



TwinLife Technical Report Series

No. 06, June 2025

Documentation *TwinLife* Data:

Height, Weight, and BMI

v4.0.0

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TwinLife Technical Report Series No. 06

Project TwinLife “Genetic and social causes of life chances”

Bielefeld, June 2025

TwinLife Technical Report Series

General Editors: Christian Kandler, Bastian Mönkediek, and Frank M. Spinath

ISSN 2512-403X

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This publication has been funded by the German Research Foundation (DFG).

TwinLife Technical Reports are refereed scholarly papers. Submissions are reviewed by the general editors before a final decision on publication is made.

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Change log BMI Report v4.0.0

Compared to the previous version v3.0.0, several changes were made, and additional checking routines were implemented. In v4.0.0, the following changes have been made:

- Revision of the structure of the report
- Inclusion of the face-to-face 5 (F2F 5) data
- Recalculation of all variables and longitudinal plausibility checks for all existing data
- Changes in the flagging and missing systems
- Data generation syntax added to the appendix of the report

Introduction

This technical report aims to document the calculations and considerations made for the height and weight data reported by the participants of the TwinLife study. Procedures were established to a) resolve multi-value differences (if multiple informants provided data for one person or one person provided multiple values), b) conduct basic plausibility checks for height and weight measurements and their longitudinal progression, and c) calculate the body mass index. These changes were only applied to the generated height (bdy0100_hgt), weight (bdy0200_wgt), and BMI (bdy0300) variables. The unaltered variables are still included in the released data sets (see bdy0100, bdy0100[t/u/s], bdy0200, bdy0200[t/u/s], zyg0200; see table 1). This technical report is a follow-up to the previous work of [Lenau and Hahn \(2017\)](#). However, the corrections reported there are no longer valid following the introduction of the TwinLife data version 9.0.0.

Table 1.

Relevant variables in this report

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)

Body Measurement

In every face-to-face (F2F) interview, participants were asked to fill in their current height [in cm] and weight [in kg] as a self-report in an open-ended format, if they reached the required minimum age (F2F1 & F2F2: 10 years or older, F2F4 & F2F5: 13 years or older). If the participant was younger than 13 years, one parent provided information on the participant's current height and weight as a parental report. In F2F1 and F2F2, the two reports overlapped, as the required minimum age of the self-report mode was 10 years and older. Thus, for the first two F2F data collections, participants aged 10 to 13 had two values for height and weight, i.e. their self-reported data and the parental report. In F2F3, only parental and no self-reports were assessed. Starting with F2F4, the required minimum age for self-reports was set to 13 years. The frequencies of body measurement values available for each data collection are depicted in Table 2.

Table 2.

Availability of raw height and weight data across data collections (target age and report form) on case level.

	Self-Report			Parental report		
	Target age	Height	Weight	Target age	Height	Weight
F2F1	10+	12,111	11,815	5-13	3,941	4,167
F2F2	10+	8,524	8,504	5-13	1,653	1,647
F2F3	--	--	--	5-13	1,572	1,559
F2F4	13+	6,169	6,127	5-13	1,218	1,211
F2F5	13+	5,057	5,035	5-13	1,149	1,135

Flagging System (bdy1001, bdy1002, bdy1003)

For the final data release, the flagging system has been revised. The older indicators, which hint at potential data errors, can still be generated using the syntax in the appendix, if users wish to perform additional checks.

To assist users with addressing possible inconsistencies in body measurements, three flag variables are provided for each data collection (bdy1001, bdy1002, bdy1003). These variables contain information about potential threats to data validity. Each flag variable indicates potential issues with the body measurements (height - weight - BMI, see Table 1.). The values in each of the three flag variables are divided into two categories: correction flags (flags 1 & 2), which indicate that values were altered, and potential data error flags (flags 3, 4, 8, & 9). **We strongly recommend checking cases if a value in one of the flag variables is higher than 3 in at least one data collection.**

Table 1.

Flag variable system

bdy1001 – Peculiarities in height	bdy1002 – Peculiarities in weight	bdy1003 – Peculiarities in BMI
0: no problem apparent	0: no problem apparent	0: no problem apparent
<i>Correction flags</i>		
1: typing error corrected	1: typing error corrected	
2: only valid value used as final value (in case of multiple entries)	2: only valid value used as final value (in case of multiple entries)	
<i>Potential Data Error flags</i>		
3: multi-value difference	3: multi-value difference	4: very low BMI
8: longitudinally inconsistent	8: longitudinally inconsistent	
9: value was set to missing	9: value was set to missing	9: value was set to missing

We used two different missing codes: -80 “substantial multi-value difference”, which was set automatically and -81: “implausible”, which was applied when a case was set to missing during the data cleaning process (see Table 2.). All corrections are documented in the appendix on a case-by-case basis.

Table 2.
Missing value categories

Value	Value label
-80	Substantial multi-value difference
-81	Implausible value

Multiple values for a participant in one data collection

Informant Differences between self-report and parental report in F2F1/F2F2

Differences between parental report and self-report data for the age range of 10 to 13 years (F2F1 and F2F2) 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 (Lenau & Hahn, 2017). Starting with F2F3, informant differences were avoided by design.

In accordance with the first technical report, we generated several variables indicating the number of reported values for height (bdy0100_nht) and weight (bdy0200_nwt) as well as the difference between the information sources (bdy0100_dht for height and bdy0200_dwt for weight; see Table 1.). The informant differences rarely exceeded the ± 10 cm or kg margin, with more than 95% of all values falling within this range, while around 80% of the differences were within the ± 5 cm/kg margin.

In a first step, we resolved informant differences before conducting further plausibility checks. In accordance with the first report, we decided to calculate a mean score for the participants with informant differences of 10 cm/kg or less (variables bdy0100_hgt or bdy0200_wgt). Since the raw values are included in the scientific use file, users can choose to use only the external report (e.g., bdy0100t/u/s) or self-report (e.g., bdy0100). If the informant difference exceeded ± 10 cm/kg, the cases were examined. We specifically screened for typing errors and obvious implausibility (extremely high or low values or impossible to be valid). Any changes made are documented in the flag variable. The flag variable value “9” indicates a value was set to 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 (please consult Figure 1 for a graphical overview):

- *Flag 1 – Correction of typing error:* In cases identified as possible typing errors, either the "1" at the beginning of the value for height was omitted or the "1" at the beginning of the weight value was wrongly entered (e.g., 123 kg for child instead of

23 kg). Typing errors were only corrected if the information provided was consistent with additional data (i.e. external or self-report; longitudinal data).

- *Flag 2 – Only valid value used as final value (in case of multiple entries):* 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 used as the final value for height.
- *Missing value -80 – Substantial multi-value difference:* If the informant difference exceeded the ± 10 cm/kg margin and could not be resolved otherwise, the final value was automatically set to missing.

For all remaining cases:

- *Flag 3 – Multi-value difference:* Any participant whose informant difference exceeded the 5 cm/kg margin was flagged, as this might indicate a slight bias in the final height or weight variables.

Doubled self-report for adult twins in F2F1

In F2F1, in addition to the bdy0100 question for all participants in the regular survey questionnaire, the zygosity questionnaire designed for twins also included questions regarding body height. These were reported as self-reports by adult twins (zyg0200), external reports by the adult co-twin (zyg0201), and parental reports (zyg0200[t/u]) for children younger than 10. In order to account for the varying data sources, bdy0100 does not represent the raw data as it was filled with values of zyg0200 if bdy0100 was missing. Zyg0201 was also used to fill in missings if both the "original" bdy0100 and zyg0200 were missing.

However, for the final generated height value, we considered both the raw data of bdy0100 and zyg0200 and treated them the same way as we did with the informant differences (see Figure 1).

Multiple values for a participant in one data collection (F2F1 or F2F2)

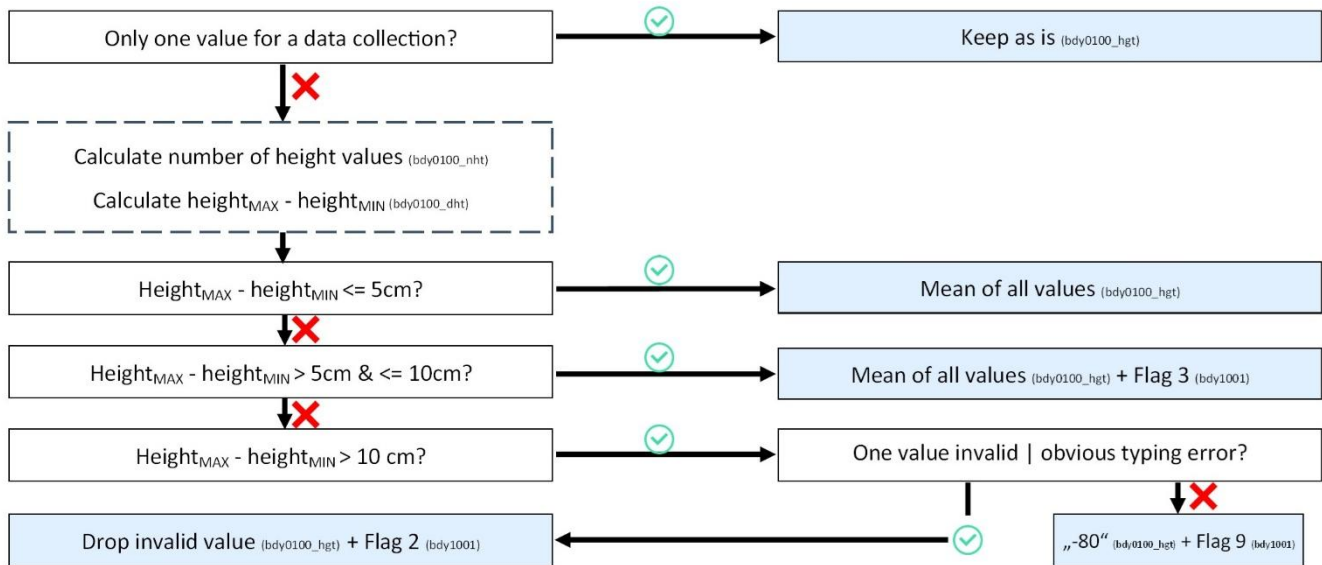


Figure 1. Data cleaning process for multiple values in one data collection.

Development of Longitudinal Checking Routines

With multiple data collections available, we established 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).

The following procedure was applied: First, identifying suspicious cases using checking routines, then screening these cases for obvious data errors, and finally, flagging extreme deviations or setting them to missing. The screening was carried out by the two authors, applying strict rules to prevent any subjective influence of the raters (see figure 2).

Starting with v3.0.0, we considered the percentile ranks (PR) of participants based on normative data. To calculate the PR of the participant's body measures, we used data of representative sources and extracted the mean and standard deviation (SD) for different age groups as the basis for the PR calculations (e.g., Schienkiewitz et al., 2017; Destatis, 2018; Gesundheitsberichterstattung des Bundes, 2024). Minor discrepancies may still occur, as slight deviations from the bell curve were present in the original distributions. Nevertheless, we considered the derived PR to be a good indicator of plausibility.

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 over an assumed two-year period between data collections, we formulated additional criteria to identify possible inconsistencies (see Prader et al., 1989; Robert Koch-Institut, 2013b):

Criterion A: Adults should not grow; therefore, the height difference between the two data collections should not exceed a tolerance limit of 5 cm.

Criterion B: Adults should not shrink, so the height difference between the two data collections should not exceed a tolerance limit of 5 cm.

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.

Criterion D: Starting with age 14 (for girls; age 16 for boys), it can also be possible that adolescents stopped growing (see Robert Koch-Institut, 2013c). The height difference should not be negative between the ages of 14 (or 16 for boys) and 21, with a tolerance margin of 5 cm.

Criterion E: Adolescents can still grow until the age of 20, so the height difference between the two data collections could exceed the tolerance limit of 5 cm (in contrast to adults) in this age group.

Criterion F: Extremely high growth rates are unlikely.

As the panel progressed, more information became available to resolve inconsistencies in the data. By face-to-face 5, most participants had at least three data points, which facilitated the correction of discrepancies. Therefore, we also revised the data from prior data collections for the data release 9.0.0. Please note that some discrepancies may exist between the current version and prior versions of this report and the released data, as all values have been recalculated and checked for plausibility in the final version of this report. Consequently, some values may have changed their missing/valid status.

As a reference for the comparisons, the last available data point was used (if the value for F2F4 was missing, the value of F2F5 was compared to F2F3, and so on). We applied the following routine for checking and cleaning the data (see Figure 2):

(Longitudinal) Plausibility Checks

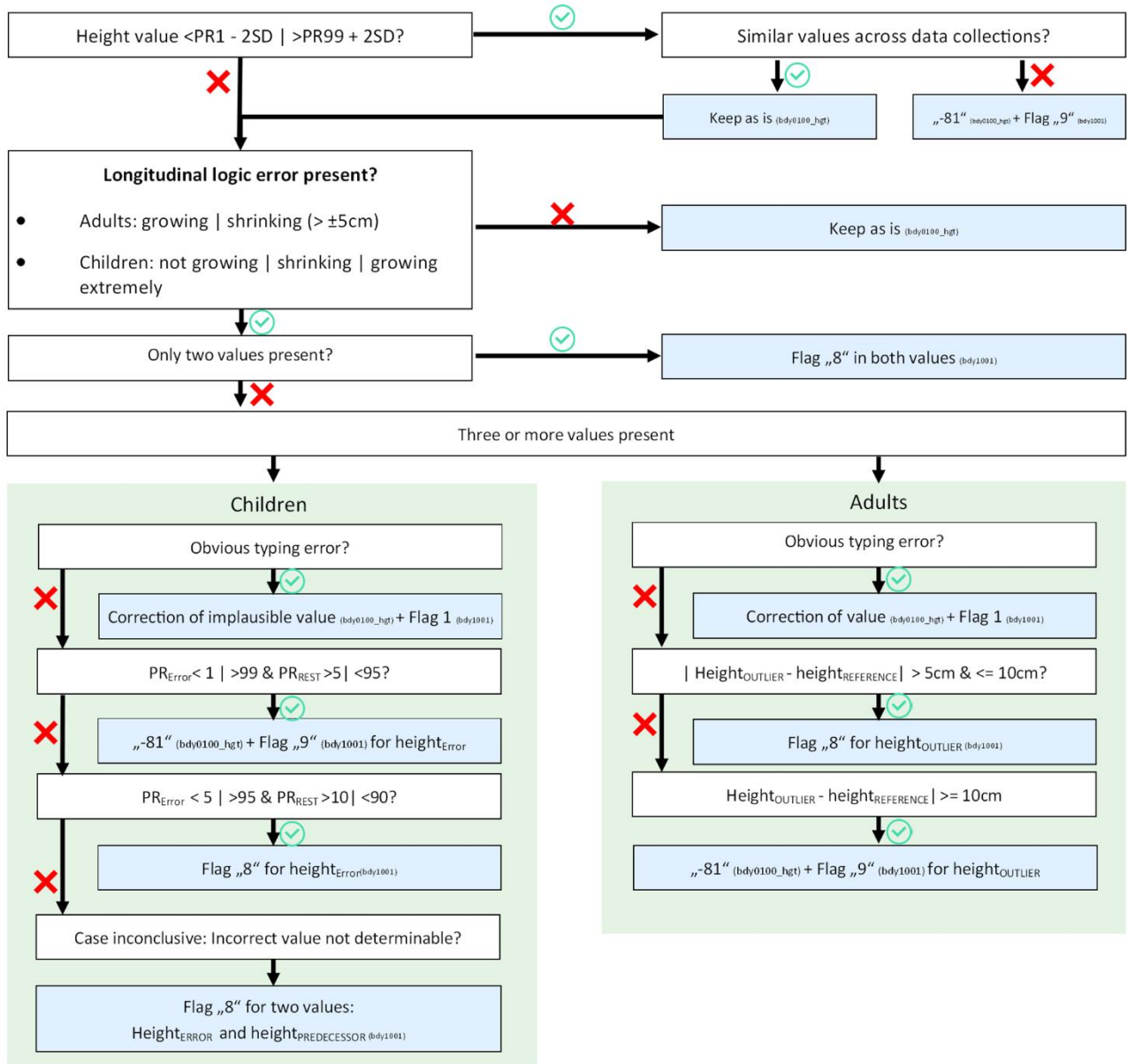


Figure 2. Longitudinal plausibility checks. PR_{ERROR} = Percentile rank of height value that does not follow the basic logic of height progression; PR_{REST} = Percentile ranks of the remaining height values that follow the basic logic of height progression; $Height_{ERROR}$ = Height value that does not follow the basic logic of height progression; $Height_{PREDECESSOR}$ = Height value of the previous data collection before the error occurred; $Height_{REFERENCE}$ = Mean of numerically closest height values; $Height_{OUTLIER}$ = Value that shows the highest numeric distance to the remaining values.

To determine a cut-off value for impossible values in each age group, two standard deviations were subtracted from PR1 of the population and added to PR99 of the population. All values exceeding the margin between the two cut-offs were set to missing automatically.

1. All cases that were set to missing automatically in at least one value (either due to the informant difference routine or exceeding the margin of possible values) or that violated one of the criteria A-F were further examined and handled as follows. We applied different routines based on the age of the participants.

- a. Adults (males 16+ and females 14+):

- i. Corrections:

1. If a person had at least three values, obvious misspellings (e.g., missing “1”, typing error) were corrected if the resulting value was consistent with the other data.

- ii. Flag 8:

1. If only two values were present and deviated more than 5 cm, both values were flagged with “8” - longitudinally inconsistent”.
 2. If three values were present and one value deviated from the mean of the two remaining, more similar values (the values with the lowest numerical distance to each other), by 5 cm to 10 cm, the corresponding value was also flagged “8”. The same applied for four or five values present, but the mean was built using the three or four remaining, more similar values.

- iii. Missing:

1. If three values were present and one value deviated from the mean of the remaining, more similar values, by more than 10 cm, the corresponding value was set to missing “-81”; flag “9” was also set in bdy1001. The same applied for four or five

values present, but the mean was built using the three or four remaining, more similar values.

b. Children and adolescents (males 15- and females 13-):

i. Corrections: If a person had at least 3 values, obvious misspellings were corrected (missing “1”, typing errors), if the resulting value fitted the logical growth progression of the other data (i.e, was higher than the previous value and lower than the following one).

ii. Flag 8:

1. If a criterion was violated, but only 2 values were present, both were flagged with “8”
2. If a criterion was violated and at least 3 values were present, a deviating value was flagged “8” when it exceeded the PR5-PR95 margin, and no other value exceeded PR10 or PR90
3. If none of the values exceeded that margin or similar PRs were present in that case ($>PR90$ or $<PR10$), all values involved in the violation of the criterion were flagged “8” (e.g. a child has shrunk in a two-year period; as it is unclear which value is correct, both are flagged)

iii. Missings: If a case showed a violation of a criterion and an involved value had a $<PR1$ or $>PR99$ and there were no other values in a similar PR range ($<PR5$ or $>PR95$), this value was set to missing “-81” and flagged with “9” in bdy1001.

