WP5: Respiratory Health

Data harmonization manual

Authors: Evelien van Meel, Rosalie Mensink-Bout, Liesbeth Duijts (ERASMUS)

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Aim

The aim of this work package is to examine respiratory tract development and disease trajectories throughout the life course, focusing on asthma and chronic obstructive pulmonary disease (COPD). We will examine the associations of exposure to early-life stressors during preconception, pregnancy, infancy and early childhood with respiratory health and disease during childhood, adolescence and adulthood

We have developed a list of respiratory and related (atopic) variables that are of interest for the EU Child Cohort Network. These variables have been selected based on prior experience with meta-analyses and data availability in the participating cohorts.

Variables and instructions

The respiratory variables list provides a description of the proposed variables: their name, description and instructions for how to derive the harmonised LifeCycle variables.

We have grouped the respiratory variables into the following groups

- Maternal characteristics (for some, please see core variable list WP1)
- Respiratory disease
- Allergic disease
- Skin disease
- Respiratory diseases in adulthood

Please note: some variables related to this work package, such as maternal asthma and smoking during pregnancy, are not in the respiratory variables list, since these variables were already harmonized within WP1. These variables can therefore be found in the core variable list.

Variable prioritization

We have assigned two different levels of priority to the variables. The highest priority variables were selected based on the variables that are part of the main LifeCycle WP5 outcomes, on number of studies that have these data and on data that is needed for the proof of principle paper. Please note that because of the latter, one exposure variable (pet exposure during pregnancy) has also been included.

The following are the highest priority variables:

- Maternal allergy (food or inhalant)
- Wheezing (ever between ages 0-4 year, and ever between ages 5-10 years)
- Ever asthma (CHICOS definition)
- Current asthma (MeDALL definition)
- Lung function measurements
- Inhalant allergy (ever)
- Inhalant allergic sensitization (SPT and/or specific IgE)
- Asthma in adulthood
- COPD in adulthood (GOLD criteria)
- Pet exposure during pregnancy

We suggest that you begin with the highest priority variables. Harmonisation of the highest priority variables should be completed by **September 2019**. Harmonisation of all the remaining variables should be completed by **February 2020**.

Harmonisation

When harmonizing the variables, please use the cleanest variables available within your cohort. Harmonisation is done in the wide format. When creating variables, if no data exist within your cohort for a given variable at any age or at specific ages, then skip these and don't create the variable. For example, if there are no lung function measures then don't create any lung function measure variables.

If there is only one measure of inhalant allergic sensitization by skin prick test at the age of 7.5 years, then you only need to create the variable inh_all_sens_SPT_7. For repeated measures, please use the actual age at time of measurement (as opposed to the average age of the cohort at follow-up).

A brief explanation of the table headings is given below (Table 1). The actual respiratory variables table follows on the following pages (Table 3), and additionally as a separate excel file.

For continuous variables (data type 'decimal'), a description of the required units for each variable is provided in the harmonization table.

Please record a description of harmonization, to be entered in the online catalogue. This includes a description of the source variables and whether the variable is fully or partially harmonized. Where a variable is only partially harmonized, please provide an explanation for why the variable is partially harmonized in the harmonization description.

If you have any queries about harmonization or the WP5 variables list please contact Rosalie Mensink-Bout (s.mensink-bout@erasmusmc.nl) and Liesbeth Duijts (l.duijts@erasmusmc.nl) from WP5.

Variable name	**Label/description**	**Values**	**Unit**	**Data Type**	**Comments**	**Further instructions**
The name of the harmonised variable. This name needs to match exactly with the derived (harmonised) variable.	The description of the harmonised LifeCycle variable (matches with that provided in the online catalogue). There is no need to label variables.	Details the categories for categorical and binary variables.	Gives the units for continuous variables	The data type: decimal, binary, categorical and integer. Binary, categorical and integer variables will be included as integer variables in Opal. For decimal variables, the level of precision available within the cohort should be maintained.	Instructions/ comments for harmonization	Further specific instructions for harmonization.

Table 1. A brief explanation of the harmonization table headings

Respiratory health variables harmonization table

	Variable name	Label/description	Values	Unit	Data Type	Comments	Further instructions
highest priority variables (deadline Sept 2019)							
2nd priority variables (deadline Feb 2020)							
META VARIABLES							
Mother identifier	mother_id	Unique identifier number for the mother			Integer	Either the original id or a new id generated by the cohort	Should already be created for the core variable list, please add here to make it possible to combine data
Child identifier	child_id	Unique identifier number for the index child			Integer	Either the original id or a new id generated by the cohort	Should already be created for the core variable list, please add here to make it possible to combine data
MATERNAL CHARACTERISTICS:							
HEALTH-RELATED CHARACTERISTICS							
Maternal eczema	eczema_m	Maternal history of eczema before pregnancy (of index child)	0) No 1) Yes		Binary	Where data are available, eczema should be doctor diagnosed. If no information is available on doctor diagnosis, the variable is partially harmonised.	
Maternal inhalant allergy	allergy_inh_m	Maternal history of inhalant allergy before pregnancy (of index child)	0) No 1) Yes		Binary	Where data are available, inhalant allergy should be doctor diagnosed. If no information is available on doctor diagnosis, the variable is partially harmonised.	
Maternal food allergy	allergy_food_m	Maternal history of food allergy before pregnancy (of index child)	0) No 1) Yes		Binary	Where data are available, food allergy should be doctor diagnosed. If no information is available on doctor diagnosis, the variable is partially harmonised.	

Maternal allergy (food or inhalant)	allergy_any_m	Maternal history of any allergy before pregnancy (of index child)	0) No 1) Yes		Binary	Where data are available, allergy should be doctor diagnosed. If no information is available on doctor diagnosis, the variable is partially harmonised.	
CHILD CHARACTERISTICS							
RESPIRATORY DISEASE							
Wheezing	whe_ever	Wheezing between ages 0-4 years	0) No 1) Yes		Binary	Where data are available, wheezing should be obtained by ISAAC questionnaires. If this is not the case, the variabele is partially harmonized	
	whe_ever2	Wheezing between ages 0-2 years	0) No 1) Yes		Binary	Where data are available, wheezing should be obtained by ISAAC questionnaires. If this is not the case, the variabele is partially harmonized	
	whe_ever 4	Wheezing between ages 2-4 years	0) No 1) Yes		Binary	Where data are available, wheezing should be obtained by ISAAC questionnaires. If this is not the case, the variabele is partially harmonized	
	whe_ever5_10	Wheezing between ages 5-10 years	0) No 1) Yes		Binary	Where data are available, wheezing should be obtained by ISAAC questionnaires. If this is not the case, the variabele is partially harmonized	

	whe_0 whe_1 whe_2 … whe_17	Wheezing of the child. If more than one status is recorded within the defined time frame, use the highest reported level. Repeated measures: whe_0: wheezing within one year of birth (child aged between >-1 year and <1 year) whe_1: wheezing when the child was aged between ≥1 and <2 years whe_2: wheezing when the child was aged between ≥2 and <3 years whe_3: wheezing when the child was aged between ≥3 and <4 years .... whe_17: wheezing when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary	Where data are available, wheezing should be obtained by ISAAC questionnaires. If this is not the case, the variabele is partially harmonized	
Ever asthma	asthma_ever_CHICOS	School age asthma according to CHICOS definition	0) No 1) Yes		Binary	Asthma diagnosis at the age of ≥5 years. Where data are available, asthma should be obtained by ISAAC questionnaires. If this is not the case, the variabele is partially harmonized	Please indicate the age. If multiples ages are available, please take the oldest age
	asthma_ever_MeDALL	Ever diagnosis of asthma according to MeDALL definition	0) No 1) Yes		Binary	Ever diagnosis of asthma. Where data are available, asthma should be obtained by ISAAC questionnaires. If this is not the case, the variabele is partially harmonized	Please indicate the age. If multiples ages are available, please take the oldest age

	asthma_0 asthma_1 asthma_2 … asthma_17	Asthma diagnosis of the child. If more than one status is recorded within the defined time frame, use the highest reported level. Repeated measures: asthma_0: diagnosis of asthma within one year of birth (child aged between >-1 year and <1 year) asthma_1: diagnosis of asthma when the child was aged between ≥1 and <2 years asthma_2: diagnosis of asthma when the child was aged between ≥2 and <3 years asthma_3: diagnosis of asthma when the child was aged between ≥3 and <4 years .... asthma_17: diagnosis of asthma when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary	Where data are available, asthma should be obtained by ISAAC questionnaires. If this is not the case, the variabele is partially harmonized	
Current asthma	asthma_current_MeDALL	Current asthma (MeDALL)	0) No 1) Yes		Binary	2 out of 3 of: 1. Doctor diagnosed asthma 2. Wheezing in the past 12 months 3. Use of asthma medication in the past 12 months	Please indicate the age. If multiples ages are available, please create multiple variables, one for each age available (i.e. asthma_current_MeDALL_0, asthma_current_MeDALL_1 etc.)
	asthma_current_ISAAC	Current asthma (ISAAC)	0) No 1) Yes		Binary	1, and (2 or 3) 1. Doctor diagnosed asthma 2. Wheezing in the past 12 months 3. Use of asthma medication in the past 12 months	Please indicate the age. If multiples ages are available, please create multiple variables, one for each age available (i.e. asthma_current_ISAAC_0, asthma_current_ISAAC_1 etc.)

