 (55.8%) | | Female | 587.0 (45.3%) | 92.0 (45.1%) | 85.0 (42.9%) | 101.0 (45.7%) | 92.0 (45.3%) | 129.0 (47.4%) | 88.0 (44.2%) | | Child weight (kg) | 26.9 (22.9, 32.6) | 22.3 (20.3, 25.0) | 35.7 (32.4, 41.2) | 30.7 (26.8, 36.5) | 23.6 (21.4, 27.1) | 28.5 (25.7, 31.6) | 23.3 (21.2, 27.2) | | Chiod mood before assessment |  |  |  |  |  |  |  | | Usual | 1,232.0 (95.1%) | 198.0 (97.1%) | 176.0 (89.3%) | 214.0 (96.8%) | 187.0 (92.1%) | 262.0 (96.3%) | 195.0 (98.0%) | | Not usual | 64.0 (4.9%) | 6.0 (2.9%) | 21.0 (10.7%) | 7.0 (3.2%) | 16.0 (7.9%) | 10.0 (3.7%) | 4.0 (2.0%) | | Unknown | 1 | 0 | 1 | 0 | 0 | 0 | 0 | | Creatinine night sample (g/l) | 1.7 (0.9, 3.0) | 0.8 (0.6, 1.1) | 3.3 (2.0, 4.3) | 2.5 (1.5, 3.8) | 1.7 (0.9, 2.7) | 2.0 (1.2, 3.0) | 0.8 (0.4, 1.3) | | Unknown | 321 | 72 | 64 | 19 | 23 | 72 | 71 | | Creatinine pooled sample (g/l) | 1.0 (0.8, 1.2) | 1.0 (0.8, 1.2) | 1.2 (1.0, 1.5) | 1.0 (0.8, 1.3) | 0.9 (0.7, 1.1) | 0.9 (0.7, 1.1) | 0.9 (0.7, 1.1) | | Date of test (season) |  |  |  |  |  |  |  | | Spring | 358.0 (27.7%) | 48.0 (23.5%) | 64.0 (32.3%) | 71.0 (32.4%) | 61.0 (30.0%) | 37.0 (13.6%) | 77.0 (38.9%) | | Winter | 339.0 (26.2%) | 40.0 (19.6%) | 61.0 (30.8%) | 97.0 (44.3%) | 38.0 (18.7%) | 73.0 (26.8%) | 30.0 (15.2%) | | Autumn | 300.0 (23.2%) | 49.0 (24.0%) | 1.0 (0.5%) | 30.0 (13.7%) | 77.0 (37.9%) | 105.0 (38.6%) | 38.0 (19.2%) | | Summer | 297.0 (23.0%) | 67.0 (32.8%) | 72.0 (36.4%) | 21.0 (9.6%) | 27.0 (13.3%) | 57.0 (21.0%) | 53.0 (26.8%) | | Unknown | 3 | 0 | 0 | 2 | 0 | 0 | 1 | | Family affluence scale |  |  |  |  |  |  |  | | 6 | 410.0 (31.7%) | 34.0 (16.7%) | 64.0 (32.3%) | 75.0 (34.1%) | 50.0 (24.8%) | 142.0 (52.2%) | 45.0 (22.6%) | | 5 | 325.0 (25.1%) | 48.0 (23.5%) | 29.0 (14.6%) | 65.0 (29.5%) | 69.0 (34.2%) | 57.0 (21.0%) | 57.0 (28.6%) | | 7 | 248.0 (19.2%) | 26.0 (12.7%) | 90.0 (45.5%) | 43.0 (19.5%) | 14.0 (6.9%) | 53.0 (19.5%) | 22.0 (11.1%) | | 4 | 174.0 (13.4%) | 40.0 (19.6%) | 13.0 (6.6%) | 22.0 (10.0%) | 38.0 (18.8%) | 16.0 (5.9%) | 45.0 (22.6%) | | 3 | 92.0 (7.1%) | 34.0 (16.7%) | 2.0 (1.0%) | 11.0 (5.0%) | 22.0 (10.9%) | 3.0 (1.1%) | 20.0 (10.1%) | | 2 | 28.0 (2.2%) | 16.0 (7.8%) | 0.0 (0.0%) | 1.0 (0.5%) | 4.0 (2.0%) | 0.0 (0.0%) | 7.0 (3.5%) | | 1 | 12.0 (0.9%) | 4.0 (2.0%) | 0.0 (0.0%) | 2.0 (0.9%) | 4.0 (2.0%) | 1.0 (0.4%) | 1.0 (0.5%) | | 0 | 6.0 (0.5%) | 2.0 (1.0%) | 0.0 (0.0%) | 1.0 (0.5%) | 1.0 (0.5%) | 0.0 (0.0%) | 2.0 (1.0%) | | Unknown | 2 | 0 | 0 | 1 | 1 | 0 | 0 | | Fast food/take away (times/week) | 0.1 (0.1, 0.5) | 0.5 (0.1, 1.0) | 0.1 (0.1, 0.5) | 0.1 (0.1, 0.5) | 0.1 (0.0, 0.1) | 0.1 (0.1, 0.5) | 0.5 (0.1, 0.5) | | Unknown | 7 | 0 | 0 | 5 | 2 | 0 | 0 | | Fasting time before visit (hours) | 3.3 (2.8, 4.0) | 3.3 (2.8, 4.1) | 3.2 (2.8, 3.7) | 3.0 (2.6, 3.8) | 3.3 (2.8, 3.8) | 3.4 (2.8, 3.8) | 4.0 (3.3, 4.8) | | Financial situation of the parents |  |  |  |  |  |  |  | | Doing alright | 414.0 (32.1%) | 73.0 (35.8%) | 94.0 (47.5%) | 64.0 (29.2%) | 61.0 (30.5%) | 64.0 (23.5%) | 58.0 (29.3%) | | Living comfortably | 412.0 (31.9%) | 59.0 (28.9%) | 49.0 (24.7%) | 29.0 (13.2%) | 48.0 (24.0%) | 202.0 (74.3%) | 25.0 (12.6%) | | Getting by | 331.0 (25.6%) | 59.0 (28.9%) | 36.0 (18.2%) | 82.0 (37.4%) | 70.0 (35.0%) | 4.0 (1.5%) | 80.0 (40.4%) | | Finding it quite difficult | 86.0 (6.7%) | 8.0 (3.9%) | 9.0 (4.5%) | 29.0 (13.2%) | 12.0 (6.0%) | 1.0 (0.4%) | 27.0 (13.6%) | | Finding it very difficult | 40.0 (3.1%) | 5.0 (2.5%) | 10.0 (5.1%) | 15.0 (6.8%) | 2.0 (1.0%) | 0.0 (0.0%) | 8.0 (4.0%) | | Does not wish to answer | 8.0 (0.6%) | 0.0 (0.0%) | 0.0 (0.0%) | 0.0 (0.0%) | 7.0 (3.5%) | 1.0 (0.4%) | 0.0 (0.0%) | | Unknown | 6 | 0 | 0 | 2 | 3 | 0 | 1 | | Fish and seafood (times/week) | 2.0 (1.1, 3.5) | 2.0 (1.0, 3.1) | 2.1 (1.4, 3.0) | 3.5 (2.1, 5.0) | 1.0 (0.4, 1.6) | 2.6 (1.6, 5.0) | 1.5 (1.0, 2.0) | | Unknown | 5 | 1 | 0 | 2 | 2 | 0 | 0 | | Fruits (times/week) | 9.0 (5.9, 18.0) | 15.5 (10.0, 21.0) | 6.6 (3.3, 13.5) | 7.5 (3.6, 12.6) | 7.3 (3.8, 9.6) | 14.1 (8.6, 21.0) | 8.5 (6.2, 13.5) | | Unknown | 7 | 2 | 0 | 2 | 2 | 1 | 0 | | Hit reaction time standard error (ms) | 299.6 (231.3, 368.2) | 355.1 (292.1, 397.5) | 237.7 (184.7, 307.0) | 256.0 (197.4, 313.8) | 368.4 (324.2, 406.6) | 248.7 (193.0, 300.9) | 340.9 (281.1, 399.2) | | Unknown | 18 | 3 | 11 | 3 | 0 | 0 | 1 | | Marital status |  |  |  |  |  |  |  | | Living with the father | 1,212.0 (94.5%) | 178.0 (87.3%) | 193.0 (98.0%) | 219.0 (99.1%) | 168.0 (84.4%) | 260.0 (98.5%) | 194.0 (98.5%) | | Living alone | 39.0 (3.0%) | 0.0 (0.0%) | 2.0 (1.0%) | 0.0 (0.0%) | 31.0 (15.6%) | 3.0 (1.1%) | 3.0 (1.5%) | | Other situation | 31.0 (2.4%) | 26.0 (12.7%) | 2.0 (1.0%) | 2.0 (0.9%) | 0.0 (0.0%) | 1.0 (0.4%) | 0.0 (0.0%) | | Unknown | 15 | 0 | 1 | 0 | 4 | 8 | 2 | | Maternal tobacco consumption |  |  |  |  |  |  |  | | Non-smoker and has never smoked | 681.0 (52.6%) | 148.0 (72.5%) | 87.0 (43.9%) | 103.0 (46.8%) | 104.0 (51.7%) | 138.0 (50.7%) | 101.0 (50.8%) | | Daily smoker | 200.0 (15.5%) | 27.0 (13.2%) | 45.0 (22.7%) | 45.0 (20.5%) | 24.0 (11.9%) | 6.0 (2.2%) | 53.0 (26.6%) | | Non-smoker but previously smoked daily | 186.0 (14.4%) | 11.0 (5.4%) | 37.0 (18.7%) | 42.0 (19.1%) | 21.0 (10.4%) | 53.0 (19.5%) | 22.0 (11.1%) | | Non-smoker but previously smoked although not daily | 163.0 (12.6%) | 12.0 (5.9%) | 19.0 (9.6%) | 23.0 (10.5%) | 32.0 (15.9%) | 63.0 (23.2%) | 14.0 (7.0%) | | Smoker but not daily | 64.0 (4.9%) | 6.0 (2.9%) | 10.0 (5.1%) | 7.0 (3.2%) | 20.0 (10.0%) | 12.0 (4.4%) | 9.0 (4.5%) | | Unknown | 3 | 0 | 0 | 1 | 2 | 0 | 0 | | Organic food (times/week) | 0.5 (0.0, 3.0) | 0.0 (0.0, 0.5) | 0.5 (0.1, 3.0) | 0.0 (0.0, 0.5) | 1.0 (0.1, 3.0) | 1.0 (0.5, 3.0) | 0.0 (0.0, 1.0) | | Unknown | 7 | 0 | 0 | 5 | 2 | 0 | 0 | | Pregnancy maternal active smoking | 190.0 (15.1%) | 25.0 (13.7%) | 47.0 (23.7%) | 55.0 (25.1%) | 12.0 (6.0%) | 9.0 (3.4%) | 42.0 (21.2%) | | Unknown | 40 | 22 | 0 | 2 | 4 | 11 | 1 | | Pregnancy maternal passive smoking | 514.0 (40.3%) | 55.0 (27.5%) | 43.0 (21.8%) | 126.0 (57.8%) | 97.0 (48.7%) | 14.0 (5.3%) | 179.0 (90.4%) | | Unknown | 21 | 4 | 1 | 3 | 4 | 8 | 1 | | Vegetables (times/week) | 6.5 (4.0, 10.0) | 6.0 (4.0, 10.0) | 8.3 (4.4, 11.0) | 6.0 (3.0, 8.5) | 6.0 (3.5, 8.5) | 8.5 (6.0, 14.0) | 6.5 (4.0, 10.0) | | Unknown | 6 | 1 | 0 | 2 | 2 | 1 | 0 | | *a*Median (IQR); n (%) | | | | | | | |   Supplementary Table 5. **Participant characteristics, by cohort and overall (HELIX subcohort; 2013-2016).** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **Characteristic** | **Overall**, N = 1,297*a* | **BIB**, N = 204*a* | **EDEN**, N = 198*a* | **INMA**, N = 221*a* | **KANC**, N = 203*a* | **MOBA**, N = 272*a* | **RHEA**, N = 199*a* | | **OP pesticide metabolites** | | | | | | | | | DEP | 1.8 (0.1, 0.4, 4.6, 9.8) | 3.5 (0.1, 1.1, 8.8, 38.5) | 2.0 (0.1, 0.4, 4.2, 7.5) | 1.6 (0.1, 0.5, 3.7, 7.6) | 0.7 (0.1, 0.1, 2.1, 4.0) | 2.0 (0.1, 0.6, 5.7, 10.0) | 2.0 (0.1, 0.6, 5.4, 10.7) | | DETP | 0.1 (0.1, 0.1, 1.7, 5.0) | 0.1 (0.1, 0.1, 1.5, 3.6) | 0.1 (0.1, 0.1, 1.8, 5.7) | 0.1 (0.1, 0.1, 1.8, 6.3) | 0.1 (0.1, 0.1, 0.4, 2.0) | 0.1 (0.1, 0.1, 1.5, 3.6) | 0.7 (0.1, 0.1, 2.9, 6.4) | | DMP | 0.4 (0.2, 0.3, 4.6, 9.5) | 0.3 (0.2, 0.3, 3.5, 9.2) | 0.6 (0.3, 0.3, 6.8, 12.1) | 0.4 (0.2, 0.3, 5.9, 9.0) | 0.3 (0.2, 0.3, 2.3, 4.7) | 1.9 (0.2, 0.3, 4.4, 9.2) | 1.6 (0.2, 0.3, 6.5, 11.5) | | DMTP | 2.8 (0.2, 1.2, 6.3, 13.1) | 2.2 (0.1, 0.9, 5.5, 11.3) | 4.0 (0.3, 1.6, 9.0, 15.1) | 3.5 (0.6, 1.6, 7.9, 14.4) | 2.4 (0.1, 0.9, 4.6, 10.2) | 2.4 (0.1, 1.0, 5.1, 9.9) | 3.4 (0.8, 1.7, 6.6, 13.3) | | **Phenols** | | | | | | | | | BPA | 3.8 (1.5, 2.3, 7.0, 14.4) | 5.2 (1.7, 2.5, 9.7, 20.7) | 2.9 (1.2, 1.8, 4.6, 7.2) | 4.0 (1.6, 2.3, 7.0, 13.1) | 3.4 (1.2, 2.1, 5.9, 11.8) | 4.0 (1.8, 2.7, 7.5, 15.3) | 4.4 (1.5, 2.6, 9.2, 21.3) | | BUPA | 0.1 (0.0, 0.0, 0.1, 0.3) | 0.1 (0.0, 0.0, 0.1, 0.3) | 0.0 (0.0, 0.0, 0.1, 0.2) | 0.1 (0.0, 0.1, 0.2, 0.4) | 0.1 (0.0, 0.1, 0.2, 0.4) | 0.1 (0.0, 0.0, 0.1, 0.2) | 0.1 (0.0, 0.0, 0.1, 0.3) | | ETPA | 0.7 (0.3, 0.4, 1.2, 3.3) | 0.7 (0.3, 0.4, 1.6, 6.0) | 0.7 (0.3, 0.5, 1.1, 2.4) | 0.8 (0.3, 0.5, 1.5, 5.6) | 0.6 (0.2, 0.3, 1.5, 2.7) | 0.6 (0.2, 0.4, 1.0, 2.8) | 0.6 (0.2, 0.4, 1.1, 2.1) | | MEPA | 6.3 (1.9, 3.1, 24.1, 122.3) | 9.9 (2.8, 5.0, 47.0, 217.6) | 5.3 (2.0, 3.0, 22.2, 116.9) | 14.0 (3.0, 5.1, 65.8, 293.9) | 6.4 (1.9, 3.1, 29.7, 129.8) | 3.7 (1.0, 1.9, 8.7, 26.3) | 5.2 (1.9, 2.6, 12.5, 59.7) | | OXBE | 2.0 (0.4, 0.8, 6.6, 23.2) | 4.0 (0.8, 1.4, 12.8, 61.8) | 0.7 (0.2, 0.4, 1.8, 5.1) | 2.2 (0.4, 1.0, 6.2, 17.6) | 2.1 (0.5, 0.9, 6.3, 32.7) | 3.0 (0.6, 1.1, 7.6, 22.4) | 1.6 (0.2, 0.6, 8.3, 23.8) | | PRPA | 0.2 (0.0, 0.0, 1.6, 14.3) | 0.7 (0.0, 0.2, 4.4, 39.2) | 0.1 (0.0, 0.0, 0.5, 5.2) | 1.4 (0.0, 0.2, 8.3, 65.4) | 0.1 (0.0, 0.0, 1.2, 13.2) | 0.0 (0.0, 0.0, 0.4, 1.7) | 0.1 (0.0, 0.0, 0.9, 6.1) | | TRCS | 0.6 (0.2, 0.3, 1.5, 4.2) | 1.2 (0.4, 0.6, 2.8, 10.9) | 0.7 (0.2, 0.4, 1.5, 5.1) | 1.0 (0.3, 0.5, 2.5, 7.6) | 0.7 (0.3, 0.4, 1.5, 2.6) | 0.2 (0.1, 0.1, 0.4, 1.0) | 0.4 (0.1, 0.2, 1.1, 3.4) | | **Phthalate metabolites** | | | | | | | | | MBzP | 4.8 (1.7, 2.7, 8.7, 16.9) | 2.5 (0.9, 1.5, 4.9, 8.9) | 7.3 (3.2, 4.9, 12.3, 25.1) | 5.2 (1.8, 3.1, 8.9, 16.2) | 6.1 (2.0, 3.5, 10.5, 20.4) | 3.6 (1.7, 2.4, 6.3, 11.2) | 6.0 (2.2, 3.5, 10.6, 21.3) | | MECPP | 32.8 (13.4, 19.9, 57.6, 98.6) | 41.3 (15.1, 22.7, 67.4, 115.0) | 21.4 (11.0, 15.3, 32.4, 45.7) | 34.4 (17.1, 24.2, 60.5, 101.6) | 45.3 (22.3, 33.6, 70.7, 103.8) | 19.0 (10.2, 13.5, 29.9, 45.8) | 62.3 (26.0, 35.3, 96.9, 146.7) | | MEHHP | 19.3 (7.1, 11.4, 33.1, 56.0) | 22.3 (8.7, 13.2, 38.7, 71.3) | 13.5 (6.6, 9.3, 20.9, 30.8) | 21.3 (10.1, 14.1, 36.8, 62.7) | 26.1 (11.7, 17.5, 37.9, 55.7) | 10.8 (5.3, 6.8, 17.6, 26.7) | 34.5 (12.1, 20.7, 54.5, 80.9) | | MEHP | 2.8 (1.0, 1.6, 5.1, 8.8) | 3.3 (0.9, 1.7, 6.1, 9.9) | 2.3 (0.9, 1.3, 3.7, 5.6) | 3.3 (1.3, 1.9, 6.0, 10.1) | 3.2 (1.1, 1.8, 4.8, 8.2) | 1.7 (0.8, 1.1, 2.8, 4.4) | 4.7 (1.5, 2.7, 8.3, 15.0) | | MEOHP | 12.2 (4.5, 7.1, 20.4, 34.0) | 13.7 (4.7, 7.9, 24.1, 44.0) | 8.3 (3.9, 5.4, 13.5, 18.4) | 12.7 (6.0, 8.5, 21.4, 37.7) | 16.7 (7.7, 11.3, 24.5, 36.4) | 6.8 (3.4, 4.5, 10.7, 16.6) | 21.1 (8.2, 12.9, 33.8, 50.4) | | MEP | 32.5 (8.8, 15.0, 79.2, 173.3) | 45.2 (12.6, 20.4, 113.8, 249.0) | 50.0 (13.1, 26.4, 97.6, 225.8) | 86.7 (23.1, 41.4, 169.5, 345.1) | 