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Documentation TwinLife Data: Height, Weight, and BMI

v3.0.0

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Table of Contents

Change log BMI Report v3.0.0	4
Introduction	5
Body Measurement	5
Flagging System (bdy1001, bdy1002, bdy1003)	7
Informant Differences	10
Corrections in face-to-face 2	10
Corrections in face-to-face 3	11
Corrections in face-to-face 4	11
Retrospective corrections in face-to-face 1	12
Development of Longitudinal Checking Routines	14
Routines Based on the Distribution of Body Measures Within One Data Collection	14
Additional Routines Based on the Comparison of Values Between Data Collections	15
Checking Routine for Height	15
Checking Routine for Weight	18
Calculation and Checking of the BMI	20
References	21
Appendix	23
Corrections Release 4.0.0	23
Corrections Release 6.0.0	31
Corrections Release 8.0.0	33

Change log BMI Report v3.0.0

Compared to the previous version v.2.0.0 several changes were made, and additional checking routines were implemented. In v3.0.0 the following changes have been made:

- Inclusion of face-to-face 3 and face-to-face 4 data
- Overhaul of the structure of the report
- Corrections based on the full longitudinal data
- Recalculation of flags and bdy0300 for every data collection

Introduction

This technical report aims to document the calculations and considerations made to a) resolve informant differences, b) conduct basic plausibility checks for height and weight measurements, and c) calculate the body mass index. Data corrections reported here apply mostly to the face-to-face 2 to face-to-face 4 data (Version 4.1.0 – Version 8.0.0), but for consistency reasons, the corrections were also adopted for the first data collection of *TwinLife*. These changes were only implemented for the final height (bdy0100_hgt), final weight (bdy0200_wgt) and final BMI (bdy0300) variables. The unaltered variables are still included in the final data set (see bdy0100, bdy0100[t/u/s], bdy0200, bdy0200[t/u/s]). This technical report builds on the previous work of Lenau and Hahn (2017). The calculations provided there are still valid.

Body Measurement

Similar to the face-to-face 1 in TwinLife (F2F 1), participants of F2F 2 were asked to fill in their current height [in cm] and weight [in kg] in an open-ended format. For children younger than 14 years, one parent was asked to provide information on their child's current height and weight (external report). For parents as well as children and adolescents aged 10 years or older, current height and weight were measured via self-report. In face-to-face 2, these values were part of the CASI (computer assisted self-interview), which was a questionnaire to be filled out on a tablet. In contrast to the first data assessment (F2F 1), information on height and weight was provided by two informants for all twins of cohort 2 and all siblings in the similar age range, i.e., via self-report and external report of the parents, as the filter conditions overlapped for the age range of 10 to 13 years. Differences in the external report and self-report for the age range of 10 to 13 years are referred to as "informant differences" throughout this report. Variables indicating the occurrence of informant differences (bdy0100_dht, bdy0200_dwt) were generated in accordance with the first technical report (see Table 1.). The assessment in subsequent waves followed in a similar manner, however, in F2F3 only data from children were assessed via parent-report. The frequencies of body measurement values available for each data collection are depicted in Fehler! Verweisquelle konnte nicht gefunden werden.

Table 1.

Measure	Label
bdy0100	Height in cm (>= 10 yr.)
bdy0100[t/u/s]	Height in cm [twin1/twin2/sibling] (m/f/n/g)
bdy0200	Weight in kg (>=10 yr.)
bdy0200[t/u/s]	Weight in cm [twin1/twin2/sibling] (m/f/n/g)
bdy0100_nht	Number of height values given (gen)
bdy0200_nwt	Number of weight values given (gen)
bdy0100_dht	Difference between several height values
	(gen)
bdy0200_dwt	Difference between several weight values
	(gen)
bdy0100_hgt	Height in cm: corrected (gen)
bdy0200_wgt	Weight in kg: corrected (gen)
bdy0300	BMI: corrected (gen)
bdy1001	Flag: Peculiarities in height (gen)
bdy1002	Flag: Peculiarities in weight (gen)
bdy1003	Flag: Peculiarities in BMI (gen)

Relevant variables in this report

Table 2.

Availability of height and weight data for the data collections (target age and frequencies).

		Self-Repo	ort	External reports by parents			
	Target age	Height Weight		Target Heigl age Heigl		Weight	
F2F 2	10+	8,280	8,259	5-13	3,024	3,014	
F2F 3				5-13	1,569	1,549	
F2F 4	13+	6,169	6,127	5-13	837	828	

Flagging System (bdy1001, bdy1002, bdy1003)

In order to provide users with assistance in dealing with possible inconsistencies in body measurements, we have added three flag variables for each data collection. These contain information on possible threats to the validity of the data. Each flag variable indicates possible problems with each of the body measurements (height - weight – BMI, see Table 3.). As the numerical value in the variables increases, the severity of the potential "threat" to the validity of the data also increases, while "9" stands for "was set missing" and "0" for "no problem apparent". While flag values 1, 2, and 3 indicate little threat to the validity of the data, an increasing value provides stronger indications that a data point may be invalid. We divided the flags into two categories: correction flags, which were set to indicate which values were altered, and potential data error flags. If a person was assigned multiple flags in one variable, only the numerically highest value was kept. We strongly recommend checking cases with numbers higher than 3 in the flag variables.

Additionally, beginning with v.2.0.0 we introduced some new missing categories for the final body measurement variables to provide more details on the reasons why a case was set invalid (see Table 4.). All corrections are documented in the appendix on a case to case basis.

Table 3.