Asthma medication use	asthma_med_0 asthma_med_1 asthma_med_2 … asthma_med_17	Use of asthma medication Repeated measures: asthma_med_0: asthma medication use within one year of birth (child aged between >-1 year and <1 year) asthma_med_1: asthma medication use when the child was aged between ≥1 and <2 years asthma_med_2: asthma medication use when the child was aged between ≥2 and <3 years asthma_med_3: asthma medication use when the child was aged between ≥3 and <4 years .... asthma_med_17: asthma medication use when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary		
	asthma_med_spec_0 asthma_med_spec_1 asthma_med_spec_2 … asthma_med_spec_17	Use of asthma medication, type specified Repeated measures: asthma_med_0: asthma medication use within one year of birth (child aged between >-1 year and <1 year) asthma_med_1: asthma medication use when the child was aged between ≥1 and <2 years asthma_med_2: asthma medication use when the child was aged between ≥2 and <3 years asthma_med_3: asthma medication use when the child was aged between ≥3 and <4 years .... asthma_med_17: asthma medication use when the child was aged between ≥17 and <18 years	0) No 1) Inhaled bronchodilator (reliever inhaler) only 2) Inhaled corticosteroid (preventer inhaler) only 3) Both 1 and 2 4) Other/unspecified		Categorical		

Upper respiratory tract infections	URTI_0 URTI_1 URTI_2 … URTI_17	Upper respiratory tract infections (ear infection, throat infections, laryngitis, croup, whooping cough or equivalent) Repeated measures: URTI_0: Upper respiratory tract infectionswithin one year of birth (child aged between >-1 year and <1 year) URTI_1: Upper respiratory tract infections when the child was aged between ≥1 and <2 years URTI_2: Upper respiratory tract infections when the child was aged between ≥2 and <3 years URTI_3: Upper respiratory tract infections when the child was aged between ≥3 and <4 years .... URTI_17: Upper respiratory tract infections when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary	Please specify which infections were assessed. Where data are available, infections should be doctor diagnosed. If this is not the case, the variabele is partially harmonized	
Lower respiratory tract infections	LRTI_0 LRTI_1 LRTI_2 … LRTI_17	Lower respiratory tract infections (bronchiolitis, bronchitis, pneumonia, chest infection, or equivalent) Repeated measures: LRTI_0: Lower respiratory tract infectionswithin one year of birth (child aged between >-1 year and <1 year) LRTI_1: Lower respiratory tract infections when the child was aged between ≥1 and <2 years LRTI_2: Lower respiratory tract infections when the child was aged between ≥2 and <3 years LRTI_3: Lower respiratory tract infections when the child was aged between ≥3 and <4 years .... LRTI_17: Lower respiratory tract infections when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary	Please specify which infections were assessed. Where data are available, infections should be doctor diagnosed. If this is not the case, the variabele is partially harmonized	
LUNG FUNCTION							

Lung function measurement, absolute values	FEV1_abs_0 FEV1_abs_1 FEV1_abs_2 … FEV1_abs_17	Forced Expiratotory Volume in the first second (L) Repeated measures: FEV1_abs_0: FEV1 within one year of birth (child aged between >-1 year and <1 year) FEV1_abs_1: FEV1when the child was aged between ≥1 and <2 years FEV1_abs_2: FEV1when the child was aged between ≥2 and <3 years FEV1_abs_3: FEV1use when the child was aged between ≥3 and <4 years .... FEV1_abs_17: FEV1use when the child was aged between ≥17 and <18 years		L	Decimal		
	FVC_abs_0 FVC_abs_1 FVC_abs_2 … FVC_abs_17	Forced Vital Capacity (L) Repeated measures: FVC_abs_0: FVC within one year of birth (child aged between >-1 year and <1 year) FVC_abs_1: FVC when the child was aged between ≥1 and <2 years FVC_abs_2: FVC when the child was aged between ≥2 and <3 years FVC_abs_3: FVC when the child was aged between ≥3 and <4 years .... FVC_abs_17: FVC when the child was aged between ≥17 and <18 years		L	Decimal		
	FEF25_abs_0 FEF25_abs_1 FEF25_abs_2 … FEF25_abs_17	Forced Expiratory Flow after exhaling 25% of FVC (L/s) Repeated measures: FEF25_abs_0: FEF25 within one year of birth (child aged between >-1 year and <1 year) FEF25_abs_1: FEF25 when the child was aged between ≥1 and <2 years FEF25_abs_2: FEF25 when the child was aged between ≥2 and <3 years FEF25_abs_3: FEF25 when the child was aged between ≥3 and <4 years .... FEF25_abs_17: FEF25 when the child was aged between ≥17 and <18 years		L/s	Decimal		

	FEF50_abs_0 FEF50_abs_1 FEF50_abs_2 … FEF50_abs_17	Forced Expiratory Flow after exhaling 50% of FVC (L/s) Repeated measures: FEF50_abs_0: FEF50 within one year of birth (child aged between >-1 year and <1 year) FEF50_abs_1: FEF50 when the child was aged between ≥1 and <2 years FEF50_abs_2: FEF50 when the child was aged between ≥2 and <3 years FEF50_abs_3: FEF50 when the child was aged between ≥3 and <4 years .... FEF50_abs_17: FEF50 when the child was aged between ≥17 and <18 years		L/s	Decimal		
	FEF75_abs_0 FEF75_abs_1 FEF75_abs_2 … FEF75_abs_17	Forced Expiratory Flow after exhaling 75% of FVC (L/s) Repeated measures: FEF75_abs_0: FEF75 within one year of birth (child aged between >-1 year and <1 year) FEF75_abs_1: FEF75 when the child was aged between ≥1 and <2 years FEF75_abs_2: FEF75 when the child was aged between ≥2 and <3 years FEF75_abs_3: FEF75 when the child was aged between ≥3 and <4 years .... FEF75_abs_17: FEF75 when the child was aged between ≥17 and <18 years		L/s	Decimal		
Lung function measurements, GLI z-scores	FEV1_z_0 FEV1_z_1 FEV1_z_2 … FEV1_z_17	Forced Expiratotory Volume in the first second, z-score according to GLI reference criteria Repeated measures: FEV1_abs_0: FEV1 within one year of birth (child aged between >-1 year and <1 year) FEV1_abs_1: FEV1when the child was aged between ≥1 and <2 years FEV1_abs_2: FEV1when the child was aged between ≥2 and <3 years FEV1_abs_3: FEV1use when the child was aged between ≥3 and <4 years .... FEV1_abs_17: FEV1use when the child was aged between ≥17 and <18 years		z-score	Decimal		

	FVC_z_0 FVC_z_1 FVC_z_2 … FVC_z_17	Forced Vital Capacity, z-score according to GLI reference criteria Repeated measures: FVC_abs_0: FVC within one year of birth (child aged between >-1 year and <1 year) FVC_abs_1: FVC when the child was aged between ≥1 and <2 years FVC_abs_2: FVC when the child was aged between ≥2 and <3 years FVC_abs_3: FVC when the child was aged between ≥3 and <4 years .... FVC_abs_17: FVC when the child was aged between ≥17 and <18 years		z-score	Decimal		
	FEV1FVC_z_0 FEV1FVC_z_1 FEV1FVC_z_2 … FEV1FVC_z_17	FEV1 FVC ratio , z-score according to GLI reference criteria Repeated measures: FEV1FVC_z_0: FEV1/FVC within one year of birth (child aged between >-1 year and <1 year) FEV1FVC_z_1: FEV1/FVC when the child was aged between ≥1 and <2 years FEV1FVC_z_2: FEV1/FVC when the child was aged between ≥2 and <3 years FEV1FVC_z_3: FEV1/FVC when the child was aged between ≥3 and <4 years .... FEV1FVC_z_17: FEV1/FVC when the child was aged between ≥17 and <18 years		z-score	Decimal		
	FEF75_z_0 FEF75_z_1 FEF75_z_2 … FEF75_z_17	Forced Expiratory Flow after exhaling 75% of FVC, z-score according to GLI reference criteria Repeated measures: FEF75_abs_0: FEF75 within one year of birth (child aged between >-1 year and <1 year) FEF75_abs_1: FEF75 when the child was aged between ≥1 and <2 years FEF75_abs_2: FEF75 when the child was aged between ≥2 and <3 years FEF75_abs_3: FEF75 when the child was aged between ≥3 and <4 years .... FEF75_abs_17: FEF75 when the child was aged between ≥17 and <18 years		z-score	Decimal		

Reproducibility of spirometry	repro_0 repro_1 repro_2 … repro_17	Reproducibility of the spiromery Repeated measures: Repro_0: Reproducibility of the spiromtery performed within one year of birth (child aged between >-1 year and <1 year) Repro_1: Reproducibility of the spiromtery performed when the child was aged between ≥1 and <2 years Repro_2: Reproducibility of the spiromtery performed when the child was aged between ≥2 and <3 years Repro_3: Reproducibility of the spiromtery performed when the child was aged between ≥3 and <4 years .... Repro_17: Reproducibility of the spiromtery performed when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary	Reproducibility should preferably be according to ERS/ATS criteria. If not, the variable is partially harmonized.	If other reproducibilty criteria are used then ATS/ERS, please indicate in the online catalogue which criteria were used.
Bronchial hyperresponsiveness (BHR)	BHR_0 BHR_1 BHR_2 … BHR_17	Bronchial hyperresponsiveness, as measured by metacholine challenge test Repeated measures: BHR_0: Bronchial hyperresponsiveness within one year of birth (child aged between >-1 year and <1 year) BHR_1: Bronchial hyperresponsiveness when the child was aged between ≥1 and <2 years BHR_2: Bronchial hyperresponsiveness when the child was aged between ≥2 and <3 years BHR_3: Bronchial hyperresponsiveness when the child was aged between ≥3 and <4 years .... BHR_17: Bronchial hyperresponsiveness when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary	Bronchial hyperresponsiveness is defined as a decrease in FEV1 of ≥20% after the administration of methacholine.	

Fractional exhaled nitric oxide (FeNO)	FeNO_0 FeNO_1 FeNO_2 … FeNO_17	FeNO, in sympercent change Repeated measures: FeNO_0 :FeNO within one year of birth (child aged between >-1 year and <1 year) FeNO_1: FeNO when the child was aged between ≥1 and <2 years FeNO_2: FeNO when the child was aged between ≥2 and <3 years FeNO_3: FeNO when the child was aged between ≥3 and <4 years .... FeNO_17: FeNO when the child was aged between ≥17 and <18 years		Sympercent change	Decimal		
ALLERGIC DISEASE							
Food allergy	food_all_0 food_all_1 food_all_2 … food_all_17	Doctor diagnosis of food allergy Repeated measures: food_all_0: Food allergy within one year of birth (child aged between >-1 year and <1 year) food_all_1: Food allergy when the child was aged between ≥1 and <2 years food_all_2: Food allergy when the child was aged between ≥2 and <3 years food_all_3: Food allergy when the child was aged between ≥3 and <4 years .... food_all_17: Food allergy when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary	Where data are available, allergy should be obtained by ISAAC questionnaires. If this is not the case, the variabele is partially harmonized. If no information is available on doctor diagnosis, the variable is partially harmonised.	Please specify in the online catalogue which allergies were asked for
	food_all_ever	Ever doctor diagnosis of food allergy	0) No 1) Yes		Binary	Where data are available, allergy should be obtained by ISAAC questionnaires. If this is not the case, the variabele is partially harmonized. If no information is available on doctor diagnosis, the variable is partially harmonised.	Please indicate the age. If multiples ages are available, please take the oldest age. Please specify in the online catalogue which allergies were asked for