26.1 (10.1, 14.0, 54.4, 84.7) | 12.8 (5.8, 8.3, 20.9, 38.8) | 28.1 (9.3, 14.2, 62.1, 109.6) | | MiBP | 40.2 (14.6, 24.5, 71.1, 123.1) | 61.9 (24.6, 38.8, 103.2, 168.4) | 47.4 (16.3, 27.5, 82.4, 159.2) | 28.5 (13.1, 17.7, 44.6, 61.4) | 69.9 (28.7, 42.4, 108.6, 164.6) | 23.5 (9.5, 14.2, 36.5, 53.9) | 43.2 (22.0, 30.0, 71.8, 117.6) | | MnBP | 22.7 (9.5, 14.5, 38.8, 66.7) | 25.4 (8.6, 16.8, 42.0, 65.3) | 21.7 (10.1, 13.8, 37.5, 55.1) | 15.0 (6.6, 10.2, 23.2, 38.0) | 39.9 (17.7, 25.6, 60.5, 90.7) | 20.4 (10.8, 15.0, 32.6, 55.9) | 22.5 (9.7, 14.0, 38.9, 78.4) | | oh-MiNP | 5.0 (2.1, 3.1, 9.3, 17.4) | 8.2 (2.8, 4.5, 14.4, 27.6) | 4.5 (1.9, 2.9, 8.4, 14.2) | 5.4 (2.2, 3.4, 10.2, 18.0) | 4.5 (1.8, 2.6, 7.5, 14.1) | 4.4 (2.1, 2.9, 7.7, 15.3) | 5.3 (2.3, 3.3, 8.6, 14.8) | | oxo-MiNP | 2.7 (1.1, 1.7, 5.0, 9.1) | 3.1 (1.3, 1.9, 5.7, 8.4) | 2.3 (1.0, 1.5, 3.9, 6.4) | 3.1 (1.4, 2.0, 5.3, 11.7) | 2.4 (1.1, 1.5, 4.3, 8.1) | 2.2 (1.0, 1.4, 4.0, 9.3) | 3.5 (1.4, 2.1, 6.7, 9.5) | | *a*Median (10%, IQR, 90%) | | | | | | | |   Supplementary Table 6. **Participants non-persistent endocrine disrupting chemicals (EDCs) concentrations, by cohort and overall (HELIX subcohort; 2013-2016).** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **Characteristic** | **Overall**, N = 1,004*a* | **BIB**, N = 154*a* | **EDEN**, N = 137*a* | **INMA**, N = 205*a* | **KANC**, N = 180*a* | **MOBA**, N = 200*a* | **RHEA**, N = 128*a* | | **Glucocorticosteroid** | | | | | | | | | A | 4.3 (1.4, 2.4, 8.2, 16.4) | 4.8 (1.5, 2.8, 9.0, 18.6) | 5.1 (1.7, 2.6, 9.1, 18.0) | 3.0 (0.7, 1.6, 5.6, 9.9) | 3.8 (1.1, 2.0, 7.3, 15.1) | 4.3 (2.0, 2.7, 8.4, 14.7) | 5.9 (2.1, 3.5, 14.9, 23.6) | | Unknown | 1 | 0 | 0 | 1 | 0 | 0 | 0 | | E | 22.9 (7.7, 13.1, 38.5, 62.9) | 25.7 (8.0, 14.5, 41.4, 61.2) | 28.6 (9.1, 14.1, 42.0, 73.6) | 17.1 (6.6, 10.3, 27.4, 40.9) | 21.4 (7.4, 12.0, 33.7, 51.5) | 23.3 (8.5, 14.1, 38.1, 62.2) | 28.9 (10.0, 19.3, 59.4, 98.8) | | F | 5.5 (1.9, 3.2, 9.5, 16.4) | 6.3 (2.2, 4.2, 10.4, 16.1) | 7.8 (2.8, 4.2, 11.4, 19.8) | 4.6 (1.6, 2.9, 7.1, 11.1) | 4.9 (1.7, 2.7, 8.2, 14.9) | 5.2 (1.6, 3.0, 9.1, 15.7) | 6.2 (2.2, 3.4, 13.1, 18.7) | | Unknown | 2 | 0 | 0 | 0 | 1 | 1 | 0 | | **Glucocorticosteroid metabolite** | | | | | | | | | 11OHAndros | 234.2 (72.3, 130.3, 390.5, 565.2) | 259.7 (86.5, 151.9, 375.0, 475.1) | 413.0 (161.6, 221.7, 617.0, 786.7) | 256.7 (80.1, 142.9, 365.1, 512.1) | 163.3 (38.9, 80.7, 298.5, 421.0) | 254.4 (89.3, 151.5, 408.4, 531.4) | 165.4 (62.3, 95.9, 304.2, 470.7) | | Unknown | 3 | 0 | 0 | 0 | 3 | 0 | 0 | | 17-DO-cortolone | 57.5 (10.7, 29.1, 101.7, 158.8) | 56.1 (11.2, 32.8, 100.6, 170.9) | 76.5 (22.9, 46.0, 137.6, 236.6) | 61.3 (17.1, 32.5, 102.1, 145.7) | 43.7 (4.7, 15.1, 93.4, 133.7) | 56.4 (11.7, 26.4, 92.0, 136.1) | 51.2 (9.4, 28.5, 94.3, 148.8) | | Unknown | 2 | 0 | 0 | 0 | 1 | 0 | 1 | | 20aDHE | 16.6 (5.9, 9.7, 27.5, 40.8) | 14.2 (3.2, 7.0, 25.8, 38.1) | 25.8 (10.2, 15.1, 37.8, 49.8) | 15.6 (6.0, 10.2, 23.0, 34.0) | 14.8 (4.3, 7.7, 25.6, 40.8) | 17.5 (8.1, 11.7, 26.1, 38.1) | 14.8 (5.3, 8.7, 27.6, 41.9) | | Unknown | 11 | 7 | 0 | 0 | 4 | 0 | 0 | | 20aDHF | 6.6 (1.8, 3.3, 13.3, 23.0) | 7.2 (1.8, 3.8, 14.0, 24.0) | 10.0 (2.9, 5.7, 19.5, 31.5) | 5.5 (1.8, 3.0, 9.4, 15.7) | 4.8 (1.1, 2.2, 11.4, 21.4) | 7.4 (2.4, 4.2, 14.0, 24.1) | 6.5 (1.8, 2.9, 13.8, 23.2) | | Unknown | 7 | 4 | 0 | 0 | 3 | 0 | 0 | | 20bDHE | 9.5 (3.7, 6.2, 14.3, 20.0) | 8.7 (2.3, 4.8, 14.8, 22.2) | 13.2 (7.5, 9.7, 17.3, 22.7) | 9.0 (4.7, 6.6, 11.7, 15.6) | 8.9 (3.2, 5.1, 13.7, 19.4) | 9.0 (3.4, 5.9, 14.3, 19.1) | 8.7 (3.3, 5.3, 15.2, 21.9) | | Unknown | 17 | 14 | 0 | 0 | 3 | 0 | 0 | | 20bDHF | 15.2 (5.3, 9.1, 24.8, 37.3) | 16.5 (6.7, 10.8, 26.5, 38.5) | 19.9 (7.8, 12.0, 32.0, 44.0) | 13.0 (4.4, 8.0, 18.1, 26.9) | 14.0 (4.9, 8.5, 24.5, 36.5) | 14.2 (4.7, 8.4, 23.5, 34.2) | 14.3 (5.5, 7.9, 27.5, 42.4) | | 5a20acortol | 88.9 (31.1, 52.1, 141.6, 208.0) | 109.8 (36.4, 61.7, 177.3, 283.2) | 103.0 (35.1, 58.0, 153.8, 213.2) | 83.0 (22.8, 45.9, 118.7, 171.4) | 84.7 (28.3, 46.9, 145.9, 221.9) | 88.6 (35.7, 53.7, 138.2, 182.3) | 72.4 (29.0, 47.2, 130.2, 211.4) | | Unknown | 9 | 9 | 0 | 0 | 0 | 0 | 0 | | 5a20bcortol | 122.4 (43.8, 70.4, 185.0, 262.5) | 131.0 (41.7, 66.3, 182.3, 279.0) | 148.8 (64.2, 108.8, 226.1, 291.5) | 124.3 (41.4, 68.9, 178.8, 241.6) | 115.2 (40.5, 62.9, 189.2, 272.4) | 114.7 (44.3, 67.8, 172.7, 236.0) | 105.3 (43.3, 72.6, 175.0, 239.8) | | Unknown | 5 | 5 | 0 | 0 | 0 | 0 | 0 | | 5aTHB | 133.1 (43.3, 76.1, 222.4, 359.7) | 159.8 (59.2, 101.7, 241.3, 428.4) | 144.2 (58.7, 87.9, 255.3, 365.2) | 115.7 (34.2, 73.3, 171.7, 256.8) | 148.0 (42.6, 82.6, 245.6, 411.5) | 106.1 (38.0, 61.1, 184.9, 293.4) | 139.9 (48.8, 74.6, 260.5, 385.0) | | 5aTHE | 73.9 (22.3, 39.7, 124.0, 195.9) | 82.0 (25.7, 52.1, 145.7, 214.4) | 83.9 (27.0, 41.5, 132.7, 203.9) | 62.2 (15.5, 32.3, 97.3, 141.2) | 71.3 (23.6, 40.3, 121.7, 197.7) | 64.5 (20.9, 36.4, 103.9, 156.8) | 107.9 (28.0, 51.2, 183.2, 355.7) | | Unknown | 1 | 0 | 0 | 0 | 0 | 0 | 1 | | 5aTHF | 2,870.0 (979.4, 1,663.7, 4,389.0, 6,150.4) | 3,394.6 (1,364.9, 2,288.1, 5,308.1, 7,169.4) | 3,474.2 (1,301.5, 1,856.1, 5,253.4, 6,625.7) | 2,756.9 (804.1, 1,565.6, 3,758.3, 5,438.7) | 2,907.3 (1,017.8, 1,656.1, 4,621.2, 6,464.2) | 2,283.3 (840.7, 1,259.8, 3,454.6, 4,906.8) | 3,001.9 (1,040.7, 1,652.3, 4,613.6, 6,203.4) | | 5b20acortol | 147.7 (51.7, 83.5, 225.8, 320.2) | 177.4 (46.4, 98.9, 302.3, 430.2) | 169.7 (64.2, 91.1, 252.9, 331.8) | 141.9 (37.8, 76.6, 187.6, 271.1) | 143.0 (49.8, 80.2, 229.8, 310.1) | 143.7 (60.6, 86.6, 204.2, 289.0) | 137.7 (51.2, 79.6, 220.5, 310.0) | | Unknown | 11 | 11 | 0 | 0 | 0 | 0 | 0 | | 5b20acortolone | 641.9 (206.0, 366.0, 983.1, 1,402.2) | 638.3 (213.4, 385.0, 1,028.2, 1,432.2) | 903.7 (401.7, 574.5, 1,296.1, 1,775.1) | 654.6 (189.4, 398.7, 890.7, 1,143.2) | 518.0 (157.9, 261.2, 870.2, 1,338.1) | 580.6 (200.2, 318.0, 901.5, 1,298.0) | 629.3 (265.8, 400.9, 962.4, 1,418.5) | | 5b20bcortol | 195.7 (67.8, 120.1, 302.4, 438.7) | 242.7 (87.6, 152.0, 356.8, 502.2) | 225.2 (97.8, 142.1, 371.5, 504.5) | 199.9 (58.8, 130.5, 289.3, 407.2) | 155.8 (45.4, 88.0, 270.4, 343.5) | 186.3 (80.6, 115.5, 269.4, 391.8) | 177.5 (66.2, 113.7, 301.7, 450.8) | | Unknown | 3 | 3 | 0 | 0 | 0 | 0 | 0 | | 5b20bcortolone | 546.9 (184.8, 336.3, 837.1, 1,224.3) | 561.3 (230.0, 331.3, 889.9, 1,372.6) | 682.3 (298.5, 452.0, 1,031.1, 1,363.8) | 534.1 (163.5, 372.6, 792.7, 1,071.7) | 505.0 (144.0, 272.3, 769.3, 1,147.1) | 496.1 (170.7, 289.2, 761.3, 1,150.2) | 563.5 (209.8, 328.4, 881.5, 1,370.4) | | 5bDHF | 1.4 (0.6, 0.9, 2.0, 2.9) | 1.4 (0.7, 0.9, 2.2, 2.9) | 1.8 (1.0, 1.3, 2.6, 3.6) | 1.1 (0.4, 0.6, 1.8, 2.6) | 1.5 (0.9, 1.1, 1.9, 2.4) | 1.1 (0.4, 0.6, 1.7, 2.9) | 1.5 (0.7, 1.0, 2.1, 2.7) | | Unknown | 2 | 0 | 0 | 1 | 0 | 1 | 0 | | 5bTHB | 49.3 (17.5, 28.0, 82.7, 120.8) | 53.3 (19.4, 27.5, 98.3, 139.7) | 60.9 (22.5, 34.9, 94.5, 122.4) | 50.0 (18.2, 29.7, 73.1, 103.8) | 43.8 (15.0, 27.5, 89.7, 134.0) | 40.0 (13.6, 24.7, 65.7, 102.1) | 53.5 (18.2, 28.4, 76.7, 123.5) | | Unknown | 1 | 0 | 0 | 0 | 1 | 0 | 0 | | 5bTHE | 3,138.3 (1,060.9, 1,889.5, 4,694.0, 6,288.2) | 3,552.8 (1,452.7, 2,335.3, 4,797.4, 5,636.6) | 3,649.6 (1,594.3, 2,293.5, 5,317.1, 7,827.6) | 2,911.6 (814.5, 1,615.2, 4,050.7, 5,844.7) | 2,754.6 (904.4, 1,448.0, 3,989.3, 5,963.6) | 3,070.1 (1,099.8, 1,785.5, 4,637.7, 5,686.3) | 3,541.6 (1,127.5, 2,010.1, 5,901.3, 7,481.9) | | 5bTHF | 906.5 (303.5, 548.0, 1,416.1, 1,939.7) | 1,116.2 (384.5, 660.8, 1,644.8, 2,389.0) | 1,238.6 (527.4, 743.1, 1,578.3, 2,089.2) | 882.9 (274.3, 542.6, 1,199.8, 1,619.9) | 753.9 (218.1, 389.4, 1,258.7, 1,860.0) | 859.7 (301.2, 492.9, 1,261.3, 1,788.5) | 881.5 (402.8, 565.0, 1,441.1, 1,962.0) | | Unknown | 2 | 2 | 0 | 0 | 0 | 0 | 0 | | 6OHE | 11.9 (3.8, 6.5, 18.4, 27.7) | 13.2 (4.2, 7.6, 20.6, 33.0) | 12.2 (4.3, 6.1, 17.4, 26.2) | 9.2 (3.1, 5.3, 14.1, 20.5) | 13.1 (3.9, 7.1, 19.6, 28.6) | 11.2 (3.7, 6.4, 18.1, 25.5) | 14.3 (4.6, 8.7, 24.3, 32.5) | | 6OHF | 42.8 (11.9, 22.5, 76.7, 127.8) | 51.9 (13.4, 29.8, 93.9, 167.7) | 55.8 (15.3, 29.8, 82.3, 127.7) | 32.3 (8.8, 18.5, 53.3, 77.8) | 36.6 (11.0, 19.7, 68.7, 107.8) | 46.0 (12.3, 27.9, 82.9, 136.6) | 42.0 (13.0, 21.1, 93.2, 128.0) | | **Glucocorticosteroid precursor** | | | | | | | | | S | 0.4 (0.2, 0.3, 0.8, 1.2) | 0.5 (0.2, 0.3, 0.9, 1.4) | 0.4 (0.2, 0.3, 0.7, 1.6) | 0.6 (0.2, 0.4, 0.9, 1.2) | 0.3 (0.2, 0.2, 0.5, 0.7) | 0.4 (0.2, 0.3, 0.7, 1.2) | 0.4 (0.2, 0.2, 0.8, 1.2) | | Unknown | 94 | 6 | 5 | 12 | 9 | 51 | 11 | | **Glucocorticosteroid precursor metabolite** | | | | | | | | | 17HP | 22.3 (10.1, 15.1, 33.5, 49.3) | 17.0 (9.4, 11.1, 27.6, 38.5) | 33.2 (18.6, 23.5, 44.0, 66.0) | 20.3 (8.6, 13.2, 32.2, 48.8) | 20.3 (6.7, 10.8, 33.1, 48.2) | 23.0 (15.3, 17.5, 31.2, 43.8) | 21.8 (11.9, 15.7, 32.2, 50.8) | | Unknown | 1 | 0 | 0 | 0 | 0 | 0 | 1 | | 5bDHS | 0.3 (0.1, 0.2, 0.4, 0.6) | 0.3 (0.1, 0.2, 0.4, 0.6) | 0.3 (0.1, 0.2, 0.5, 0.7) | 0.3 (0.1, 0.2, 0.3, 0.6) | 0.2 (0.1, 0.2, 0.3, 0.4) | 0.3 (0.1, 0.2, 0.4, 0.7) | 0.3 (0.1, 0.2, 0.5, 0.8) | | Unknown | 132 | 5 | 20 | 43 | 0 | 57 | 7 | | 5bTHS | 30.7 (10.1, 18.5, 50.5, 74.3) | 35.7 (14.9, 20.7, 59.2, 98.9) | 34.5 (13.1, 19.8, 52.1, 71.4) | 27.7 (8.8, 17.6, 43.0, 60.0) | 31.3 (9.8, 18.6, 55.1, 84.1) | 26.2 (8.6, 14.2, 40.8, 59.9) | 33.7 (15.7, 20.0, 58.2, 77.9) | | Unknown | 2 | 0 | 0 | 1 | 0 | 1 | 0 | | PT | 200.6 (63.0, 112.8, 342.0, 521.9) | 149.1 (47.9, 87.6, 246.3, 379.7) | 378.8 (148.3, 230.8, 542.8, 813.5) | 253.4 (81.8, 150.0, 404.4, 648.3) | 142.2 (47.3, 82.4, 273.7, 440.3) | 176.4 (57.2, 112.9, 283.3, 378.8) | 189.4 (68.3, 104.9, 306.3, 447.8) | | **Androgen** | | | | | | | | | AED | 0.2 (0.1, 0.2, 0.3, 0.6) | 0.2 (0.2, 0.2, 0.3, 0.3) | 0.3 (0.1, 0.2, 0.5, 0.7) | 0.2 (0.1, 0.1, 0.4, 0.6) | 0.2 (0.1, 0.1, 0.3, 0.4) | 0.2 (0.1, 0.1, 0.3, 0.4) | 0.2 (0.1, 0.1, 1.1, 1.7) | | Unknown | 407 | 0 | 34 | 73 | 117 | 106 | 77 | | T | 0.5 (0.2, 0.3, 1.0, 1.6) | 0.7 (0.5, 0.5, 1.0, 1.3) | 1.0 (0.3, 0.5, 1.9, 3.3) | 0.6 (0.2, 0.3, 1.0, 1.7) | 0.3 (0.1, 0.2, 0.6, 1.0) | 0.4 (0.2, 0.3, 0.7, 1.3) | 0.4 (0.2, 0.3, 0.7, 1.2) | | Unknown | 75 | 0 | 5 | 3 | 29 | 24 | 14 | | **Androgen metabolite** | | | | | | | | | Andros | 186.0 (35.2, 78.1, 394.0, 741.4) | 148.4 (32.8, 72.0, 267.9, 446.0) | 552.2 (203.0, 308.7, 980.2, 1,491.1) | 295.4 (58.8, 129.1, 513.8, 894.7) | 98.4 (19.5, 39.6, 227.5, 388.3) | 134.7 (30.9, 63.4, 293.1, 489.2) | 110.0 (33.1, 61.6, 226.5, 406.1) | | Unknown | 1 | 0 | 0 | 0 | 1 | 0 | 0 | | Etio | 110.9 (24.6, 50.7, 237.8, 451.4) | 75.1 (19.6, 32.6, 151.0, 266.5) | 369.7 (122.7, 231.8, 561.0, 910.0) | 169.7 (44.0, 84.0, 306.1, 560.3) | 74.8 (17.6, 37.6, 122.6, 239.7) | 91.4 (19.2, 45.8, 184.0, 258.4) | 76.2 (24.6, 41.2, 147.0, 234.5) | | Unknown | 1 | 0 | 0 | 0 | 1 | 0 | 0 | | *a*Median (10%, IQR, 90%) | | | | | | | |   Supplementary Table 7. **Participants glucocorticosteroids concentrations, by cohort and overall (HELIX subcohort; 2013-2016).