Flag variable system		
bdy1001 – Peculiarities in	bdy1002 - Peculiarities in	bdy1003 - Peculiarities in
height	weight	BMI
Face-to-face 1		
9: value was set missing	9: value was set missing	9: value was set missing
0: no problem apparent	0: no problem apparent	0: no problem apparent
Correction flags	Correction flags	
1: typing error corrected	1: typing error corrected	
2: one value invalid	2:one value invalid	
(informant difference)	(informant difference)	
Potential Data Error flags	Potential Data Error flags	Potential Data Error flags
3: informant difference	3: informant difference	4. very low BMI
5. momune unterence	5. momune difference	+. Very low bin
Face-to-face 2 to face- face 4		
9: value was set missing	9: value was set missing	9: value was set missing
0: no problem apparent	0: no problem apparent	0: no problem apparent
Correction flags	Correction flags	
1: typing error corrected	1: typing error corrected	
2: one value invalid	2: one value invalid	
(informant difference)	(informant difference)	
Potential Data Error flags	Potential Data Error flags	Potential Data Error flags
3: informant difference	3: informant difference	4: very low BMI
4: unusual growth (adults)	4: high weight difference	
5: negative growth (adults)	(children)	
6: no or negative growth	5: high weight difference	
(children)	(teenagers and adults)	
7: extreme growth	6: no weight gains while	
(children)	growing	

Note. Bold font indicates that these flag categories are not part of the F2F1 file.

Missing value categories	
Value	Value label
-80	Substantial informant difference
-81	Implausible value
-82	Weight instead of height reported/ height
	instead of weight reported
-83	Twins' values could be interchanged

Table 4.

Informant Differences

Corrections in face-to-face 2

In face-to-face 2, for twins in cohort 2 or siblings in the age range of 10 to 13 years, multiple values are available from two different informants (self-report and external report of one parent). 1,369 cases (13.7% of the sample) had double information in weight or height. In analogy to the first technical report, we generated several variables indicating the number of reported values for height (bdy0100_nht) and weight (bdy0200_nwt) and the difference between the information sources (bdy0100_dht for height and bdy0200_dwt for weight; see Table 1.). The distribution of differences is depicted in Table 5. Please note that only the absolute value of the difference was kept in the final variable.

As it is apparent from the descriptive statistics, the informant difference rarely exceeded the ± 10 cm or kg margin, with more than 95% of all values falling into this margin, while around 80% of the differences lay within the ± 5 cm/kg difference margin. Therefore, in a first step, we resolved these informant differences before conducting further plausibility checks. In accordance with the first report, we decided to build a mean score for those participants who had informant differences of 10 cm/kg or less (variables bdy0100_hgt or bdy0200_wgt). Since raw values are still included in the data set, users are free to use only the external report (e.g. bdy0100t/u/s) or self-report (e.g. bdy0100).

If the informant difference was higher than 10 cm/kg, we decided to take a closer look at these cases (n = 95). We specifically searched for typing errors and obvious implausibilities (extremely high or low values or obviously impossible to be valid values, for a documentation on case level see Appendix B). If not automatically conducted, all decisions regarding the corrections in this report were made independently by the two first authors. Any changes made are specified in the flag variable. The flag variable value "9" indicates a value was set missing with a specific missing code in the generated variables (bdy0100_hgt and bdy0200_wgt), providing additional information about these cases. Ultimately, we applied the following criteria:

Flag 1 – Correction of typing error: Obvious typing errors were only corrected if the independent decision of the two raters were congruent. If one of the raters decided that a case was valid, it was set valid. In the cases identified as possible typing errors, either the "1" at the beginning of the value for height was forgotten or the "1" at the beginning

of the value for weight was wrongly entered (e.g., 123 kg for child instead of 23 kg). Possible typing errors were only corrected if the information provided was consistent with the additional information (i.e. external or self-report) or the information from the face-to-face 1 survey. If the informant difference with corrected information was within the acceptable margin of 10 cm/kg or less, we then calculated the mean score for final height (bdy0100_hg; $n_{\text{height}} = 13$) or final weight (bdy0200_wgt; $n_{\text{weight}} = 3$).

- *Flag 2 One value invalid:* If only one value was valid and the other value was missing or highly implausible, the invalid value was omitted and the valid value was taken as the final value for height (bdy0100_hg; n_{height} = 4) or weight (bdy0200_wgt; n_{weight} = 4).
- *Missing value -80 Substantial informant difference:* If the informant difference exceeded the \pm 10 cm/kg margin and could not be resolved otherwise, the final value was set missing (-80: substantial informant difference) ($n_{\text{height}} = 32$, $n_{\text{weight}} = 39$).
- *Missing value -83 Twins' values could be interchanged:* One pair of twins was probably mixed up in the self-report. However, as this could not be clearly determined, we set their final values to "missing" with a separate missing code (-83: Twins' values could be interchanged, n_{height} = 2, n_{weight} = 2).

For all remaining cases:

• *Flag 3 – Informant difference:* Any participant who exceeded the 5 cm/kg margin was flagged ($n_{\text{height}} = 88$, $n_{\text{weight}} = 111$), as this might reflect a slight bias in the final height or weight variables.

Corrections in face-to-face 3

In only one case there were doubled values provided for height by two parents. The difference was 1 cm, so according to the standard procedure, we set the final height to the mean of both values.

Corrections in face-to-face 4

In face-to-face 4, there should not have been any cases with doubled values, as body characteristics were measured as a parental report for participants aged 13 or younger and as a self-report for participants aged 14 or older. However, in 6 cases there were doubled values from both the parental report and the self-report as some participants turned 14 by the time they

were surveyed themselves but were still 13 when their parents were interviewed. However, none of the value differences exceeded a 10 cm/kg margin, so no value was set to missing and the mean score of the values was taken as the final body measure value. The informant difference was flagged if it exceeded a 5cm/kg margin.