Inhalant allergy	inh_all_0 inh_all_1 inh_all_2 … inh_all_17	Doctor diagnosis of inhalant allergy Repeated measures: inh_all_0: Inhalant allergy within one year of birth (child aged between >-1 year and <1 year) inh_all_1: Inhalant allergy when the child was aged between ≥1 and <2 years inh_all_2: Inhalant allergy when the child was aged between ≥2 and <3 years inh_all_3: Inhalant allergy when the child was aged between ≥3 and <4 years .... inh_all_17: Inhalant allergy when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary	Where data are available, allergy should be obtained by ISAAC questionnaires. If this is not the case, the variabele is partially harmonized. If no information is available on doctor diagnosis, the variable is partially harmonised.	Please specify in the online catalogue which allergies were asked for
	inh_all_ever	Ever doctor diagnosis of inhalant allergy	0) No 1) Yes		Binary	Where data are available, allergy should be obtained by ISAAC questionnaires. If this is not the case, the variabele is partially harmonized. If no information is available on doctor diagnosis, the variable is partially harmonised.	Please indicate the age. If multiples ages are available, please take the oldest age. Please specify in the online catalogue which allergies were asked for
Allergy, unspecified	all_0 all_1 all_2 ... all_17	Doctor diagnosis of allergy, type of allergen unspecified Repeated measures: inh_all_0: Allergy within one year of birth (child aged between >-1 year and <1 year) inh_all_1: Allergy when the child was aged between ≥1 and <2 years inh_all_2: Allergy when the child was aged between ≥2 and <3 years inh_all_3: Allergy when the child was aged between ≥3 and <4 years .... inh_all_17: Allergy when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary	Where data are available, allergy should be obtained by ISAAC questionnaires. If this is not the case, the variabele is partially harmonized. If no information is available on doctor diagnosis, the variable is partially harmonised.	Please specify in the online catalogue which allergies were asked for

	all_ever	Ever doctor diagnosis of allergy, type of allergen unspecified	0) No 1) Yes		Binary	Where data are available, allergy should be obtained by ISAAC questionnaires. If this is not the case, the variabele is partially harmonized. If no information is available on doctor diagnosis, the variable is partially harmonised.	Please indicate the age. If multiples ages are available, please take the oldest age. Please specify in the online catalogue which allergies were asked for.
Food allergic sensitization, SPT	food_all_sens_SPT_0 food_all_sens_SPT_1 food_all_sens_SPT_2 ... food_all_sens_SPT_17	Food allergic sensitization, measured by skin prick test Repeated measures: food_all_sens_SPT_0: Food allergic sensitization within one year of birth (child aged between >-1 year and <1 year) food_all_sens_SPT_1: Food allergic sensitization when the child was aged between ≥1 and <2 years food_all_sens_SPT_2: Food allergic sensitization when the child was aged between ≥2 and <3 years food_all_sens_SPT_3: Food allergic sensitization when the child was aged between ≥3 and <4 years .... food_all_sens_SPT_17: Food allergic sensitization when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary		Please specify in the online catalogue which allergens were tested

	food_all_sens_SPT_COWMILK_0 food_all_sens_SPT_COWMILK_1 food_all_sens_SPT_COWMILK_2 … food_all_sens_SPT_COWMILK_17	food allergic sensitization to cow milk, measured by skin prick test Repeated measures: food_all_sens_SPT_COWMILK_0: food allergic sensitization to cow milk within one year of birth (child aged between >-1 year and <1 year) food_all_sens_SPT_COWMILK_1: food allergic sensitization to cow milk when the child was aged between ≥1 and <2 years food_all_sens_SPT_COWMILK_2: food allergic sensitization to cow milk when the child was aged between ≥2 and <3 years food_all_sens_SPT_COWMILK_3: food allergic sensitization to cow milk when the child was aged between ≥3 and <4 years .... food_all_sens_SPT_COWMILK_17: food allergic sensitization to cow milk when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary		
	food_all_sens_SPT_EGG_0 food_all_sens_SPT_EGG_1 food_all_sens_SPT_EGG_2 … food_all_sens_SPT_EGG_17	food allergic sensitization to chicken egg, measured by skin prick test Repeated measures: food_all_sens_SPT_EGG_0: food allergic sensitization to chicken egg within one year of birth (child aged between >-1 year and <1 year) food_all_sens_SPT_EGG_1: food allergic sensitization to chicken egg when the child was aged between ≥1 and <2 years food_all_sens_SPT_EGG_2: food allergic sensitization to chicken egg when the child was aged between ≥2 and <3 years food_all_sens_SPT_EGG_3: food allergic sensitization to chicken egg when the child was aged between ≥3 and <4 years .... food_all_sens_SPT_EGG_17: food allergic sensitization to chicken egg when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary		

	food_all_sens_SPT_WHEAT_0 food_all_sens_SPT_WHEAT_1 food_all_sens_SPT_WHEAT_2 … food_all_sens_SPT_WHEAT_17	food allergic sensitization to wheat, measured by skin prick test Repeated measures: food_all_sens_SPT_WHEAT_0: food allergic sensitization to wheat within one year of birth (child aged between >-1 year and <1 year) food_all_sens_SPT_WHEAT_1: food allergic sensitization to wheat when the child was aged between ≥1 and <2 years food_all_sens_SPT_WHEAT_2: food allergic sensitization to wheat when the child was aged between ≥2 and <3 years food_all_sens_SPT_WHEAT_3: food allergic sensitization to wheat when the child was aged between ≥3 and <4 years .... food_all_sens_SPT_WHEAT_17: food allergic sensitization to wheat when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary		
	food_all_sens_SPT_PNT_0 food_all_sens_SPT_PNT_1 food_all_sens_SPT_PNT_2 … food_all_sens_SPT_PNT_17	food allergic sensitization to peanut, measured by skin prick test Repeated measures: food_all_sens_SPT_PNT_0: food allergic sensitization to peanut within one year of birth (child aged between >-1 year and <1 year) food_all_sens_SPT_PNT_1: food allergic sensitization to peanut when the child was aged between ≥1 and <2 years food_all_sens_SPT_PNT_2: food allergic sensitization to peanut when the child was aged between ≥2 and <3 years food_all_sens_SPT_PNT_3: food allergic sensitization to peanut when the child was aged between ≥3 and <4 years .... food_all_sens_SPT_PNT_17: food allergic sensitization to peanut when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary		

	food_all_sens_SPT_NUT_mix_0 food_all_sens_SPT_NUT_mix_1 food_all_sens_SPT_NUT_mix_2 … food_all_sens_SPT_NUT_mix_17	food allergic sensitization to nut mix, measured by skin prick test Repeated measures: food_all_sens_SPT_NUT_mix_0: food allergic sensitization to nut mix within one year of birth (child aged between >-1 year and <1 year) food_all_sens_SPT_NUT_mix_1: food allergic sensitization to nut mix when the child was aged between ≥1 and <2 years food_all_sens_SPT_NUT_mix_2: food allergic sensitization to nut mix when the child was aged between ≥2 and <3 years food_all_sens_SPT_NUT_mix_3: food allergic sensitization to nut mix when the child was aged between ≥3 and <4 years .... food_all_sens_SPT_NUT_mix_17: food allergic sensitization to nut mix when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary		Please specify in online catalogue which nuts were included in the mix
	food_all_sens_SPT_NUT_wal_0 food_all_sens_SPT_NUT_wal_1 food_all_sens_SPT_NUT_wal_2 … food_all_sens_SPT_NUT_wal_17	food allergic sensitization to walnut, measured by skin prick test Repeated measures: food_all_sens_SPT_NUT_wal_0: food allergic sensitization to walnut within one year of birth (child aged between >-1 year and <1 year) food_all_sens_SPT_NUT_wal_1: food allergic sensitization to walnut when the child was aged between ≥1 and <2 years food_all_sens_SPT_NUT_wal_2: food allergic sensitization to walnut when the child was aged between ≥2 and <3 years food_all_sens_SPT_NUT_wal_3: food allergic sensitization to walnut when the child was aged between ≥3 and <4 years .... food_all_sens_SPT_NUT_wal_17: food allergic sensitization to walnut when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary		

	food_all_sens_SPT_NUT_cas_0 food_all_sens_SPT_NUT_cas_1 food_all_sens_SPT_NUT_cas_2 … food_all_sens_SPT_NUT_cas_17	food allergic sensitization to cashew nut, measured by skin prick test Repeated measures: food_all_sens_SPT_NUT_cas_0: food allergic sensitization to cashew nut within one year of birth (child aged between >-1 year and <1 year) food_all_sens_SPT_NUT_cas_1: food allergic sensitization to cashew nut when the child was aged between ≥1 and <2 years food_all_sens_SPT_NUT_cas_2: food allergic sensitization to cashew nut when the child was aged between ≥2 and <3 years food_all_sens_SPT_NUT_cas_3: food allergic sensitization to cashew nut when the child was aged between ≥3 and <4 years .... food_all_sens_SPT_NUT_cas_17: food allergic sensitization to cashew nut when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary		
	food_all_sens_SPT_NUT_haz_0 food_all_sens_SPT_NUT_haz_1 food_all_sens_SPT_NUT_haz_2 … food_all_sens_SPT_NUT_haz_17	food allergic sensitization to hazelnut, measured by skin prick test Repeated measures: food_all_sens_SPT_NUT_haz_0: food allergic sensitization to hazelnut within one year of birth (child aged between >-1 year and <1 year) food_all_sens_SPT_NUT_haz_1: food allergic sensitization to hazelnut when the child was aged between ≥1 and <2 years food_all_sens_SPT_NUT_haz_2: food allergic sensitization to hazelnut when the child was aged between ≥2 and <3 years food_all_sens_SPT_NUT_haz_3: food allergic sensitization to hazelnut when the child was aged between ≥3 and <4 years .... food_all_sens_SPT_NUT_haz_17: food allergic sensitization to hazelnut when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary		

	food_all_sens_SPT_SES_0 food_all_sens_SPT_SES_1 food_all_sens_SPT_SES_2 … food_all_sens_SPT_SES_17	food allergic sensitization to sesame, measured by skin prick test Repeated measures: food_all_sens_SPT_SES_0: food allergic sensitization to sesame within one year of birth (child aged between >-1 year and <1 year) food_all_sens_SPT_SES_1: food allergic sensitization to sesame when the child was aged between ≥1 and <2 years food_all_sens_SPT_SES_2: food allergic sensitization to sesame when the child was aged between ≥2 and <3 years food_all_sens_SPT_SES_3: food allergic sensitization to sesame when the child was aged between ≥3 and <4 years .... food_all_sens_SPT_SES_17: food allergic sensitization to sesame when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary		
	food_all_sens_SPT_FISH_mix_0 food_all_sens_SPT_FISH_mix_1 food_all_sens_SPT_FISH_mix_2 … food_all_sens_SPT_FISH_mix_17	food allergic sensitization to fish mix, measured by skin prick test Repeated measures: food_all_sens_SPT_FISH_mix_0: food allergic sensitization to fish mix within one year of birth (child aged between >-1 year and <1 year) food_all_sens_SPT_FISH_mix_1: food allergic sensitization to fish mix when the child was aged between ≥1 and <2 years food_all_sens_SPT_FISH_mix_2: food allergic sensitization to fish mix when the child was aged between ≥2 and <3 years food_all_sens_SPT_FISH_mix_3: food allergic sensitization to fish mix when the child was aged between ≥3 and <4 years .... food_all_sens_SPT_FISH_mix_17: food allergic sensitization to fish mix when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary		Please specify in online catalogue which types of fish were included in the mix

