|  | EU-AIMS LEAP T1 (baseline) cohort: Clinical information |
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| **Date:** | 29.08.2019 |
| **Database release** | 15.12.2017 |
| **Database release version** | v2.1 |
| **Legend version:** | V7.4 |
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| **Code for missing information** | |
| **999** | Question was not asked, and the answer was not provided |
| **777** | Question was asked, but the answer was not provided by the participant/parent |

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| **Clinical information** | | | |
| **Variable Name** | **Label/Description** | **Value Codes/Notes** | |
| **participant\_id** | Identification number of individual given by study |  | |
| **t1\_group** | Group of participants | **1** | Typically developing (TD) |
| **2** | Autism Spectrum Disorder (ASD) |
| **3** | Intellectual disability & no ASD diagnosis (ID-control) |
| **4** | Intellectual disability & ASD diagnosis (ID-ASD) |
| **t1\_diagnosis** | Diagnostic status of participants (may be useful to use in some analyses rather than variable coding “t1\_group”) | **1** | Control  (includes t1\_group=1 & 4) |
| **2** | Autism Spectrum Disorder (ASD)  (includes t1\_group=2 & 4) |
| **t1\_asd\_tresh** | ASD group identification with ‘narrower’ definition of ASD: codes only for individuals with ASD. TD/Mild ID no ASD=999  For further information, please consult “LEAP clinical recommendation\_analysis strategy - 26-09-2017.doc” and/or contact Julian Tillmann | **0** | No (Does not meet narrower ASD threshold) |
| **1** | Yes (Meets narrower ASD threshold) |
| **777** | N/A – Not able to determine, missing data |
| **t1\_site** | Site that data was collected from | **1** | King’s College London (KCL) |
| **2** | Nijmegen |
| **3** | Cambridge |
| **4** | Utrecht |
| **5** | Mannheim |
| **6** | Rome |
| **t1\_schedule\_enrol** | Assigned schedule at enrolment (as recorded in eCRF) | **1** | Adults |
| **2** | Adolescents |
| **3** | Children |
| **4** | Adolescents/Adults with IQ <75 |
| **t1\_schedule\_adj** | Schedule after IQ adjustment (Schedule 1-2: IQ >=75; Schedule 4: IQ 50-74) and age adjustment (Schedule 1: 18+; Schedule 2: 12 - <18; Schedule 3: < 12) | **1** | Adults |
| **2** | Adolescents |
| **3** | Children |
| **4** | Adolescents/Adults with IQ <75 |
| Note: t1\_schedule\_adj should be the preferred variable in analyses to allow consistency across analyses | | | |
| **t1\_sex** | Sex of individual | **-1** | Female |
| **1** | Male |
| **t1\_nat\_speaker** | Participant native or non-native speaker | **0** | Non-native speaker |
| **1** | Native speaker |
| **t1\_age** | Age of individual (in days) – as recorded in eCRF |  | |
| **t1\_ageyrs** | Age of individual (in years) – as recorded in eCRF |  | |

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| **IQ information** | | |
| **Variable Name** | **Label/Description** | **Value Codes/Notes** |
| **t1\_viq** | Measure of intellectual functioning | Verbal IQ |
| **t1\_piq** | Non-verbal IQ |
| **t1\_fsiq** | Full-scale IQ |
| Note: VIQ, PIQ or FSIQ (depending on specific analysis done) should be the preferred variables in analyses to allow consistency across analyses | | |
| **t1\_iqtype** | Type of IQ test used at T1 | String answer: e.g. WASI2, WAIS3, WAIS4, etc.  WAISR = Wechsler Adult Intelligence Scale-Revised  WA4VP = WAIS-IV using Visual Puzzles  WA4MR = WAIS-IV using Matrix Completion  REUSE = Reused scores |
| **t1\_iqwechrawscores\_bd\_raw** | Block design: raw score |  |
| **t1\_iqwechrawscores\_bd\_t** | Block design: raw score |  |
| **t1\_iqwechrawscores\_vo\_raw** | Vocabulary: raw score |  |
| **t1\_iqwechrawscores\_vo\_t** | Vocabulary: raw score |  |
| **t1\_iqwechrawscores\_mr\_raw** | Matrix Reasoning: raw score |  |
| **t1\_iqwechrawscores\_mr\_t** | Matrix Reasoning: raw score |  |
| **t1\_iqwechrawscores\_vp\_raw** | Visual Puzzles: raw score |  |
| **t1\_iqwechrawscores\_vp\_t** | Visual Puzzles: raw score |  |
| **t1\_iqwechrawscores\_pc\_raw** | Picture Completion: raw score |  |
| **t1\_iqwechrawscores\_pc\_t** | Picture Completion: raw score |  |
| **t1\_iqwechrawscores\_si\_raw** | Similarities: raw score |  |
| **t1\_iqwechrawscores\_si\_t** | Similarities: raw score |  |