In rare cases where multiple violations were present and the height progression was inconclusive, these cases were flagged with “8” for the complete set of values.

Checking Routine for Weight

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

- a) A weight difference of at least 20 kilograms in any direction compared to a prior data assessment for children younger than 13.
- b) A weight difference of at least 30 kilograms in any direction compared to a prior data assessment for children older than 12.
- c) No or negative weight gains while growing for boys under the age of 16 and girls under the age of 14¹.

In contrast to the height, these criteria are far less indicative of potential data errors.

In the data cleaning process, we used the last available data point as a reference. If e.g. F2F4 data was missing, we used the F2F3 data in comparison to F2F5 data. For every data collection that we had to go back, we allowed the difference to be 10 kg higher (e.g., when comparing a child's score from F2F2 and F2F4, the limit was 30 kg instead of 20 kg).

Like the height variables, obvious typing errors were corrected (e.g., additional "1") when longitudinal information was available and consistent. These cases were flagged in bdy1002 with a "1".

To assess the plausibility of weight values, we also considered the percentile rank (PR) progression. A value was set to missing ("-81") and flagged in bdy1001 with "9", if any of the criteria were violated and the PR was PR0 or PR100. Unlike height, we did not use the flag "8" at all as even very high fluctuations in weight could still be valid.

¹ Age cut-offs based on the data of the Robert-Koch-Institute (2013c).

Calculation and Checking of the BMI

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

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

Although the data on which the BMI was ultimately 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 those under 10 years) below 13 (for under 13 years) or below 14 (for older participants)².

Recommendations for data use

- Checking all flagged values case-by-case, especially those flagged with “8”.
- For a conservative approach, we recommend setting all values flagged with “8” to missing, as there are some inconsistencies in the longitudinal growth progression.
- For an even more conservative approach, setting all flagged values to missing could be considered.
- For adults, it may be feasible to “save” missing values by replacing them with the mean of the other available height values, as their height should be stable.

² 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

Appendix 1.

Height values that were set to missing in the data cleaning process.

PID	Sex	Age	Height values	PR	Flags	New value				
						F2F1	F2F2	F2F3	F2F4	F2F5
114028001	2	5.7 7.5 9.8 11.5 13.4	120 128 143 155 140	88 60 60 71 0	0 0 0 0 9					-81
116689300	2	37.8 40 42 44.1 46.2	178 176 *** 176 62	98 95 ** 95 0	0 0 * 0 9					-81
122107200	2	7.5 9.4 11.4 13.6 15.7	135 150 160 133 170	93 96 90 0 77	0 0 0 9 0				-81	
126022002	1	5.4 7.4 9.3 11.8 13.8	120 172 135 168 ***	87 99 25 97 **	0 9 0 0 *		-81			
132067002	1	5.6 7.3 9.6 11.6 13.5	104 100 132 134 140	1 0 12 1 0	0 9 0 0 0		-81			
138527001	2	6 8 10 12 14	175 *** *** *** ***	100 ** ** ** **	9 * * * *	-81				
139613001	1	5.2 7.2 9.2 11.2 13.2	90 *** *** *** ***	0 ** ** ** **	9 * * * *	-81				
139613002	1	5.2 7.2 9.2 11.2 13.2	80 *** *** *** ***	0 ** ** ** **	9 * * * *	-81				
141415001	1	5.6 7.3 9.4 11.3 13.4	122 115 140 149 155	94 0 56 48 17	0 9 0 0 0		-81			
141415002	1	5.6 7.3 9.4 11.3 13.4	122 115 140 149 155	94 0 56 48 17	0 9 0 0 0		-81			
148195001	1	5.5 7.5 9.8 11.7 13.7	108 *** 70 *** 165	8 ** 0 ** 58	0 * 9 * 0			-81		
154492001	1	5.5 7.8 9.7 11.6 13.7	111 132 154 154 166	22 58 99 73 63	0 0 9 0 0			-81		
157488200	1	8.9 11.2 13.2 15.2 17.2	145 154 140 *** 173	92 73 0 ** 22	0 0 9 * 0			-81		
158546001	2	5.3 7.2 9.2 11.4 13.6	106 120 120 120 158	3 24 0 0 30	0 8 8 9 0				-81	
158546002	2	5.3 7.2 9.2 11.4 13.6	110 126 130 125 165	17 67 9 0 71	0 0 0 9 0				-81	
163861001	1	5.2 7.2 9.2 11.1 13.1	116 *** 146 165 164	62 ** 87 99 71	0 * 0 9 0				-81	
163861002	1	5.2 7.2 9.2 11.1 13.1	118 *** 145 165 162	77 ** 83 99 63	0 * 0 9 0				-81	
168642001	1	5.1 7.1 8.8 11 13	118 123 141 119 160	93 38 78 0 54	0 0 0 9 0				-81	
168642002	1	5.1 7.1 8.8 11 13	113 120 135 120 161	65 19 40 0 58	0 0 0 9 0				-81	
169135200	1	7.2 9 11.1 13 14.9	134 154 145 125 185	96 99 40 0 93	0 8 8 9 0				-81	
169199200	1	7.9 10.1 12.1 14 16.1	*** 154-155 126 *** 181	** 97 0 ** 72	* 0 9 * 0			-81		
169561200	2	6.8 8.8 10.8 12.8 14.9	120 128 144 86 160	24 11 29 0 24	0 0 0 9 0				-81	
172745001	2	6 7.7 9.8 11.8 14.1	119 105 138 *** ***	61 0 31 ** **	0 9 0 * *		-81			

Appendix 1.

Height values that were set to missing in the data cleaning process.

PID	Sex	Age	Height values	PR	Flags	New value				
						F2F1	F2F2	F2F3	F2F4	F2F5
172745002	2	6 7.7 9.8 11.8 14.1	120 105 140 *** ***	69 0 42 ** **	0 9 0 * *		-81			
178230001	1	6.2 7.9 9.9 11.9 13.9	98 127 *** *** ***	0 24 ** ** **	9 0 * * *	-81				
182479200	1	8.1 10.1 12.4 14.3 16.4	145 140-146 163 180 ***	99 58 82 87 **	9 3 0 0 *	-81				
183824002	1	5.1 7.3 9.2 11.1 13.2	107 127 140 150 140	17 44 56 68 0	0 0 0 0 9					-81
184840001	1	5.7 7.3 9.3 11.3 13.3	145 *** *** *** ***	99 ** ** ** **	9 * * * *	-81				
184840002	1	5.7 7.3 9.3 11.3 13.3	143 *** *** *** ***	99 ** ** ** **	9 * * * *	-81				
185718200	1	7.9 10.1 12.1 14.1 16.1	131 128-142 *** *** ***	51 ** ** ** **	0 9 * * *		-80			
186238200	1	9.1 11.2 13.2 15.2 17.1	134 152-140 165 163 180	34 ** 75 10 60	0 9 0 0 0		-80			
186238300	2	29.4 31.3 33.3 35.3 37.2	*** 160 *** 173 165	** 9 ** 87 35	* 0 * 9 0				-81	
186238400	1	29.8 31.9 33.9 35.9 37.8	168 169 *** 165 178	2 2 ** 0 36	0 0 * 0 9					-81
187586001	1	5 7 9.2 11.4 13.4	201 *** 127 135 ***	100 ** 2 2 **	9 * 0 0 *	-81				
195502001	2	5.4 7.3 9.5 11.4 13.8	128 128 140 150 160	99 60 61 44 33	9 0 0 0 0	-81				
214057001	1	11 13.2 15.2 17.2 19.2	154 150-170 *** *** ***	85 ** ** ** **	0 9 * * *		-80			
214159001	1	10.9 13.2 15.2 17.2 19.2	80 163-163 *** *** ***	0 67 ** ** **	9 0 * * *	-81				
214159002	1	10.9 13.2 15.2 17.2 19.2	80 164 *** *** ***	0 71 ** ** **	9 0 * * *	-81				
214570400	1	55.2 57 59 61.2 63.2	175 110 *** 174 174	19 0 ** 15 15	0 9 * 0 0		-81			
218748001	2	11.3 13.2 15.2 17.5 19.6	150 163-150 *** *** ***	44 ** ** ** **	0 9 * * *		-80			
222421002	2	11.8 13.8 15.8 17.8 19.8	148 145-164 *** *** ***	17 ** ** ** **	0 9 * * *		-80			
222421200	2	5.2 7.2 9.2 11.2 13.2	136 130 135 *** ***	99 73 48 ** **	9 0 0 * *	-81				
224024002	1	11.2 13.1 15.1 17.1 19.3	164 180-165 *** 183 182	97 ** ** 75 63	0 9 * 0 0		-80			
229005300	2	46.2 48.2 50.2 52.2 54.2	74 *** *** *** ***	0 ** ** ** **	9 * * * *	-81				
236509002	2	11.5 13.7 15.8 17.7 19.8	*** 65-154 *** 173 178	** ** ** 87 98	* 9 * 0 0		-80			
242089002	2	11.1 13.2 15.2 17.1 19.2	150 156-168 *** *** ***	63 ** ** ** **	0 9 * * *		-80			
245262200	1	8.7 10.9 12.9 14.9 16.9	134 134-146 *** *** ***	52 ** ** ** **	0 9 * * *		-80			
246909200	2	7.2 9.2 11.7 13.2 15.1	105 142 *** 175 170	0 86 ** 98 79	9 0 * 0 0	-81				

Appendix 1.

Height values that were set to missing in the data cleaning process.

PID	Sex	Age	Height values	PR	Flags	New value				
						F2F1	F2F2	F2F3	F2F4	F2F5
251236300	2	35.8 37.8 39.8 42 43.9	150 90 *** 150 ***	0 0 ** 0 **	0 9 * 0 *		-81			
251961002	1	11.4 13.4 15.5 17.3 19.6	138 135 *** 175 182	6 0 ** 29 63	0 9 * 0 0		-81			
253843001	2	11.9 13.8 15.8 17.8 19.8	152 167-155 *** *** ***	36 ** ** ** **	0 9 * * *		-80			
253843002	2	11.9 13.8 15.8 17.8 19.8	151 166-155 *** *** ***	31 ** ** ** **	0 9 * * *		-80			
254123002	1	11.4 13.1 15.3 17.3 19.6	148 151-165 *** 182 183	42 ** ** 68 69	0 9 * 0 0		-80			
260573002	1	10.9 12.9 14.9 16.9 18.9	113 *** *** *** ***	0 ** ** ** **	9 * * * *	-81				
261448001	1	11.2 13.1 15.1 17.3 19.3	140 136-160 *** *** ***	17 ** ** ** **	0 9 * * *		-80			
261945001	1	11.1 13.2 15.2 17.2 19.2	160 185-168 *** *** ***	97 ** ** ** **	0 9 * * *		-80			
261945002	1	11.1 13.2 15.2 17.2 19.2	150 170-150 *** *** ***	68 ** ** ** **	0 9 * * *		-80			
262672200	2	13.2 15.1 17.2 19.1 21.2	148-159 160 *** 163 163	** 24 ** 22 22	9 0 * 0 0	-80				
262672300	2	37.4 39.3 41.4 43.3 45.5	163 155 *** 155 155	22 1 ** 1 1	9 0 * 0 0	-81				
265589001	2	11.1 12.8 14.8 17.1 18.9	164 150-150 *** 164 164	99 7 ** 40 28	9 0 * 0 0	-81				
265589002	2	11.1 12.8 14.8 17.1 18.9	164 153-153 *** 162 160	99 16 ** 29 9	9 0 * 0 0	-81				
266427200	2	29 31 33 35 37	72 *** *** *** ***	0 ** ** ** **	9 * * * *	-81				
269485002	2	11.1 13 15 17.2 19.2	148 150-168 *** 170 175	52 ** ** 75 93	0 9 * 0 0		-80			
271158500	1	43.6 45.9 47.9 49.9 51.9	172 90 *** *** ***	8 0 ** ** **	0 9 * * *		-81			
272169001	2	11.6 13.8 16 17.8 20.1	*** 166-152 *** 173 174	** ** ** 86 90	* 9 * 0 0		-80			
274037001	1	11.3 13 15 17.4 19.4	152 156-140 *** *** ***	64 ** ** ** **	0 9 * * *		-80			
282112002	1	11 13.2 15.1 17.2 19	151 170-158 *** 185 184	73 ** ** 83 75	0 9 * 0 0		-80			
282449001	2	11.3 13.5 15.5 17.5 19.5	152 164-150 *** 170 ***	55 ** ** 75 **	0 9 * 0 *		-80			
282449002	2	11.3 13.5 15.5 17.5 19.5	150 163-150 *** 171 ***	44 ** ** 79 **	0 9 * 0 *		-80			
284427002	1	11.2 13.2 15.2 17.2 19.1	152 153-164 *** 188 190	77 ** ** 91 95	0 9 * 0 0		-80			
287877001	1	11.9 13.8 15.8 17.8 19.9	140 135 *** 170 178	5 0 ** 9 36	0 9 * 0 0		-81			
287877002	1	11.9 13.8 15.8 17.8 19.9	145 189-140 *** 187 190	17 ** ** 88 95	0 9 * 0 0		-80			
291206001	1	11.7 13.3 15.6 17.4 19.6	142 162-150 *** 178 176	15 ** ** 46 24	0 9 * 0 0		-80			

Appendix 1.

Height values that were set to missing in the data cleaning process.

PID	Sex	Age	Height values	PR	Flags	New value				
						F2F1	F2F2	F2F3	F2F4	F2F5
293101400	1	42.2 44.1 46.4 48 50	188 189 *** 176 ***	91 93 ** 24 **	0 0 * 9 *					-81
296152001	2	11.5 13.2 15.6 17.6 19.6	140 152-130 *** *** ***	5 ** ** ** **	0 9 * * *		-80			
296152002	2	11.5 13.2 15.6 17.6 19.6	134 45-130 *** *** ***	0 ** ** ** **	0 9 * * *		-80			
299955001	1	11.3 13.1 15 17.2 19.2	164 169-185 *** 193 ***	97 ** ** 98 **	0 9 * 0 *		-80			
299955002	1	11.3 13.1 15 17.2 19.2	157 182-168 *** 190 ***	85 ** ** 95 **	0 9 * 0 *		-80			
318074002	2	17.3 19.2 21.2 23.2 25.2	164-194 163 *** *** ***	** 22 ** ** **	9 0 * * *	-80				
318116400	1	50.5 52.5 54.5 56.5 58.5	117 *** *** *** ***	0 ** ** ** **	9 * * * *	-81				
328670300	2	51.8 53.8 55.9 57.9 60	181 *** *** 170 170	99 ** ** 71 71	9 * * 0 0	-81				
333657200	1	13.8 15.6 18 19.8 21.8	140-160 165 *** *** ***	** 8 ** ** **	9 0 * * *	-80				
336095001	1	17.5 19.8 21.7 23.6 25.7	173-173 174 *** 174 185	20 15 ** 15 80	0 0 * 0 9					-81
345125200	1	13.3 15.3 17.3 19.3 21.3	180-163 *** *** *** ***	** ** ** ** **	9 * * * *	-80				
345233120	2	17.2 19.2 21.2 23.2 25.2	*** 35 *** *** ***	** 0 ** ** **	* 9 * * *		-81			
352199001	1	17 19.3 21.3 23.3 25.3	163-179 182 *** *** ***	** 63 ** ** **	9 0 * * *	-80				
362532200	2	8.8 10.9 12.9 14.9 16.9	*** 140-152 *** *** ***	** ** ** ** **	* 9 * * *		-80			
363967400	1	53 55 57.1 58.8 60.8	180 180 *** 98 180	50 50 ** 0 50	0 0 * 9 0				-81	
371407001	2	17.2 19.2 21.2 23.2 25.2	182 170 *** 172 170	99 71 ** 83 71	9 0 * 0 0	-81				
372428300	2	47.6 49.6 51.6 53.8 55.8	183 183 *** 165 ***	99 99 ** 35 **	0 0 * 9 *				-81	
375625200	1	10.6 12.6 14.6 16.9 18.9	156 155-166 *** *** ***	96 ** ** ** **	0 9 * * *		-80			
377052300	2	55.8 57.9 60.2 61.9 64	173 175 *** 195 173	87 93 ** 99 87	0 0 * 9 0				-81	
379721002	2	17.5 19.8 21.7 23.6 25.8	171-160 176 *** *** 175	** 95 ** ** 93	9 0 * * 0	-80				
380165300	2	45.9 47.5 49.5 51.8 53.8	173 173 *** 193 173	87 87 ** 99 87	0 0 * 9 0				-81	
386425001	1	17.3 19.2 21.4 23.5 25.6	180-180 195 *** 182 182	57 99 ** 63 63	0 9 * 0 0		-81			
390135002	2	17.9 19.5 21.5 23.5 25.7	164-163 150 *** *** 162	36 0 ** ** 16	0 9 * * 0		-81			
399146001	1	17.2 19.2 21.2 23.2 25.2	166-186 *** *** *** ***	** ** ** ** **	9 * * * *	-80				
411477300	2	53.6 55.6 57.6 59.6 61.6	54 *** *** *** ***	0 ** ** ** **	9 * * * *	-81				

Appendix 1.

Height values that were set to missing in the data cleaning process.

PID	Sex	Age	Height values	PR	Flags	New value				
						F2F1	F2F2	F2F3	F2F4	F2F5
412946001	2	22.4 24.1 26.2 28.3 30.3	156-157 52 *** 162 ***	2 0 ** 16 **	0 9 * 0 *		-81			
422418200	2	27.7 29.7 31.7 33.7 35.7	141 *** *** *** ***	0 ** ** ** **	9 * * * *	-81				
423643002	1	22.9 25 27.1 29.1 31.5	182-128 178 *** 175 175	** 36 ** 19 19	9 0 * 0 0	-80				
431159400	1	56.6 58.4 60.2 62.4 64.4	180 180 *** 176 165	50 50 ** 24 0	0 0 * 0 9					-81
434771200	2	21.7 23.7 25.7 27.7 29.7	42 *** *** *** ***	0 ** ** ** **	9 * * * *	-81				
435631200	1	24.6 26.6 28.6 30.6 32.6	128 *** *** *** ***	0 ** ** ** **	9 * * * *	-81				
450567001	1	25.1 27.1 29.1 31.1 32.9	170-170 *** *** 185 185	4 ** ** 80 80	9 * * 0 0	-81				
451555300	2	57.1 58.9 60.9 62.9 64.9	126 *** *** *** ***	0 ** ** ** **	9 * * * *	-81				
451597002	1	22.3 24.3 26.3 28.3 30.3	190-176 *** *** *** ***	** ** ** ** **	9 * * * *	-80				
453292001	2	24.2 26.2 28.2 30 32.2	158-158 170 *** 170 ***	4 71 ** 71 **	9 0 * 0 *	-81				
456065002	1	22.8 24.5 26.5 28.7 30.8	184 183 *** *** 167	75 69 ** ** 1	0 0 * * 9					-81
463889002	2	23.8 25.8 27.8 29.8 31.8	115 *** *** *** ***	0 ** ** ** **	9 * * * *	-81				
463953400	1	48.9 50.9 52.9 54.9 56.9	85 *** *** *** ***	0 ** ** ** **	9 * * * *	-81				
464666002	2	24.2 26.4 28.5 30.5 32.5	161 61 *** *** ***	12 0 ** ** **	0 9 * * *	-81				
466035200	2	24.6 26.5 28.5 30.5 32.5	160 63 *** *** ***	9 0 ** ** **	0 9 * * *	-81				
472737400	1	58.4 60.4 62.4 64.4 66.4	180 78 *** *** ***	50 0 ** ** **	0 9 * * *	-81				
485347001	1	23.4 25.2 27.2 29.2 31.2	172 67 *** *** ***	8 0 ** ** **	0 9 * * *	-81				

Note. * = Value is missing in data collection. Multiple values per data collection are separated with -; different data collections are separated with |.