	food_all_sens_SPT_FISH_cod_0 food_all_sens_SPT_FISH_cod_1 food_all_sens_SPT_FISH_cod_2 … food_all_sens_SPT_FISH_cod_17	food allergic sensitization to cod fish, measured by skin prick test Repeated measures: food_all_sens_SPT_FISH_cod_0: food allergic sensitization to cod fish within one year of birth (child aged between >-1 year and <1 year) food_all_sens_SPT_FISH_cod_1: food allergic sensitization to cod fish when the child was aged between ≥1 and <2 years food_all_sens_SPT_FISH_cod_2: food allergic sensitization to cod fish when the child was aged between ≥2 and <3 years food_all_sens_SPT_FISH_cod_3: food allergic sensitization to cod fish when the child was aged between ≥3 and <4 years .... food_all_sens_SPT_FISH_cod_17: food allergic sensitization to cod fish when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary		
	food_all_sens_SPT_SHELL_mix_0 food_all_sens_SPT_SHELL_mix_1 food_all_sens_SPT_SHELL_mix_2 … food_all_sens_SPT_SHELL_mix_17	food allergic sensitization to shell fish mix, measured by skin prick test Repeated measures: food_all_sens_SPT_SHELL_mix_0: food allergic sensitization to shell fish mix within one year of birth (child aged between >-1 year and <1 year) food_all_sens_SPT_SHELL_mix_1: food allergic sensitization to shell fish mix when the child was aged between ≥1 and <2 years food_all_sens_SPT_SHELL_mix_2: food allergic sensitization to shell fish mix when the child was aged between ≥2 and <3 years food_all_sens_SPT_SHELL_mix_3: food allergic sensitization to shell fish mix when the child was aged between ≥3 and <4 years .... food_all_sens_SPT_SHELL_mix_17: food allergic sensitization to shell fish mix when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary		Please specify in online catalogue which types of shellfish were included in the mix

	food_all_sens_SPT_FRUIT_kiw_0 food_all_sens_SPT_FRUIT_kiw_1 food_all_sens_SPT_FRUIT_kiw_2 … food_all_sens_SPT_FRUIT_kiw_17	food allergic sensitization to kiwi fruit, measured by skin prick test Repeated measures: food_all_sens_SPT_FRUIT_kiw_0: food allergic sensitization to kiwi fruit within one year of birth (child aged between >-1 year and <1 year) food_all_sens_SPT_FRUIT_kiw_1: food allergic sensitization to kiwi fruit when the child was aged between ≥1 and <2 years food_all_sens_SPT_FRUIT_kiw_2: food allergic sensitization to kiwi fruit when the child was aged between ≥2 and <3 years food_all_sens_SPT_FRUIT_kiw_3: food allergic sensitization to kiwi fruit when the child was aged between ≥3 and <4 years .... food_all_sens_SPT_FRUIT_kiw_17: food allergic sensitization to kiwi fruit when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary		
	food_all_sens_SPT_FRUIT_pea_0 food_all_sens_SPT_FRUIT_pea_1 food_all_sens_SPT_FRUIT_pea_2 … food_all_sens_SPTFRUIT_pea_17	food allergic sensitization to peach fruit, measured by skin prick test Repeated measures: food_all_sens_SPT_FRUIT_pea_0: food allergic sensitization to peach fruit within one year of birth (child aged between >-1 year and <1 year) food_all_sens_SPT_FRUIT_pea_1: food allergic sensitization to peach fruit when the child was aged between ≥1 and <2 years food_all_sens_SPT_FRUIT_pea_2: food allergic sensitization to peach fruit when the child was aged between ≥2 and <3 years food_all_sens_SPT_FRUIT_pea_3: food allergic sensitization to peach fruit when the child was aged between ≥3 and <4 years .... food_all_sens_SPT_FRUIT_pea_17: food allergic sensitization to peach fruit when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary		

Inhalant allergic sensitization, SPT	inh_all_sens_SPT_0 inh_all_sens_SPT_1 inh_all_sens_SPT_2 ... inh_all_sens_SPT_17	Inahalant allergic sensitization, measured by skin prick test Repeated measures: inhalant_all_sens_SPT_0: inhalant allergic sensitization within one year of birth (child aged between >-1 year and <1 year) inhalant_all_sens_SPT_1: inhalant allergic sensitization when the child was aged between ≥1 and <2 years inhalant_all_sens_SPT_2: inhalant allergic sensitization when the child was aged between ≥2 and <3 years inhalant_all_sens_SPT_3: inhalant allergic sensitization when the child was aged between ≥3 and <4 years .... inhalant_all_sens_SPT_17: inhalant allergic sensitization when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary		Please specify in the online catalogue which allergens were tested
	inh_all_sens_SPT_GRASS_mix _0 inh_all_sens_SPT_GRASS_mix _1 inh_all_sens_SPT_GRASS_mix _2 ... inh_all_sens_SPT_GRASS_mix _17	inhalant allergic sensitization to grass mix, measured by skin prick test Repeated measures: inhalant_all_sens_SPT_GRASS_mix_0: inhalant allergic sensitization to grass mix within one year of birth (child aged between >-1 year and <1 year) inhalant_all_sens_SPT_GRASS_mix_1: inhalant allergic sensitization to grass mix when the child was aged between ≥1 and <2 years inhalant_all_sens_SPT_GRASS_mix_2: inhalant allergic sensitization to grass mix when the child was aged between ≥2 and <3 years inhalant_all_sens_SPT_GRASS_mix_3: inhalant allergic sensitization to grass mix when the child was aged between ≥3 and <4 years .... inhalant_all_sens_SPT_GRASS_mix_17: inhalant allergic sensitization to grass mix when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary		Please specify in online catalogue which species were included in the mix

	inh_all_sens_SPT_GRASS_tim _0 inh_all_sens_SPT_GRASS_tim _1 inh_all_sens_SPT_GRASS_tim _2 … inh_all_sens_SPT_GRASS_tim _17	inhalant allergic sensitization to timothy grass, measured by skin prick test Repeated measures: inh_all_sens_SPT_GRASS_tim_0: inhalant allergic sensitization to timothy grass within one year of birth (child aged between >-1 year and <1 year) inh_all_sens_SPT_GRASS_tim_1: inhalant allergic sensitization to timothy grass when the child was aged between ≥1 and <2 years inh_all_sens_SPT_GRASS_tim_2: inhalant allergic sensitization to timothy grass when the child was aged between ≥2 and <3 years inh_all_sens_SPT_GRASS_tim_3: inhalant allergic sensitization to timothy grass when the child was aged between ≥3 and <4 years .... inh_all_sens_SPT_GRASS_tim_17: inhalant allergic sensitization to timothy grass when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary		
	inh_all_sens_SPT_CAT _0 inh_all_sens_SPT_CAT _1 inh_all_sens_SPT_CAT _2 … inh_all_sens_SPT_CAT _17	inhalant allergic sensitization to cat, measured by skin prick test Repeated measures: inh_all_sens_SPT_CAT_0: inhalant allergic sensitization to cat within one year of birth (child aged between >-1 year and <1 year) inh_all_sens_SPT_CAT_1: inhalant allergic sensitization to cat when the child was aged between ≥1 and <2 years inh_all_sens_SPT_CAT_2: inhalant allergic sensitization to cat when the child was aged between ≥2 and <3 years inh_all_sens_SPT_CAT_3: inhalant allergic sensitization to cat when the child was aged between ≥3 and <4 years .... inh_all_sens_SPT_CAT_17: inhalant allergic sensitization to cat when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary		

	inh_all_sens_SPT_DOG _0 inh_all_sens_SPT_DOG _1 inh_all_sens_SPT_DOG _2 … inh_all_sens_SPT_DOG _17	inhalant allergic sensitization to dog, measured by skin prick test Repeated measures: inh_all_sens_SPT_DOG_0: inhalant allergic sensitization to dog within one year of birth (child aged between >-1 year and <1 year) inh_all_sens_SPT_DOG_1: inhalant allergic sensitization to dog when the child was aged between ≥1 and <2 years inh_all_sens_SPT_DOG_2: inhalant allergic sensitization to dog when the child was aged between ≥2 and <3 years inh_all_sens_SPT_DOG_3: inhalant allergic sensitization to dog when the child was aged between ≥3 and <4 years .... inh_all_sens_SPT_DOG_17: inhalant allergic sensitization to dog when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary		
	inh_all_sens_SPT_HDM_mix _0 inh_all_sens_SPT_HDM_mix_1 inh_all_sens_SPT_HDM_mix_2 … inh_all_sens_SPT_HDM_mix_17	inhalant allergic sensitization to house dust mite mix, measured by skin prick test Repeated measures: inh_all_sens_SPT_HDM_MIX_0: inhalant allergic sensitization to house dust mite mix within one year of birth (child aged between >-1 year and <1 year) inh_all_sens_SPT_HDM_MIX_1: inhalant allergic sensitization to house dust mite mix when the child was aged between ≥1 and <2 years inh_all_sens_SPT_HDM_MIX_2: inhalant allergic sensitization to house dust mite mix when the child was aged between ≥2 and <3 years inh_all_sens_SPT_HDM_MIX_3: inhalant allergic sensitization to house dust mite mix when the child was aged between ≥3 and <4 years .... inh_all_sens_SPT_HDM_MIX_17: inhalant allergic sensitization to house dust mite mix when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary		Please specify in online catalogue which species were included in the mix

