

Name	<b>Amsterdam Born Children and their Development (ABCD study)</b>
Description	The ABCD study examines the health of children from pregnancy until adulthood. It aims to inventarise and analyze the factors in early life that could possibly explain future health and health differences. Focus mainly lies on difference in ethnicity.
Location	Amsterdam
Lead Institute	Amsterdam UMC
Cohort size	8,266 born children followed till adulthood.
Start Cohort	2003
Follow-up	Phase 1(2003 - 2004): pregnancy Phase 2(2003 - 2005): Birth and infancy (age: 3 months) Phase 3(2008 - 2010): Toddler (age: 5 years) Child (age: 7-8 years) Phase 4(2015 - 2016): Teens (age: 11 years) Phase 5(2019 - ): adolescence/ young-adulthood (age: 15 years)
Variables and Measurement methods	<p>Measurements: through questionnaires, blood samples, and health measurements.</p> <p>Variables:</p> <p><b>Phase 1:</b></p> <p><u>Questionnaire during pregnancy for the mother:</u></p> <ul style="list-style-type: none"> <li>- Demographics</li> <li>- Previous pregnancies and complications</li> <li>- Ethnic background/culture</li> <li>- General health, diseases (<i>coded ICPC (International Classification of Primary Care)</i>)</li> <li>- Medication use (<i>coded ATC (Anatomical Therapeutic Chemical classification)</i>)</li> <li>- Intension breastfeeding</li> <li>- Knowledge about and use folic acid</li> <li>- Caffeine and alcohol intake, smoking and drugs</li> <li>- Leisure time physical activity</li> <li>- Fatigue (<i>Multidimensional Fatigue Inventory (MFI)</i>)</li> <li>- Vaginal complains</li> <li>- Pregnancy related anxiety (<i>Pregnancy Related Anxieties Questionnaire (PRAQ)</i>)</li> <li>- Working hours, work stress (<i>Job Content Questionnaire (Karasek)</i>)</li> <li>- Occupation (<i>ISCOO</i>)</li> <li>- Care for children (<i>Parenting Daily Hassle (PDH)</i>)</li> <li>- General depression/anxiety (<i>Center for Epidemiological Studies Depression (CES-D) + State Trait Anxiety Inventory (STAI)</i>)</li> <li>- Fish consumption</li> </ul> <p><u>blood sample</u></p> <ul style="list-style-type: none"> <li>- Prenatal screening</li> <li>- LC PUFA's</li> <li>- Micronutrients (<i>Vitamin D, B12, A, D, Ferritin, Fe, Ca, Zn, Mg, Folic acid</i>)</li> <li>- Lipids (<i>Triglycerides, Total Cholseterol, ApoA1, ApoB, FFA</i>)</li> <li>- Thyroid function (<i>fT4, TSH, Anti-TPO</i>)</li> <li>- Creatine Kinase (CK)</li> <li>- CRP, cortisol</li> </ul>

Pregnancy files

- BMI
- Cycle
- Blood pressure/hypertension
- Random Glucose (on indication)/GDM
- Ultra sounds
- Referral

Dutch perinatal registration

- Apgar score (*Primary, Secondary obstetric care, NICU*)
- Complications/process of birth
- Mortality
- Place of birth

**Phase 2: infancy**

Questionnaire for the mother

- Demographics
- Pregnancy and delivery
- Neonatal hospital care
- Alcohol intake, smoking and drugs
- Diseases (*coded ICPC (International Classification of Primary Care)*)
- Medication ( *Coded ATC (Anatomical Therapeutic Chemical classification )* )
- Supplement use in pregnancy
- Parental asthma and allergy
- Infant feeding
- Crying
- Sleep habits
- Baby's health, congenital malformations (*coded ICD and Eurocat*)
- Burden/pleasure of infant care (*Nijmeegse Vragenlijst voor de Opvoedingssituatie (NVOS)- Plezier + Verzorgingslijst (VL) - verzorging als belasting*)
- Maternal fatigue (*Multidimensional Fatigue Inventory (MFI)*)
- General depression/anxiety (*Center for Epidemiological Studies Depression (CES-D) + State Trait Anxiety Inventory (STAI)*)
- Physical and sexual abuse

Youth Health Care

- Growth
- Infant feeding
- Congenital malformations (*coded ICD and Eurocat*)
- Parental occupation (*ISCOO*)

**Phase 3:**

Questionnaire for the mother (Child age 5-6)

- Demographics
- Birth
- Occupational exposure during pregnancy
- Diseases child (*Coded ICPC (International Classification of Primary Care)*)
- Medication child (*Coded ATC (Anatomical Therapeutic Chemical classification )* )

- Psychosocial problems child (*Strengths & difficulties questionnaire (SDQ) + preschool anxiety scale (only "general anxiety" scale) + short mood & feelings questionnaire*)
- Eating behaviour child (*Child Eating Behaviour Questionnaire (CEBQ)*)
- Leisure time physical activity (*Screentime, playing outside, commuting to school*)
- Sleep duration
- General parenting practices (*Parenting Styles & Dimensions Questionnaire (PSDQ)*)
- Parental alcohol, smoking and drugs
- Family history of diseases
- Maternal psychosocial state (*Depression Anxiety Stress Scale - 21 (DASS-21) + Nijmeegse Ouderlijke Stress Index (bewerking van Amerikaanse Parenting Stress Index (PSI); scale "bonding")*)

#### Questionnaire for the teacher

- General
- Psychosocial problems child (*Strengths & difficulties questionnaire (SDQ)*)
- School performance (*"CITO-scores (national monitoring and evaluation system) ordening, arithmetic and language tests"*)