Appendix 2.

Height values that were corrected in the data cleaning process.

PID	Sex	Age	Height values	PR	Flags	New value				
						F2F1	F2F2	F2F3	F2F4	F2F5
129136300	2	32.4 34.5 36.8 38.6 40.4	156 166 *** 165 ***	1 42 ** 35 **	1 0 * 0 *	165				
135179002	2	5.8 7.7 9.7 12.1 14	114 127 37 151 165	22 53 0 31 63	0 0 1 0 0			137		
140958200	1	8.2 10.2 12.3 14.2 16.2	158 165-160 170 194 197	99 99 96 99 99	1 0 0 0 0	158				
142393300	2	40.6 42.4 44.3 46.5 48.6	153 163 *** 163 163	0 22 ** 22 22	1 0 * 0 0	163				
146089300	2	37.3 39.3 41.4 43.5 45.8	158 168 *** 168 168	4 57 ** 57 57	1 0 * 0 0	168				
148028300	2	36.9 39 40.9 42.8 44.8	190 190 *** 190 ***	99 99 ** 99 **	1 1 * 1 *	190	190		190	
163716400	1	54.8 57.2 59 61.1 63	175 75 *** 175 ***	19 0 ** 19 **	0 1 * 0 *		175			
164528400	1	53.4 55.2 57.2 59.4 61.5	178 187 *** 178 178	36 88 ** 36 36	0 1 * 0 0		178			
166025200	2	6.6 8.8 10.9 12.8 15	114 230 140 *** 166	9 100 13 ** 58	0 1 0 * 0		130			
166685400	1	43.6 45.8 47.8 49.9 51.8	206 206 *** 206 206	99 99 ** 99 99	1 1 * 1 1	206	206		206	206
167743002	1	5.8 8 10 11.9 14	142 160 174 191 198	99 99 99 99 99	1 1 1 1 0	142	160	174	191	
170315300	2	40.3 42 44 46.2 48.3	143 143 *** 143 143	0 0 ** 0 0	1 1 * 1 1	143	143		143	143
171885300	2	37.2 39.2 40.8 42.8 44.8	163 165 *** 156 ***	22 35 ** 1 **	0 0 * 1 *				165	
172966300	2	35.4 37.8 39.6 41.5 43.6	175 165 *** 165 165	93 35 ** 35 35	1 0 * 0 0	165				
174643400	1	33.4 35.6 37.7 39.7 41.7	206 206 *** *** ***	99 99 ** ** **	1 1 * * *	206	206			
175592300	2	39.8 41.8 43.8 46.1 48.1	165 *** *** *** 65	35 ** ** ** 0	0 * * * 1					165
187849300	2	38.3 40.5 42.5 44.5 46.5	156 156 *** 58 ***	1 1 ** 0 **	0 0 * 1 *				158	
189897400	1	44.5 46.4 48.4 50.3 52.6	154 154 *** 154 154	0 0 ** 0 0	1 1 * 1 1	154	154		154	154
197500001	1	6.1 7.9 10 12 13.8	111 122 32 140 165	8 5 0 5 41	0 0 1 0 0			132		
197500002	1	6.1 7.9 10 12 13.8	114 123 33 142 150	21 7 0 9 2	0 0 1 0 0			133		
199655400	1	34.8 36.3 38.5 40.7 42.7	186 168 *** *** 186	84 2 ** ** 84	0 1 * * 0		186			
216760002	1	11.7 13.7 15.5 17.5 19.5	146 185 *** *** ***	32 99 ** ** **	1 1 * * *	146	185			
233608200	1	13.6 15.9 17.8 19.8 21.8	184-184 200 *** 206 206	99 99 ** 99 99	0 0 * 1 1				206	206
251082002	2	11.2 13.2 15.2 17.2 19.4	*** 125 *** 154 155	** 0 ** 3 1	* 1 * 0 0		125			
251843300	2	47 48.8 50.8 52.7 54.8	172 72 *** 172 172	83 0 ** 83 83	0 1 * 0 0		172			

Appendix 2.

Height values that were corrected in the data cleaning process.

PID	Sex	Age	Height values	PR	Flags	New value				
						F2F1	F2F2	F2F3	F2F4	F2F5
263068002	2	11.9 13.7 15.7 17.8 19.8	152 54-160 *** 165 65	36 ** ** 45 0	0 2 * 0 1					165
282021002	2	11.8 13.7 15.8 17.8 19.8	144 58 *** 160 159	6 0 ** 18 6	0 1 * 0 0		158			
283641300	2	49.6 51.7 53.6 55.6 57.6	150 160 *** 160 ***	0 9 ** 9 **	1 0 * 0 *	160				
286228400	1	42.5 44.5 46.7 48.7 50.5	152 152 *** 152 151	0 0 ** 0 0	1 1 * 1 1	152	152		152	151
286379300	2	40.8 42.8 44.8 46.5 48.7	163 *** *** 153 163	22 ** ** 0 22	0 * * 1 0				163	
295728300	2	45.9 47.6 49.5 51.9 54.1	158 168 *** 158 158	4 57 ** 4 4	0 1 * 0 0		158			
315834002	1	17.2 18.8 20.9 22.9 25.2	175-175 187 *** *** 178	29 88 ** ** 36	0 1 * * 0		178			
317790400	1	50.8 52.4 54.5 56.3 58.3	167 167 *** 70 ***	1 1 ** 0 **	0 0 * 1 *				170	
318987002	1	17.3 19.3 21.5 23.3 25.2	173 176 *** 176 167	20 24 ** 24 1	0 0 * 0 1					176
339555001	2	17.2 19.1 21.6 23.6 25.2	163 66 *** *** 163	34 0 ** ** 22	0 1 * * 0		166			
340621200	1	22.8 25 26.8 28.7 30.7	185 178 *** 185 ***	80 36 ** 80 **	0 1 * 0 *		187			
373339002	1	17.5 19.5 21.5 23.5 25.5	146-146 *** *** *** ***	0 ** ** ** **	1 * * * *	146				
388972200	1	19.4 21.6 23.6 25.6 27.6	208 *** *** *** ***	99 ** ** ** **	1 * * * *	208				
398482001	1	17.8 19.7 21.8 23.9 26.3	165-165 156 *** 165 ***	1 0 ** 0 **	0 1 * 0 *		165			
466941110	2	31.9 33.9 35.9 37.9 39.9	142 *** *** *** ***	0 ** ** ** **	1 * * * *	142				
470896300	2	44.6 46.6 48.6 50.6 52.6	140 *** *** *** ***	0 ** ** ** **	1 * * * *	140				
487011300	2	60.2 62.3 64.2 66.2 68.1	179 179 *** 179 169	98 98 ** 98 64	0 0 * 0 1					179
492853200	2	18.8 20.9 23.1 24.8 26.8	167 169 *** 179 ***	50 64 ** 98 **	0 0 * 1 *				169	

Note. * = Value is missing in data collection. If the corrected value and the original value correspond, this value would have been set to missing automatically but was saved during data cleaning.

Multiple values per data collection are separated with -; different data collections are separated with |.

Appendix 3.

Cases where only one height value out of multiple values was valid.

PID	Sex	Age	Height values	PR	Flags	New value	
						F2F1	F2F2
137011200	2	8.5 10.6 12.5 14.5 16.5	*** 45-145 157 *** ***	** ** 48 ** **	* 2 0 * *		145
139324200	2	8.2 10.5 12.3 14.3 16.3	*** 36-132 150 *** 158	** ** 14 ** 12	* 2 0 * 0		132
151635200	1	7.9 10 11.9 13.9 15.8	132 46-145 158 *** 185	58 ** 77 ** 87	0 2 0 * 0		145
167021200	1	10.8 12.7 14.7 16.7 18.7	142 52-155 *** 183 184	25 ** ** 77 75	0 2 * 0 0		155
184568200	2	10.6 12.5 14.3 16.5 18.4	137 52-152 *** 152 162	13 ** ** 1 16	0 2 * 8 0		152
188672200	1	8.6 10.8 12.8 14.8 16.8	144 55-155 *** *** ***	96 ** ** ** **	0 2 * * *		155
214347002	1	11.2 13 15.2 17.2 19.5	152 136-163 *** 190 ***	77 ** ** 95 **	0 2 * 0 *		163
226177001	1	11.6 13.3 15.5 17.4 19.3	146 110-162 *** *** ***	32 ** ** ** **	0 2 * * *		162
227424001	2	11.2 13.1 15.1 17 19.1	141 159-759 *** 167 168	7 ** ** 58 57	0 2 * 0 0		159
232735001	2	11.2 13.3 15.1 17.3 19.5	158 161-140 *** 165 165	93 ** ** 45 35	0 2 * 0 0		161
232735002	2	11.2 13.3 15.1 17.3 19.5	157 159-139 *** 160 160	91 ** ** 18 9	0 2 * 0 0		159
240822001	1	11.5 13.7 15.8 17.8 19.6	148 50-164 *** 172 174	42 ** ** 14 15	0 2 * 0 0		164
257141002	2	11.2 13.5 15.6 17.5 19.5	138 45-140 *** 159 ***	2 ** ** 15 **	0 2 * 0 *		140
262571001	2	11.2 13.3 15.5 17.2 19.2	160 70-170 *** 174 ***	90 ** ** 90 **	0 2 * 0 *		170
263068002	2	11.9 13.7 15.7 17.8 19.8	152 54-160 *** 165 65	36 ** ** 45 0	0 2 * 0 1		160
264889001	1	11.7 13.6 15.6 17.5 19.5	149 61-169 *** 192 193	48 ** ** 97 98	0 2 * 0 0		169
266121002	1	11.2 13.4 15.5 17.3 19.2	149 158-39 *** 183 184	48 ** ** 73 75	0 2 * 0 0		158
274037002	1	11.3 13 15 17.4 19.4	146 153-136 *** 178 ***	32 ** ** 46 **	0 2 * 0 *		153
288444001	1	11.2 13.4 15.5 17.2 19.2	142 59-158 *** 173 175	15 ** ** 22 19	0 2 * 0 0		158
292289200	2	8.8 10.7 12.7 14.7 16.7	130 42-145 *** *** ***	19 ** ** ** **	0 2 * * *		145
378238001	2	17.2 19.2 21.2 23.1 25.1	137-173 *** *** *** 174	** ** ** ** 90	2 * * * 0	173	
388532001	2	17.2 19.2 21.2 23.2 25.2	166-100 *** *** *** ***	** ** ** ** **	2 * * * *	166	
433249002	2	22.9 24.9 26.9 28.9 30.9	1-171 *** *** *** ***	** ** ** ** **	2 * * * *	171	
475291002	2	23 25 27 29 31	175-100 *** *** *** ***	** ** ** ** **	2 * * * *	175	

Note. * = Value is missing in data collection. Multiple values per data collection are separated with -; different data collections are separated with |.

Appendix 4.

Height values that were flagged due to (longitudinal) inconsistencies.

PID	Sex	Age	Height values	PR	Flags
110137200	2	9.2 11.5 13.2 15.2 17.2	*** 155-155 159 156 ***	** 71 36 9 **	* 0 8 8 *
111920001	2	5.8 7.6 9.7 11.7 13.7	116 128 128 *** ***	37 60 5 ** **	0 8 8 * *
112133001	2	4.9 7.1 9.1 11.1 13.1	105 120 140 140 150	9 24 77 13 7	0 0 8 8 0
112133002	2	4.9 7.1 9.1 11.1 13.1	105 120 140 140 150	9 24 77 13 7	0 0 8 8 0
115810001	2	5.3 7.6 9.4 11.5 13.6	110 130 140 164 162	17 73 61 96 54	0 0 0 8 0
117408201	1	3.1 5.1 7.3 9.1 11.1	*** 120 120 *** ***	** 97 7 ** **	* 8 8 * *
118124002	1	5.5 7.8 9.8 11.7 13.8	125 134 150 150 172	98 71 90 53 72	0 0 8 8 0
118161001	1	5.4 7.3 9.5 11.3 13.5	114 *** 142 140 156	45 ** 68 10 20	0 * 8 8 0
118161002	1	5.4 7.3 9.5 11.3 13.5	113 *** 138 137 151	37 ** 43 4 7	0 * 8 8 0
121039002	2	5.7 7.8 9.6 11.8 13.8	110 122 130 162 155	17 9 9 86 11	0 0 0 8 8
123010001	2	5.8 7.7 9.8 11.8 13.9	125 136 150 149 177	93 95 91 22 98	0 0 8 8 0
125196001	2	5.6 7.9 9.8 11.8 13.8	115 140 146 161 160	55 96 76 83 33	0 0 0 8 8
125196002	2	5.6 7.9 9.8 11.8 13.8	116 140 146 163 162	64 96 76 89 45	0 0 0 8 8
126022001	1	5.4 7.4 9.3 11.7 13.7	120 138 135 165 ***	87 97 25 98 **	0 8 8 0 *
128206002	2	5.7 7.9 9.9 11.8 13.7	115-115 131 147 160 160	55 60 81 79 42	0 0 0 8 8
128538002	2	6 8.1 9.9 11.9 14	120 132 150 166 165	69 67 91 95 63	0 0 0 8 8
129164200	1	7.4 9.2 11.2 13.5 15.5	120 136 136 155 172	7 31 3 17 33	0 8 8 0 0
129353300	2	36.2 37.9 39.9 42 44.3	157 164 *** 155 ***	2 28 ** 1 **	0 8 * 0 *
129353400	1	35.9 37.7 39.7 41.8 43.8	*** 174 *** 180 ***	** 15 ** 50 **	* 8 * 8 *
129516002	2	5.5 7.4 9.2 11.4 13.4	114 130 130 149 160	47 73 9 38 42	0 8 8 0 0
132011001	1	6 7.8 9.9 11.8 13.8	120 134 156 154 168	67 71 98 59 54	0 0 8 0 0
132067400	1	35.8 37.5 39.8 41.8 43.7	180 179 *** 173 179	50 43 ** 11 43	0 0 * 8 0
136569001	2	5.2 6.9 8.8 11.1 13.1	110 125 135 150 145	17 60 48 63 1	0 0 0 0 8
136569002	2	5.2 6.9 8.8 11.1 13.1	110 125 135 150 145	17 60 48 63 1	0 0 0 0 8
136684001	2	5.7 7.8 9.8 11.8 13.7	117 130 130 *** 167	71 53 4 ** 80	0 0 8 * 0

Appendix 4.

Height values that were flagged due to (longitudinal) inconsistencies.

PID	Sex	Age	Height values	PR	Flags
136684002	2	5.7 7.8 9.8 11.8 13.7	117 130 130 *** 167	71 53 4 ** 80	0 0 8 * 0
140318200	2	13.3 15.7 17.7 19.7 21.7	164-164 162 *** *** ***	65 31 ** ** **	8 8 * * *
144667200	2	8.6 10.8 12.5 14.8 17.2	140 158-158 156 176 176	90 93 42 96 94	0 8 8 0 0
150584001	2	5.7 7.8 9.8 11.8 13.8	114 140 135 *** ***	47 96 17 ** **	0 8 8 * *
151639200	1	8.5 10.6 12.6 14.7 16.8	140 140 155 168 176	86 27 47 38 37	8 8 0 0 0
153821400	1	41.1 43 45 46.9 49	180 173 *** 175 ***	50 11 ** 19 **	8 0 * 0 *
158148001	2	5.5 7.8 9.9 11.6 13.6	111 130 136 155 155	23 53 21 71 16	0 0 0 8 8
158148002	2	5.5 7.8 9.9 11.6 13.6	111 130 136 155 155	23 53 21 71 16	0 0 0 8 8
158546001	2	5.3 7.2 9.2 11.4 13.6	106 120 120 120 158	3 24 0 0 30	0 8 8 9 0
160452001	2	5.8 8.1 9.9 11.8 13.8	112 130 140 140 155	12 53 42 1 11	0 0 0 8 0
160452002	2	5.8 8.1 9.9 11.8 13.8	112 128 140 140 155	12 39 42 1 11	0 0 0 8 0
166392001	1	5.3 7 9 11.1 13.4	117 130 140 140 155	70 85 73 17 17	0 0 8 8 0
166392002	1	5.3 7 9 11.1 13.4	117 130 140 140 155	70 85 73 17 17	0 0 8 8 0
166852300	2	32 34 36.1 37.8 40	174 174 *** *** 163	90 90 ** ** 22	0 0 * * 8
169135200	1	7.2 9 11.1 13 14.9	134 154 145 125 185	96 99 40 0 93	0 8 8 9 0
169561400	1	27.5 29.6 31.6 33.5 35.8	*** 175 *** 167 ***	** 19 ** 1 **	* 8 * 8 *
169731002	2	5.8 7.8 9.7 11.6 13.7	113 137 137 146 160	17 90 42 23 42	0 8 8 0 0
169778001	1	5.6 7.9 9.9 11.8 13.8	123 120 *** *** ***	96 2 ** ** **	8 8 * * *
171025001	2	5.5 7.5 9.6 11.4 13.3	115 128 150 150 171	55 60 96 44 92	0 0 8 8 0
171025002	2	5.5 7.5 9.6 11.4 13.3	115 129 150 150 172	55 67 96 44 94	0 0 8 8 0
171267001	2	5.3 7.2 9.3 11.2 13.2	110 110 *** *** ***	17 0 ** ** **	8 8 * * *
171267002	2	5.3 7.2 9.3 11.2 13.2	116 115 *** *** ***	64 1 ** ** **	8 8 * * *
171885001	2	6.2 8.2 9.9 11.9 13.9	128 135 156 155 ***	92 67 98 53 **	0 0 8 8 *
174018300	2	32.8 34.5 36.6 38.7 41	175 183 *** 172 173	93 99 ** 83 87	0 8 * 0 0
176731400	1	48.4 50.2 52.2 54.2 56.2	183 175 *** 183 184	69 19 ** 69 75	0 8 * 0 0
177291001	2	5.1 7.1 8.8 11.1 13.2	110 130 130 148 152	42 88 19 52 13	0 8 8 0 0
177291002	2	5.1 7.1 8.8 11.1 13.2	128 146 145 160 168	99 99 94 96 89	0 8 8 0 0

Appendix 4.