	inh_all_sens_SPT_HDM_derf _0 inh_all_sens_SPT_HDM_derf_1 inh_all_sens_SPT_HDM_derf_2 … inh_all_sens_SPT_HDM_derf_17	inhalant allergic sensitization to house dust mite (dermatophagoides farinae), measured by skin prick test Repeated measures: inh_all_sens_SPT_HDM_derf_0: inhalant allergic sensitization to house dust mite (dermatophagoides farinae) within one year of birth (child aged between >-1 year and <1 year) inh_all_sens_SPT_HDM_derf_1: inhalant allergic sensitization to house dust mite (dermatophagoides farinae) when the child was aged between ≥1 and <2 years inh_all_sens_SPT_HDM_derf_2: inhalant allergic sensitization to house dust mite (dermatophagoides farinae) when the child was aged between ≥2 and <3 years inh_all_sens_SPT_HDM_derf_3: inhalant allergic sensitization to house dust mite (dermatophagoides farinae) when the child was aged between ≥3 and <4 years .... inh_all_sens_SPT_HDM_derf_17: inhalant allergic sensitization to house dust mite (dermatophagoides farinae) when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary		

	inh_all_sens_SPT_HDM_derp _0 inh_all_sens_SPT_HDM_derp_1 inh_all_sens_SPT_HDM_derp_2 … inh_all_sens_SPT_HDM_derp_17	inhalant allergic sensitization to house dust mite (dermatophagoides pteronyssinus), measured by skin prick test Repeated measures: inh_all_sens_SPT_HDM_derp_0: inhalant allergic sensitization to house dust mite (dermatophagoides pteronyssinus) within one year of birth (child aged between >-1 year and <1 year) inh_all_sens_SPT_HDM_derp_1: inhalant allergic sensitization to house dust mite (dermatophagoides pteronyssinus) when the child was aged between ≥1 and <2 years inh_all_sens_SPT_HDM_derp_2: inhalant allergic sensitization to house dust mite (dermatophagoides pteronyssinus) when the child was aged between ≥2 and <3 years inh_all_sens_SPT_HDM_derp_3: inhalant allergic sensitization to house dust mite (dermatophagoides pteronyssinus) when the child was aged between ≥3 and <4 years .... inh_all_sens_SPT_HDM_derp_17: inhalant allergic sensitization to house dust mite (dermatophagoides pteronyssinus) when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary		

	inh_all_sens_SPT_TREE_mix _0 inh_all_sens_SPT_TREE_mix_1 inh_all_sens_SPT_TREE_mix_2 … inh_all_sens_SPT_TREE_mix_17	inhalant allergic sensitization to tree polen mix, measured by skin prick test Repeated measures: inh_all_sens_SPT_TREE_mix_0: inhalant allergic sensitization to tree polen mix within one year of birth (child aged between >-1 year and <1 year) inh_all_sens_SPT_TREE_mix_1: inhalant allergic sensitization to tree polen mix when the child was aged between ≥1 and <2 years inh_all_sens_SPT_TREE_mix_2: inhalant allergic sensitization to tree polen mix when the child was aged between ≥2 and <3 years inh_all_sens_SPT_TREE_mix_3: inhalant allergic sensitization to tree polen mix when the child was aged between ≥3 and <4 years .... inh_all_sens_SPT_TREE_mix_17: inhalant allergic sensitization to tree polen mix when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary		Please specify in online catalogue which species were included in the mix
	inh_all_sens_SPT_TREE_birch _0 inh_all_sens_SPT_TREE_birch_1 inh_all_sens_SPT_TREE_birch_2 … inh_all_sens_SPT_TREE_birch_17	inhalant allergic sensitization to birch, measured by skin prick test Repeated measures: inh_all_sens_SPT_TREE_birch_0: inhalant allergic sensitization to birch within one year of birth (child aged between >-1 year and <1 year) inh_all_sens_SPT_TREE_birch_1: inhalant allergic sensitization to birch when the child was aged between ≥1 and <2 years inh_all_sens_SPT_TREE_birch_2: inhalant allergic sensitization to birch when the child was aged between ≥2 and <3 years inh_all_sens_SPT_TREE_birch_3: inhalant allergic sensitization to birch when the child was aged between ≥3 and <4 years .... inh_all_sens_SPT_TREE_birch_17: inhalant allergic sensitization to birch when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary		

Food allergic sensitization, specific IgE	food_all_sens_IgE_0 food_all_sens_IgE_1 food_all_sens_IgE_2 ... food_all_sens_IgE_17	Food allergic sensitization, measured by specific IgE Repeated measures: food_all_sens_IgE_0: Food allergic sensitization within one year of birth (child aged between >-1 year and <1 year) food_all_sens_IgE_1: Food allergic sensitization when the child was aged between ≥1 and <2 years food_all_sens_IgE_2: Food allergic sensitization when the child was aged between ≥2 and <3 years food_all_sens_IgE_3: Food allergic sensitization when the child was aged between ≥3 and <4 years .... food_all_sens_IgE_17: Food allergic sensitization when the child was aged between ≥17 and <18 years		kUA/L	Decimal	Were data are available, allergic sensitization should be measured by specific IgE. If this is not the case, and only total IgE is measured, the variable is partially harmonized	Please specify in the online catalogue which allergens were tested
Inhalant allergic sensitization, specific IgE	inh_all_sens_IgE_0 inh_all_sens_IgE_1 inh_all_sens_IgE_2 ... inh_all_sens_IgE_17	Inahalant allergic sensitization, measured by specific IgE Repeated measures: inhalant_all_sens_IgE_0: inhalant allergic sensitization within one year of birth (child aged between >-1 year and <1 year) inhalant_all_sens_IgE_1: inhalant allergic sensitization when the child was aged between ≥1 and <2 years inhalant_all_sens_IgE_2: inhalant allergic sensitization when the child was aged between ≥2 and <3 years inhalant_all_sens_IgE_3: inhalant allergic sensitization when the child was aged between ≥3 and <4 years .... inhalant_all_sens_IgE_17: inhalant allergic sensitization when the child was aged between ≥17 and <18 years		kUA/L	Decimal	Were data are available, allergic sensitization should be measured by specific IgE. If this is not the case, and only total IgE is measured, the variable is partially harmonized	Please specify in the online catalogue which allergens were tested

	inh_all_sens_IgE_HDM_0 inh_all_sens_IgE_HDM_1 inh_all_sens_IgE_HDM_2 … inh_all_sens_IgE_HDM_17	inhalant allergic senzitization to house dust mite, measured by IgE Repeated measures: inh_all_sens_IgE_HDM_0: inhalant allergic sensitization to house dust mite within one year of birth (child aged between >-1 year and <1 year) inh_all_sens_IgE_HDM_1: inhalant allergic sensitization to house dust mite when the child was aged between ≥1 and <2 years inh_all_sens_IgE_HDM_2: inhalant allergic sensitization to house dust mite when the child was aged between ≥2 and <3 years inh_all_sens_IgE_HDM_3: inhalant allergic sensitization to house dust mite when the child was aged between ≥3 and <4 years .... inh_all_sens_IgE_HDM_17: inhalant allergic sensitization to house dust mite when the child was aged between ≥17 and <18 years		kUa/L	Decimal		Please specify in online catalogue which species were tested
	inh_all_sens_IgE_CAT_0 inh_all_sens_IgE_CAT_1 inh_all_sens_IgE_CAT_2 … inh_all_sens_IgE_CAT_17	Repeated measures: inh_all_sens_IgE_CAT_0: inhalant allergic sensitization to cat within one year of birth (child aged between >-1 year and <1 year) inh_all_sens_IgE_CAT_1: inhalant allergic sensitization to cat when the child was aged between ≥1 and <2 years inh_all_sens_IgE_CAT_2: inhalant allergic sensitization to cat when the child was aged between ≥2 and <3 years inh_all_sens_IgE_CAT_3: inhalant allergic sensitization to cat when the child was aged between ≥3 and <4 years .... inh_all_sens_IgE_CAT_17: inhalant allergic sensitization to cat when the child was aged between ≥17 and <18 years		kUa/L	Decimal		Please specify in online catalogue which species were tested

	inh_all_sens_IgE_RYE_0 inh_all_sens_IgE_RYE_1 inh_all_sens_IgE_RYE_2 … inh_all_sens_IgE_RYE_17	inhalant allergic senzitization to rye, measured by IgE Repeated measures: inh_all_sens_IgE_RYE_0: inhalant allergic sensitization to rye within one year of birth (child aged between >-1 year and <1 year) inh_all_sens_IgE_RYE_1: inhalant allergic sensitization to rye when the child was aged between ≥1 and <2 years inh_all_sens_IgE_RYE_2: inhalant allergic sensitization to rye when the child was aged between ≥2 and <3 years inh_all_sens_IgE_RYE_3: inhalant allergic sensitization to rye when the child was aged between ≥3 and <4 years .... inh_all_sens_IgE_RYE_17: inhalant allergic sensitization to rye when the child was aged between ≥17 and <18 years		kUa/L	Decimal		Please specify in online catalogue which species were tested
	inh_all_sens_IgE_MOULD_0 inh_all_sens_IgE_MOULD_1 inh_all_sens_IgE_MOULD_2 … inh_all_sens_IgE_MOULD_17	inhalant allergic senzitization to mould, measured by IgE Repeated measures: inh_all_sens_IgE_MOULD_0: inhalant allergic sensitization to mould within one year of birth (child aged between >-1 year and <1 year) inh_all_sens_IgE_MOULD_1: inhalant allergic sensitization to mould when the child was aged between ≥1 and <2 years inh_all_sens_IgE_MOULD_2: inhalant allergic sensitization to mould when the child was aged between ≥2 and <3 years inh_all_sens_IgE_MOULD_3: inhalant allergic sensitization to mould when the child was aged between ≥3 and <4 years .... inh_all_sens_IgE_MOULD_17: inhalant allergic sensitization to mould when the child was aged between ≥17 and <18 years		kUa/L	Decimal		Please specify in online catalogue which species were tested
Urticaria	urticaria	Ever diagnosis of urticaria	0) No 1) Yes		Binary	Where data are available, urticaria should be doctor diagnosed. If this is not the case, the variabele is partially	

						harmonized	
Anaphylactic shock	anaphylaxis	Ever diagnosis of anaphylactic shock	0) No 1) Yes		Binary	Where data are available, anaphylactic shock should be doctor diagnosed. If this is not the case, the variabele is partially harmonized	
SKIN DISEASE							
Eczema	eczema_ever	Ever doctor-diagnosis of eczema	0) No 1) Yes		Binary	Where data are available, eczema should be obtained by ISAAC questionnaires. If this is not the case, the variabele is partially harmonized. If no information is available on doctor diagnosis, the variable is partially harmonised.	
	eczema_0 eczema_1 eczema_2 … eczema_17	Doctor diagnosis of eczema Repeated measures: eczema_0: eczema within one year of birth (child aged between >-1 year and <1 year) eczema_1: eczema when the child was aged between ≥1 and <2 years eczema_2: eczema when the child was aged between ≥2 and <3 years eczema_3: eczema when the child was aged between ≥3 and <4 years .... eczema_17: eczema when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary	Where data are available, eczema should be obtained by ISAAC questionnaires. If this is not the case, the variabele is partially harmonized. If no information is available on doctor diagnosis, the variable is partially harmonised.	