Retrospective corrections in face-to-face 1

Consistent with our routine established in this report for the face-to-face 2 data, we applied the same rules to the face-to-face 1 data. This led to an additional n = 6 values in height and n = 5 values in weight to be set missing (-80: substantial informant difference) due to informant differences higher than 10 cm/kg. Changes in the BMI-variable were made accordingly. We also flagged n = 17 cases for height and n = 11 cases for weight due to informant differences exceeding the 5 cm/kg difference margin (flag 3).

Due to a syntax error, height values stemming from the zygosity questionnaire for cohort 3 and 4 were not taken into account for the second born twin in prior releases. However, we were able to redeem 501 more height values for twins in F2F1 by correcting this error with Release 6.0.0. But having these values introduced a new source of inconsistencies which resulted in 455 cases with doubled values of which 183 showed inconsistencies in their height values. These doubled values were handled in the same way the informant differences were handled: Discrepancies were resolved by building a mean score for the two values, if the discrepancy margin did not exceed \pm 10 cm. 5 Cases did exceed this margin and were set to missing (-80, pid: 352199001, 378238001, 379721002, 388532001, 399146001). Cases exceeding a \pm 5 cm margin were flagged (n = 14, flag 3 in variable byd1001). The BMI variable was generated for these cases. No peculiarities in BMI were apparent.

Maaaaa	17	14	(D)	Percentile						
Measure	IN	М	SD	1	5	25	50	75	95	99
Informant difference in height in cm (bdy0100_dht)	1369	-1.32	20.50	-99.00	-5.00	0.00	0.00	1.00	6.00	13.30
Informant difference in weight in kg (bdy0200_dwt)	1365	0.96	9.02	-11.34	-5.00	0.00	0.00	1.00	8.00	18.00

Table 5.Descriptive statistics on informant differences in the face-to-face 2 data collection

Note. N = Number of doubled values; M = Mean of the informant difference (self-report – proxy report), SD = standard deviation.

Development of Longitudinal Checking Routines

With multiple data collections at hand, we were able to establish checking routines based on the natural progression of the growth or weight development in certain age groups (Robert Koch-Institut, 2013b; Robert Koch-Institut, 2013c). Additionally, we investigated the upper and lower boundaries of age and gender specific body measurement distribution in order to uncover potential implausibilities in the data.

First, we present routines for detecting implausible values that operate without the need to compare data between data collections. Second, we present the additional criteria used to investigate implausible changes in weight or height between the data collections.

The procedure was always as following: First, identifying suspicious cases with checking routines (all checking routines were applied simultaneously), then screening these cases for obvious data errors, and finally, flagging very extreme deviations automatically. The screening was done by the two first authors, yielding high concordance rates (e.g. F2F 4: 93% on case level). Differences between screeners were resolved in joint discussions.

Routines Based on the Distribution of Body Measures Within One Data Collection

For the first data collections, we chose an empirical approach for the checking routine based on the distributions of body measures. For each age and gender group, we ranked the values and set a 2.5 % percent cut-off at both the top and bottom of the distribution in order to identify typing errors or implausible values. Until the age of 20, each age group formed its own reference group. From the age of 20 onwards, the intervals were expanded to 5-year intervals. In addition to this indicator, which was specific for each data collection, we used further criteria that benefited from the comparison between data collections.

Starting with face-to-face 4, we took the percent rank of persons based on normative data into account. To calculate the percent rank of the participant's body measures, we used data of representative sources (e.g., Schienkiewitz et al., 2017; Destatis, 2018; Gesundheitsberichterstattung des Bundes, 2024).

In the following, we will describe the longitudinal criteria for each body measurement. Subsequently, we describe the corrections that were conducted based on all checking routines combined.

Additional Routines Based on the Comparison of Values Between Data Collections Checking Routine for Height

To monitor the growth of children and adolescents, we first established an indicator for the monthly growth rate to control for the temporal variance between the data assessments. Given the natural course that body length growth should follow in an assumed two-year period between data collections, we were able to formulate additional criteria that mark possible inconsistencies (see Prader et al., 1989; Robert Koch-Institut, 2013b):

Criterion A: Adults (people over 20) should not grow, hence the height difference between the two data collections should not exceed a tolerance limit of 5 cm. (Flag 4)

Criterion B: Adults should not shrink and the height difference between the two data collections should therefore not exceed a tolerance limit of 5 cm. (Flag 5)

Criterion C: Boys under the age of 16 and girls under the age of 14 should grow (see Robert Koch-Institut, 2013c). The growth rate must therefore be higher than 0 cm/per month. The height difference should not be negative between the age of 14 (or 16 for boys) and 21 (with a 5 cm tolerance margin). (Flag 6)

Criterion D: Extremely high growth rates are unlikely. We reviewed the 2.5% at the top of the growth rate distribution for each age and gender group under 21 years.¹ (Flag 7)

As the panel progressed, more and more information became available to resolve contradictions in the data. Starting with the face-to-face 4, most participants had at least 3 data points, making the correction of inconsistencies much easier. Hence, we revised cases that have been flagged in prior data collections for the data release 8.0.0 (including F2F 4) and corrected these values accordingly. Table 6. provides an overview of the changes and flags for the height variables of all data collections. Please note that there might be some discrepancies in the table to the numbers provided in former versions as data was altered when more information became available and more corrections could be made. In the appendix you can see on case-to-case basis for which data version the corrections have been implemented. As a reference for the

¹ The lower boundary of the distribution was not included separately, as it was already covered by Criterion C.

comparisons, the last available data point was used (if the value for F2F 3 was missing, the value of F2F 4 was compared to F2F 2 etc.). For adults with data of 3 data collections, if two height values were the same, but a third one was fundamentally different, the deviating value was set to the value of the two consistent ones. If two of the three values were at least similar (in a 5 cm margin), the dissimilar value was replaced by the mean of the two more consistent ones.