Height values that were flagged due to (longitudinal) inconsistencies.

PID	Sex	Age	Height values	PR	Flags
178062400	1	42.4 44.5 46.5 48.5 50.7	180 180 *** *** 189	50 50 ** ** 93	0 0 * * 8
178946001	2	5.8 7.7 9.8 11.7 13.7	122 130 130 160 160	81 73 4 90 42	0 0 8 8 8
178946002	2	5.8 7.7 9.8 11.7 13.7	122 130 130 160 155	81 73 4 90 16	0 0 8 8 8
180951001	1	5.7 7.4 9.7 11.6 13.7	112 128 144 156 155	29 51 79 81 17	0 0 0 8 8
181078002	1	6 8 9.9 11.8 14	119 *** 146 146 173	59 ** 75 21 76	0 * 8 8 0
181283001	1	4.8 7 9.1 11 13	111 120 136 150 150	47 19 47 68 13	0 0 0 8 8
182975200	2	7.6 9.7 11.6 13.8 16	125 150 160 170 167	38 96 90 86 59	0 0 0 8 8
184568200	2	10.6 12.5 14.3 16.5 18.4	137 52-152 *** 152 162	13 ** ** 1 16	0 2 * 8 0
184840200	2	11.2 12.9 14.9 16.9 18.9	160 160 *** *** ***	90 52 ** ** **	8 8 * * *
186238001	2	5.6 7.7 9.7 11.7 13.6	120 120 135 145 151	88 11 30 19 5	8 8 0 0 0
187279001	2	4.8 7.1 9.1 11 13.2	105 115 136 135 145	9 4 54 3 1	0 0 8 8 0
187337001	2	5.2 7.3 9.4 11.2 13.5	97 108 126 125 146	0 0 2 0 1	0 0 8 8 0
187390001	2	6.2 8 10.1 12.2 13.9	126 122 155 *** 176	95 9 98 ** 97	8 8 0 * 0
187390002	2	6.2 8 10.1 12.2 13.9	122 122 145 *** 170	81 9 71 ** 86	8 8 0 * 0
187830200	1	15 16.8 19.2 20.8 22.9	160 172 *** 172 160	4 18 ** 8 0	8 8 * 8 8
188007001	1	5.6 7.7 9.6 11.8 14	118 130 130 135 160	77 66 7 1 20	0 0 8 8 0
188007200	2	13.9 16 17.9 20.1 22.4	163-165 160 *** *** ***	57 20 ** ** **	8 8 * * *
188007400	1	46.2 48.2 50.2 52.3 54.6	178 178 *** 171 178	36 36 ** 6 36	0 0 * 8 0
190610200	2	6.7 8.8 10.8 12.9 15.1	117 140 138 150 ***	23 77 7 7 **	0 8 8 0 *
192663300	2	41.7 43.2 45.3 47.5 49.5	*** 174 *** 168 169	** 90 ** 57 64	* 8 * 0 0
193153002	1	5.2 7.5 9.5 11.4 13.4	113 130 143 140 ***	37 66 74 10 **	0 0 8 8 *
194017001	2	5.5 7.8 9.5 11.5 13.5	102 *** 140 140 165	0 ** 61 5 71	0 * 8 8 0
194017002	2	5.5 7.8 9.5 11.5 13.5	102 *** 140 140 163	0 ** 61 5 59	0 * 8 8 0
194419200	2	9.4 11.5 13.5 15.6 17.7	145 164-164 162 170 175	85 96 54 77 92	0 8 8 0 0
194461001	2	6 8.2 10 11.9 13.8	116 125 143 150 150	37 21 60 26 2	0 0 0 0 8
211961400	1	46.2 48.4 50.4 52.4 54.4	180 170 *** *** ***	50 4 ** ** **	8 8 * * *
212386001	1	11.2 13.6 15.5 17.4 19.6	*** 163-160 *** 182 174	** 42 ** 68 15	* 0 * 8 8

Appendix 4.

Height values that were flagged due to (longitudinal) inconsistencies.

PID	Sex	Age	Height values	PR	Flags
212386200	1	14.5 16.8 18.8 20.8 22.8	178 176 *** *** ***	82 37 ** ** **	8 8 * * *
214345002	2	11.2 13.2 15.5 17.4 19.5	140 55-155 *** 152 153	13 ** ** 1 0	0 8 * 8 0
214473002	1	11.7 13.8 15.8 17.8 19.8	159 170-168 *** 185 178	90 59 ** 81 36	0 0 * 8 8
220414400	1	42.7 44.5 46.3 48.6 50.5	182 182 *** 176 181	63 63 ** 24 56	0 0 * 8 0
222088400	1	42.9 44.8 47.3 49 51.1	*** 180 *** 186 ***	** 50 ** 84 **	* 8 * 8 *
222625001	2	11.8 13.8 15.9 17.7 19.7	145 142-140 *** 150 ***	8 0 ** 0 **	8 8 * 0 *
222625002	2	11.8 13.8 15.9 17.7 19.7	148 150-145 *** 150 ***	17 1 ** 0 **	8 8 * 0 *
224547001	2	11.5 13.7 15.7 17.7 19.7	160 160-160 *** *** ***	90 42 ** ** **	8 8 * * *
224547002	2	11.5 13.8 15.8 17.8 19.8	161 161-161 *** *** ***	92 39 ** ** **	8 8 * * *
224547200	2	13.7 15.9 17.9 19.9 21.9	165-163 160 *** *** ***	65 20 ** ** **	8 8 * * *
224613200	1	14.5 16.5 18.6 20.5 22.8	189 185 *** *** 186	98 85 ** ** 84	8 8 * * 0
225009300	2	50.6 52.6 54.6 56.6 58.6	160 166 *** *** ***	9 42 ** ** **	8 8 * * *
225130001	1	11.4 13.3 15.3 17.5 19.5	150 145-146 *** 171 ***	53 2 ** 13 **	0 8 * 0 *
231642400	1	43 45.1 47.1 49.1 51.1	189 150 *** *** ***	93 0 ** ** **	8 8 * * *
233231001	1	11.1 12.8 15.4 17.4 19.4	140 135-135 *** *** ***	17 0 ** ** **	8 8 * * *
233231002	1	11.1 12.8 15.4 17.4 19.4	141 137-137 *** *** ***	20 0 ** ** **	8 8 * * *
233452200	2	17.8 19.9 21.7 23.8 26.2	172 178 *** 172 172	83 98 ** 83 83	0 8 * 0 0
234013300	2	41.5 43.3 45.4 47.3 49.2	160 160 *** 166 160	9 9 ** 42 9	0 0 * 8 0
236509200	2	6 8.2 10.2 12.2 14.2	128 136 153 150 172	98 87 90 26 89	0 0 8 8 0
239500200	2	5.5 7.3 9.3 11.3 13.3	110 105 *** *** ***	17 0 ** ** **	8 8 * * *
243019300	2	47.6 49.2 51.3 53.5 55.8	150 158 *** 158 158	0 4 ** 4 4	8 0 * 0 0
247060200	2	10.2 12.3 14 16 18	*** 160-160 150 *** ***	** 65 2 ** **	* 8 8 * *
249535300	2	37.2 38.9 41 43.2 45.2	165 174 *** 172 173	35 90 ** 83 87	8 0 * 0 0
250627002	1	11.4 13.3 15.3 17.3 19.2	150 144 *** 183 185	53 1 ** 73 80	0 8 * 0 0
251961001	1	11.4 13.4 15.5 17.3 19.6	148 145 *** 185 187	42 1 ** 82 88	0 8 * 0 0
252574001	2	11.3 13.6 15.7 17.4 19.4	136 150 *** 169 160	1 4 ** 69 9	0 0 * 8 8
253357001	1	11.5 13.2 15.2 17.5 19.4	166 150-140 *** 176 176	98 1 ** 34 24	8 8 * 0 0

Appendix 4.

Height values that were flagged due to (longitudinal) inconsistencies.

PID	Sex	Age	Height values	PR	Flags
253910200	1	8.3 9.9 12.1 14 16	150-140 150 164 190 183	97 90 93 99 80	3 0 0 8 8
254379400	1	50.1 51.8 53.9 55.9 57.9	150 189 *** *** ***	0 93 ** ** **	8 8 * * *
257903002	1	11.1 13.2 15.2 17.3 19.3	150 150-150 *** 185 ***	68 13 ** 82 **	8 8 * 0 *
261505200	2	5.8 7.7 9.7 11.8 13.9	*** 122 148 170 170	** 20 93 98 86	* 0 0 8 8
261945300	2	41.4 43.5 45.5 47.5 49.5	188 182 *** *** ***	99 99 ** ** **	8 8 * * *
262270200	2	12.7 14.4 16.4 18.6 20.7	155 153 *** 154 ***	37 4 ** 0 **	8 8 * 0 *
262672400	1	41.4 43.3 45.4 47.4 49.6	178 197 *** 185 ***	36 99 ** 80 **	8 8 * 8 *
263863400	1	40.2 42.4 44.4 46.3 48.4	172 *** *** 185 ***	8 ** ** 80 **	8 * * 8 *
264761002	2	11.2 13.2 15.3 17.2 19.2	142 1-142 *** 147 ***	9 ** ** 0 **	8 8 * 0 *
264761201	1	4.5 6.5 8.7 10.5 12.5	*** *** 140 140 ***	** ** 86 27 **	* * 8 8 *
272800300	2	43.8 45.6 47.6 49.6 51.6	187 178 *** *** ***	99 98 ** ** **	8 8 * * *
276874200	1	14.1 15.8 18 20.1 21.8	175 174 *** *** ***	82 35 ** ** **	8 8 * * *
278287001	2	12 13.8 15.8 17.8 19.9	161 160-160 *** 165 165	83 33 ** 45 35	8 8 * 0 0
280816300	2	40.4 42.2 44.3 46.5 48.6	172 165 *** 172 168	83 35 ** 83 57	8 8 * 8 8
283490500	1	51 53.3 55.3 57.2 59.2	168 178 *** *** ***	2 36 ** ** **	8 8 * * *
283671200	2	8.6 10.9 12.9 14.9 16.9	140 139-140 150 *** 160	90 11 7 ** 19	8 8 0 * 0
284375200	1	8.3 10.6 12.4 14.4 16.4	134 150-150 150 *** ***	52 81 25 ** **	0 8 8 * *
286228200	2	13.8 15.8 17.9 19.9 21.8	161-161 160 *** *** 162	39 20 ** ** 16	8 8 * * 0
286672200	2	13.7 15.7 17.8 19.7 22	159-164 159 *** 165 160	51 17 ** 35 9	8 8 * 0 0
287010400	1	47.4 49.3 51.3 53.3 55.3	196 190 *** *** ***	99 95 ** ** **	8 8 * * *
291384300	2	33.7 35.7 37.5 39.5 41.5	150 158 *** *** ***	0 4 ** ** **	8 8 * * *
291384400	1	50 52 53.8 55.8 57.8	167 176 *** *** ***	1 24 ** ** **	8 8 * * *
293855400	1	48.9 51.1 53.2 55.1 57.3	187 180 *** 187 187	88 50 ** 88 88	0 8 * 0 0
294080200	2	9.9 11.8 13.8 16.1 18.2	135 154-154 165 160 160	17 48 63 20 18	0 0 8 8 0
297248200	2	9.4 11.6 13.6 15.5 17.8	146 168-168 172 185 173	89 99 94 99 86	0 0 0 8 8
299661200	2	8.6 10.8 12.8 14.7 16.8	128 134-134 134 154 157	22 2 0 6 9	0 8 8 0 0
310546300	2	39.2 40.8 42.8 44.8 46.8	163 173 *** *** ***	22 87 ** ** **	8 8 * * *

Appendix 4.

Height values that were flagged due to (longitudinal) inconsistencies.

PID	Sex	Age	Height values	PR	Flags
311010300	2	51.2 53.6 55.6 57.6 59.6	175 168 *** *** ***	93 57 ** ** **	8 8 * * *
317273400	1	54.2 56 58.4 60.4 62.4	178 185 *** *** ***	36 80 ** ** **	8 8 * * *
318028001	2	17.2 19.2 21.2 23.1 25.2	167-167 176 *** 170 170	58 95 ** 71 71	0 8 * 0 0
319225002	1	17.2 19.1 21.1 23.2 25.2	179 177 *** 185 184	51 30 ** 80 75	0 8 * 8 0
321808002	2	17.9 20.2 22.2 24.2 26.2	170-168 196 *** *** ***	69 99 ** ** **	8 8 * * *
323512400	1	60.8 62.9 64.8 66.8 69	186 175 *** 175 185	84 19 ** 19 80	8 8 * 8 8
327984400	1	53.6 55.6 57.6 59.6 61.6	189 198 *** *** ***	93 99 ** ** **	8 8 * * *
329634001	2	17.2 19 21 23.6 25.6	168-168 *** *** 158 ***	64 ** ** 4 **	8 * * 8 *
332561001	1	17.8 20 22 23.9 25.8	176 170 *** 178 ***	32 4 ** 36 **	0 8 * 0 *
335058001	2	17.8 19.9 22.1 24 26.1	163-163 170 *** 167 173	33 71 ** 50 87	8 8 * 8 8
335549400	1	44.5 46.5 48.5 50.4 52.4	180 *** *** 186 180	50 ** ** 84 50	0 * * 8 0
341612001	1	18.3 19.9 21.9 23.9 26.1	195-185 181 *** 181 181	95 56 ** 56 56	8 0 * 0 0
342655120	2	18 20 22 24 26	*** *** *** 169 159	** ** ** 64 6	* * * 8 8
344107002	2	17 19 21.1 23.1 24.9	162-162 157 *** 168 168	29 2 ** 57 57	0 8 * 0 0
348778001	2	17.1 19.2 21.2 23.2 25.3	152 *** *** *** 160	1 ** ** ** 9	8 * * * 8
353107200	2	19.9 22.2 24.2 26.2 28.2	170 163 *** *** ***	71 22 ** ** **	8 8 * * *
353790300	2	45.9 47.9 49.9 52.3 54.3	168 *** *** 162 ***	57 ** ** 16 **	8 * * 8 *
354919400	1	44.3 45.9 47.9 49.9 51.9	155 149 *** *** ***	0 0 ** ** **	8 8 * * *
356297002	1	17.8 19.4 21.4 23.4 25.4	185 175 *** *** ***	81 19 ** ** **	8 8 * * *
357692400	1	58.3 60.1 62.6 64.3 66.3	172 178 *** *** ***	8 36 ** ** **	8 8 * * *
365861001	2	17.1 19.4 21.4 23.4 25.4	167 156 *** *** ***	58 1 ** ** **	8 8 * * *
370008001	1	17.5 19.5 21.6 23.4 25.6	174 175 *** 168 ***	24 19 ** 2 **	0 0 * 8 *
371848001	1	18.2 19.8 21.8 23.9 26.1	183-183 175 *** 173 173	72 19 ** 11 11	8 8 * 0 0
371848002	1	18.2 19.8 21.8 23.9 26.1	180-180 170 *** 171 172	55 4 ** 6 8	8 0 * 0 0
374296200	2	9 10.8 13.2 14.9 16.9	140 160 160 *** ***	77 96 52 ** **	0 8 8 * *
377052400	1	68.2 70.1 72.3 74.2 76.2	183 196 *** *** ***	69 99 ** ** **	8 8 * * *
382340400	1	48.6 50.6 52.6 54.6 56.6	175 *** *** 168 ***	19 ** ** 2 **	8 * * 8 *

Appendix 4.

Height values that were flagged due to (longitudinal) inconsistencies.

PID	Sex	Age	Height values	PR	Flags
383383001	1	18.1 20.3 22 24 26	200-200 190 *** 180 185	99 95 ** 50 80	8 8 * 8 8
385113400	1	60.5 62.9 64.8 66.8 68.8	186 178 *** *** ***	84 36 ** ** **	8 8 * * *
385621400	1	44.7 46.8 48.7 50.6 52.6	192 196 *** 189 187	97 99 ** 93 88	0 8 * 0 0
386425002	1	17.3 19.2 21.4 23.5 25.6	191-191 182 *** *** 190	96 63 ** ** 95	0 8 * * 0
387395001	2	17.5 19.8 21.8 23.4 25.4	170 173 *** 165 165	75 87 ** 35 35	8 8 * 8 8
390237200	1	15.9 17.9 19.9 21.9 23.9	174 170 *** *** ***	35 9 ** ** **	8 8 * * *
391105001	1	17.6 19.7 21.8 23.8 25.8	183-183 176 *** 180 ***	73 24 ** 50 **	8 8 * 0 *
391273002	1	17.4 19.1 21.1 23.4 25.3	180-180 172 *** 176 ***	57 8 ** 24 **	8 8 * 0 *
396327002	2	17.8 19.6 21.6 23.8 25.8	183-173 173 *** 173 173	97 87 ** 87 87	8 0 * 0 0
397051200	1	13.3 15.1 17 18.9 21	165-165 155 *** 178 182	58 1 ** 36 63	0 8 * 0 0
397633002	2	17.6 19.6 21.6 23.8 25.8	174-175 *** *** 168 170	91 ** ** 57 71	8 * * 0 0
398820002	2	17 19 21 23.2 25.2	160 158 *** 158 150	19 4 ** 4 0	0 0 * 0 8
414849002	1	22.4 24.4 26.4 28.3 30.5	172-172 *** *** 178 180	8 ** ** 36 50	8 * * 0 0
416518001	1	23.4 25.5 27.5 29.5 31.6	183-178 180 *** 187 180	53 50 ** 88 50	0 0 * 8 0
419679110	1	26.9 28.9 30.9 32.9 35.1	*** 156 *** *** 176	** 0 ** ** 24	* 8 * * 8
420235002	2	23.3 25.3 27.5 29.4 31.2	167-167 175 *** *** ***	50 93 ** ** **	8 8 * * *
425287300	2	56.1 58 60 61.9 63.9	150 160 *** 159 159	0 9 ** 6 6	8 0 * 0 0
427378001	1	24 25.8 27.8 29.8 31.8	170-170 177 *** 177 168	4 30 ** 30 2	8 8 * 8 8
430661001	2	23.1 25.2 27.3 29.3 31.3	170-170 174 *** 167 ***	71 90 ** 50 **	8 8 * 8 *
435081200	2	31.3 33.3 35.3 37.2 39.4	*** *** *** 172 178	** ** ** 83 98	* * * 8 8
437865200	1	14.5 16.2 18.7 20.4 22.5	170 *** *** *** 180	48 ** ** ** 50	8 * * * 8
440425400	1	66.1 68 69.8 72 74.2	180 *** *** *** 187	50 ** ** ** 88	8 * * * 8
442068200	2	26.3 28.3 30.3 32.4 34.5	160 *** *** *** 170	9 ** ** ** 71	8 * * * 8
443136002	1	24.4 26.4 28.4 30.4 32.4	180 168 *** *** ***	50 2 ** ** **	8 8 * * *
449916300	2	52.5 54.5 56.4 58.8 60.7	168 *** *** *** 177	57 ** ** ** 97	8 * * * 8
451024400	1	65.2 67.1 69.1 71.1 73.1	187 180 *** *** ***	88 50 ** ** **	8 8 * * *
454103002	2	24.2 26.2 28.2 30.1 32.2	153-153 *** *** 155 148	0 ** ** 1 0	0 * * 0 8

Appendix 4.