Itchy rash	rash_0 rash_1 rash_2 … rash_17	Itchy rash Repeated measures: rash_0: itchy rash within one year of birth (child aged between >-1 year and <1 year) rash_1: itchy rash when the child was aged between ≥1 and <2 years rash_2: itchy rash when the child was aged between ≥2 and <3 years rash_3: itchy rash when the child was aged between ≥3 and <4 years .... rash_17: itchy rash when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary	Where data are available, itchy rash should be obtained by ISAAC questionnaires. If this is not the case, the variabele is partially harmonized. If no information is available on doctor diagnosis, the variable is partially harmonised.	
	rash_loc_0 rash_loc_1 rash_loc_2 … rash_loc_17	Location of itchy rash typical for eczema Repeated measures: rash_loc_0: location of itchy rash typical for eczema, for itchy rash within one year of birth (child aged between >-1 year and <1 year) rash_loc_1: location of itchy rash typical for eczema, for itchy rash when the child was aged between ≥1 and <2 years rash_loc_2: location of itchy rash typical for eczema, for itchy rash when the child was aged between ≥2 and <3 years rash_loc_3: location of itchy rash typical for eczema, for itchy rash when the child was aged between ≥3 and <4 years .... rash_loc_17: location of itchy rash typical for eczema, for itchy rash when the child was aged between ≥17 and <18 years	0) No 1) Yes		Binary	Where data are available, itchy rash and location should be obtained by ISAAC questionnaires. If this is not the case, the variabele is partially harmonized. If no information is available on doctor diagnosis, the variable is partially harmonised. Locations typical for itchy rash are folds of the elbow, behind the knees, in front of the ankles, under the buttocks, or around the neck, ears of eyes (ISAAC).	
DISEASES IN ADULTHOOD							
Asthma in adhulthood	asthma_adult	Ever diagnosis of asthma in adulthood based on physician diagnosis	0) No 1) Yes		Binary	Where data are available, asthma should be doctor diagnosed. If no information is available on doctor diagnosis, the variable is partially harmonised.	
COPD in adulthood	COPD_adult_GOLD	Ever diagnosis of COPD in adulthood based on GOLD criteria	0) No 1) Yes		Binary	COPD defined according to the GOLD criteria encompasses an obstructive pre-	

						bronchodilator spirometry (FEV1/FVC < 0.70)	
	COPD_adult_LLN	Ever diagnosis of COPD in adulthood based on lower limit of normal (LLN)	0) No 1) Yes		Binary	COPD defined according to the lower limit of normal (LLN), as described in J.L. Hankinson et al, Am J Respir Crit Care Med, 1999.	
	COPD_adult_diagnosis	Ever diagnosis of COPD in adulthood based on physician diagnosis	0) No 1) Yes		Binary	Where data are available, COPD should be doctor diagnosed. If no information is available on doctor diagnosis, the variable is partially harmonised.	
OTHER							
Pet exposure	pets_preg	Furry pet (dogs, cats, rodents) ownership in child's household during pregnancy.	0) No 1) Yes		Binary		

Example harmonization

Example of complete harmonization using data from Generation R

Definition of the harmonized LifeCycle variable (ever asthma)).

	Variable name	Label/description	Values	Unit	Data Type	Comments
META VARIABLES						
Ever asthma	asthma_ever_MeDALL	Ever diagnosis of asthma according to MeDALL definition	0) No 1) Yes		Binary	Ever diagnosis of asthma. Where data are available, asthma should be obtained by ISAAC questionnaires. If this is not the case, the variable is partially harmonized

A. Data (source variables): Generation R, focus @9 questionnaire and visit.

1. Has your child **ever** had one of the following **diseases diagnosed by a doctor**? If yes, at what age was it first diagnosed?

	No	*Yes, younger than 3 years*	*Yes, between 3 and 6 years*	*Yes, 6 years and older*
a. Asthma	☐	☐	☐	☐

B. Harmonisation: description

*F0100181_cleaned: GR1081 F1-c Has your child ever had one of the following diseases diagnosed by a doctor? If yes, at what age was it first diagnosed? Asthma (F0100181) (1: no, 2: yes, < 3 year, 3: 3-6 year; 4: > 6 year)

USE ALL.

frequencies F0100181_cleaned.

Recode F0100181_cleaned (1=0) (2=1) (3=1) (4=1) (else=SYSMIS) into asthma_ever_MeDALL.
Value labels asthma_ever_MeDALL 0'No' 1'Yes'.
Execute.

Frequencies F0100181_cleaned asthma_ever_MeDALL.

Complete harmonization: The harmonized variable matches the description provided in the respiratory variable table (Based on ISAAC Questionnaire).

Uploading to Opal

The wide format datasets should be reshaped into two tables: one with non-repeated measures, and one with yearly repeated measures (no monthly repeated measures are created in WP5). These scripts will create .csv files that can be uploaded in Opal/DataSHIELD, and contain the meta variable child_id to allow merging with the other tables that are uploaded online. These reshaping scripts will be shared with all cohorts at a later stage.

Appendix

I. Year, month, week, day conversions

1 year = 12 months
1 year = 52.1775 weeks
1 year = 365.2422 days

1 month = 0.0833 years
1 month = 4.3481 weeks
1 month = 30.4368 days

1 week = 0.0192 years
1 week = 0.2300 months
1 week = 7 days

1 day = 0.0027 years
1 day =0.0329 months
1 day = 0.1429 weeks

Instructions for Quality Control

of Harmonized WP5 Variables in LifeCycle

Rationale

As the final part of harmonizing the Work Package 5 data of LifeCycle, the list of harmonized core variables needs a local validation. In this document, instructions for such local quality control are described.

The aim of this Quality Control is to firstly check that each cohort's harmonized variables match those described in the WP5 Variable list (*WP5_harmonisation_manual_final_V2.1_14042020*), and secondly ensure the quality of harmonization. If any unmatched or errors are found these should be amended accordingly. Each cohort should carry out the quality checks and any necessary corrections themselves. The quality checks for WP5 are in line with the quality checks for the core variables of WP1, the examples are mainly based on the core variables but directly translatable to the WP5 variables.

If you have any queries about the quality control WP5 variables please make contact to Liesbeth Duijts (l.duijts@erasmusmc.nl) and Rosalie Mensink-Bout (s.mensink-bout@erasmusmc.nl).

The deadline for finalizing the Quality Control Checks is April 17th 2020.

Step 1: Verify list of variables and formats

Please, verify that your cohort-specific harmonized WP5 variables completely match with the information provided in the WP5 Variable List.

- Each cohort needs to check that the *name* and *data type* of each of the variables corresponds exactly to the WP5 Variable List (please see the document '*WP5_harmonisation_manual_final_V2.1_14042020*').
- Please check the requirements for *type of harmonization*. Variables considered 'fully harmonised' must match the information provided in the comment's section**.** Please, see the following examples of Step 1 in the Quality Control:

Example: History of Asthma

Variable	Variable name	Label/description	Values	Unit	Data Type	Comments
History of asthma	asthma_m	Maternal history of asthma before pregnancy (of index child)	0) No 1) Yes		Binary	Where data are available, asthma should be doctor diagnosed. If no information is available on doctor diagnosis, the variable is partially harmonised.

Core Variable List

1. Check the variable name ('asthma_m')
2. Check that the numbers of categories match (two)
3. Check 'comments':
    a. Full Harmonization: if asthma is doctor diagnosed
    b. Partial Harmonization: if asthma is not doctor diagnosed

Example: Apgar Score

Variable	Variable name	Label/description	Values	Unit	Data Type	Comments
Apgar score	apgar	5-minute Apgar score	Score 1-10		Integer	10-minute Apgar score can be used if 5-minute Apgar score is not available; this will be partial harmonisation and should be detailed in the online catalogue 1-minute Apgar score cannot be used in place of 5-minute Apgar score

Core Variable List

1. Check the variable name ('apgar')
2. Check that values are integer
3. Check 'comments':
    a. Full Harmonization: if Apgar score is based on a 5-minute Apgar test.
    b. Partial Harmonization: if Apgar score is based on a 10-minute Apgar test.

If any mismatch is observed, please correct the errors accordingly.

Step 2: Check univariate distributions

Please, generate distributions for all WP5 variables, and check for outliers and improbable values. Also, for variables that have been reported in papers/publications, verify that distributions or summary statistics of the harmonized LifeCycle variable match those of the reported/published variables.

For continuous variables:
- Check that there are no outliers, i.e. values out of the minimum and maximum range based on the instrument used to measure each variable.
- Check the distribution of the variables, for example for the lung function z-score variables you expect a normal distribution with a mean around zero.
- Please use your scientific knowledge and practical sense when making this quality check so as not to drop interesting outliers. Errors are probably caused by an error in your harmonization script, so please check this carefully and correct where required.

Example: Mothers Age at Birth in years (agebirth_m_y)

For this variable, it is relevant to check for unusual values of mother's age at birth. A valid argument is that values outside the range 15-50 years need further considerations, especially if values are substantially low.

Variable	Variable name	Label/description	Values	Unit	Data Type
Maternal age at birth (years)	agebirth_m_y	Mother's age at delivery in complete years.	Continuous in years	years	Integer

Core Variables List

A concrete example (please, see output below) is mother's age at child's birth in the Danish National Birth Cohort (DNBC) where age range is 15-47 years, which seems fairly usual; hence no amendment is needed.

```
. sum agebirth_m_y

    Variable |        Obs        Mean    Std. Dev.       Min        Max
-------------+---------------------------------------------------------
agebirth_m_y |    102,442    29.97417    4.348355         15         47
```

Output from STATA

For categorical variables:

- Check that there are no improbable values, i.e. values not corresponding to the categories defined in the Core Variable List. Please, correct errors where relevant.