#### Food frequency questionnaire

#### Health Check

- Anthropometry (*height, weight, hip and waist circumference, leg length, fat%*)
- Autonomic nervous system activation (*heart rate, HRV (time domein, frequency domein), RSA, PEP*)
- Blood pressure/ hypertension
- Blood parameters (*fasting glucose, lipids, c-peptide*)
- Cognition (*Amsterdamse Neurocognitieve Test (ANT) Baseline Speed; Pursuit; Tracking; Response Organisation Objects*)

#### New questionnaire for parents when child is 7-8 years old(3b – IRAS)

- Demographics
- Sleep (*Child Sleep Habit Questionnaire*)
- Asthma and allergies (*ISAAC*)
- Home and bedroom
- Mobile phone use
- Telecommunication pregnancy
- Day care use
- Occupation father (*ISCOO*)

#### EMF and RF measurements

- School
- Home

#### New questionnaire for parents when child is 7-8 years old(3c – OS)

- Demographics
- Screentime, playing outside, sport membership
- Sleep

- Walking, cycling
- Questionnaire child
- Physical activity (*frequency / duration*)

Health check

- Anthropometry (*length, weight*)
- Blood pressure
- Muscle strength (*hand grip, standing broad jump*)
- Aerobic fitness (*shuttle run test*)
- Physical activity (*7 day accelerometry*)

**Phase 4:**

Youth health care registration Amsterdam

- Anthropometry (*length, weight*)
- Psychosocial problems child (*SDQ*)
- General health (*school situation, dental health, nutrition*)
- Puberty (*girls only*)

Questionnaire for the child

- Demographics
- Sleep
- Psychosocial problems (*Strengths and Difficulties Questionnaire (SDQ)*)
- Mobile phone, tablet and laptop use
- Risk profile (*The Substance Use Risk Profile Scale (SURPS)*)
- Nutritional habits
- alcohol and smoking
- physical activity and sport membership

Questionnaire for the mother

- Demographics
- General health (*Puberty Development Scale (PDS); life events*)
- Psychosocial problems child (*strengths & difficulties questionnaire (SDQ)+ Behavior Rating Inventory of Executive Function Questionnaire (BRIEF)*)
- Eating behavior and parenting practices concerning feeding (*Child Eating Behaviour Questionnaire (CEBQ) (2 domeinen 'Food responsiveness' en 'Satiety responsiveness') + The Child Feeding Questionnaire (CFQ) + Comprehensive Feeding Practices Questionnaire (CFPQ).)*)
- Mobile phone, tablet and laptop use
- Sleep (*The Children's Sleep Habits Questionnaire (CSHQ)*)
- General parenting practices (*Parenting Styles and Dimensions Questionnaire-32 (PSDQ-32) + Child Caregiving Involvement + Nijmeegse ouderlijke stress index*)
- Maternal lifestyle and health
- Maternal psychosocial state (*Depression Anxiety Stress Scale (DASS-21)*)
- Maternal nutritional habits

Questionnaire for the father

- Demographics
- Eating behaviour and parenting practices concerning feeding (*The Child Feeding Questionnaire (CFQ) + Comprehensive Feeding Practices Questionnaire (CFPQ).)*)

	<ul style="list-style-type: none"> <li>- General parenting practices (<i>Parenting Styles and Dimensions Questionnaire-32 (PSDQ-32) + Child Caregiving Involvement + Nijmeegse ouderlijke stress index</i>)</li> <li>- Paternal lifestyle and health</li> <li>- Paternal psychosocial state (<i>Depression Anxiety Stress Scale (DASS-21)</i>)</li> <li>- Paternal nutritional habits</li> <li>-</li> </ul> <p><u>Questionnaire for the teacher</u></p> <ul style="list-style-type: none"> <li>- General questions</li> <li>- Psychosocial problems child (<i>SDQ</i>)</li> <li>- School performance ("<i>CITO-scores (national monitoring and evaluation system) ordening, arithmetic and language tests</i>")</li> </ul> <p><u>Computer tests</u></p> <ul style="list-style-type: none"> <li>- Cognition (<i>RAVEN (n= ± 1842)</i>)</li> <li>- Memory (<i>Self-Ordered Pointing Task (SOPT)</i>)</li> <li>- Risk taking behavior (<i>Balloon Analogue Risk Task (BART) (n=2017)</i>)</li> </ul> <p><u>Health check</u></p> <ul style="list-style-type: none"> <li>- Anthropometry (<i>height, weight, hip and waist circumference, leg length, fat%</i>)</li> <li>- Autonomic nervous system activation (<i>heart rate, HRV (time domain, frequency domain), RSA, PEP</i>)</li> <li>- Blood pressure/hypertension</li> <li>- Blood parameters (<i>fasting glucose, lipids, lipodome</i>)</li> <li>- Muscle strength (<i>hand grip, standing broad jump</i>)</li> <li>- Ultra sound scans (<i>cIMT, abdominal fat</i>)</li> <li>- Psychological interview(trauma) (<i>CRIES, CBCL, YSR.</i>)</li> </ul> <p><u>Measurements on location</u></p> <ul style="list-style-type: none"> <li>- Physical activity (<i>7 days accelerometry (actigraph) and shuttle run test</i>)</li> <li>- Light measurement (<i>7 days Lightwatcher</i>)</li> <li>- Electromagnetic radiation (<i>bedroom measurement+ questionnaire phone use+3day measurer</i>)</li> </ul> <p><b>phase 5:</b> this phase will also include a questionnaire for the child and the parents. No further information is available yet.</p>
Availability and Type of -omic data	Blood samples (N = 4300) Genetic GWAS (N = 1154)
Design paper	<a href="#">van Dijk et al. 2010</a>
Website	<a href="http://www.abcd-studie.nl/">www.abcd-studie.nl/</a>