** |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  | | --- | --- | --- | | Exposure | Unadjusted | Adjusted*a* | | **Phenols** | | | | ETPA | 1,297 | 1,289 | | OXBE | 1,297 | 1,277 | | BUPA | 1,297 | 1,276 | | PRPA | 1,297 | 1,275 | | MEPA | 1,297 | 1,266 | | TRCS | 1,297 | 1,255 | | BPA | 1,297 | 1,137 | | **OP pesticide metabolites** | | | | DETP | 1,297 | 1,222 | | DEP | 1,297 | 1,222 | | DMTP | 1,297 | 1,219 | | DMP | 1,297 | 1,172 | | **Phthalate metabolites** | | | | oxo-MiNP | 1,297 | 1,199 | | oh-MiNP | 1,297 | 1,171 | | MBzP | 1,297 | 1,114 | | MEHP | 1,297 | 1,090 | | MEP | 1,297 | 1,054 | | MnBP | 1,297 | 1,035 | | MEHHP | 1,297 | 1,010 | | MEOHP | 1,297 | 1,000 | | MECPP | 1,297 | 980.7 | | MiBP | 1,297 | 927.3 | | *a*Truncated weights. | | |   Supplementary Table 8. **Effective sample size before and after balancing weights estimation (exposures: endocrine disrupting chemicals (EDCs); outcome: hit reaction time standard error (HRT-SE)) (HELIX subcohort; 2013-2016).** |

|  |  |  |
| --- | --- | --- |
|  | Median (IQR) | Range |
| **Characteristic***a* | **N = 1,297***a* | **N = 1,297***a* |
| **OP pesticide metabolites** | | |
| DMP | 0.99 (0.73, 1.25) | 0.49, 1.50 |
| DMTP | 1.00 (0.81, 1.20) | 0.59, 1.39 |
| DEP | 1.01 (0.81, 1.19) | 0.59, 1.39 |
| DETP | 0.99 (0.81, 1.18) | 0.61, 1.41 |
| **Phenols** | | |
| MEPA | 1.01 (0.90, 1.13) | 0.74, 1.25 |
| ETPA | 1.01 (0.96, 1.07) | 0.88, 1.14 |
| PRPA | 1.01 (0.92, 1.12) | 0.80, 1.23 |
| BPA | 0.99 (0.70, 1.27) | 0.38, 1.57 |
| BUPA | 1.01 (0.91, 1.11) | 0.81, 1.22 |
| OXBE | 1.01 (0.92, 1.09) | 0.79, 1.21 |
| TRCS | 1.01 (0.87, 1.13) | 0.68, 1.28 |
| **Phthalate metabolites** | | |
| MEP | 0.93 (0.61, 1.27) | 0.27, 1.77 |
| MiBP | 0.91 (0.46, 1.38) | 0.05, 1.92 |
| MnBP | 0.98 (0.59, 1.33) | 0.20, 1.74 |
| MBzP | 0.98 (0.66, 1.27) | 0.35, 1.62 |
| MEHP | 0.98 (0.64, 1.28) | 0.31, 1.68 |
| MEHHP | 0.96 (0.54, 1.35) | 0.16, 1.76 |
| MEOHP | 0.96 (0.52, 1.35) | 0.16, 1.78 |
| MECPP | 0.95 (0.50, 1.34) | 0.14, 1.84 |
| oh-MiNP | 1.01 (0.74, 1.24) | 0.47, 1.51 |
| oxo-MiNP | 1.01 (0.78, 1.20) | 0.52, 1.43 |
| *a*Truncated weights. | | |

Supplementary Table 9. **Summary statistics of the estimated balancing weights (exposures: endocrine disrupting chemicals (EDCs); outcome: hit reaction time standard error (HRT-SE)) (HELIX subcohort; 2013-2016).**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | HRT-SE*a* | corticosterone production*a* | cortisol production*a* | cortisone production*a* | | **OP pesticide metabolites** | | | | | | DEP | 0.019 (-0.022, 0.061) | -0.082 (-0.276, 0.113) | -0.139 (-0.374, 0.096) | -0.104 (-0.311, 0.103) | | DETP | 0.025 (-0.054, 0.104) | -0.16 (-0.332, 0.012) | -0.071 (-0.264, 0.123) | -0.096 (-0.269, 0.076) | | DMP | -0.034 (-0.093, 0.025) | 0.007 (-0.217, 0.231) | -0.031 (-0.119, 0.057) | -0.069 (-0.207, 0.07) | | DMTP | 0.005 (-0.095, 0.106) | -0.014 (-0.165, 0.137) | -0.21 (-0.326, -0.094) | -0.166 (-0.353, 0.022) | | **Phenols** | | | | | | BPA | 0.032 (-0.026, 0.09) | -0.153 (-0.291, -0.015) | -0.125 (-0.269, 0.018) | -0.085 (-0.216, 0.047) | | BUPA | -0.022 (-0.067, 0.024) | -0.117 (-0.247, 0.012) | -0.129 (-0.209, -0.048) | -0.013 (-0.112, 0.085) | | ETPA | 0.012 (-0.021, 0.045) | -0.254 (-0.416, -0.092) | -0.184 (-0.39, 0.022) | -0.219 (-0.472, 0.034) | | MEPA | -0.001 (-0.061, 0.058) | -0.129 (-0.271, 0.013) | -0.127 (-0.258, 0.004) | -0.144 (-0.257, -0.03) | | OXBE | 0.032 (0.004, 0.061) | -0.213 (-0.486, 0.059) | -0.077 (-0.306, 0.153) | -0.064 (-0.274, 0.146) | | PRPA | 0.015 (-0.045, 0.074) | -0.12 (-0.262, 0.022) | -0.043 (-0.238, 0.151) | -0.102 (-0.223, 0.019) | | TRCS | -0.017 (-0.076, 0.042) | -0.142 (-0.251, -0.034) | -0.13 (-0.248, -0.012) | -0.152 (-0.207, -0.096) | | **Phthalate metabolites** | | | | | | MBzP | -0.066 (-0.126, -0.007) | -0.025 (-0.098, 0.047) | -0.018 (-0.142, 0.107) | -0.079 (-0.174, 0.015) | | MECPP | 0.008 (-0.077, 0.092) | -0.014 (-0.165, 0.137) | -0.043 (-0.084, -0.001) | 0.017 (-0.055, 0.09) | | MEHHP | 0.028 (-0.075, 0.131) | -0.052 (-0.264, 0.161) | -0.091 (-0.208, 0.026) | -0.006 (-0.087, 0.075) | | MEHP | 0.017 (-0.082, 0.115) | -0.165 (-0.26, -0.071) | -0.221 (-0.289, -0.153) | -0.177 (-0.299, -0.055) | | MEOHP | 0.02 (-0.068, 0.108) | -0.061 (-0.232, 0.111) | -0.075 (-0.157, 0.006) | 0.009 (-0.063, 0.08) | | MEP | -0.053 (-0.138, 0.033) | -0.05 (-0.408, 0.308) | -0.083 (-0.384, 0.218) | -0.119 (-0.339, 0.1) | | MiBP | -0.02 (-0.138, 0.098) | 0.037 (-0.175, 0.25) | -0.042 (-0.267, 0.184) | -0.021 (-0.163, 0.12) | | MnBP | -0.035 (-0.11, 0.041) | 0.029 (-0.186, 0.243) | 0.063 (-0.134, 0.26) | 0.017 (-0.077, 0.111) | | oh-MiNP | 0.046 (-0.009, 0.102) | -0.127 (-0.335, 0.08) | -0.181 (-0.33, -0.033) | -0.164 (-0.304, -0.024) | | oxo-MiNP | -0.026 (-0.059, 0.008) | -0.12 (-0.315, 0.076) | -0.146 (-0.303, 0.011) | -0.127 (-0.238, -0.016) | | *a*Estimate and 95% CI. | | | | | |