Example: History of diabetes (prepreg_dia)

For History of Diabetes, there are five possible categories following the Core Variable List :

Variable	Variable name	Label/description	Values	Unit	Data Type
History of diabetes (all kinds)	prepreg_dia	Diagnosis of mother with diabetes before index pregnancy	1) No 2) Type I 3) Type II 4) Gestational diabetes 5) Other/unspecified		Categorical

Core Variables List

Check that data is coded into a maximum of five categories, and falls into the categories 1-5 (see output):

```
. tab prepreg_dia

prepreg_dia |      Freq.     Percent        Cum.
------------+-----------------------------------
          1 |    101,962       99.45       99.45
          2 |        292        0.28       99.73
          3 |         34        0.03       99.77
          4 |        233        0.23       99.99
          5 |          6        0.01      100.00
------------+-----------------------------------
```

Output from STATA

Example: Birth outcome (outcome)

For Birth Outcome, there are six possible categories following the Harmonization Protocol:

Variable	Variable name	Label/description	Values	Unit	Data Type	Comments
Birth outcome	outcome	The child's condition at delivery	1) Live-born 2) Stillborn 3) Spontaneous abortion 4) Induced abortion 5) Unspecified abortion 6) Other (e.g. Molar + extrauterine pregnancy)		Categorical	A complete match is achieved when data on all categories (live born, still born, spontaneous abortion etc.) are available. When detailing the match of the variable in the catalogue it is important to include the approximate age of recruitment; in many cases this will explain a partial match. Where the match is only partial, also indicate whether there are complete data on live-born vs. stillborn. Stillborn defined according to WHO recommendations (22 completed weeks)

Core Variables List

Check that data is coded into a maximum of six categories. It might be that you don't have data in all six categories, but simply check that data falls into the categories 1-6 (see Stata-output below):

```
. tab outcome, nolabel

 RECODE of
  outcom_f
 (Udfald af
graviditet) |      Freq.     Percent        Cum.
------------+-----------------------------------
          1 |     96,834       94.51       94.51
          2 |        329        0.32       94.83
          3 |      4,739        4.63       99.46
          4 |        443        0.43       99.89
          6 |        114        0.11      100.00
------------+-----------------------------------
```

Output from STATA

Step 3: Check internal validity

Internal validation is an important part of the local quality control. Thus, <u>within reason</u> cross-tabulate the variables against other variables to check for consistency. For example:

- The variables whe_ever2 and whe_ever4 should be in line with the variables whe_0 to whe_4
- The variable whe_ever should be in line with the variables whe_ever2 and whe_ever4
- Check that children which have a specified asthma medication type (so a 1, 2, 3 or 4 for the variable asthma_med_spec_) are specified as 'yes' for the variable asthma_med_, and vice versa.
- Check that all children who have information for the FEV_1 z-score also have information on the absolute value of the FEV_1.
- Children who are coded as a 'yes' for the location of the rash (rash_loc_) should be coded as having a rash.

Please, amend any errors accordingly.

Step 4: Check consistency in repeated measures

In the WP5 variable list we have yearly repeated measures. Quality checking the repeated measures includes checking the consistency in time bands and order.

- The data is still in wide format. Check that there are no duplicates in the *child_id* variable.
- Check that the actual age when the variable is assessed (as opposed to the average age of the cohort at follow-up) matches with the age range of the variable. For example if inhalant allergic sensitization is measured by skin prick test at the age of 7.5 years, then the variable inh_all_sens_SPT_7 should be created.

Step 5: Complete the Online Catalogue

As part of the Quality Control, each cohort must ensure that the Online Catalogue is aligned accordingly. This means that in the Online Catalogue description of harmonisation is complete and information in all three tabs ('description, 'variables used and script syntax' are completed in full.

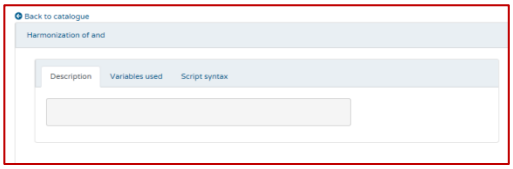
The checklist below is intended to help cohorts with this alignment process. It is important that each cohort check the list step-by-step to qualify the core fundament of The LifeCycle Project: THE DATA!

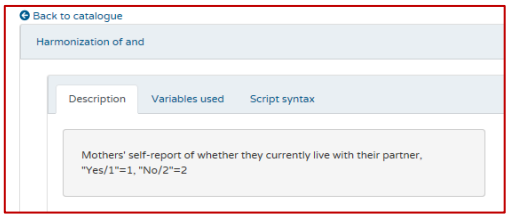
<u>Checklist to align the Online Catalogue with the Quality Control</u>

Each cohort has the responsibility to ensure that all cohort-specific information is correctly listed in the Online Catalogue. The Online Catalogue is a vital platform for future use of the LifeCycle data, hence it is very important that anyone outside the cohorts can understand the information reported and described in the Online Catalogue and are able to use the data provided by each cohort.

Check and verify ‘Description’

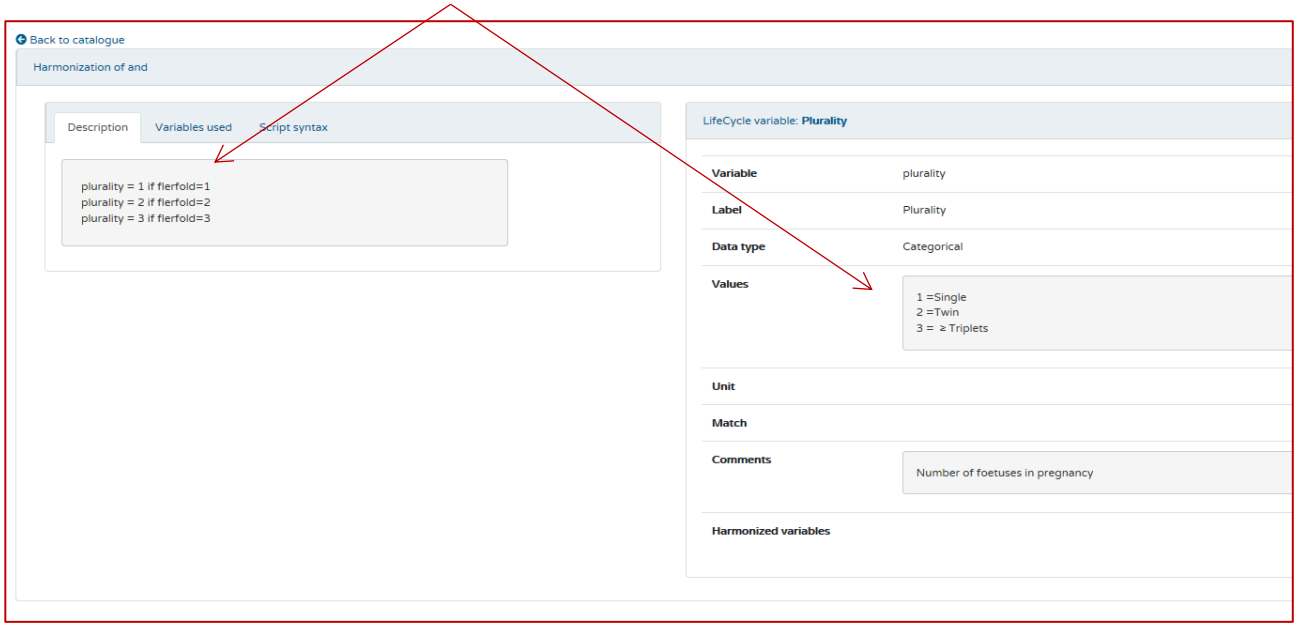
Ensure that a description is filled in – if no description is filled in, please fill in (see picture on the right for inadequate example)





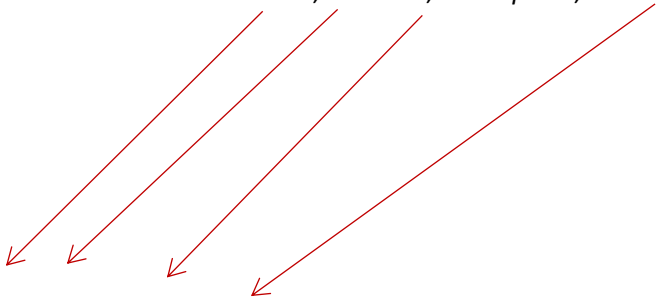
Ensure that the description can be understood by anyone outside the cohort (see picture on the left for adequate example)

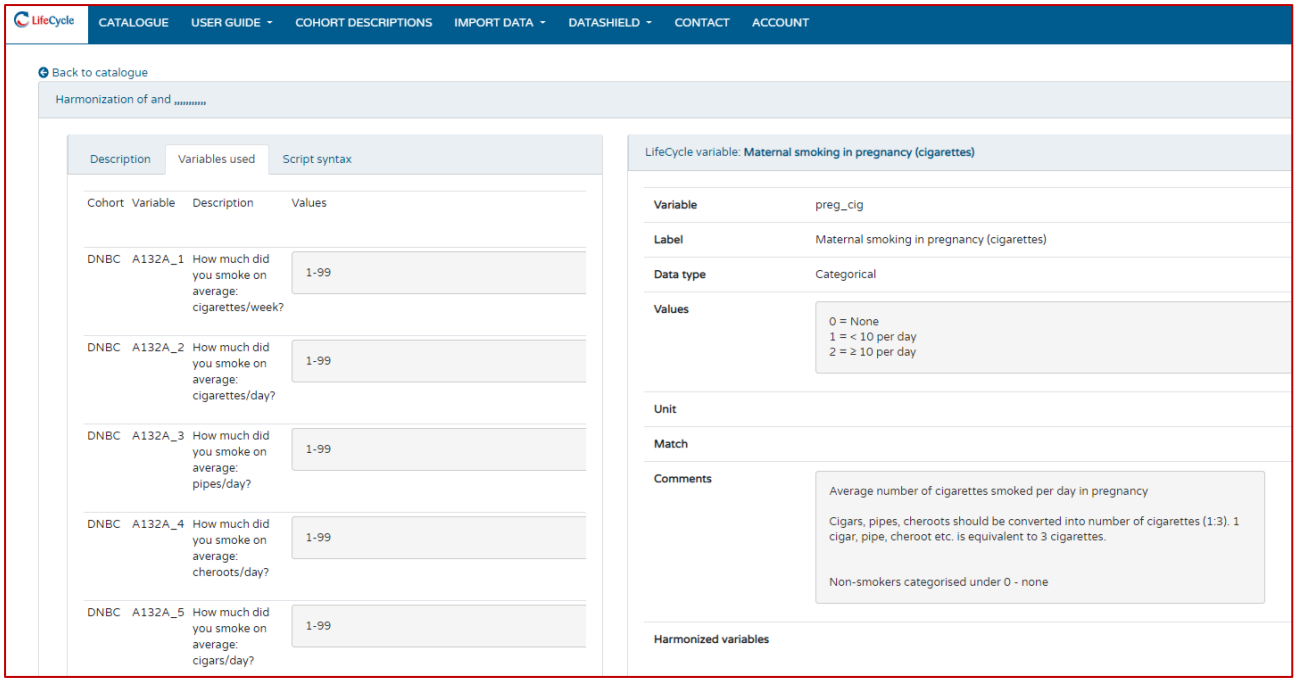
Ensure that cohort-specific information (left) exactly match the Harmonization Protocol (right)