Table 6.

	Missings					Flags						
Data collection	-80	-81	-82	-83	1	2	3	4	5	6	7	
F2F 1	11	14			15		30					
F2F 2	30	24	2	2	33	2	85	21	15	36	1	
F2F 3		2			3					21	0	
F2F 4		9			9		4	19	24	25	0	

Frequencies for different missing codes and flags for height in all released data collections.

Note. Missing codes: -80: Substantial informant difference, -81: Implausible value, -82: Weight instead height, -83: Twins values could be interchanged; Flags: 1:Typing Error corrected, 2: One value invalid, 3: Informant difference, 4: Unusual Growth, 5: Negative growth, 6: No or negative growth, 7: Extreme growth

Checking Routine for Weight

Unfortunately, in contrast to the development of height, weight development follows fewer natural rules, so that we were able to apply strict criteria for checking routines only to a limited extent. In addition to checking the distribution for every data collection, we decided to check the cases that showed:

- a) A weight difference of at least 20 kilograms in any direction compared to the prior data assessment for children younger than 13. (Flag 4)
- b) A weight difference of at least 30 kilograms in any direction compared to a prior data assessment for children older than 12. (Flag 5)
- c) No or negative weight gains while growing for boys under the age of 16 and girls under the age of 14². (Flag 6)

In contrast to the height flags, these flags are far less indicative of potential data errors. We therefore advise users to check these cases thoroughly.

In the data cleaning process of F2F 4, we used the last available data point as reference. If e.g. F2F 3 data was missing, we used the F2F 2 in comparison to F2F 4 data. For every data collection that we had to go back in time, we allowed the difference to be 10 kg higher (so e.g., comparing a child's score of F2F 2 and F2F 4, the limit was 30 kg instead of 20 kg). Table 7. provides an overview of the changes and flags for the weight variables of all data collections.

² Age cut-offs base on the data of the Robert-Koch-Institute (2013c).

Data collection	Missings					Flags				
	-80	-81	-82	-83	1	2	3	4	5	6
F2F 1	5	3			4		13			
F2F 2	39	6	2	2	8	4	110	3	19	69
F2F 3		7			3			19		37
F2F 4		9	1		5			32	28	30

Table 7.Frequencies for different missing codes and flags for weight in all released data collections.

Note. Missing codes: -80: Substantial informant difference, -81: Implausible value, -82: Height instead weight, -83: Twins values could be interchanged; Flags: 1:Typing Error corrected, 2: One value invalid, 3: Informant difference, 4: Unusual weight difference \pm 20, 5: Unusual weight difference \pm 30, 6: No or negative weight gains while growing,

Calculation and Checking of the BMI

Finally, the Body Mass Index was calculated using the Quetelet's body mass index formula (for an overview on indices, see Khosla & Lowe, 1967):

$BMI = \frac{Weight in kg}{(Height in m)^2}$

Although the data on which the BMI was finally based were thoroughly checked, some BMI values were suspiciously low. We flagged these cases (flag 4: very low BMI), if their BMI fell below 12 (for under 10-year-olds) below 13 (for under 13-year-olds) or below 14 (for older participants, see also Table 8.)³.

Table 8.

Frequencies for BMI flags in the different data collections.

Data collection	Very low BMI (Flag 4)
F2F 1	106
F2F 2	66
F2F 3	57
F2F 4	29

³ These cut-offs were based on the normative data of the Robert-Koch-Institute (2013a) and literature indicating life-threatening low BMIs common for anorexia nervosa patients (e.g., Queensland Eating Disorder Service, 2019).

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Appendix

Corrections Release 4.0.0

Appendix A. Corrections in face-to-face 1

PID	Age	Sex	Original value (Difference)	Correction F2F1
Height				
187586001	5	Male	201 cm	-81
214159001	10	Male	80 cm (Height Diff: 83 cm)	-81
214159002	10	Male	80 cm (Height Diff: 84 cm)	-81
224233200	13	Male	0 cm (Height Diff: 168 cm)	-81
318116400	50	Male	117 cm	-81
388532001	17	Female	100 cm	-81
435631200	24	Male	128 cm	-81
451555300	57	Female	126 cm	-81
463889002	23	Female	115 cm	-81
463953400	48	Male	85 cm	-81
Weight				-81
221865002	11	Female	160 kg	-81
224233200	13	Male	0 kg (Weight diff: 50 kg)	-81
289480200	14	Female	136 kg (Weight diff: -93 kg)	36 kg
352132002	17	Female	160 kg (Weight diff: -85 kg)	60 kg
399208400	53	Male	182 kg (Weight diff: -99 kg)	82 kg
498367300	51	Female	158 kg (Weight diff: -98 kg)	58 kg

Note. PID = scientific use file person identifier; Height diff = Height difference, calculated: height value of face-to-face 2 – height value of face-to-face 1; Weight diff = Weight difference, calculated: weight value of face-to-face 2 – weight value of face-to-face 1; if there is no difference indicated, no value for face-to-face 2 was provided by the participants.