Supplementary Table 10. **Pairwise differences between marginal contrasts on the logarithmic scale of males and females, for the effect of an increase from the 10th to the 90th percentile of endocrine disrupting chemicals (EDCs) on hit reaction time standard error (HRT-SE), expressed in ms, and on the glucocorticosteroids, expressed in ng/ml (HELIX subcohort; 2013-2016).**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Median (IQR) | Range | | |
| **Characteristic***a* | **females** N = 587*a* | **males** N = 710*a* | **females** N = 587*a* | **males** N = 710*a* |
| **OP pesticide metabolites** | | | | |
| DMP | 0.99 (0.74, 1.25) | 1.00 (0.74, 1.25) | 0.53, 1.46 | 0.53, 1.46 |
| DMTP | 1.00 (0.79, 1.22) | 1.02 (0.82, 1.20) | 0.58, 1.38 | 0.58, 1.38 |
| DEP | 1.01 (0.82, 1.19) | 1.02 (0.84, 1.17) | 0.64, 1.36 | 0.64, 1.36 |
| DETP | 1.00 (0.77, 1.22) | 1.01 (0.82, 1.20) | 0.57, 1.39 | 0.57, 1.39 |
| **Phenols** | | | | |
| MEPA | 1.02 (0.89, 1.15) | 1.02 (0.94, 1.11) | 0.76, 1.23 | 0.76, 1.23 |
| ETPA | 1.02 (0.96, 1.08) | 1.01 (0.97, 1.06) | 0.91, 1.12 | 0.91, 1.12 |
| PRPA | 1.02 (0.92, 1.13) | 1.02 (0.95, 1.10) | 0.82, 1.21 | 0.82, 1.21 |
| BPA | 1.02 (0.73, 1.28) | 1.02 (0.74, 1.25) | 0.41, 1.50 | 0.41, 1.50 |
| BUPA | 1.02 (0.94, 1.10) | 1.01 (0.81, 1.20) | 0.67, 1.29 | 0.67, 1.29 |
| OXBE | 1.03 (0.92, 1.12) | 1.02 (0.94, 1.09) | 0.81, 1.19 | 0.81, 1.19 |
| TRCS | 1.03 (0.92, 1.13) | 1.01 (0.89, 1.12) | 0.73, 1.25 | 0.73, 1.25 |
| **Phthalate metabolites** | | | | |
| MEP | 0.96 (0.67, 1.26) | 0.93 (0.62, 1.30) | 0.31, 1.67 | 0.31, 1.67 |
| MiBP | 0.93 (0.51, 1.39) | 0.96 (0.51, 1.40) | 0.16, 1.85 | 0.16, 1.85 |
| MnBP | 1.00 (0.62, 1.33) | 0.98 (0.59, 1.35) | 0.28, 1.69 | 0.28, 1.69 |
| MBzP | 1.00 (0.70, 1.27) | 0.99 (0.69, 1.27) | 0.40, 1.57 | 0.40, 1.57 |
| MEHP | 1.02 (0.69, 1.28) | 0.98 (0.62, 1.32) | 0.33, 1.62 | 0.33, 1.62 |
| MEHHP | 1.01 (0.60, 1.30) | 0.95 (0.55, 1.36) | 0.26, 1.72 | 0.26, 1.72 |
| MEOHP | 1.00 (0.63, 1.29) | 0.95 (0.52, 1.40) | 0.23, 1.74 | 0.23, 1.74 |
| MECPP | 1.00 (0.59, 1.33) | 0.95 (0.50, 1.37) | 0.23, 1.76 | 0.23, 1.76 |
| oh-MiNP | 1.02 (0.78, 1.22) | 1.00 (0.76, 1.23) | 0.51, 1.46 | 0.51, 1.46 |
| oxo-MiNP | 1.02 (0.83, 1.17) | 1.01 (0.76, 1.21) | 0.58, 1.39 | 0.58, 1.39 |
| *a*Truncated weights. | | | | |

Supplementary Table 11. **Summary statistics of the estimated balancing weights for effect modification (exposures: endocrine disrupting chemicals (EDCs); outcome: hit reaction time standard error (HRT-SE); modifier: sex) (HELIX subcohort; 2013-2016).**

|  |  |  |
| --- | --- | --- |
|  | HRT-SE males*a* | HRT-SE females*a* |
| **OP pesticide metabolites** | | |
| dep | -0.001 (-0.032, 0.031) | -0.02 (-0.066, 0.027) |
| detp | -0.016 (-0.064, 0.031) | -0.041 (-0.091, 0.008) |
| dmp | -0.009 (-0.069, 0.051) | 0.024 (-0.032, 0.081) |
| dmtp | 0.008 (-0.082, 0.099) | 0.003 (-0.083, 0.089) |
| **Phenols** | | |
| bpa | 0.028 (-0.009, 0.065) | -0.004 (-0.055, 0.047) |
| bupa | -0.009 (-0.048, 0.03) | 0.012 (-0.027, 0.052) |
| etpa | 0.013 (-0.027, 0.054) | 0.001 (-0.037, 0.039) |
| mepa | 0.04 (-0.004, 0.083) | 0.041 (0.01, 0.072) |
| oxbe | 0.034 (-0.011, 0.08) | 0.002 (-0.028, 0.031) |
| prpa | 0.017 (-0.05, 0.084) | 0.002 (-0.047, 0.052) |
| trcs | 0.011 (-0.022, 0.043) | 0.028 (-0.058, 0.113) |
| **Phthalate metabolites** | | |
| mbzp | -0.01 (-0.037, 0.018) | 0.057 (0.009, 0.104) |
| mecpp | 0.034 (-0.037, 0.104) | 0.026 (-0.01, 0.061) |
| mehhp | 0.057 (-0.022, 0.136) | 0.028 (-0.017, 0.074) |
| mehp | 0.06 (-0.011, 0.131) | 0.043 (0.004, 0.083) |
| meohp | 0.067 (-0.016, 0.151) | 0.047 (0.016, 0.079) |
| mep | 0.002 (-0.029, 0.033) | 0.054 (-0.005, 0.114) |
| mibp | 0.017 (-0.083, 0.117) | 0.037 (-0.029, 0.104) |
| mnbp | -0.011 (-0.07, 0.047) | 0.023 (-0.037, 0.083) |
| ohminp | 0.058 (-0.003, 0.118) | 0.011 (-0.007, 0.03) |
| oxominp | 0.017 (-0.013, 0.046) | 0.042 (0.034, 0.051) |
| *a*Estimate and 95% CI. | | |

Supplementary Table 12. **Marginal contrasts on the logarithmic scale for effect modification by sex of a increase from the 10th to the 90th percentile of the endocrine disrupting chemicals (EDCs) on hit reaction time standard error (HRT-SE) expressed in ms (HELIX subcohort; 2013-2016).**

|  |  |  |
| --- | --- | --- |
| Exposure | Unadjusted | Adjusted*a* |
| **Phenols** | | |
| OXBE | 976.0 | 960.1 |
| PRPA | 976.0 | 956.0 |
| MEPA | 976.0 | 953.7 |
| BUPA | 976.0 | 952.3 |
| ETPA | 976.0 | 951.7 |
| TRCS | 976.0 | 942.4 |
| BPA | 976.0 | 856.4 |
| **OP pesticide metabolites** | | |
| DEP | 976.0 | 922.1 |
| DETP | 976.0 | 922.1 |
| DMTP | 976.0 | 907.3 |
| DMP | 976.0 | 893.3 |
| **Phthalate metabolites** | | |
| oh-MiNP | 976.0 | 877.9 |