Check and verify ‘Variables used’

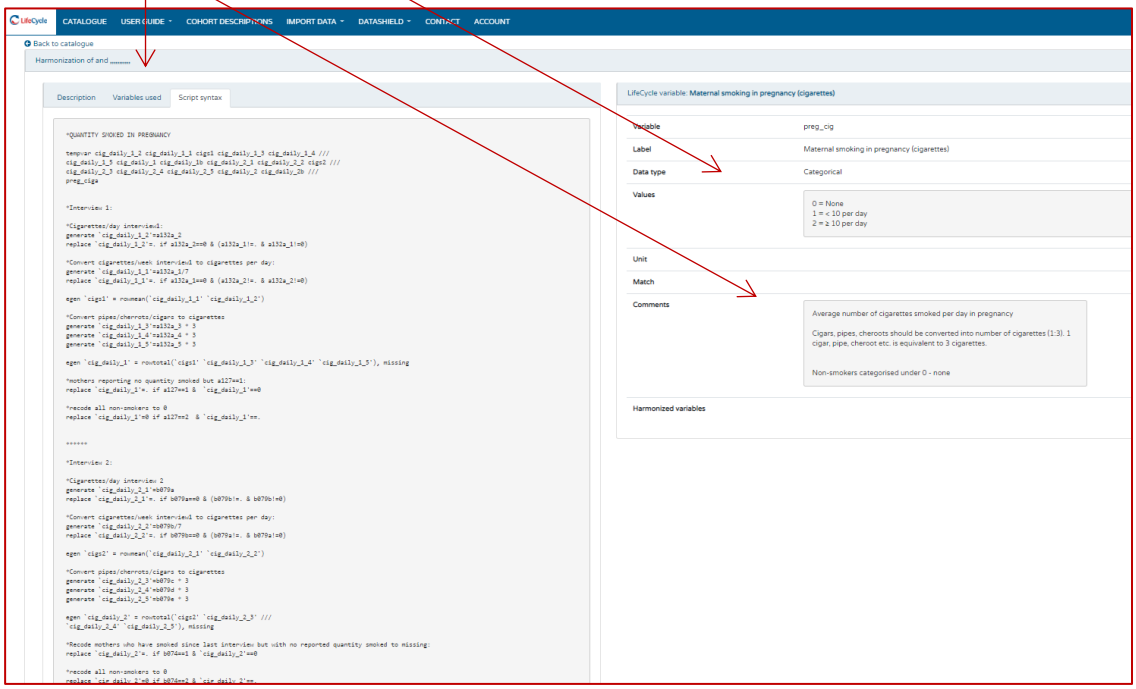
Ensure that information on *Cohort*, *Variable*, *Description*, and *Values* are completed in full.





Check and verify 'Script syntax'

Check that the script syntax is filled in, and verify that the syntax reported is completed in full and matches the '*comments*' and '*values*' displayed on the right side. Also, ensure that any person outside the cohort can understand the syntax, and verify that any description in the syntax is in English.

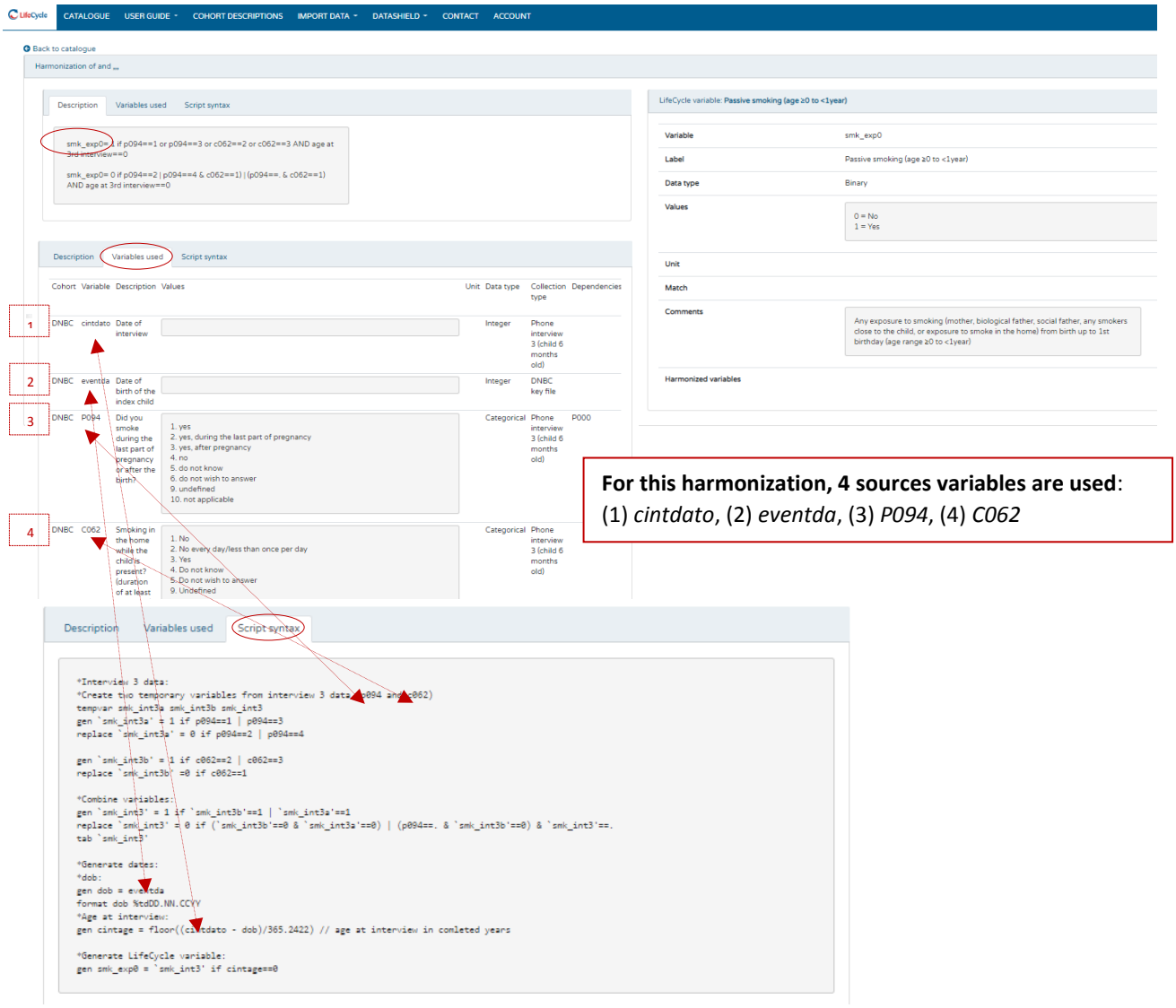


Check and verify consistency in Online Catalogue

As noted above, information in the Online Catalogue should be filled in by the cohorts themselves. Not only is it important that information in 'description', 'variables used' and 'script syntax' are filled in, but also information across the three boxes must be consistent.

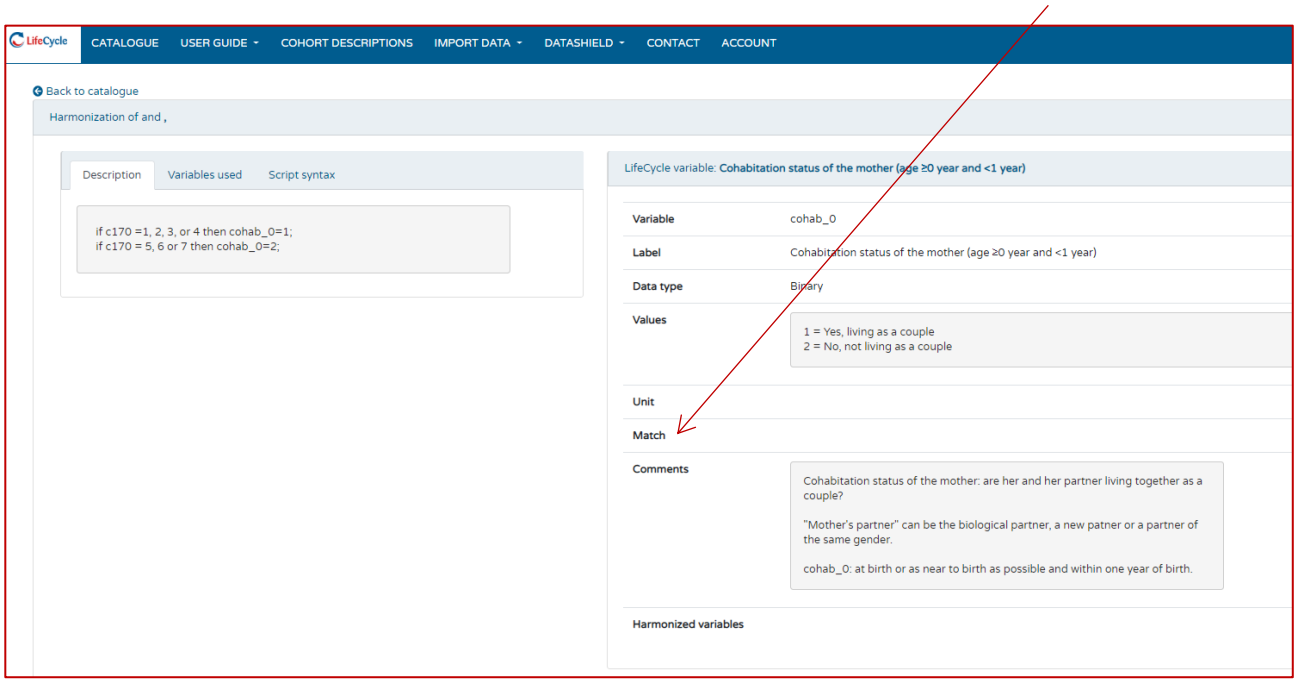
Hence, the script syntax should include the variables used and match the variable description.

Please, check and verify consistency in the core variables incl. non-repeated and repeated measures:



Check and verify consistency in repeated measures

Check that information (in '*description*', '*source variables*' and '*script syntax*') is filled in for each time band of the repeated measures. Each time band must have information on harmonization if variables are partial.

Check and verify the description of partially harmonized variables

Ensure that details of why a variable is only partially harmonized should be given in detail in ‘match’.