	5 5	55			External		
			Face-to-Face 1	Self-report -	report – Face-	Informant	
PID	Age	Sex	data	Face-to-Face 2	to-Face 2	difference	Correction F2F2
Height							
137011200	10	Female	-95	45 cm	145 cm	-100 cm	145 cm
139324200	10	Female	-95	36 cm	132 cm	-96 cm	134 cm
151635200	10	Male	132 cm	46 cm	145 cm	-99 cm	145.5 cm
167021200	12	Male	142 cm	52 cm	155 cm	-103 cm	153.5 cm
184568200	12	Female	137 cm	52 cm	152 cm	-100 cm	152 cm
185718200	10	Male	131 cm	128 cm	142 cm	-14 cm	-80
186238200	11	Male	134 cm	152 cm	140 cm	12 cm	-80
188672200	10	Male	144 cm	55 cm	155 cm	-100 cm	155 cm
214057001	13	Male	154 cm	150 cm	170 cm	-20 cm	-80
214345002	13	Female	140 cm	55 cm	155 cm	-100 cm	155 cm
214347002	13	Male	152 cm	136 cm	163 cm	-27 cm	163 cm
218748001	13	Female	150 cm	163 cm	150 cm	13 cm	-80
222421002	13	Female	148 cm	145 cm	164 cm	-19 cm	-80
224024002	13	Male	164 cm	180 cm	165 cm	15 cm	-80
226177001	13	Male	146 cm	110 cm	162 cm	-52 cm	162 cm
227424001	13	Female	141 cm	159 cm	759 cm	-600 cm	159 cm
232735001	13	Female	158 cm	161 cm	140 cm	21 cm	-80
232735002	13	Female	157 cm	159 cm	139 cm	20 cm	-80
236509002	13	Female	-95	65 cm	154 cm	-89 cm	-80
240822001	13	Male	148 cm	50 cm	164 cm	-114 cm	164 cm
245262200	10	Male	134 cm	134 cm	146 cm	-12 cm	-80
253843001	13	Female	152 cm	167 cm	155 cm	12 cm	-80
253843002	13	Female	151 cm	166 cm	155 cm	11 cm	-80

	0 0				External		
			Face-to-Face 1	Self-report -	report – Face-	Informant	
PID	Age	Sex	data	Face-to-Face 2	to-Face 2	difference	Correction F2F2
254123002	13	Male	148 cm	151 cm	165 cm	-14 cm	-80
257141002	13	Female	138 cm	45 cm	140 cm	-95 cm	142.5 cm
261448001	13	Male	140 cm	136 cm	160 cm	-24 cm	-80
261945001	13	Male	160 cm	185 cm	168 cm	17 cm	-80
261945002	13	Male	150 cm	170 cm	150 cm	20 cm	-80
262571001	13	Female	160 cm	70 cm	170 cm	-100 cm	170 cm
264761002	13	Female	142 cm	1 cm	142 cm	-141 cm	142 cm
264889001	13	Male	149 cm	61 cm	169 cm	-108 cm	165 cm
266121002	13	Male	149 cm	158 cm	39 cm	119 cm	158 cm
269485002	13	Female	148 cm	150 cm	168 cm	-18 cm	-80
272169001	13	Female	-95	166 cm	152 cm	14 cm	-80
274037001	13	Male	152 cm	156 cm	140 cm	16 cm	-80
274037002	13	Male	146 cm	153 cm	136 cm	17 cm	-80
282112002	13	Male	151 cm	170 cm	158 cm	12 cm	-80
282449001	13	Female	152 cm	164 cm	150 cm	14 cm	-80
282449002	13	Female	150 cm	163 cm	150 cm	13 cm	-80
284427002	13	Male	152 cm	153 cm	164 cm	-11 cm	-80
287877002	13	Male	145 cm	189 cm	140 cm	49 cm	-80
288444001	13	Male	142 cm	59 cm	158 cm	-99 cm	158.5 cm
291206001	13	Male	142 cm	162 cm	150 cm	12 cm	-80
292289200	10	Female	130 cm	42 cm	145 cm	-103 cm	143.5 cm
296152001	13	Female	140 cm	152 cm	130 cm	22 cm	-80
296152002	13	Female	134 cm	45 cm	130 cm	-85 cm	-80
299955001	13	Male	164 cm	169 cm	185 cm	-16 cm	-83

	5 5	55	External					
			Face-to-Face 1	Self-report –	report – Face-	Informant		
PID	Age	Sex	data	Face-to-Face 2	to-Face 2	difference	Correction F2F2	
299955002	13	Male	157 cm	182 cm	168 cm	14 cm	-83	
362532200	10	Female	-95	140 cm	152 cm	-12 cm	-80	
375625200	12	Male	156 cm	155 cm	166 cm	-11 cm	-80	
Weight								
126786200	12	Female	-95	50 kg	65 kg	-15 kg	-80	
130692200	10	Female	40 kg	66 kg	50 kg	16 kg	-80	
135840200	12	Female	30 kg	51 kg	40 kg	11 kg	-80	
144426200	11	Female	38 kg	52 kg	36 kg	16 kg	-80	
161885200	10	Female	30 kg	53 kg	33 kg	20 kg	-80	
212647002	13	Male	34 kg	47 kg	30 kg	17 kg	-80	
214057001	13	Male	43 kg	45 kg	57 kg	-12 kg	-80	
214473002	13	Male	46 kg	65 kg	54 kg	11 kg	-80	
216596002	13	Male	-95	60 kg	48 kg	12 kg	-80	
221518001	13	Male	38 kg	58 kg	0 kg	58 kg	58 kg	
221518002	13	Male	35 kg	50 kg	0 kg	50 kg	50 kg	
224158001	13	Male	40 kg	65 kg	50 kg	15 kg	-80	
224158002	13	Male	34 kg	61 kg	50 kg	11 kg	-80	
224922001	13	Female	37 kg	50 kg	35 kg	15 kg	-80	
226177001	13	Male	41 kg	42 kg	55 kg	-13 kg	-80	
227298002	13	Male	36 kg	38 kg	51 kg	-13 kg	-80	
232794001	13	Male	30 kg	60 kg	40 kg	20 kg	-80	
236662001	13	Male	32 kg	52 kg	35 kg	17 kg	-80	
239175001	13	Female	35 kg	49 kg	35 kg	14 kg	-80	
239873200	12	Male	45 kg	42 kg	55 kg	-13 kg	-80	