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| **Medication information** | | | |
| **Variable Name** | **Label/Description** | **Value Codes/Notes** | |
| **t1\_med\_use** | Participant taking medication acting on the nervous system (see note below) | **0** | No medication use |
| **1** | Medication use |
| **2** | Other medication use |
| **3** | Unknown/missing medication use |
| **t1\_drugclass\_1** | Free-text entry detailing drug class of medication if med\_use= Medication use (see list below) | Participants may be using 1-3 different medications at T1 across the categories below | |
| **t1\_drugclass\_2** |
| **t1\_drugclass\_3** |
| Note: Here we outline the process by which we generated T1 medication information   1. The medication use of participants at baseline was subjected to a high-level grouping according to whether the medication taken has an effect on the brain 2. To do so, we mapped each medication reported (e.g. Methylphenidate hydrochloride) to the ATC classification system. If a medication has an effect on the brain, it is designated with the Level-1 ATC code “N”. 3. We retained all reported medication data with the associated ATC code “N” 4. This information then allows to include/exclude or group participants in analyses depending on the pharmacological effect of the medication used.   We provide two levels of information:   1. **t1\_med\_use**: Global psychoactive medication use. Coded with “yes”/”no”/”unknown” 2. **t1\_drugclass\_1-3**: If t1\_med\_use=yes, we detail here the pharmacological subgroup/category this particular medication relates to. See the list below:  |  |  | | --- | --- | | **Medication** | **Category** | | Selective serotonin reuptake inhibitor (ssri) | Antidepressant | | Tricyclic antidepressant (tca) | Antidepressant | | Tetracyclic antidepressant (teca) | Antidepressant | | Antiepileptics | Antiepileptics | | Antimigraine preparations | Antimigraine preparations | | Aripiprazole | Antipsychotic | | Clozapine | Antipsychotic | | Pipamperon | Antipsychotic | | Quetiapine | Antipsychotic | | Risperidone | Antipsychotic | | Anxiolytics | Anxiolytics | | Drugs used in addictive disorder | Drugs used in addictive disorder | | Hyoscine Butylbromide | Hypnotics and sedatives | | Melatonin | Hypnotics and sedatives | | Niaprazine | Hypnotics and sedatives | | Other analgesics and antipyretics | Other analgesics and antipyretics | | Atomoxetine | Psychostimulants and other drugs used to treat ADHD | | Dexamfetamine | Psychostimulants and other drugs used to treat ADHD | | Methylphenidate hydrochloride | Psychostimulants and other drugs used to treat ADHD | | | | |

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| **Demographic information** | | | |
| **Variable Name** | **Label/Description** | **Value Codes/Notes** | |
| **t1\_ethnicity** | Parent-reported ethnicity of individual | **1** | 777 |
| **2** | Asian |
| **3** | Black |
| **4** | White |
| **5** | Mixed Race |
| **6** | Other |
| **7** | Decline |
| **8** | Don’t know |
| **t1\_education\_moth** | Parental education – Mother | **1** | Primary |
| **2** | Secondary – GCSE |
| **3** | Secondary – A-levels |
| **4** | Tertiary – Undergraduate |
| **5** | Tertiary – Postgraduate |
| **6** | Not known |
| **t1\_education\_fath** | Parental education – Father | **1** | Primary |
| **2** | Secondary – GCSE |
| **3** | Secondary – A-levels |
| **4** | Tertiary – Undergraduate |
| **5** | Tertiary – Postgraduate |
| **6** | Not known |
| **t1\_handedness** | Categorical variable indicating handedness of participant | “999”: Missing  “Left(1)” : Left handedness  “Ambidextrous (2)” : Ambidextrous  “Right (3)” : Right handedness | |
| **t1\_handedness\_score** | Continuous variable indicating handedness of participant | Range from +500 (completely right) to -500 (completely left) | |

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| **ADI-R: Diagnostic instrument** | | |
| **Variable Name** | **Label/Description** | **Value Codes/Notes** |
| **t1\_adi\_social\_total** | ADI-R Social domain total score |  |
| **t1\_adi\_communication\_total** | ADI-R Communication domain total score |  |
| **t1\_adi\_rrb\_total** | ADI-R Restricted and Repetitive Behaviours total domain score |  |