Height values that were flagged due to (longitudinal) inconsistencies.

PID	Sex	Age	Height values	PR	Flags
454709001	1	23.1 25.2 27.3 29.2 31.2	186-187 196 *** 187 ***	86 99 ** 88 **	0 8 * 0 *
457571300	2	54.4 56.3 58.3 60.2 62.2	157 157 *** 165 ***	2 2 ** 35 **	0 0 * 8 *
458058120	2	16.2 18.2 20.2 22.2 24.3	*** *** *** 180 163	** ** ** 99 22	* * * 8 8
461526300	2	52 53.7 56.2 58 60.3	166 *** *** 160 ***	42 ** ** 9 **	8 * * 8 *
465557001	2	24.1 26.2 28.2 30.2 32.1	158-158 165 *** *** 165	4 35 ** ** 35	8 0 * * 0
467878002	2	23.9 25.8 28.1 29.9 32.1	170-170 169 *** 169 163	71 64 ** 64 22	0 0 * 0 8
467878300	2	55 57 59.2 61.1 63.2	158 153 *** 156 165	4 0 ** 1 35	0 0 * 0 8
469598120	1	21.7 23.7 25.7 27.6 30	175 *** *** 158 ***	19 ** ** 0 **	8 * * 8 *
471553002	1	23.9 26.1 28.3 30.2 32	176-176 170 *** 170 176	24 4 ** 4 24	8 8 * 8 8
471883001	2	23.2 25 27.2 29.3 31.3	160-160 160 *** 162 168	9 9 ** 16 57	0 0 * 0 8
473571400	1	54.5 56.8 58.8 60.6 62.6	180 172 *** *** ***	50 8 ** ** **	8 8 * * *
477315002	2	24.1 26.2 28.2 30.2 32.2	164-164 153 *** *** ***	28 0 ** ** **	8 8 * * *
477384200	1	29.7 31.8 33.8 35.8 37.8	183 176 *** *** ***	69 24 ** ** **	8 8 * * *
479915110	2	20.4 22.4 24.4 26.4 28.6	*** *** *** 163 151	** ** ** 22 0	* * * 8 8
481109300	2	58.2 59.8 61.8 63.8 65.8	172 179 *** *** ***	83 98 ** ** **	8 8 * * *
484611110	1	23.4 24.7 26.7 28.7 30.7	179 192 *** *** ***	43 97 ** ** **	8 8 * * *
487809400	1	60.3 62.7 64.6 66.2 68.2	*** 181 *** 171 ***	** 56 ** 6 **	* 8 * 8 *
490504400	1	51.4 53 55.3 57.3 59.3	173 183 *** *** ***	11 69 ** ** **	8 8 * * *
498152400	1	54.9 57 58.8 60.8 62.8	160 167 *** *** ***	0 1 ** ** **	8 8 * * *

Note. * = Value is missing in data collection. Multiple values per data collection are separated with -; different data collections are separated with |.

Appendix 5.

Weight values that were set to missing in the data cleaning process.

PID	Sex	Age	Weight values	PR	Flags	New value				
						F2F1	F2F2	F2F3	F2F4	F2F5
113159200	2	6.7 8.8 10.9 12.8 14.8	21 32 ** 334 **	29 60 ** 100 **	0 0 * 9 *				-81	
114097001	1	5.6 7.5 9.4 11.4 13.5	188 22 26 32 47	100 13 10 11 31	9 0 0 0 0	-81				
115568002	1	5.1 7.3 9.3 11.2 13.7	145 17 21 27 **	100 0 1 3 **	9 0 0 0 *	-81				
115584002	2	5.1 7.1 9.3 11.1 13.1	107 20 25 35 50	100 11 9 28 49	9 0 0 0 0	-81				
126339001	2	5.3 7.3 9.3 11.8 13.7	176 ** 282 ** 43	100 ** 100 ** 15	9 * 9 * 0	-81		-81		
126339002	2	5.3 7.3 9.3 11.8 13.7	18 ** 280 ** 43	21 ** 100 ** 15	0 * 9 * 0			-81		
126339202	1	3.2 5.2 6.9 8.9 11.2	** ** 215 ** 36	** ** 100 ** 34	* * 9 * 0			-81		
126786200	2	10.9 12.5 14.8 16.5 18.8	** 50-65 ** 63 63	** ** ** 68 24	* 9 * 0 0		-80			
130692200	2	8.6 10.9 12.9 15 17.2	40 66-50 65 93 **	99 ** 94 99 **	0 9 0 0 *		-80			
133053200	1	8.8 10.6 12.8 14.7 16.7	** 48-48 65 727 **	** 95 95 100 **	* 0 0 9 *				-81	
135840200	2	10.8 12.9 15.1 17 19	30 51-40 ** 65 65	11 ** ** 74 29	0 9 * 0 0		-80			
142393400	1	40.2 42.1 44 46.2 48.2	90 92 ** 183 100	61 67 ** 100 87	0 0 * 9 0				-81	
144426200	2	9.3 11.6 13.3 15.3 17.3	38 52-36 60 ** **	82 ** 80 ** **	0 9 0 * *		-80			
154461002	2	5.1 7.5 9.5 11.3 13.2	24 338 43 52 53	98 100 96 88 53	0 9 0 0 0		-81			
161885200	2	8.2 10.2 12.2 14.2 16.2	30 53-33 46 ** **	61 ** 43 ** **	0 9 0 * *		-80			
164528001	2	5.9 7.8 9.7 11.9 14	191 27 ** 46 57	100 49 ** 55 63	9 0 * 0 0	-81				
169135200	1	7.2 9 11.1 13 14.9	35 37 49 22 90	99 88 92 0 99	0 0 0 9 0				-81	
169561200	2	6.8 8.8 10.8 12.8 14.9	20 26 34 14 50	11 19 24 0 21	0 0 0 9 0				-81	
172728001	2	5.7 7.5 9.9 11.8 13.8	24 ** 52 0 **	93 ** 99 0 **	0 * 0 9 *				-81	
172728002	2	5.7 7.5 9.9 11.7 13.8	24 ** 52 0 **	93 ** 99 0 **	0 * 0 9 *				-81	
173154001	1	5.3 7.6 9.5 11.5 13.7	107 22 27 34 48	100 13 13 18 34	9 0 0 0 0	-81				
173501001	1	5.6 7.7 9.8 11.7 13.8	20-25 92 37 51 60	82 100 64 90 66	0 9 0 0 0		-81			
174018002	1	5.1 6.8 8.9 11 13.3	18 115 27 50 58	32 100 20 94 71	0 9 0 0 0		-81			
210076200	1	13.6 15.4 17.2 19.2 21.2	75-60 90 ** ** **	** 99 ** ** **	9 0 * * *	-80				
212647002	1	11.7 13.7 15.7 17.6 19.5	34 47-30 ** ** **	18 ** ** ** **	0 9 * * *		-80			
214057001	1	11 13.2 15.2 17.2 19.2	43 45-57 ** ** **	72 ** ** ** **	0 9 * * *		-80			

Appendix 5.

Weight values that were set to missing in the data cleaning process.

PID	Sex	Age	Weight values	PR	Flags	New value				
						F2F1	F2F2	F2F3	F2F4	F2F5
214473002	1	11.7 13.8 15.8 17.8 19.8	46 65-54 ** 71 77	74 ** ** 48 20	0 9 * 0 0		-80			
214570002	1	11 12.8 14.8 17 19.1	29 35-35 ** 0 65	7 7 ** 0 3	0 0 * 9 0				-81	
216596002	1	11.7 13.6 15.6 17.6 19.6	** 60-48 ** ** **	** ** ** ** **	* 9 * * *		-80			
218748400	1	42.6 44.6 46.6 48.8 50.8	106 1 ** ** **	95 0 ** ** **	0 9 * * *		-81			
221865002	2	11 13 15 17 19	160 ** ** ** **	100 ** ** ** **	9 * * * *	-81				
221865200	2	13.8 15.8 17.8 19.8 21.8	50-65 ** ** ** **	** ** ** ** **	9 * * * *	-80				
224158001	1	11.6 13.3 15.3 17.3 19.3	40 65-50 ** ** **	44 ** ** ** **	0 9 * * *	-80				
224158002	1	11.6 13.3 15.3 17.3 19.3	34 61-50 ** ** **	18 ** ** ** **	0 9 * * *	-80				
224922001	2	11.6 13.8 15.8 17.6 19.6	37 50-35 ** 59 **	27 ** ** 46 **	0 9 * 0 *	-80				
226177001	1	11.6 13.3 15.5 17.4 19.3	41 42-55 ** ** **	50 ** ** ** **	0 9 * * *	-80				
227298002	1	11.8 13.6 15.6 17.6 19.6	36 38-51 ** ** **	19 ** ** ** **	0 9 * * *	-80				
232794001	1	11.8 13.7 15.9 17.7 19.7	30 60-40 ** 64 72	5 ** ** 26 10	0 9 * 0 0	-80				
236662001	1	11.2 13.1 15.4 17.1 19.1	32 52-35 ** 62 **	11 ** ** 24 **	0 9 * 0 *	-80				
239175001	2	11.2 13.1 15.1 17.2 19.2	35 49-35 ** ** **	28 ** ** ** **	0 9 * * *	-80				
239873200	1	10.2 12 13.9 15.9 17.9	45 42-55 70 ** **	89 ** 90 ** **	0 9 0 * *	-80				
240282001	1	11.2 13.7 15.6 17.4 19.4	42 45-60 ** 82 90	67 ** ** 87 61	0 9 * 0 0	-80				
241228001	2	11.8 13.8 15.8 18.1 20.1	40 56-40 ** 55 **	29 ** ** 26 **	0 9 * 0 *	-80				
241228002	2	11.8 13.8 15.9 18.1 20.1	40 57-40 ** ** **	29 ** ** ** **	0 9 * * *	-80				
243338001	1	11.7 13.9 16.1 18.1 20.1	** 50-70 ** ** **	** ** ** ** **	* 9 * * *	-80				
245714001	1	11.8 13.4 15.6 17.6 19.6	45 55-55 ** 770 75	58 60 ** 100 15	0 0 * 9 0				-81	
250331002	1	11.2 13.6 15.6 17.6 19.6	55 70-55 ** ** **	96 ** ** ** **	0 9 * * *	-80				
251236001	1	11.6 13.6 15.6 17.8 19.8	26 43-20 ** ** **	2 ** ** ** **	0 9 * * *	-80				
251236002	1	11.6 13.6 15.6 17.8 19.8	22 36-18 ** 65 **	0 ** ** 26 **	0 9 * 0 *	-80				
256655001	2	11.4 13.2 15.2 17.2 19.2	50 45-56 ** ** **	82 ** ** ** **	0 9 * * *	-80				
259506002	2	11 13.2 15.2 17.1 19.1	** 42-40 ** 521 **	** 11 ** 100 **	* 0 * 9 *				-81	
261505002	1	11 13 15 17.1 19.2	31 73-38 ** 75 80	13 ** ** 71 28	0 9 * 0 0	-80				

Appendix 5.

Weight values that were set to missing in the data cleaning process.

PID	Sex	Age	Weight values	PR	Flags	New value				
						F2F1	F2F2	F2F3	F2F4	F2F5
262149002	1	11.4 13.4 15.4 17.4 19.4	34 55-44 ** ** **	18 ** ** ** **	0 9 * * *		-80			
262270002	2	11.4 13.1 15.1 17.2 19.5	42 59-46 ** 76 **	49 ** ** 97 **	0 9 * 0 *		-80			
269242002	1	11.3 13.2 15.2 17.2 19.2	62 48-63 ** ** **	99 ** ** ** **	0 9 * * *		-80			
271158002	1	11.1 13.4 15.4 17.2 19.2	35 45-56 ** 63 **	29 ** ** 27 **	0 9 * 0 *		-80			
272800002	2	11.8 13.5 15.5 17.5 19.5	214 50 ** ** **	100 40 ** ** **	9 0 * * *	-81				
272937001	1	11.3 13.2 15.2 17.2 19.2	41 71-53 ** ** **	50 ** ** ** **	0 9 * * *		-80			
274341001	1	11.5 13.3 15.3 17.2 19.2	** 40-56 ** ** **	** ** ** ** **	* 9 * * *		-80			
274341300	2	48.9 50.8 52.8 54.7 56.7	** 95 ** 0 **	** 96 ** 0 **	* 0 * 9 *				-81	
276455002	1	11.6 13.8 15.8 17.8 19.8	40 49-60 ** ** **	44 ** ** ** **	0 9 * * *		-80			
276883002	2	11.8 13.6 15.9 17.8 19.8	40 55-43 ** 60 58	29 ** ** 49 13	0 9 * 0 0		-80			
279926001	1	11.7 13.7 15.7 17.6 19.6	23 43-30 ** 48 **	0 ** ** 1 **	0 9 * 0 *		-80			
280816200	1	9.8 11.6 13.8 15.8 17.9	** 36-48 64 68 **	** ** 78 56 **	* 9 0 0 *		-80			
286672200	2	13.7 15.7 17.8 19.7 22	38-49 49 ** 50 48	** 15 ** 4 3	9 0 * 0 0	-80				
289299002	1	11.5 13.7 15.5 17.4 19.5	38 40-60 ** 72 75	34 ** ** 56 15	0 9 * 0 0		-80			
289925001	1	11.6 13.3 15.6 17.5 19.6	39 39-50 ** 70 75	39 ** ** 48 15	0 9 * 0 0		-80			
290742200	1	11 13.1 15 17 19	46 42-55 ** ** **	84 ** ** ** **	0 9 * * *		-80			
293077300	2	49.7 51.7 53.7 55.6 57.6	75 85 ** 999 **	59 84 ** 100 **	0 0 * 9 *				-81	
299955001	1	11.3 13.1 15 17.2 19.2	50 48-75 ** 89 **	88 ** ** 96 **	0 9 * 0 *		-80			
299955002	1	11.3 13.1 15 17.2 19.2	35 75-46 ** 79 **	21 ** ** 80 **	0 9 * 0 *		-80			
349119400	1	54.3 56.5 58.9 60.5 62.5	77 73 ** 712 **	20 12 ** 100 **	0 0 * 9 *				-81	
413591002	1	24.5 26.5 28.5 30.5 32.5	91 125 ** 250 **	64 99 ** 100 **	0 0 * 9 *				-81	
433249002	2	22.9 24.9 26.9 28.9 30.9	1 ** ** ** **	0 ** ** ** **	9 * * * *	-81				
464666002	2	24.2 26.4 28.5 30.5 32.5	45 12 ** ** **	1 0 ** ** **	0 9 * * *		-81			

Note. * = Value is missing in data collection. Multiple values per data collection are separated with -; different data collections are separated with |.

Appendix 6. Weight values that were corrected in the data cleaning process.

PID	Sex	Age	Weight values	PR	Flags	New value				
						F2F1	F2F2	F2F3	F2F4	F2F5
148195001	1	5.5 7.5 9.8 11.7 13.7	17 ** 140 ** 50	9 ** 100 ** 41	0 * 1 * 0				40	
157488200	1	8.9 11.2 13.2 15.2 17.2	32 38 145 ** 66	58 34 100 ** 37	0 0 1 * 0				45	
159070001	2	5.5 7.4 9.3 11.5 13.6	22 130 33 48 55	77 100 52 75 62	0 1 0 0 0		30			
170132002	2	4.8 6.8 9.2 11 13.2	16 20 128 34 40	11 11 100 24 13	0 0 1 0 0				28	
178029300	2	40.6 42.8 44.8 46.7 48.6	66 70 ** 170 **	32 43 ** 99 **	0 0 * 1 *				70	
195364002	1	5.1 7.2 9.1 11 13	18 20 133 34 43	32 8 100 24 27	0 0 1 0 0				33	
242922300	2	48.2 49.9 51.9 54.2 56.2	65 64 ** 64 167	29 26 ** 26 99	0 0 * 0 1					67
256281001	2	11.9 14.2 16.2 18.2 20.2	34 158 ** ** **	11 100 ** ** **	0 1 * * *		58			
269058300	2	42.1 44.3 46.4 48.2 50.2	72 72 ** 172 **	50 50 ** 99 **	0 0 * 1 *				72	
289480200	2	14.1 16 18.2 20.1 22.1	136 43 ** 50 **	100 3 ** 4 **	1 0 * 0 *	36				
299846002	2	10.8 13.2 15.2 17 19.1	128 35-35 ** ** 50	100 5 ** ** 4	1 0 * * 0	28				
323960002	2	18.1 19.6 22 23.7 25.8	66 171 ** 68 **	76 99 ** 37 **	0 1 * 0 *		71			
346234002	1	17 19.2 21.5 23.3 25.2	67 170 ** 75 85	41 99 ** 15 44	0 1 * 0 0		70			
352132002	2	17.2 19.3 21.4 23.4 25.4	160 75 ** ** **	100 59 ** ** **	1 0 * * *	60				
370522001	1	18.1 19.9 21.8 23.8 25.8	64 165 ** ** 74	23 99 ** ** 13	0 1 * * 0		65			
399208400	1	53.6 55.5 57.8 59.8 61.8	182 83 ** 83 80	99 37 ** 37 28	1 0 * 0 0	82				
423467001	2	23 25 27 29.2 31.4	152 ** ** 55 54	99 ** ** 9 8	1 * * 0 0	52				
435519400	1	50.2 52.1 54.2 56.2 58.4	71 170 ** 70 74	8 99 ** 7 13	0 1 * 0 0		70			
436021002	2	24.8 26.6 28.7 30.6 32.7	67 68 ** 165 67	34 37 ** 99 34	0 0 * 1 0				65	
472760400	1	59.2 61.2 63.2 65.2 67.7	186 ** ** 90 88	100 ** ** 61 54	1 * * 0 0	86				
498367300	2	51.4 53.3 55.3 57.3 59.3	158 60 ** ** **	99 17 ** ** **	1 0 * * *	58				

Note. * = Value is missing in data collection. Multiple values per data collection are separated with -; different data collections are separated with |.

Appendix 7. Cases where only one weight value out of multiple values was valid.