	<i>v v</i>				External		
			Face-to-Face 1	Self-report –	report – Face-	Informant	
PID	Age	Sex	data	Face-to-Face 2	to-Face 2	difference	Correction F2F2
240282001	13	Male	42 kg	45 kg	60 kg	-15 kg	-80
241228001	13	Female	40 kg	56 kg	40 kg	16 kg	-80
241228002	13	Female	40 kg	57 kg	40 kg	17 kg	-80
243338001	13	Male	-95	50 kg	70 kg	-20 kg	-80
249311002	13	Male	39 kg	151 kg	51 kg	100 kg	51 kg
250331002	13	Male	55 kg	70 kg	55 kg	15 kg	-80
251236001	13	Male	26 kg	43 kg	20 kg	23 kg	-80
251236002	13	Male	22 kg	18 kg	36 kg	18 kg	-80
256655001	13	Female	50 kg	45 kg	56 kg	-11 kg	-80
261505002	13	Male	31 kg	73 kg	38 kg	35 kg	37.5 kg
262149002	13	Male	34 kg	55 kg	44 kg	11 kg	-80
262270002	13	Female	42 kg	59 kg	46 kg	13 kg	-80
264021002	13	Male	31 kg	250 kg	45 kg	205 kg	45 kg
268513002	13	Female	55 kg	157 kg	65 kg	92 kg	65 kg
269242002	13	Male	62 kg	48 kg	63 kg	-15 kg	-80
271158002	13	Male	35 kg	45 kg	56 kg	-11 kg	-80
272937001	13	Male	41 kg	71 kg	53 kg	18 kg	-80
274341001	13	Male	-95	40 kg	56 kg	-16 kg	-80
276455002	13	Male	40 kg	49 kg	60 kg	-11 kg	-80
276883002	13	Female	40 kg	55 kg	43 kg	12 kg	-80
279926001	13	Male	23 kg	43 kg	30 kg	13 kg	-80
280816200	11	Male	-95	36 kg	48 kg	-12 kg	-80
285302001	13	Male	38 kg	160 kg	50 kg	110 kg	55 kg
289299002	13	Male	38 kg	40 kg	60 kg	-20 kg	-80

	5 5	55	External							
			Face-to-Face 1	Self-report –	report – Face-	Informant				
PID	Age	Sex	data	Face-to-Face 2	to-Face 2	difference	Correction F2F2			
289925001	13	Male	39 kg	39 kg	50 kg	-11 kg	-80			
290742200	13	Male	46 kg	42 kg	55 kg	-13 kg	-80			
291543002	13	Female	-95	159 kg	56 kg	103 kg	57.5 kg			
299955001	13	Male	50 kg	48 kg	75 kg	-27 kg	-83			
299955002	13	Male	35 kg	75 kg	46 kg	29 kg	-83			

Note. PID = scientific use file person identifier; Informant difference is calculated as: self-report – external report.

PID	Age	Sex	F2F1 - Height	F2F2 - Height	Growth per Month	Correction F2F2
126022002	7	Male	120 cm	172 cm	2.17 cm/m	-81
163716400	57	Male	175 cm	75 cm	-3.45 cm/m	175 cm
166025200	8	Female	114 cm	230 cm	4.46 cm/m	-81
214570400	57	Male	175 cm	110 cm	-2.95 cm/m	-81
216760002	13	Male	146 cm	185 cm	1.63 cm/m	-81
251236300	37	Female	150 cm	90 cm	-2.50 cm/m	-81
251843300	48	Female	172 cm	72 cm	-4.76 cm/m	172 cm
271158500	45	Male	172 cm	90 cm	-2.93 cm/m	-81
282021002	13	Female	144 cm	58 cm	-3.74 cm/m	158 cm
339555001	19	Female	163 cm	66 cm	-4.22 cm/m	166 cm
412946001	24	Female	157 cm	52 cm	-5.25 cm/m	-82
464666002	26	Female	161 cm	61 cm	-3.70 cm/m	161 cm
466035200	26	Female	160 cm	63 cm	-4.22 cm/m	163 cm
472737400	60	Male	180 cm	78 cm	-4.25 cm/m	178 cm
485347001	25	Male	-95	67 cm	-	-82

Appendix C. Corrections in face-to-face 2 for height

Note. PID = scientific use file person identifier; F2F1 = Face-to-face 1 data collection; F2F2 = Face-to-face 2 data collection.