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| **ADOS-2: Diagnostic instrument** | | |
| **Variable Name** | **Label/Description** | **Value Codes/Notes** |
| **t1\_css\_total** | Calibrated Severity Scores (CSS) Total | CSS based on full data |
| **t1\_sa\_css** | Social Affect CSS |
| **t1\_rrb\_css** | Restricted and Repetitive Behaviours CSS |
| **t1\_css\_total\_imputed** | Imputed CSS Total | CSS imputed from ADOS-G total summary scores for Module 3 & 4 separately (see note below) |
| **t1\_sa\_css\_imputed** | Imputed Social Affect CSS |
| **t1\_rrb\_css\_imputed** | Imputed Restricted and Repetitive Behaviours CSS |
| **t1\_css\_total\_all** | CSS Total | Combined CSS (CSS based on full data & imputed CSS) |
| **t1\_sa\_css\_all** | Social Affect CSS |
| **t1\_rrb\_css\_all** | Restricted and Repetitive Behaviours CSS |
| Note: Combined CSS should be used in analyses to make use of all participants in the dataset. Refer to imputation procedure if required. | | |

Calculation of ADOS-2 algorithm total scores for Social Affect, RRB and Overall total (required to derive CSS):

* ADOS 2 Module 1-3 SA, RRB and Overall total (SA+RRB) calculated according to ADOS 2 Manual. ADOS 2 Module 4 algorithm calculated according to Hus & Lord (2014) *JADD*.
* If ADOS 2 was not available, ADOS G Module 3 & 4 algorithm item scores were mapped onto ADOS 2 Module 3 & 4 algorithm scores.

Calculation of ADOS Calibrated Severity Scores (CSS):

* Total Module 1-3: Gotham, Pickles, Lord (2009) *JADD*
* Total Module 4: Hus & Lord (2014) *JADD*
* SA & RRB Module 1-3: Hus, Gotham, Lord (2014) *JADD*
* SA & RRB Module 4: Hus & Lord (2014) *JADD*

Details on imputation procedure (imputed observations: *N* = 52; 12% of total ASD observations)

Variables included in the imputation procedure, due to their high correlation with ADOS CSS, were ADOS-G Communication and Social Interaction Total scores for ADOS CSS Social Affect (Module 3 & 4: *r* = .92) and ADOS-G Stereotyped Behaviours and Restricted Interests Total scores for ADOS CSS RRB (Module 3: *r* = .81; Module 4: *r* = .66) and run for Module 3 and 4 separately. To satisfy the missing at random (MAR) assumption, site was included as an auxiliary variable in the model and a total of 30 imputations were run for each outcome variable.

*If more information on the imputation procedure is required, please contact julian.tillmann@kcl.ac.uk*

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| **Dimensional ASD measures** | | | |
| **Variable Name** | **Label/Description** | **Value Codes/Notes** | |
| **Social Responsiveness Scale-2 (SRS-2)** | | | |
| **t1\_srs\_tscore** | SRS-2 Total T-score (parent-report)\* |  | |
| **t1\_srs\_tscore\_self** | SRS-2 Total T-score (self-report) |  | |
| **t1\_srs\_rawscore** | SRS-2 Total Raw-score (parent-report) |  | |
| **t1\_srs\_rawscore\_self** | SRS-2 Total Raw-score (self-report) |  | |
| **t1\_srs\_tscore\_combined** | SRS-2 Total T-score (combined parent- and self-report) | Parent-report score prioritised over self-report score | |
| **t1\_srs\_rawscore\_combined** | SRS-2 Total Raw score (combined parent- and self-report) |
| **Children's Social Behavior Questionnaire (CSBQ)/ Adult's Social Behavior Questionnaire (ASBQ)** | | | |
| **t1\_csbq\_total\_score** | CSBQ Total score (parent-report) |  | |
| **t1\_asbq\_total\_adult\_parent** | ASBQ Total score (parent-report) |  | |
| **t1\_asbq\_total\_adult\_self** | ASBQ Total score (self-report) |  | |
| **Autism Quotient (AQ)** | | | |
| **t1\_aq\_child\_total** | AQ Total score (Child version) parent-report |  | |
| **t1\_aq\_adol\_total** | AQ Total score (Adolescent version) parent-report |  | |
| **t1\_aq\_adult\_total** | AQ Total score (Adult version) self-report |  | |
| **Repetitive Behaviors Scale-Revised (RBS-R)** | | | |
| **t1\_rbs\_total** | RBS-R Total score (parent-report) |  | |
| **Short Sensory Profile (SSP)** | | | |
| **t1\_ssp\_tactile** | Tactile Sensitivity (parent-report) |  | |
| **t1\_ssp\_taste** | Taste/Smell Sensitivity (parent-report) |  | |
| **t1\_ssp\_move** | Movement Sensitivity (parent-report) |  | |
| **t1\_ssp\_underresp** | Underresponsive/Seeks Sensation |  | |
| **t1\_ssp\_audfilt** | Auditory Filtering |  | |
| **t1\_ssp\_lowenergy** | Low Energy/Weak |  | |
| **t1\_ssp\_visualaudisens** | Visual/Auditory Sensitivity |  | |
| **t1\_ssp\_total** | Total score (parent-report) |  | |
| **t1\_ssp\_prorated** | Sub-scale and Total score pro-rated  Novel sub-scale: Hypersensitivity (5- Factor solution) | **0** | Not pro-rated |
| **1** | Pro-rated sub-scale only |
| **2** | Pro-rated sub-scale & total score |
| **t1\_ssp\_hype** | Sub-scale and Total score pro-rated | Contact Julian Tillmann for further details | |
| **t1\_ssp\_underrespo\_mod** | Novel sub-scale: Hypersensitivity (5- Factor solution) | Contact Julian Tillmann for further details | |