PID	Sex	Age	Weight values	PR	Flags	New value	
						F2F1	F2F2
221518001	1	11.7 13.5 15.5 17.8 19.9	38 58-0 ** 74 76	34 ** ** 60 18	0 2 * 0 0		58
221518002	1	11.7 13.5 15.5 17.8 19.9	35 50-0 ** ** 78	21 ** ** ** 23	0 2 * * 0		50
249311002	1	11.7 13.6 15.8 17.6 19.6	39-39 151-51 ** 65 72	39 ** ** 30 10	0 2 * 0 0		51
264021002	1	11.1 13.3 15.4 17.2 19.2	31 250-45 ** 55 54	13 ** ** 6 0	0 2 * 0 0		45
268513002	2	11.9 13.5 15.6 17.5 19.6	55 157-65 ** 69 80	87 ** ** 86 73	0 2 * 0 0		65
285302001	1	10.9 13 15 17 19	38 160-50 ** ** **	45 ** ** ** **	0 2 * * *		50
291543002	2	11.1 13.3 15.3 17.3 19.3	** 159-56 ** ** **	** ** ** ** **	* 2 * * *		56

Note. * = Value is missing in data collection. Multiple values per data collection are separated with -; different data collections are separated with |.

importing datasets and merging them

```
# Load relevant libraries
library(haven)
library(dplyr)
library(stringr)
library(foreign)
library(openxlsx)

# if control == 1 all the indicators are going to be computed, so cases can
# be checked on case-to-case basis
# if control == 0, the suf-data in its final form will be created
control <- 0

options(scipen=999)

# import datasets
master_data <-
read_dta("Y:/TwinLife_Internal_V11/TwinLife_Internal_V11/Master_iuf.dta")

f2f1_data <- read_dta("Y:/ZA6701_TwinLife_8-0-0/Release_8-0-0/TL_v8-0-
0_Stata/ZA6701_person_wid1_v8-0-0.dta")
f2f2_data <- read_dta("Y:/ZA6701_TwinLife_8-0-0/Release_8-0-0/TL_v8-0-
0_Stata/ZA6701_person_wid3_v8-0-0.dta")
f2f3_data <- read_dta("Y:/ZA6701_TwinLife_8-0-0/Release_8-0-0/TL_v8-0-
0_Stata/ZA6701_person_wid5_v8-0-0.dta")
f2f4_data <- read_dta("Y:/ZA6701_TwinLife_8-0-0/Release_8-0-0/TL_v8-0-
0_Stata/ZA6701_person_wid7_v8-0-0.dta")
f2f5_data <- read_dta("Y:/Datenaufbereitungen/BMIF2F5/Nachlieferung von
DM/ZA6701_person_wid9_v9-0-0_beta_11122024.dta")
zyg_data <- read_dta("Y:/ZA6701_TwinLife_8-0-0/Release_8-0-0/TL_v8-0-
0_Stata/ZA6701_zygosity_v8-0-0.dta")

# overwriting missing values in master dataset with NA
master_data[is.na(master_data)] <- NA

f2f1_data_bdy <- read_dta("Y:/Datenaufbereitungen/BMIF2F5/Nachlieferung von
DM/TwinLife_W1_F2F_iuf_bdy0100_17022025.dta")

ptyp_values <- c(1,2)

# Loop through prefixes, ptyp_values, suffixes, and f2f_versions
for (a in ptyp_values) {
  # Construct the column names based on prefix, suffix, and f2f
  version
  temp_column <- paste0("zyg0201", "_temp")
  result_column <- paste0("zyg0201", "_", a)
```

```

# Use dplyr functions to apply the transformation
f2f1_data_bdy <- f2f1_data_bdy %>%
  group_by(fid_suf) %>%
  mutate(
    # Create a temporary column based on the condition
    !!temp_column := ifelse(!!sym("ptyp") == a, !!sym("zyg0201"),
NA),

    # Calculate the mean for the temporary column and store in result
column
    !!result_column := mean(!!sym(temp_column), na.rm = TRUE)
  ) %>%
  # Remove the temporary column
  select(-!!sym(temp_column)) %>%
  ungroup()
}

# Delete the duplicates, only one person should have the specific information
for (a in ptyp_values) {
  # Construct the column names based on prefix, suffix, and f2f version
  result_column <- paste0("zyg0201", "_", a)

  # Apply conditionally setting values to NA based on patterns in
column_name; set the value that is not meant for that person type missing
  if (result_column == "zyg0201_1") {
    f2f1_data_bdy[[result_column]][f2f1_data_bdy[["ptyp"]] != 2
|is.na(f2f1_data_bdy[["ptyp"]])] <- NA
  } else if (result_column == "zyg0201_2") {
    f2f1_data_bdy[[result_column]][f2f1_data_bdy[["ptyp"]] != 1
|is.na(f2f1_data_bdy[["ptyp"]])] <- NA
  }

}

if (is.data.frame(f2f1_data_bdy)) {
  f2f1_data_bdy[] <- lapply(f2f1_data_bdy, function(x) {
    if (is.numeric(x)) {
      x[is.nan(x)] <- NA
    }
    return(x)
  })
}

f2f1_data_bdy <- f2f1_data_bdy %>%
  rowwise() %>%
  mutate(zyg0201_ext := {
    # Construct column names dynamically
    vals <- c_across(all_of(c("zyg0201_1", "zyg0201_2"))) # Get the values
    first_non_na <- vals[!is.na(vals)][1] # Get the first non-NA value,

```

```

if available
  if (!is.na(first_non_na)) first_non_na else NA # Return the value or
NA if all are NA
})

f2f1_data_bdy$bdy0100_orig_gen <- ifelse(!is.na(f2f1_data_bdy$bdy0100_orig) &
f2f1_data_bdy$bdy0100_orig >= 0, f2f1_data_bdy$bdy0100_orig,
ifelse(!is.na(f2f1_data_bdy$zyg0201_ext) & f2f1_data_bdy$zyg0201_ext >= 0 &
f2f1_data_bdy$zyg0200 <= 0 & !is.na(f2f1_data_bdy$zyg0200),
f2f1_data_bdy$zyg0201_ext, f2f1_data_bdy$bdy0100_orig))

View(f2f1_data_bdy[, c("bdy0100_orig", "bdy0100_orig_gen", "zyg0200",
"zyg0201_ext")])

# add a suffix to f2f1 data but rename the pid variable for merging
f2f1_data <- f2f1_data %>% rename_at(vars(everything()), ~ paste0(.,
"_f2f1"))
f2f1_data <- f2f1_data %>% rename(pid_suf = pid_f2f1)
# add a suffix to f2f1 data but rename the pid variable for merging
f2f1_data_bdy <- f2f1_data_bdy[, c("pid_suf", "bdy0100_orig_gen")]
f2f1_data_bdy <- f2f1_data_bdy %>% rename_at(vars(everything()), ~ paste0(.,
"_f2f1"))
f2f1_data_bdy <- f2f1_data_bdy %>% rename(pid_suf = pid_suf_f2f1)
# add a suffix to f2f2 data but rename the pid variable for merging
f2f2_data <- f2f2_data %>% rename_at(vars(everything()), ~ paste0(.,
"_f2f2"))
f2f2_data <- f2f2_data %>% rename(pid_suf = pid_f2f2)
# add a suffix to f2f3 data but rename the pid variable for merging
f2f3_data <- f2f3_data %>% rename_at(vars(everything()), ~ paste0(.,
"_f2f3"))
f2f3_data <- f2f3_data %>% rename(pid_suf = pid_f2f3)
# add a suffix to f2f4 data but rename the pid variable for merging
f2f4_data <- f2f4_data %>% rename_at(vars(everything()), ~ paste0(.,
"_f2f4"))
f2f4_data <- f2f4_data %>% rename(pid_suf = pid_f2f4)
# add a suffix to f2f5 data but rename the pid variable for merging
f2f5_data <- f2f5_data %>% rename_at(vars(everything()), ~ paste0(.,
"_f2f5"))
f2f5_data <- f2f5_data %>% rename(pid_suf = pid_f2f5)
# add a suffix to zygoty data but rename the pid variable for merging
zyg_data <- zyg_data %>% rename_at(vars(everything()), ~ paste0(., "_zyg"))
zyg_data <- zyg_data %>% rename(pid_suf = pid_zyg)

# merging all the datasets into one
merged_data <- NA
merged_data <- master_data %>% full_join(f2f1_data, by = "pid_suf")
merged_data <- merged_data %>% full_join(f2f1_data_bdy, by = "pid_suf")
merged_data <- merged_data %>% full_join(f2f2_data, by = "pid_suf")
merged_data <- merged_data %>% full_join(f2f3_data, by = "pid_suf")
merged_data <- merged_data %>% full_join(f2f4_data, by = "pid_suf")

```

```

merged_data <- merged_data %>% full_join(f2f5_data, by = "pid_suf")
merged_data <- merged_data %>% full_join(zyg_data, by = "pid_suf")

#creating a function to search for specific variables in the dataset
search_var_function <- function(datensatz, stamm, variables = "[0-9]{4}",
suffix="", zeitpunkt="((f2f|cati)[1-5])?(_inv|_rec)?"){

if (as.character(substitute(variables)) == ".*"){
number_char <- paste0(as.character(substitute(variables)))
} else if (nchar(as.character(substitute(variables))) == 1){
number_char <- paste0(as.character(substitute(variables)), "[0-9]{3}") #
define search pattern
} else if (nchar(as.character(substitute(variables))) == 2){
number_char <- paste0(as.character(substitute(variables)), "[0-9]{2}")
} else if (nchar(as.character(substitute(variables))) == 3){
number_char <- paste0(as.character(substitute(variables)), "[0-9]{1}")
} else if (nchar(as.character(substitute(variables))) == 4){
number_char <- paste0(as.character(substitute(variables)))
} else {number_char <- paste0(as.character(substitute(variables)))}
suchmuster <- paste0("^", as.character(substitute(stamm)), number_char,
as.character(substitute(suffix)), "\\_", as.character(substitute(zeitpunkt)))
print("This is the searching pattern: ")
print(suchmuster)
ergebnis_vector <- c()
for (i in colnames(datensatz)){
if (grepl(suchmuster ,i)){
ergebnis_vector <- c(ergebnis_vector,i)
}
}
if (length(ergebnis_vector) == 0) {
print("Variables not found")
}
inverted<- ergebnis_vector[grep("_rec|_inv", ergebnis_vector)]
inverted_first <- substr(inverted, 1, nchar(inverted)-4)
ergebnis_v <- setdiff(ergebnis_vector, inverted_first)
return(ergebnis_v)
}

# define which variables should be kept in the data set- gender, body
measures, interview date, birthday and specific data from the zygostiy
questionnaire
var_keep_sex <- search_var_function(merged_data, "sex", "")
var_keep_bdy <- search_var_function(merged_data, "bdy", ".*.")
var_keep_yea <- search_var_function(merged_data, "yea", ".*.")
var_keep_mon <- search_var_function(merged_data, "mon", ".*.")
var_keep_ptyp <- search_var_function(merged_data, "ptyp", "", "")
var_keep_zyg <- search_var_function(merged_data, "zyg", "020[0-1]", "[t/u]")
# mon_pq
# yea_pq

# birth month = fpr0104 & birth year = fpr0105

```

```
var_keep <- c("pid_suf", "pid_infas", "fpr0104", "fpr0105",
"fid_suf", "sib1000", "cgr", var_keep_sex, var_keep_bdy, var_keep_yea,
var_keep_mon, var_keep_ptyp, var_keep_zyg, "zyg0200_zyg",
"age0201_f2f1", "age0201_f2f2", "age0201_f2f3", "age0201_f2f4", "age0201_f2f5",
"sex")
```

Creating subsets

```
# create subset for the relevant variables
subset_data <- subset(merged_data, select=var_keep)
names(subset_data)

# exact age calculated by date of interview and birthday
# age variable values are years with months in decimal places e. g. 12.5 = 12
# years and 6 months
# code 0 does not exist; therefore, it can be used for filtering out missing
# values

# Perform the calculation for age_f2f1 only if none of the variables is less
# than 0
subset_data$age_f2f1 <- ifelse(subset_data$yea_pq_f2f1 >= 0 &
subset_data$fpr0105 >= 0 & subset_data$mon_pq_f2f1 >= 0 & subset_data$fpr0104
>= 0, (subset_data$yea_pq_f2f1 - subset_data$fpr0105) +
((subset_data$mon_pq_f2f1 - subset_data$fpr0104)/12), NA)

subset_data$age_f2f1 <- ifelse(is.na(subset_data$age_f2f1) &
!is.na(subset_data$age0201_f2f1) & subset_data$age0201_f2f1 >0 ,
subset_data$age0201_f2f1/12, subset_data$age_f2f1)

# Perform the calculation for age_f2f2 only if none of the variables is less
# than 0
subset_data$age_f2f2 <- ifelse(subset_data$yea_pq_f2f2 >= 0 &
subset_data$fpr0105 >= 0 & subset_data$mon_pq_f2f2 >= 0 & subset_data$fpr0104
>= 0, (subset_data$yea_pq_f2f2 - subset_data$fpr0105) +
((subset_data$mon_pq_f2f2 - subset_data$fpr0104)/12), NA)

subset_data$age_f2f2 <- ifelse(is.na(subset_data$age_f2f2) &
!is.na(subset_data$age0201_f2f2) & subset_data$age0201_f2f2 >0,
subset_data$age0201_f2f2/12, subset_data$age_f2f2)

# Perform the calculation for age_f2f3 only if none of the variables is less
# than 0
subset_data$age_f2f3 <- ifelse(subset_data$yea_pq_f2f3 >= 0 &
subset_data$fpr0105 >= 0 & subset_data$mon_pq_f2f3 >= 0 & subset_data$fpr0104
>= 0, (subset_data$yea_pq_f2f3 - subset_data$fpr0105) +
((subset_data$mon_pq_f2f3 - subset_data$fpr0104)/12), NA)

subset_data$age_f2f3 <- ifelse(is.na(subset_data$age_f2f3) &
!is.na(subset_data$age0201_f2f3) & subset_data$age0201_f2f3 >0,
subset_data$age0201_f2f3/12, subset_data$age_f2f3)
```

```

# Perform the calculation for age_f2f4 only if none of the variables is less
than 0
subset_data$age_f2f4 <- ifelse(subset_data$yea_pq_f2f4 >= 0 &
subset_data$fpr0105 >= 0 & subset_data$mon_pq_f2f4 >= 0 & subset_data$fpr0104
>= 0, (subset_data$yea_pq_f2f4 - subset_data$fpr0105) +
((subset_data$mon_pq_f2f4 - subset_data$fpr0104)/12), NA)

subset_data$age_f2f4 <- ifelse(is.na(subset_data$age_f2f4) &
!is.na(subset_data$age0201_f2f4) & subset_data$age0201_f2f4 >0,
subset_data$age0201_f2f4/12, subset_data$age_f2f4)
# Perform the calculation for age_f2f5 only if none of the variables is less
than 0
subset_data$age_f2f5 <- ifelse(subset_data$yea_pq_f2f5 >= 0 &
subset_data$fpr0105 >= 0 & subset_data$mon_pq_f2f5 >= 0 & subset_data$fpr0104
>= 0, (subset_data$yea_pq_f2f5 - subset_data$fpr0105) +
((subset_data$mon_pq_f2f5 - subset_data$fpr0104)/12), NA)

subset_data$age_f2f5 <- ifelse(is.na(subset_data$age_f2f5) &
!is.na(subset_data$age0201_f2f5) & subset_data$age0201_f2f5 >0,
subset_data$age0201_f2f5/12, subset_data$age_f2f5)

table(subset_data$yea_pq_f2f5)

subset_data_1 <- subset_data
# parental reports are stored with the parents; in order to work with them,
they need to be transferred to the child

# Define the variables to loop over - parental report variables
suffixes <- c("t", "u", "s")
ptyp_values <- c(300, 400, 500, 600)
prefixes <- c("bdy0100", "bdy0200")
f2f_versions <- c("_f2f1", "_f2f2", "_f2f3", "_f2f4", "_f2f5")

# Loop through prefixes, ptyp_values, suffixes, and f2f_versions
for (prefix in prefixes) {
  for (ptyp in ptyp_values) {
    for (suffix in suffixes) {
      for (f2f in f2f_versions) {

        # Construct the column names based on prefix, suffix, and f2f version
        ptyp_name <- paste0("ptyp", f2f)
        column_name <- paste0(prefix, suffix, f2f)
        temp_column <- paste0(column_name, "_temp")
        result_column <- paste0(column_name, "_", ptyp)

        # Use dplyr functions to apply the transformation
        subset_data_1 <- subset_data_1 %>%
          group_by(fid_suf) %>%
          mutate(
            # Create a temporary column based on the condition

```

```

    !!temp_column := ifelse(!!sym(ptyp_name) == ptyp,
!!sym(column_name), NA),

    # Calculate the mean for the temporary column and store in result
column
    !!result_column := mean(!!sym(temp_column), na.rm = TRUE)
  ) %>%
  # Remove the temporary column
  select(-!!sym(temp_column)) %>%
  ungroup()
}
}
}
}

# create a vector for all the new variable names
new_variable_names <- c()

for (prefix in prefixes) {
  for (ptyp in ptyp_values) {
    for (suffix in suffixes) {
      for (f2f in f2f_versions) {
        column_name <- paste0(prefix, suffix, f2f)
        temp_column <- paste0(column_name, "_temp")
        result_column <- paste0(column_name, "_", ptyp)

        # Add the result column name to the new_variable_names vector
        new_variable_names <- c(new_variable_names, result_column)
      }
    }
  }
}

# Delete the duplicates, only one person should have the specific
information: t --> first twin, u --> second twin, s--> sibling
for (prefix in prefixes) {
  for (ptyp in ptyp_values) {
    for (suffix in suffixes) {
      for (f2f in f2f_versions) {

        # Construct the column names based on prefix, suffix, and f2f version
        ptyp_name <- paste0("ptyp", f2f)
        column_name <- paste0(prefix, suffix, f2f)
        result_column <- paste0(column_name, "_", ptyp)

        # Apply conditionally setting values to NA based on patterns in
column_name; set the value that is not meant for that person type missing
        if (str_detect(result_column, "00t_")) {
          subset_data_1[[result_column]][subset_data_1[[ptyp_name]] != 1
|is.na(subset_data_1[[ptyp_name]])] <- NA
        } else if (str_detect(result_column, "00u_")) {

```

```

subset_data_1[[result_column]][subset_data_1[[ptyp_name]]] != 2
|is.na(subset_data_1[[ptyp_name]])] <- NA
} else if (str_detect(result_column, "00s_")) {
subset_data_1[[result_column]][subset_data_1[[ptyp_name]]] != 200
|is.na(subset_data_1[[ptyp_name]])] <- NA
}
}
}
}
}
}

```

#Delete NaNs in the dataset

```

if (is.data.frame(subset_data_1)) {
subset_data_1[] <- lapply(subset_data_1, function(x) {
if (is.numeric(x)) {
x[is.nan(x)] <- NA
}
return(x)
})
} else if (is.list(subset_data_1)) {
subset_data_1 <- lapply(subset_data_1, function(x) {
if (is.numeric(x)) {
x[is.nan(x)] <- NA
}
return(x)
})
}
}