PID	Age	Sex	F2F1 - Weight	F2F2 - Weight	Weight difference	Correction F2F2
15//61002	7	Female	24 kg	338 kg	314 kg	38 kg
159070001	7	Female	24 Kg 22 kg	130 kg	108 kσ	-82
173501001	, 7	Male	22.5 kg	92 kg	69.5 kg	-81
174018002	6	Male	18 kg	115 kg	97 kg	-81
218748400	44	Male	106 kg	1 kg	-105 kg	-81
256281001	14	Female	34 kg	158 kg	124 kg	58 kg
323960002	19	Female	66 kg	171 kg	105 kg	-82
346234002	19	Male	67 kg	170 kg	103 kg	70 kg
370522001	19	Male	64 kg	165 kg	101 kg	65 kg
435519400	52	Male	71 kg	170 kg	99 kg	70 kg
464666002	26	Female	45 kg	12 kg	-33 kg	-81
464666002	26	Female	45 kg	12 kg	-33 kg	-81

Appendix D. Corrections in face-to-face 2 for weight

Note. PID = scientific use file person identifier; F2F1 = Face-to-face 1 data collection; F2F2 = Face-to-face 2 data collection.

Corrections Release 6.0.0

Appendix E.

Corrections in face-to-face 3 for height.

PID	Age	Sex	F2F1 - Height	F2F2 - Height	F2F3 - Height	Correction F2F3
135179002	9	Female	114	127	37	137
148195001	9	Male	108	NA	70	-81
169199200	12	Male	NA	154,5	126	-81
197500001	10	Male	111	122	32	132
197500002	10	Male	114	123	33	133

Note. PID = scientific use file person identifier; F2F1 = Face-to-face 1 data collection; F2F2 = Face-to-face 2 data collection; F2F3 = Face-to-face 3 data collection; F2

data collection.

F2F1 - Weight F2F2 - Weight PID Sex F2F3 - Weight Correction F2F3 Age 126339001 -81 9 Female 17,5 NA 282 18 280 126339002 9 Female NA -81 126339202 Male NA NA 215 -81 6 148195001 Male 9 NA 140 -81 17 157488200 13 32 Male 38 145 -81 170132002 9 Female 16 20 128 -81 20 195364002 9 Male 18 133 -81

Corrections in face-to-face 3 for weight.

Note. PID = scientific use file person identifier; F2F1 = Face-to-face 1 data collection; F2F2 = Face-to-face 2 data collection; F2F3 = Face-to-face 3 data collection.

Corrections Release 8.0.0

Appendix G.

PID	Sex	F2F1	F2F2	F2F3	F2F4	F2F1	F2F2	F2F3	F2F4	Correction	Data
		Age	Age	Age	Age	Height	Height	Height	Height	contection	collection
142393300	Female	40	42	44	46	153	163	NA	163	163	F2F1
172966300	Female	35	37	39	41	175	165	NA	165	165	F2F1
262672300	Female	37	39	41	43	163	155	NA	155	155	F2F1
323512400	Male	60	62	64	66	186	175	NA	175	175	F2F1
425287300	Female	56	57	NA	61	150	160	NA	159	160	F2F1
453292001	Female	24	26	28	30	158	170	NA	170	170	F2F1
471553002	Male	23	26	28	30	176	170	NA	170	170	F2F1
383383001	Male	18	20	22	24	200	190	NA	180	-81	F2F1
129136300	Female	32	34	36	38	156	166	NA	165	165	F2F1
146089300	Female	37	39	41	43	158	168	NA	168	168	F2F1
153821400	Male	41	43	NA	46	180	173	NA	175	174	F2F1
243019300	Female	47	49	51	53	150	158	NA	158	158	F2F1
265589001	Female	11	12	14	17	164	150	NA	164	-81	F2F1
265589002	Female	11	12	14	17	164	153	NA	162	-81	F2F1
283641300	Female	49	51	53	55	150	160	NA	160	160	F2F1

PID	Sex	F2F1	F2F2	F2F3	F2F4	F2F1	F2F2	F2F3	F2F4	Correction	Data
		Age	Age	Age	Age	Height	Height	Height	Height		collection
427378001	Male	24	25	27	29	170	177	NA	177	177	F2F1
222421200	Female	5	7	9	NA	136	130	135	NA	-81	F2F1
246909200	Female	7	9	11	NA	105	142	NA	NA	-81	F2F1
341612001	Male	18	19	21	23	190	181	NA	181	181	F2F1
396327002	Female	17	19	21	23	183	173	NA	173	173	F2F1
164528400	Male	53	55	57	59	178	187	NA	178	178	F2F2
295728300	Female	45	47	49	51	158	168	NA	158	158	F2F2
176731400	Male	48	50	52	54	183	175	NA	183	183	F2F2
280816300	Female	40	42	44	46	172	165	NA	172	172	F2F2
293855400	Male	48	51	53	55	187	180	NA	187	187	F2F2
340621200	Male	22	24	26	28	185	178	NA	185	185	F2F2
398482001	Male	17	19	21	23	165	156	NA	165	165	F2F2
141415001	Male	5	7	9	11	122	115	140	149	-81	F2F2
141415002	Male	5	7	9	11	122	115	140	149	-81	F2F2
250627002	Male	11	13	15	17	150	144	NA	183	-81	F2F2
397051200	Male	13	15	17	18	165	155	NA	178	-81	F2F2