Note: \*exact SRS2-2 parent-report T-score >90 not calculated, therefore converted to 90

In green recommended outcome variables

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| **Measures of associated psychiatric comorbidities** | | | |
| **Variable Name** | **Label/Description** | **Value Codes/Notes** | |
| **t1\_adhd\_inattentiv\_parent** | ADHD rating scale – inattentiveness (parent-report) |  | |
| **t1\_adhd\_hyperimpul\_parent** | ADHD rating scale – hyperactivity/impulsivity (parent-report) |  | |
| **t1\_adhd\_inattentiv\_self** | ADHD rating scale – inattentiveness (self-report) |  | |
| **t1\_adhd\_hyperimpul\_self** | ADHD rating scale – hyperactivity/impulsivity (self-report) |  | |
| **t1\_adhd\_cat\_parent** | Categorical indicator whether participant meets DSM-5 criteria for ADHD on ADHD rating scale (based on parent-reported scores) | **0** | Does not meet DSM-5 criteria for ADHD |
| **1** | Meets DSM-5 criteria for ADHD |
| **t1\_adhd\_cat\_self** | Categorical indicator whether participant meets DSM-5 criteria for ADHD on ADHD rating scale (based on self-reported scores) | **0** | Does not meet DSM-5 criteria for ADHD |
| **1** | Meets DSM-5 criteria for ADHD |
| **t1\_adhd\_cat\_combined** | Combined indicator score whether participant meets DSM-5 criteria for ADHD on ADHD rating scale (combining information from parent-report & self-report) | **0** | Does not meet DSM-5 criteria for ADHD |
| **1** | Meets DSM-5 criteria for ADHD |
| **Beck Anxiety** | | | |
| **t1\_beck\_anx\_adulta\_self** | Beck Anxiety Total raw score | Adult version; self-report (Adult schedule only) | |
| **t1\_beck\_anx\_youthb\_self** | Beck Anxiety Total raw score | Beck Youth Inventory; self-report (Adolescent schedule only) | |
| **t1\_beck\_anx\_youthb\_self\_tscore** | Beck Anxiety T-score | Beck Youth Inventory; self-report (Adolescent schedule only) | |
| **t1\_beck\_anx\_youthcd\_parent** | Beck Anxiety Total raw score | Beck Youth Inventory; parent-report (Children and Mild ID schedule only) | |
| **t1\_beck\_anx\_youthcd\_parent\_t** | Beck Anxiety T-score | Beck Youth Inventory; parent-report (Children and Mild ID schedule only) | |
| **t1\_beck\_anx\_adultd\_parent** | Beck Anxiety Total raw score | Adult version; adult-report (Mild ID schedule only) | |
| **Beck Depression** | | | |
| **t1\_beck\_dep\_adulta\_self** | Beck Depression Total raw score | Adult version; self-report (Adult schedule only) | |
| **t1\_beck\_dep\_youthb** | Beck Depression Total raw score | Beck Youth Inventory; self-report (Adolescent schedule only) | |
| **t1\_beck\_dep\_youthb\_self\_tscore** | Beck Depression T-score | Beck Youth Inventory; self-report (Adolescent schedule only) | |
| **t1\_beck\_dep\_youthcd** | Beck Depression Total raw score | Beck Youth Inventory; parent-report (Children and mild ID schedule only) | |
| **t1\_beck\_dep\_youthcd\_parent\_t** | Beck Depression T-score | Beck Youth Inventory; parent-report (Children and mild ID schedule only) | |
| **t1\_beck\_dep\_adultd\_parent** | Beck Depression Total raw score | Adult version; adult-report (Mild ID schedule only) | |