```

Remove unnecessary duplicates: [t/u/s] variables are distinct for each family, so they can be combined to one external report variable per respondent type (300,400,500,600): ext_[respondant type]

```

prefixes_100 <- c("bdy0100t", "bdy0100u", "bdy0100s")
prefixes_200 <- c("bdy0200t", "bdy0200u", "bdy0200s")
prefixes <- list(prefixes_100, prefixes_200)
suffixes <- c("f2f1_300", "f2f2_300", "f2f3_300", "f2f4_300", "f2f5_300",
"f2f1_400", "f2f2_400", "f2f3_400", "f2f4_400", "f2f5_400",
"f2f1_500", "f2f2_500", "f2f3_500", "f2f4_500", "f2f5_500",
"f2f1_600", "f2f2_600", "f2f3_600", "f2f4_600", "f2f5_600")

```

Combine the variables

```

for (pre in prefixes) {
for (suffix in suffixes) {

# Determine the appropriate new variable name based on the prefix
if (identical(pre, prefixes_100)) {
new_var_name <- paste0("bdy0100ext_", suffix)
} else if (identical(pre, prefixes_200)) {
new_var_name <- paste0("bdy0200ext_", suffix)
}
}
}

```

```

}

# Create the new variable by finding the first non-NA value
subset_data_1 <- subset_data_1 %>%
  rowwise() %>%
  mutate(!new_var_name := {
    # Construct column names dynamically
    vals <- c_across(all_of(paste0(pre, "_", suffix))) # Get the values
    first_non_na <- vals[!is.na(vals)][1] # Get the first non-NA value,
if available
    if (!is.na(first_non_na)) first_non_na else NA # Return the value or
NA if all are NA
  }) %>%
  ungroup()
}
}

names(subset_data)

# extract the helper variable names
old_vars <- paste0(rep(unlist(prefixes), each = length(suffixes)), "_",
suffixes)

# Delete the helper variables and keep the newly generated ones
subset_data_1 <- subset_data_1 %>%
  select(-all_of(old_vars))

# Remove columns that contain only NA or values less than zero (custom
missings)
subset_data_2 <- subset_data_1[, !sapply(subset_data_1, function(x)
all(is.na(x) | x < 0))]

# calculate how many height values there are for a person and save it in
bdy0100_nht, do it for every f2f data collection
# the "_new" was used for control purposes, this part can be omitted, if you
want to regenerate the variables

#For convenience, in the SUF in F2f1, bdy0100 was filled in with values of
zyg0200, if bdy0100 was missing. However, this lead to an artificially higher
number of doubled values, so the "not-filled-in" version of bdy0100
(bdy0100_orig_gen) was used. However, all other variables and data
collections are unaffected by this.
subset_data_3 <- subset_data_2

subset_data_3 <- subset_data_3 %>%
  rowwise() %>%
  mutate(
    bdy0100_nht_f2f1_new = {
      values <- c_across(c(bdy0100_orig_gen_f2f1, bdy0100ext_f2f1_300,
bdy0100ext_f2f1_400, bdy0100ext_f2f1_500, zyg0200_zyg))
      if (any(values >= 0, na.rm = TRUE)) {

```

```

    sum(values >= 0 & !is.na(values), na.rm = TRUE)
  } else if (any(values < 0, na.rm = TRUE)) {
    min(values[values < 0], na.rm = TRUE)
  } else {
    NA
  }
},
bdy0100_nht_f2f2_new = {
  values <- c_across(c(bdy0100_f2f2, bdy0100ext_f2f2_300,
bdy0100ext_f2f2_400))
  if (any(values >= 0, na.rm = TRUE)) {
    sum(values >= 0 & !is.na(values), na.rm = TRUE)
  } else if (any(values < 0, na.rm = TRUE)) {
    min(values[values < 0], na.rm = TRUE)
  } else {
    NA
  }
},
bdy0100_nht_f2f3_new = {
  values <- c_across(c(bdy0100ext_f2f3_300, bdy0100ext_f2f3_400,
bdy0100ext_f2f3_600))
  values_1 <- c_across(c(bdy0100t_f2f3, bdy0100u_f2f3, bdy0100s_f2f3))
  if (any(values >= 0, na.rm = TRUE)) {
    sum(values >= 0 & !is.na(values), na.rm = TRUE)
  } else if (any(values < 0, na.rm = TRUE)) {
    min(values[values < 0], na.rm = TRUE)
  } else if (any(!is.na(values_1))) {
    -95
  } else {
    NA
  }
},
bdy0100_nht_f2f4_new = {
  values <- c_across(c(bdy0100_f2f4, bdy0100ext_f2f4_300,
bdy0100ext_f2f4_400))
  if (any(values >= 0, na.rm = TRUE)) {
    sum(values >= 0 & !is.na(values), na.rm = TRUE)
  } else if (any(values < 0, na.rm = TRUE)) {
    min(values[values < 0], na.rm = TRUE)
  } else {
    NA
  }
},
bdy0100_nht_f2f5 = {
  values <- c_across(c(bdy0100_f2f5, bdy0100ext_f2f5_300,
bdy0100ext_f2f5_400))
  if (any(values >= 0, na.rm = TRUE)) {
    sum(values >= 0 & !is.na(values), na.rm = TRUE)
  } else if (any(values < 0, na.rm = TRUE)) {
    min(values[values < 0], na.rm = TRUE)
  } else {

```

```

      NA
    }
  }
) %>%
ungroup()

#build the maximum difference between all available values for a person, save
in bdy0100_dht
subset_data_3 <- subset_data_3 %>%
  rowwise() %>%
  mutate(
    bdy0100_dht_f2f1_new = {
      values <- c_across(c(bdy0100_orig_gen_f2f1, bdy0100ext_f2f1_300,
bdy0100ext_f2f1_400, bdy0100ext_f2f1_500, zyg0200_zyg))
      if (sum(values >= 0, na.rm = TRUE) >= 2) {
        diff <- max(values[values >= 0], na.rm = TRUE) - min(values[values >=
0], na.rm = TRUE)
        ifelse(is.finite(diff), diff, NA)
      } else if (sum(values >= 0, na.rm = TRUE) == 1) {
        -95
      } else if (any(values < 0, na.rm = TRUE)) {
        min(values[values < 0], na.rm = TRUE)
      } else {
        NA
      }
    },
    bdy0100_dht_f2f2_new = {
      values <- c_across(c(bdy0100_f2f2, bdy0100ext_f2f2_300,
bdy0100ext_f2f2_400))
      if (sum(values >= 0, na.rm = TRUE) >= 2){
        diff <- max(values[values >= 0], na.rm = TRUE) - min(values[values >=
0], na.rm = TRUE)
        ifelse(is.finite(diff), diff, NA)
      } else if (sum(values >= 0, na.rm = TRUE) == 1) {
        -95
      } else if (any(values < 0, na.rm = TRUE)) {
        min(values[values < 0], na.rm = TRUE)
      } else {
        NA
      }
    },
    bdy0100_dht_f2f3_new = {
      values <- c_across(c(bdy0100ext_f2f3_300, bdy0100ext_f2f3_400,
bdy0100ext_f2f3_600))
      values_1 <- c_across(c(bdy0100t_f2f3, bdy0100u_f2f3, bdy0100s_f2f3))
      if (sum(values >= 0, na.rm = TRUE) >= 2) {
        diff <- max(values[values >= 0], na.rm = TRUE) - min(values[values >=
0], na.rm = TRUE)
        ifelse(is.finite(diff), diff, NA)
      } else if (sum(values >= 0, na.rm = TRUE) == 1) {

```

```

      -95
    } else if (any(values < 0, na.rm = TRUE)) {
      min(values[values < 0], na.rm = TRUE)
    } else if (any(!is.na(values_1))) {
      -95
    } else {
      NA
    }
  },
  bdy0100_dht_f2f4_new = {
    values <- c_across(c(bdy0100_f2f4, bdy0100ext_f2f4_300,
bdy0100ext_f2f4_400))
    if (sum(values >= 0, na.rm = TRUE) >= 2) {
      diff <- max(values[values >= 0], na.rm = TRUE) - min(values[values >=
0], na.rm = TRUE)
      ifelse(is.finite(diff), diff, NA)
    } else if (sum(values >= 0, na.rm = TRUE) == 1) {
      -95
    } else if (any(values < 0, na.rm = TRUE)) {
      min(values[values < 0], na.rm = TRUE)
    } else {
      NA
    }
  },
  bdy0100_dht_f2f5 = {
    values <- c_across(c(bdy0100_f2f5, bdy0100ext_f2f5_300,
bdy0100ext_f2f5_400))
    if (sum(values >= 0, na.rm = TRUE) >= 2) {
      diff <- max(values[values >= 0], na.rm = TRUE) - min(values[values >=
0], na.rm = TRUE)
      ifelse(is.finite(diff), diff, NA)
    } else if (sum(values >= 0, na.rm = TRUE) == 1) {
      -95
    } else if (any(values < 0, na.rm = TRUE)) {
      min(values[values < 0], na.rm = TRUE)
    } else {
      NA
    }
  }
) %>%
ungroup()

#same procedure for weight variables as for height variables
subset_data_4 <- subset_data_3

#number of weight values available per person

subset_data_4 <- subset_data_4 %>%
  rowwise() %>%
  mutate(
    bdy0200_nwt_f2f1_new = {

```

```

    values <- c_across(c(bdy0200_f2f1, bdy0200ext_f2f1_300,
bdy0200ext_f2f1_400, bdy0200ext_f2f1_500))
    if (sum(values >= 0, na.rm = TRUE) > 0) {
      sum(values >= 0 & !is.na(values), na.rm = TRUE)
    } else if (any(values < 0, na.rm = TRUE)) {
      min(values[values < 0], na.rm = TRUE)
    } else {
      NA
    }
  },
  bdy0200_nwt_f2f2_new = {
    values <- c_across(c(bdy0200_f2f2, bdy0200ext_f2f2_300,
bdy0200ext_f2f2_400))
    if (sum(values >= 0, na.rm = TRUE) > 0) {
      sum(values >= 0 & !is.na(values), na.rm = TRUE)
    } else if (any(values < 0, na.rm = TRUE)) {
      min(values[values < 0], na.rm = TRUE)
    } else {
      NA
    }
  },
  bdy0200_nwt_f2f3_new = {
    values <- c_across(c(bdy0200ext_f2f3_300, bdy0200ext_f2f3_400,
bdy0200ext_f2f3_600))
    values_1 <- c_across(c(bdy0200t_f2f3, bdy0200u_f2f3, bdy0200s_f2f3))
    if (sum(values >= 0, na.rm = TRUE) > 0) {
      sum(values >= 0 & !is.na(values), na.rm = TRUE)
    } else if (any(!is.na(values_1))){
      -95
    } else if (any(values < 0, na.rm = TRUE)) {
      min(values[values < 0], na.rm = TRUE)
    } else {
      NA
    }
  },
  bdy0200_nwt_f2f4_new = {
    values <- c_across(c(bdy0200_f2f4, bdy0200ext_f2f4_300,
bdy0200ext_f2f4_400))
    if (sum(values >= 0, na.rm = TRUE) > 0) {
      sum(values >= 0 & !is.na(values), na.rm = TRUE)
    } else if (any(values < 0, na.rm = TRUE)) {
      min(values[values < 0], na.rm = TRUE)
    } else {
      NA
    }
  },
  bdy0200_nwt_f2f5 = {
    values <- c_across(c(bdy0200_f2f5, bdy0200ext_f2f5_300,
bdy0200ext_f2f5_400))
    if (sum(values >= 0, na.rm = TRUE) > 0) {
      sum(values >= 0 & !is.na(values), na.rm = TRUE)

```

```

    } else if (any(values < 0, na.rm = TRUE)) {
      min(values[values < 0], na.rm = TRUE)
    } else {
      NA
    }
  }
)

# Build the maximum difference across all values
subset_data_4 <- subset_data_4 %>%
  rowwise() %>%
  mutate(
    bdy0200_dwt_f2f1_new = {
      values <- c_across(c(bdy0200_f2f1, bdy0200ext_f2f1_300,
bdy0200ext_f2f1_400, bdy0200ext_f2f1_500))
      if (sum(values >= 0, na.rm = TRUE) >= 2) {
        diff <- max(values[values >= 0], na.rm = TRUE) - min(values[values >=
0], na.rm = TRUE)
        ifelse(is.finite(diff), diff, NA)
      } else if (sum(values >= 0, na.rm = TRUE) == 1) {
        -95
      } else if (any(values < 0, na.rm = TRUE)) {
        min(values[values < 0], na.rm = TRUE)
      } else {
        NA
      }
    },
    bdy0200_dwt_f2f2_new = {
      values <- c_across(c(bdy0200_f2f2, bdy0200ext_f2f2_300,
bdy0200ext_f2f2_400))
      if (sum(values >= 0, na.rm = TRUE) >= 2) {
        diff <- max(values[values >= 0], na.rm = TRUE) - min(values[values >=
0], na.rm = TRUE)
        ifelse(is.finite(diff), diff, NA)
      } else if (sum(values >= 0, na.rm = TRUE) == 1) {
        -95
      } else if (any(values < 0, na.rm = TRUE)) {
        min(values[values < 0], na.rm = TRUE)
      } else {
        NA
      }
    },
    bdy0200_dwt_f2f3_new = {
      values <- c_across(c(bdy0200ext_f2f3_300, bdy0200ext_f2f3_400,
bdy0200ext_f2f3_600))
      values_1 <- c_across(c(bdy0200t_f2f3, bdy0200u_f2f3, bdy0200s_f2f3))
      if (sum(values >= 0, na.rm = TRUE) >= 2) {
        diff <- max(values[values >= 0], na.rm = TRUE) - min(values[values >=
0], na.rm = TRUE)

```

```

      ifelse(is.finite(diff), diff, NA)
    } else if (sum(values >= 0, na.rm = TRUE) == 1) {
      -95
    } else if (any(values < 0, na.rm = TRUE)) {
      min(values[values < 0], na.rm = TRUE)
    } else if (any(!is.na(values_1))){
      -95
    } else {
      NA
    }
  },
  bdy0200_dwt_f2f4_new = {
    values <- c_across(c(bdy0200_f2f4, bdy0200ext_f2f4_300,
bdy0200ext_f2f4_400))
    if (sum(values >= 0, na.rm = TRUE) >= 2) {
      diff <- max(values[values >= 0], na.rm = TRUE) - min(values[values >=
0], na.rm = TRUE)
      ifelse(is.finite(diff), diff, NA)
    } else if (sum(values >= 0, na.rm = TRUE) == 1) {
      -95
    } else if (any(values < 0, na.rm = TRUE)) {
      min(values[values < 0], na.rm = TRUE)
    } else {
      NA
    }
  },
  bdy0200_dwt_f2f5 = {
    values <- c_across(c(bdy0200_f2f5, bdy0200ext_f2f5_300,
bdy0200ext_f2f5_400))
    if (sum(values >= 0, na.rm = TRUE) >= 2) {
      diff <- max(values[values >= 0], na.rm = TRUE) - min(values[values >=
0], na.rm = TRUE)
      ifelse(is.finite(diff), diff, NA)
    } else if (sum(values >= 0, na.rm = TRUE) == 1) {
      -95
    } else if (any(values < 0, na.rm = TRUE)) {
      min(values[values < 0], na.rm = TRUE)
    } else {
      NA
    }
  }
) %>%
ungroup()

subset_data_5 <- subset_data_4

#building an average height and weight score across all available values in a
data collection
subset_data_5 <- subset_data_5 %>%
  mutate(
    # Height variables

```

```

bdy0100_hgt_f2f1_new = apply(across(c(bdy0100_orig_gen_f2f1,
bdy0100ext_f2f1_300, bdy0100ext_f2f1_400, bdy0100ext_f2f1_500, zyg0200_zyg)),
1, function(x) {
  if (any(x >= 0, na.rm = TRUE)) {
    mean(x[x >= 0], na.rm = TRUE)
  } else if (any(x < 0, na.rm = TRUE)) {
    min(x[x < 0], na.rm = TRUE)
  } else {
    NA
  }
}),

```

```

bdy0100_hgt_f2f2_new = apply(across(c(bdy0100_f2f2, bdy0100ext_f2f2_300,
bdy0100ext_f2f2_400)), 1, function(x) {
  if (any(x >= 0, na.rm = TRUE)) {
    mean(x[x >= 0], na.rm = TRUE)
  } else if (any(x < 0, na.rm = TRUE)) {
    min(x[x < 0], na.rm = TRUE)
  } else {
    NA
  }
}),

```

```

bdy0100_hgt_f2f4_new = apply(across(c(bdy0100_f2f4, bdy0100ext_f2f4_300,
bdy0100ext_f2f4_400)), 1, function(x) {
  if (any(x >= 0, na.rm = TRUE)) {
    mean(x[x >= 0], na.rm = TRUE)
  } else if (any(x < 0, na.rm = TRUE)) {
    min(x[x < 0], na.rm = TRUE)
  } else {
    NA
  }
}),

```

```

bdy0100_hgt_f2f5 = apply(across(c(bdy0100_f2f5, bdy0100ext_f2f5_300,
bdy0100ext_f2f5_400)), 1, function(x) {
  if (any(x >= 0, na.rm = TRUE)) {
    mean(x[x >= 0], na.rm = TRUE)
  } else if (any(x < 0, na.rm = TRUE)) {
    min(x[x < 0], na.rm = TRUE)
  } else {
    NA
  }
}),

```

```

# Weight variables
bdy0200_wgt_f2f1_new = apply(across(c(bdy0200_f2f1, bdy0200ext_f2f1_300,
bdy0200ext_f2f1_400, bdy0200ext_f2f1_500)), 1, function(x) {
  if (any(x >= 0, na.rm = TRUE)) {
    mean(x[x >= 0], na.rm = TRUE)
  }

```

```

    } else if (any(x < 0, na.rm = TRUE)) {
      min(x[x < 0], na.rm = TRUE)
    } else {
      NA
    }
  }
}),

  bdy0200_wgt_f2f2_new = apply(across(c(bdy0200_f2f2, bdy0200ext_f2f2_300,
bdy0200ext_f2f2_400)), 1, function(x) {
  if (any(x >= 0, na.rm = TRUE)) {
    mean(x[x >= 0], na.rm = TRUE)
  } else if (any(x < 0, na.rm = TRUE)) {
    min(x[x < 0], na.rm = TRUE)
  } else {
    NA
  }
}),

  bdy0200_wgt_f2f4_new = apply(across(c(bdy0200_f2f4, bdy0200ext_f2f4_300,
bdy0200ext_f2f4_400)), 1, function(x) {
  if (any(x >= 0, na.rm = TRUE)) {
    mean(x[x >= 0], na.rm = TRUE)
  } else if (any(x < 0, na.rm = TRUE)) {
    min(x[x < 0], na.rm = TRUE)
  } else {
    NA
  }
}),

  bdy0200_wgt_f2f5 = apply(across(c(bdy0200_f2f5, bdy0200ext_f2f5_300,
bdy0200ext_f2f5_400)), 1, function(x) {
  if (any(x >= 0, na.rm = TRUE)) {
    mean(x[x >= 0], na.rm = TRUE)
  } else if (any(x < 0, na.rm = TRUE)) {
    min(x[x < 0], na.rm = TRUE)
  } else {
    NA
  }
}),
)