| oxo-MiNP | 976.0 | 873.6 |
| MBzP | 976.0 | 828.8 |
| MEHP | 976.0 | 827.3 |
| MEP | 976.0 | 796.3 |
| MEHHP | 976.0 | 784.8 |
| MECPP | 976.0 | 768.1 |
| MEOHP | 976.0 | 761.5 |
| MnBP | 976.0 | 745.7 |
| MiBP | 976.0 | 690.9 |
| *a*Truncated weights. | | |

Supplementary Table 13. **Effective sample size before and after balancing weights estimation (exposures: endocrine disrupting chemicals (EDCs); outcomes: glucocorticosteroids) (HELIX subcohort; 2013-2016).**

|  |  |  |
| --- | --- | --- |
|  | Median (IQR) | Range |
| **Characteristic***a* | **N = 976***a* | **N = 976***a* |
| **OP pesticide metabolites** | | |
| DMP | 0.99 (0.75, 1.23) | 0.51, 1.46 |
| DMTP | 1.00 (0.78, 1.23) | 0.56, 1.41 |
| DEP | 0.99 (0.81, 1.20) | 0.64, 1.41 |
| DETP | 0.99 (0.82, 1.18) | 0.62, 1.41 |
| **Phenols** | | |
| MEPA | 1.00 (0.90, 1.13) | 0.75, 1.26 |
| ETPA | 1.02 (0.90, 1.14) | 0.72, 1.24 |
| PRPA | 1.00 (0.92, 1.12) | 0.76, 1.26 |
| BPA | 1.00 (0.70, 1.26) | 0.40, 1.58 |
| BUPA | 1.01 (0.90, 1.13) | 0.75, 1.27 |
| OXBE | 1.01 (0.92, 1.10) | 0.78, 1.21 |
| TRCS | 1.01 (0.86, 1.14) | 0.68, 1.29 |
| **Phthalate metabolites** | | |
| MEP | 0.92 (0.60, 1.27) | 0.28, 1.74 |
| MiBP | 0.88 (0.44, 1.38) | 0.09, 1.98 |
| MnBP | 0.97 (0.52, 1.35) | 0.14, 1.84 |
| MBzP | 0.94 (0.68, 1.29) | 0.35, 1.68 |
| MEHP | 0.98 (0.65, 1.29) | 0.33, 1.64 |
| MEHHP | 0.98 (0.56, 1.35) | 0.21, 1.69 |
| MEOHP | 0.98 (0.53, 1.35) | 0.18, 1.77 |
| MECPP | 0.96 (0.55, 1.36) | 0.19, 1.76 |
| oh-MiNP | 0.99 (0.73, 1.26) | 0.45, 1.49 |
| oxo-MiNP | 1.01 (0.71, 1.25) | 0.45, 1.52 |
| *a*Truncated weights. | | |

Supplementary Table 14. **Summary statistics of the estimated balancing weights (exposures: endocrine disrupting chemicals (EDCs); outcomes: glucocorticosteroids) (HELIX subcohort; 2013-2016).**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Median (IQR) | Range | | |
| **Characteristic***a* | **females** N = 434*a* | **males** N = 542*a* | **females** N = 434*a* | **males** N = 542*a* |
| **OP pesticide metabolites** | | | | |
| DMP | 0.98 (0.77, 1.23) | 1.01 (0.76, 1.21) | 0.57, 1.45 | 0.57, 1.45 |
| DMTP | 1.03 (0.78, 1.22) | 1.00 (0.79, 1.23) | 0.56, 1.40 | 0.56, 1.40 |
| DEP | 1.01 (0.85, 1.16) | 1.00 (0.84, 1.19) | 0.67, 1.36 | 0.67, 1.36 |
| DETP | 1.00 (0.77, 1.22) | 1.01 (0.86, 1.17) | 0.57, 1.40 | 0.57, 1.40 |
| **Phenols** | | | | |
| MEPA | 1.01 (0.88, 1.17) | 1.03 (0.94, 1.11) | 0.73, 1.26 | 0.73, 1.26 |
| ETPA | 1.04 (0.92, 1.12) | 1.02 (0.91, 1.12) | 0.78, 1.22 | 0.78, 1.22 |
| PRPA | 1.03 (0.87, 1.16) | 1.02 (0.95, 1.10) | 0.74, 1.24 | 0.74, 1.24 |
| BPA | 1.00 (0.71, 1.29) | 1.01 (0.75, 1.24) | 0.44, 1.52 | 0.44, 1.52 |
| BUPA | 1.02 (0.95, 1.11) | 1.01 (0.80, 1.20) | 0.64, 1.30 | 0.64, 1.30 |
| OXBE | 1.03 (0.86, 1.16) | 1.02 (0.95, 1.09) | 0.76, 1.22 | 0.76, 1.22 |
| TRCS | 1.03 (0.92, 1.13) | 1.01 (0.87, 1.14) | 0.73, 1.25 | 0.73, 1.25 |
| **Phthalate metabolites** | | | | |
| MEP | 0.99 (0.70, 1.24) | 0.95 (0.55, 1.30) | 0.31, 1.68 | 0.31, 1.68 |
| MiBP | 0.92 (0.45, 1.40) | 0.92 (0.54, 1.39) | 0.15, 1.85 | 0.15, 1.85 |
| MnBP | 0.97 (0.51, 1.41) | 0.98 (0.57, 1.32) | 0.21, 1.78 | 0.21, 1.78 |
| MBzP | 0.99 (0.70, 1.26) | 0.98 (0.66, 1.31) | 0.38, 1.58 | 0.38, 1.58 |
| MEHP | 1.01 (0.72, 1.29) | 0.98 (0.61, 1.34) | 0.36, 1.58 | 0.36, 1.58 |
| MEHHP | 1.02 (0.64, 1.31) | 1.00 (0.59, 1.35) | 0.30, 1.63 | 0.30, 1.63 |
| MEOHP | 1.01 (0.62, 1.32) | 1.01 (0.50, 1.41) | 0.24, 1.68 | 0.24, 1.68 |
| MECPP | 0.98 (0.62, 1.32) | 0.98 (0.53, 1.40) | 0.29, 1.67 | 0.29, 1.67 |
| oh-MiNP | 1.00 (0.73, 1.26) | 1.00 (0.78, 1.24) | 0.49, 1.44 | 0.49, 1.44 |
| oxo-MiNP | 1.03 (0.73, 1.27) | 1.02 (0.76, 1.24) | 0.47, 1.45 | 0.47, 1.45 |
| *a*Truncated weights. | | | | |

Supplementary Table 15. **Summary statistics of the estimated balancing weights for effect modification (exposures: endocrine disrupting chemicals (EDCs); outcomes: glucocorticosteroids; modifier: sex) (HELIX subcohort; 2013-2016).**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | corticosterone production males*a* | corticosterone production females*a* | cortisol production males*a* | cortisol production females*a* | cortisone production males*a* | cortisone production females*a* |
| **OP pesticide metabolites** | | | | | | |
| dep | 0.127 (0.003, 0.252) | 0.209 (0.035, 0.383) | 0.105 (-0.049, 0.26) | 0.244 (0.092, 0.396) | 0.11 (-0.024, 0.243) | 0.214 (0.08, 0.348) |
| detp | -0.026 (-0.087, 0.036) | 0.135 (-0.053, 0.323) | -0.046 (-0.13, 0.038) | 0.025 (-0.157, 0.207) | -0.024 (-0.117, 0.07) | 0.073 (-0.104, 0.249) |
| dmp | 0.07 (-0.051, 0.192) | 0.063 (-0.105, 0.231) | 0.029 (-0.083, 0.14) | 0.059 (-0.021, 0.14) | 0.065 (-0.035, 0.165) | 0.134 (0.025, 0.243) |
| dmtp | 0.067 (-0.03, 0.163) | 0.08 (-0.053, 0.214) | -0.026 (-0.084, 0.032) | 0.184 (0.073, 0.296) | 0.063 (-0.024, 0.149) | 0.228 (0.087, 0.37) |
| **Phenols** | | | | | | |
| bpa | 0.218 (0.027, 0.409) | 0.372 (0.177, 0.566) | 0.22 (0.024, 0.416) | 0.345 (0.176, 0.515) | 0.229 (0.082, 0.376) | 0.314 (0.159, 0.469) |
| bupa | -0.109 (-0.22, 0.001) | 0.008 (-0.09, 0.106) | -0.086 (-0.18, 0.008) | 0.043 (-0.062, 0.148) | -0.048 (-0.137, 0.04) | -0.035 (-0.138, 0.068) |