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| **DAWBA** | | |
| **t1\_dawba\_dep** | DAWBA Depression band (DSM-IV & ICD-10) | Ordinal score 0-5 |
| **t1\_dawba\_adhd** | DAWBA ADHD band (DSM-IV) |
| **t1\_dawba\_anx** | DAWBA Pooled Anxiety Disorder band (DSM-IV)\* |
| **t1\_dawba\_behavdis** | DAWBA Behavioural Disorder band (DSM-IV & ICD-10) | Ordinal score 1-5 |
| **t1\_dawba\_int** | DAWBA Internalising Behaviour band (DSM-IV) | Ordinal score 0-5 |
| **t1\_dawba\_ext** | DAWBA Externalising Behaviour band (DSM-IV) |
| **Important note:**  To maximise the number of observations with available DAWBA scores and allow analyses across biomarker modalities with the largest sample possible, we have decided to create a Combined/Overall output. This Combined/Overall output utilises a built-in DAWBA algorithm, recommended by the author of the instrument, to create DAWBA scores based on reports by either the primary caregiver (mother, father, parents, grandparents, etc.), the proband, or a combination of caregiver and proband (multi-informant).  Thus, for some participants, scores on the 6 DAWBA bands described above may be based on either only the primary caregiver, only the proband, or a combination of caregiver and proband (multi-informant).  This produces a notable caveat, namely that the Combined/Overall output does not allow to stratify DAWBA scores by type of informant. Accounting for the effect of informant (caregiver vs. self vs. both) may however be important in some analyses, particularly in those that compare/contrast DAWBA scores with other clinical report measures (that may be based on either parent- or self-report only). In those instances, we recommend using the parent-reported SDQ scores to take account of the effect of informant.  If you have any questions about the applicability of DAWBA scores in your project, please consult with Julian Tillmann (E-mail: julian.tillmann@kcl.ac.uk) or Bethany Oakley (bethany.oakley@kcl.ac.uk) to obtain further guidance. | | |
| **Strengths & Difficulties Questionnaire** | | |
| **t1\_sdq\_total\_difficulties\_p** | Total Difficulties Score  (parent-report) | Sum of Emotional, conduct, hyperactivity and peer problems scales. |
| **t1\_sdq\_emotional\_p** | Emotional Symptoms Score (parent-report) |  |
| **t1\_sdq\_conduct\_p** | Conduct Problems Score  (parent-report) |  |
| **t1\_sdq\_hyperactivity\_p** | Hyperactivity Score  (parent-report) |  |
| **t1\_sdq\_peer\_p** | Peer Problems Score  (parent-report) |  |
| **t1\_sdq\_prosocial\_p** | Prosocial Score  (parent-report) |  |
| **t1\_sdq\_impact\_p** | Impact Score  (parent-report) |  |
| **t1\_sdq\_internalising\_p** | Internalising Score  (parent-report) | Sum of Emotional and Peer Problems scales |
| **t1\_sdq\_externalising\_p** | Externalising Score  (parent-report) | Sum of Conduct and Hyperactivity scales |

Note: In green are the recommended outcome variables

DAWBA Pooled Anxiety Disorder band (DSM-IV)\*: To facilitate comparisons and following Angold et al. (2012), we created a pooled anxiety prediction score reflecting an individual’s highest risk score across a group of disorders (OCD, generalised anxiety, panic disorder, agoraphobia, PTSD, separation anxiety, social phobia, & specific phobia).  
  
Ref: Angold, A., Erkanli, A., Copeland, W., Goodman, R., Fisher, P. W., & Costello, E. J. (2012). Psychiatric diagnostic interviews for children and adolescents: a comparative study. Journal of the American Academy of Child & Adolescent Psychiatry, 51(5), 506-517.

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| **Measures of adaptive functioning – Vineland-II** | | |
| **Variable Name** | **Label/Description** | **Value Codes/Notes** |
| **t1\_vabsdscoresc\_dss** | Vineland-II Communication Domain Score | Domain Standard Score |
| **t1\_vabsdscoresd\_dss** | Vineland-II Daily Living Domain Score |
| **t1\_vabsdscoress\_dss** | Vineland-II Socialisation Domain Score |
| **t1\_vabsabcabc\_standard** | Vineland-II Adaptive Behaviour Composite (ABC) standard score | Standard Score |