PID	Sex	F2F1	F2F2	F2F3	F2F4	F2F1	F2F2	F2F3	F2F4	Correction	Data
		Age	Age	Age	Age	Height	Height	Height	Height		collection
129353300	Female	36	37	39	42	157	164	NA	155	156	F2F2
174018300	Female	32	34	36	38	175	183	NA	172	173	F2F2
383383001	Male	18	20	22	24	200	190	NA	180	-81	F2F2
386425001	Male	17	19	21	23	180	195	NA	182	181	F2F2
454709001	Male	23	25	27	29	186.5	196	NA	187	186	F2F2
332561001	Male	17	19	NA	23	176	170	NA	178	177	F2F2
132067002	Male	5	7	9	11	104	100	132	134	-81	F2F2
222625001	Female	11	13	15	17	145	141	NA	150	-81	F2F2
225130001	Male	11	13	NA	17	150	145.5	NA	171	-81	F2F2
251961001	Male	11	13	15	17	148	145	NA	185	-81	F2F2
251961002	Male	11	13	15	17	138	135	NA	175	-81	F2F2
253357001	Male	11	13	15	17	166	145	NA	176	-81	F2F2
287877001	Male	11	13	15	17	140	135	NA	170	-81	F2F2
495542002	Male	24	26	28	30	174.5	170	NA	174	174.25	F2F2
171267001	Female	5	7	9	NA	110	110	NA	NA	-81	F2F2
172745001	Female	6	7	9	NA	119	105	138	NA	-81	F2F2

PID	Sex	F2F1	F2F2	F2F3	F2F4	F2F1	F2F2	F2F3	F2F4	Correction	Data
		Age	Age	Age	Age	Height	Height	Height	Height		collection
172745002	Female	6	7	9	NA	120	105	140	NA	-81	F2F2
233231001	Male	11	12	15	NA	140	135	NA	NA	-81	F2F2
233231002	Male	11	12	15	NA	141	137	NA	NA	-81	F2F2
239500200	Female	5	7	NA	NA	110	105	NA	NA	-81	F2F2
158546001	Female	5	7	9	11	106	120	120	120	-81	F2F3
169135200	Male	7	9	11	13	134	154	145	125	-81	F2F3
157488200	Male	8	11	13	NA	145	154	140	NA	-81	F2F3
158546002	Female	5	7	9	11	110	126	130	125	-81	F2F4
168642002	Male	5	7	8	11	113	120	135	120	-81	F2F4
262184002	Female	11	13	15	17	136	153.5	NA	149	-81	F2F4
171885300	Female	37	39	40	42	163	165	NA	156	165	F2F4
178946400	Male	36	38	40	42	193	193	NA	187	193	F2F4
187849300	Female	38	40	NA	44	156	156	NA	58	156	F2F4
317790400	Male	50	52	54	56	167	167	NA	70	167	F2F4
363967400	Male	53	54	57	58	180	180	NA	98	180	F2F4
234013300	Female	41	43	45	47	160	160	NA	166	160	F2F4

Corrections for height.

PID	Sex	F2F1	F2F2	F2F3	F2F4	F2F1	F2F2	F2F3	F2F4	Correction	Data
		Age	Age	Age	Age	Height	Height	Height	Height	Contection	collection
377052300	Female	55	57	59	61	173	175	NA	195	175	F2F4
380165300	Female	45	47	49	51	173	173	NA	193	173	F2F4
492853200	Female	18	20	22	24	167	169	NA	179	169	F2F4
158546001	Female	5	7	9	11	106	120	120	120	-81	F2F4
168642001	Male	5	7	8	11	118	123	141	119	-81	F2F4
169135200	Male	7	9	11	13	134	154	145	125	-81	F2F4
169561200	Female	6	8	10	12	120	128	144	86	-81	F2F4
383383001	Male	18	20	22	24	200	190	NA	180	-81	F2F4
457571300	Female	54	56	NA	60	157	157	NA	165	-81	F2F4

Note. PID = scientific use file person identifier; F2F1 = Face-to-face 1 data collection; F2F2 = Face-to-face 2 data collection; F2F3 = Face-to-face 3 data

collection, F2F4

Corrections in face-to-face 3 for weight.

PID	Sex	F2F1 Age	F2F2 Age	F2F3 Age	F2F4 Age	F2F1 Weight	F2F2 Weight	F2F3 Weight	F2F4 Weight	Correction	Data collection
423467001	Female	23	NA	NA	29	152	NA	NA	55	-81	F2F1
143377001	Female	5	7	9	NA	19	15	40	NA	-81	F2F2
143377002	Female	5	7	9	NA	18	16	35	NA	-81	F2F2
259506002	Female	11	13	15	17	NA	41	NA	521	-81	F2F4
269058300	Female	42	44	46	48	72	72	NA	172	72	F2F4
169135200	Male	7	9	11	13	35	37	49	22	-81	F2F4
169561200	Female	6	8	10	12	20	26	34	14	-81	F2F4
113159200	Female	6	8	10	12	21	32	NA	334	-81	F2F4
133053200	Male	8	10	12	14	NA	48	65	727	-81	F2F4
142393400	Male	40	42	44	46	90	92	NA	183	-82	F2F4
172728001	Female	5	7	9	11	24	NA	52	0	-81	F2F4
178029300	Female	40	42	44	46	66	70	NA	170	70	F2F4
245714001	Male	11	13	15	17	45	55	NA	770	-81	F2F4
274341300	Female	48	50	52	54	NA	95	NA	0	-81	F2F4
293077300	Female	49	51	53	55	75	85	NA	999	99	F2F4

Corrections in face-to-face 3 for weight.

PID	Sex	F2F1	F2F2	F2F3	F2F4	F2F1	F2F2	F2F3	F2F4	Correction	Data
		Age	Age	Age	Age	Weight	Weight	Weight	Weight		collection
349119400	Male	54	56	58	60	77	73	NA	712	71.5	F2F4
436021002	Female	24	26	28	30	67	68	NA	165	65	F2F4
214570002	Male	11	12	NA	17	29	35	NA	0	-81	F2F4

Note. PID = scientific use file person identifier; F2F1 = Face-to-face 1 data collection; F2F2 = Face-to-face 2 data collection; F2F3 = Face-to-face 3 data collection.