| etpa | 0.084 (-0.029, 0.196) | 0.337 (0.18, 0.494) | 0.08 (-0.031, 0.191) | 0.264 (0.105, 0.422) | 0.076 (-0.02, 0.172) | 0.295 (0.091, 0.499) |
| mepa | 0.022 (-0.047, 0.092) | 0.151 (0.006, 0.296) | 0.013 (-0.059, 0.085) | 0.14 (0.047, 0.233) | 0.047 (-0.013, 0.108) | 0.191 (0.063, 0.319) |
| oxbe | -0.091 (-0.258, 0.076) | 0.122 (-0.034, 0.279) | -0.022 (-0.192, 0.149) | 0.055 (-0.085, 0.194) | -0.023 (-0.188, 0.141) | 0.041 (-0.067, 0.149) |
| prpa | -0.013 (-0.109, 0.083) | 0.107 (-0.042, 0.256) | 0.009 (-0.078, 0.097) | 0.053 (-0.112, 0.218) | -0.01 (-0.067, 0.046) | 0.091 (-0.048, 0.231) |
| trcs | 0.08 (-0.077, 0.238) | 0.223 (0.06, 0.385) | 0.036 (-0.104, 0.176) | 0.166 (0.012, 0.319) | 0 (-0.094, 0.094) | 0.152 (0.015, 0.289) |
| **Phthalate metabolites** | | | | | | |
| mbzp | 0.101 (-0.096, 0.297) | 0.126 (-0.104, 0.356) | 0.062 (-0.145, 0.269) | 0.08 (-0.12, 0.279) | 0.019 (-0.186, 0.224) | 0.098 (-0.021, 0.217) |
| mecpp | 0.208 (-0.001, 0.418) | 0.222 (-0.035, 0.48) | 0.13 (-0.057, 0.317) | 0.173 (-0.028, 0.373) | 0.148 (-0.042, 0.339) | 0.131 (-0.058, 0.321) |
| mehhp | 0.192 (0.014, 0.369) | 0.243 (-0.013, 0.5) | 0.112 (-0.093, 0.318) | 0.203 (-0.011, 0.418) | 0.144 (-0.027, 0.315) | 0.15 (-0.021, 0.321) |
| mehp | 0.202 (0.059, 0.345) | 0.367 (0.216, 0.518) | 0.116 (-0.044, 0.277) | 0.337 (0.176, 0.499) | 0.136 (-0.006, 0.278) | 0.313 (0.188, 0.439) |
| meohp | 0.174 (-0.004, 0.352) | 0.235 (0.001, 0.469) | 0.1 (-0.092, 0.291) | 0.175 (-0.012, 0.361) | 0.113 (-0.052, 0.278) | 0.104 (-0.044, 0.253) |
| mep | 0.03 (-0.246, 0.306) | 0.08 (-0.036, 0.196) | -0.004 (-0.233, 0.225) | 0.079 (-0.048, 0.206) | -0.048 (-0.261, 0.165) | 0.071 (-0.039, 0.181) |
| mibp | 0.153 (0.036, 0.27) | 0.115 (-0.081, 0.312) | 0.043 (-0.062, 0.148) | 0.085 (-0.143, 0.313) | -0.041 (-0.145, 0.063) | -0.02 (-0.147, 0.107) |
| mnbp | 0.153 (-0.054, 0.359) | 0.124 (-0.182, 0.43) | 0.126 (-0.042, 0.294) | 0.063 (-0.256, 0.382) | 0.1 (-0.07, 0.27) | 0.082 (-0.116, 0.281) |
| ohminp | 0.102 (0.045, 0.159) | 0.229 (0.026, 0.432) | 0.051 (-0.065, 0.167) | 0.232 (0.083, 0.382) | 0.046 (-0.027, 0.12) | 0.21 (0.074, 0.347) |
| oxominp | 0.073 (0.022, 0.123) | 0.192 (0.021, 0.363) | 0.035 (-0.101, 0.17) | 0.181 (0.097, 0.264) | 0.021 (-0.064, 0.106) | 0.148 (0.069, 0.227) |
| *a*Estimate and 95% CI. | | | | | | |

Supplementary Table 16. **Marginal contrasts on the logarithmic scale for effect modification by sex of a increase from the 10th to the 90th percentile of the endocrine disrupting chemicals (EDCs) on the glucocorticosteroids expressed in ng/ml (HELIX subcohort; 2013-2016).**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  | | --- | --- | --- | | Exposure | Unadjusted | Adjusted*a* | | cortisone production | 976.0 | 777.2 | | corticosterone production | 976.0 | 757.5 | | cortisol production | 976.0 | 751.5 | | *a*Truncated weights. | | |   Supplementary Table 17. **Effective sample size before and after balancing weights estimation (exposures: glucocorticosteroids; outcome: hit reaction time standard error (HRT-SE)) (HELIX subcohort; 2013-2016).** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  | | --- | --- | --- | |  | Median (IQR) | Range | | **Characteristic***a* | **N = 976***a* | **N = 976***a* | | cortisol production | 1.00 (0.54, 1.39) | 0.14, 1.80 | | cortisone production | 1.00 (0.58, 1.39) | 0.19, 1.73 | | corticosterone production | 0.98 (0.56, 1.39) | 0.15, 1.78 | | *a*Truncated weights. | | |   Supplementary Table 18. **Summary statistics of the estimated balancing weights (exposures: glucocorticosteroids; outcome: hit reaction time standard error (HRT-SE)) (HELIX subcohort; 2013-2016).** |

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|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | |  | HRT-SE*a* | | **Glucocorticosteroids** | | | corticosterone production | 0.126 (0.009, 0.243) | | cortisol production | 0.096 (-0.045, 0.238) | | cortisone production | 0.14 (0.019, 0.261) | | *a*Estimate and 95% CI. | | |   Supplementary Table 19. **Pairwise differences between marginal contrasts on the logarithmic scale of males and females, for the effect of an increase from the 10th to the 90th percentile of the glucocorticosteroids on hit reaction time standard error (HRT-SE) expressed in ms (HELIX subcohort; 2013-2016).** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | Median (IQR) | Range | | | | **Characteristic***a* | **females** N = 434*a* | **males** N = 542*a* | **females** N = 434*a* | **males** N = 542*a* | | cortisol production | 0.97 (0.57, 1.41) | 1.01 (0.58, 1.35) | 0.24, 1.72 | 0.24, 1.72 | | cortisone production | 1.00 (0.61, 1.40) | 1.00 (0.59, 1.38) | 0.26, 1.69 | 0.26, 1.69 | | corticosterone production | 1.00 (0.60, 1.39) | 1.03 (0.56, 1.37) | 0.23, 1.71 | 0.23, 1.71 | | *a*Truncated weights. | | | | |   Supplementary Table 20. **Summary statistics of the estimated balancing weights for effect modification (exposures: glucocorticosteroids; outcome: hit reaction time standard error (HRT-SE); modifier: sex) (HELIX subcohort; 2013-2016).** |