```

#f2f3 needs to be handled differently as there are no self-reports and custom missings would be deleted by the procedure above

```

subset_data_5 <- subset_data_5 %>%
  rowwise() %>%
  mutate(
    bdy0100_hgt_f2f3_new = {

```

```

      x <- c_across(c(bdy0100ext_f2f3_300, bdy0100ext_f2f3_400,
bdy0100ext_f2f3_600))
      if (any(x >= 0, na.rm = TRUE)) {
        mean(x[x >= 0], na.rm = TRUE)
      } else if (any(x < 0, na.rm = TRUE)) {
        min(x[x < 0], na.rm = TRUE)
      } else if (any(!is.na(c_across(c(bdy0100t_f2f3, bdy0100u_f2f3,
bdy0100s_f2f3))))) {
        -95
      } else {
        NA
      }
    },
    bdy0200_wgt_f2f3_new = {
      x <- c_across(c(bdy0200ext_f2f3_300, bdy0200ext_f2f3_400,
bdy0200ext_f2f3_600))
      if (any(x >= 0, na.rm = TRUE)) {
        mean(x[x >= 0], na.rm = TRUE)
      } else if (any(x < 0, na.rm = TRUE)) {
        min(x[x < 0], na.rm = TRUE)
      } else if (any(!is.na(c_across(c(bdy0200t_f2f3, bdy0200u_f2f3,
bdy0200s_f2f3))))) {
        -95
      } else {
        NA
      }
    }
  ) %>%
  ungroup()

```

```
subset_data_55 <- subset_data_5
```

if the difference between the values exceeds a +- 10 margin, the generated mean value is automatically set missing: -80

```

subset_data_55$bdy0100_hgt_f2f1_new <-
ifelse(!is.na(subset_data_55$bdy0100_dht_f2f1_new) &
(subset_data_55$bdy0100_dht_f2f1_new >10), -80,
subset_data_55$bdy0100_hgt_f2f1_new)
subset_data_55$bdy0100_hgt_f2f2_new <-
ifelse(!is.na(subset_data_55$bdy0100_dht_f2f2_new) &
(subset_data_55$bdy0100_dht_f2f2_new >10), -80,
subset_data_55$bdy0100_hgt_f2f2_new)
subset_data_55$bdy0100_hgt_f2f3_new <-
ifelse(!is.na(subset_data_55$bdy0100_dht_f2f3_new) &
(subset_data_55$bdy0100_dht_f2f3_new >10), -80,
subset_data_55$bdy0100_hgt_f2f3_new)
subset_data_55$bdy0100_hgt_f2f4_new <-
ifelse(!is.na(subset_data_55$bdy0100_dht_f2f4_new) &
(subset_data_55$bdy0100_dht_f2f4_new >10), -80,
subset_data_55$bdy0100_hgt_f2f4_new)
subset_data_55$bdy0100_hgt_f2f5 <-
ifelse(!is.na(subset_data_55$bdy0100_dht_f2f5) &

```

```
(subset_data_55$bdy0100_dht_f2f5>10), -80, subset_data_55$bdy0100_hgt_f2f5)
```

```
subset_data_55$bdy0200_wgt_f2f1_new <-  
ifelse(!is.na(subset_data_55$bdy0200_dwt_f2f1_new) &  
(subset_data_55$bdy0200_dwt_f2f1_new>10), -80,  
subset_data_55$bdy0200_wgt_f2f1_new)  
subset_data_55$bdy0200_wgt_f2f2_new <-  
ifelse(!is.na(subset_data_55$bdy0200_dwt_f2f2_new) &  
(subset_data_55$bdy0200_dwt_f2f2_new>10), -80,  
subset_data_55$bdy0200_wgt_f2f2_new)  
subset_data_55$bdy0200_wgt_f2f3_new <-  
ifelse(!is.na(subset_data_55$bdy0200_dwt_f2f3_new) &  
(subset_data_55$bdy0200_dwt_f2f3_new>10), -80,  
subset_data_55$bdy0200_wgt_f2f3_new)  
subset_data_55$bdy0200_wgt_f2f4_new <-  
ifelse(!is.na(subset_data_55$bdy0200_dwt_f2f4_new) &  
(subset_data_55$bdy0200_dwt_f2f4_new>10), -80,  
subset_data_55$bdy0200_wgt_f2f4_new)  
subset_data_55$bdy0200_wgt_f2f5 <-  
ifelse(!is.na(subset_data_55$bdy0200_dwt_f2f5) &  
(subset_data_55$bdy0200_dwt_f2f5>10), -80, subset_data_55$bdy0200_wgt_f2f5)
```

#Remove NaN in dataset again

```
if (is.data.frame(subset_data_55)) {  
  subset_data_55[] <- lapply(subset_data_55, function(x) {  
    if (is.numeric(x)) {  
      x[is.nan(x)] <- NA  
    }  
    return(x)  
  })  
} else if (is.list(subset_data_55)) {  
  subset_data_55 <- lapply(subset_data_55, function(x) {  
    if (is.numeric(x)) {  
      x[is.nan(x)] <- NA  
    }  
    return(x)  
  })  
}
```

#only for control purposes: generate a variable with all raw height values combined in a string

```
subset_data_6 <- subset_data_55
```

```
subset_data_6 <- subset_data_6 %>%  
  rowwise() %>%  
  mutate(  
    hgt_values = paste(  
      paste(na.omit(c_across(c(bdy0100_orig_gen_f2f1, bdy0100ext_f2f1_300,  
bdy0100ext_f2f1_400, bdy0100ext_f2f1_500,  
zyg0200_zyg)))[c_across(c(bdy0100_orig_gen_f2f1, bdy0100ext_f2f1_300,  
bdy0100ext_f2f1_400, bdy0100ext_f2f1_500, zyg0200_zyg)) >= 0]], collapse = "-
```

```
"),
  paste(na.omit(c_across(c(bdy0100_f2f2, bdy0100ext_f2f2_300,
    bdy0100ext_f2f2_400)))[c_across(c(bdy0100_f2f2, bdy0100ext_f2f2_300,
    bdy0100ext_f2f2_400)) >= 0]), collapse = "-"),
  paste(na.omit(c_across(c(bdy0100ext_f2f3_300, bdy0100ext_f2f3_400,
    bdy0100ext_f2f3_600)))[c_across(c(bdy0100ext_f2f3_300, bdy0100ext_f2f3_400,
    bdy0100ext_f2f3_600)) >= 0]), collapse = "-"),
  paste(na.omit(c_across(c(bdy0100_f2f4, bdy0100ext_f2f4_300,
    bdy0100ext_f2f4_400)))[c_across(c(bdy0100_f2f4, bdy0100ext_f2f4_300,
    bdy0100ext_f2f4_400)) >= 0]), collapse = "-"),
  paste(na.omit(c_across(c(bdy0100_f2f5, bdy0100ext_f2f5_300,
    bdy0100ext_f2f5_400)))[c_across(c(bdy0100_f2f5, bdy0100ext_f2f5_300,
    bdy0100ext_f2f5_400)) >= 0]), collapse = "-"),
  sep = " | "
)
) %>%
ungroup()
```

#only for control purposes: generate a variable with all raw weight values combined in a string

```
subset_data_6 <- subset_data_6 %>%
  rowwise() %>%
  mutate(
    wgt_values = paste(
      paste(na.omit(c_across(c(bdy0200_f2f1, bdy0200ext_f2f1_300,
        bdy0200ext_f2f1_400, bdy0200ext_f2f1_500)))[c_across(c(bdy0200_f2f1,
        bdy0200ext_f2f1_300, bdy0200ext_f2f1_400, bdy0200ext_f2f1_500)) >= 0]),
        collapse = "-"),
      paste(na.omit(c_across(c(bdy0200_f2f2, bdy0200ext_f2f2_300,
        bdy0200ext_f2f2_400)))[c_across(c(bdy0200_f2f2, bdy0200ext_f2f2_300,
        bdy0200ext_f2f2_400)) >= 0]), collapse = "-"),
      paste(na.omit(c_across(c(bdy0200ext_f2f3_300, bdy0200ext_f2f3_400,
        bdy0200ext_f2f3_600)))[c_across(c(bdy0200ext_f2f3_300, bdy0200ext_f2f3_400,
        bdy0200ext_f2f3_600)) >= 0]), collapse = "-"),
      paste(na.omit(c_across(c(bdy0200_f2f4, bdy0200ext_f2f4_300,
        bdy0200ext_f2f4_400)))[c_across(c(bdy0200_f2f4, bdy0200ext_f2f4_300,
        bdy0200ext_f2f4_400)) >= 0]), collapse = "-"),
      paste(na.omit(c_across(c(bdy0200_f2f5, bdy0200ext_f2f5_300,
        bdy0200ext_f2f5_400)))[c_across(c(bdy0200_f2f5, bdy0200ext_f2f5_300,
        bdy0200ext_f2f5_400)) >= 0]), collapse = "-"),
      sep = " | "
    )
  ) %>%
  ungroup()
```

```
View(subset_data_6["wgt_values"])
```

```
subset_data_61 <- subset_data_6
```

```
table((is.na(subset_data_61$age_f2f1) | subset_data_61$age_f2f1 < -50) &
(is.na(subset_data_61$age_f2f2) | subset_data_61$age_f2f2 < -50) &
```

```

(is.na(subset_data_61$age_f2f3) | subset_data_61$age_f2f3 < -50) &
(is.na(subset_data_61$age_f2f4) | subset_data_61$age_f2f4 < -50) &
(is.na(subset_data_61$age_f2f5) | subset_data_61$age_f2f5 < -50))

subset_data_61$age_f2f1 <- ifelse((is.na(subset_data_61$age_f2f1) |
subset_data_61$age_f2f1 < -50) & (is.na(subset_data_61$age_f2f2) |
subset_data_61$age_f2f2 < -50) & (is.na(subset_data_61$age_f2f3) |
subset_data_61$age_f2f3 < -50) & (is.na(subset_data_61$age_f2f4) |
subset_data_61$age_f2f4 < -50) & (is.na(subset_data_61$age_f2f5) |
subset_data_61$age_f2f5 < -50)), 18, subset_data_61$age_f2f1)

subset_data_61$age_f2f2 <- ifelse(is.na(subset_data_61$age_f2f2) &
!is.na(subset_data_61$age_f2f1) & subset_data_61$age_f2f1 >0,
subset_data_61$age_f2f1 + 2, subset_data_61$age_f2f2 )
subset_data_61$age_f2f3 <- ifelse(is.na(subset_data_61$age_f2f3) &
!is.na(subset_data_61$age_f2f2) & subset_data_61$age_f2f2 >0,
subset_data_61$age_f2f2 + 2, subset_data_61$age_f2f3 )
subset_data_61$age_f2f4 <- ifelse(is.na(subset_data_61$age_f2f4) &
!is.na(subset_data_61$age_f2f3) & subset_data_61$age_f2f3 >0,
subset_data_61$age_f2f3 + 2, subset_data_61$age_f2f4 )
subset_data_61$age_f2f5 <- ifelse(is.na(subset_data_61$age_f2f5) &
!is.na(subset_data_61$age_f2f4) & subset_data_61$age_f2f4 >0,
subset_data_61$age_f2f4 + 2, subset_data_61$age_f2f5 )

subset_data_61$age_f2f4 <- ifelse(is.na(subset_data_61$age_f2f4) &
!is.na(subset_data_61$age_f2f5) & subset_data_61$age_f2f5 >0,
subset_data_61$age_f2f5 - 2, subset_data_61$age_f2f4 )
subset_data_61$age_f2f3 <- ifelse(is.na(subset_data_61$age_f2f3) &
!is.na(subset_data_61$age_f2f4) & subset_data_61$age_f2f4 >0 ,
subset_data_61$age_f2f4 - 2, subset_data_61$age_f2f3 )
subset_data_61$age_f2f2 <- ifelse(is.na(subset_data_61$age_f2f2) &
!is.na(subset_data_61$age_f2f3) & subset_data_61$age_f2f3 >0,
subset_data_61$age_f2f3 - 2, subset_data_61$age_f2f2 )
subset_data_61$age_f2f1 <- ifelse(is.na(subset_data_61$age_f2f1) &
!is.na(subset_data_61$age_f2f2) & subset_data_61$age_f2f2 >0,
subset_data_61$age_f2f2 - 2, subset_data_61$age_f2f1 )

# Define the reference table for PR-Rank 1 calculations - MALES
pr_table <- data.frame(
  age_min = c(3.75, 4.25, 4.75, 5.25, 5.75, 6.25, 6.75, 7.25, 7.75, 8.25,
8.75, 9.25, 9.75, 10.25, 10.75, 11.25, 11.75, 12.25, 12.75,
13.25,
13.75, 14.25, 14.75, 15.25, 15.75, 16.25, 16.75, 17.25, 17.75,
18.25),
  age_max = c(4.24, 4.74, 5.24, 5.74, 6.24, 6.74, 7.24, 7.74, 8.24, 8.74,
9.24, 9.74, 10.24, 10.74, 11.24, 11.74, 12.24, 12.74, 13.24,
13.74,
14.24, 14.74, 15.24, 15.74, 16.24, 16.74, 17.24, 17.74, 18.24,
Inf),
  mean_height = c(104.56, 107.94, 111.23, 114.51, 117.78, 121.13, 124.51,
127.77,

```

```

130.79, 133.62, 136.35, 138.98, 141.55, 144.09, 146.68,
149.35,
152.22, 155.43, 159.13, 163.10, 166.93, 170.35, 173.12,
175.20,
176.66, 177.62, 178.24, 178.68, 179.04, 180),
sd_height = c(4.0746, 4.2985, 4.4925, 4.6865, 4.8657, 5.0298, 5.1940,
5.3433,
5.5224, 5.7015, 5.9104, 6.1493, 6.3880, 6.6865, 7.0149,
7.3582,
7.7313, 8.0746, 8.4029, 8.5820, 8.5522, 8.3283, 7.9701,
7.5820,
7.2835, 7.0746, 6.9402, 6.8507, 6.7612, 5.844)
)

# Calculate the height corresponding to PR1 (1st percentile) for each age
group
pr1_table_male <- pr_table
pr1_table_male$height_pr1 <- qnorm(0.01, mean = pr1_table_male$mean_height,
sd = pr1_table_male$sd_height)
pr1_table_male$cut_off_low <- pr1_table_male$height_pr1 - 2*
pr1_table_male$sd_height
pr1_table_male$height_pr99 <- qnorm(0.99, mean = pr1_table_male$mean_height,
sd = pr1_table_male$sd_height)
pr1_table_male$cut_off_high <- pr1_table_male$height_pr99 + 2*
pr1_table_male$sd_height
# View the table

View(pr1_table_male)

# Create the data frame with age group data
age_groups_df_female <- data.frame(
  min_age = c(3.75, 4.25, 4.75, 5.25, 5.75, 6.25, 6.75, 7.25, 7.75, 8.25,
8.75, 9.25, 9.75, 10.25, 10.75, 11.25, 11.75, 12.25, 12.75, 13.25, 13.75,
14.25, 14.75, 15.25, 15.75, 16.25, 16.75, 17.25, 17.75, 18.25),
  max_age = c(4.24, 4.74, 5.24, 5.74, 6.24, 6.74, 7.24, 7.74, 8.24, 8.74,
9.24, 9.74, 10.24, 10.74, 11.24, 11.74, 12.24, 12.74, 13.24, 13.74, 14.24,
14.74, 15.24, 15.74, 16.24, 16.74, 17.24, 17.74, 18.24, Inf),
  mean = c(103.51, 107.15, 110.82, 114.31, 117.59, 120.69, 123.65, 126.56,
129.49, 132.40, 135.28, 138.18, 141.18, 144.33, 147.65, 151.04, 154.31,
157.22, 159.53, 161.33, 162.74, 163.81, 164.58, 165.09, 165.39, 165.50,
165.54, 165.65, 165.77, 167),
  sd = c(4.01492537313435, 4.23880597014926, 4.46268656716417,
4.65671641791045, 4.85074626865672, 5.02985074626866, 5.22388059701492,
5.43283582089552, 5.65671641791046, 5.89552238805973, 6.13432835820898,
6.35820895522391, 6.56716417910449, 6.73134328358212, 6.85074626865672,
6.91044776119402, 6.88059701492539, 6.82089552238805, 6.71641791044776,
6.62686567164183, 6.56716417910449, 6.5223880597015, 6.49253731343287,
6.4626865671642, 6.44776119402984, 6.44776119402984, 6.43283582089553,
6.43283582089553, 6.43283582089553, 5.224)
)

```

```

pr1_table_female <- age_groups_df_female
pr1_table_female$height_pr1 <- qnorm(0.01, mean = pr1_table_female$mean, sd =
pr1_table_female$sd)
pr1_table_female$cut_off_low <- pr1_table_female$height_pr1 - 2*
pr1_table_female$sd
pr1_table_female$height_pr99 <- qnorm(0.99, mean = pr1_table_female$mean, sd
= pr1_table_female$sd)
pr1_table_female$cut_off_high <- pr1_table_female$height_pr99 + 2*
pr1_table_female$sd
# View the table
View(pr1_table_female)

```

normative percentiles for height and weight in all waves

the means and sds for all age groups were reconstructed using normative data, see report for more information

```

# percentage men / boys height F2F1
subset_data_61$prh0100_f2f5 <- NA
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=3.75 &
subset_data_61$age_f2f5 <=4.24 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0100_hgt_f2f5 -104.56) /4.07462686567165)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=4.25 &
subset_data_61$age_f2f5 <=4.74 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0100_hgt_f2f5 -107.94) /4.29850746268656)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=4.75 &
subset_data_61$age_f2f5 <=5.24 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0100_hgt_f2f5 -111.23) /4.49253731343284)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=5.25 &
subset_data_61$age_f2f5 <=5.74 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0100_hgt_f2f5 -114.51) /4.68656716417911)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=5.75 &
subset_data_61$age_f2f5 <=6.24 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0100_hgt_f2f5 -117.78) /4.86567164179105)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=6.25 &
subset_data_61$age_f2f5 <=6.74 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0100_hgt_f2f5 -121.13) /5.02985074626864)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=6.75 &
subset_data_61$age_f2f5 <=7.24 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0100_hgt_f2f5 -124.51) /5.19402985074627)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=7.25 &
subset_data_61$age_f2f5 <=7.74 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0100_hgt_f2f5 -127.77) /5.34328358208955)

```

```

,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=7.75 &
subset_data_61$age_f2f5 <=8.24 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0100_hgt_f2f5 -130.79) /5.52238805970148)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=8.25 &
subset_data_61$age_f2f5 <=8.74 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0100_hgt_f2f5 -133.62) /5.70149253731342)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=8.75 &
subset_data_61$age_f2f5 <=9.24 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0100_hgt_f2f5 -136.35) /5.91044776119404)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=9.25 &
subset_data_61$age_f2f5 <=9.74 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0100_hgt_f2f5 -138.98) /6.14925373134325)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=9.75 &
subset_data_61$age_f2f5 <=10.24 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0100_hgt_f2f5 -141.55) /6.38805970149254)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=10.25 &
subset_data_61$age_f2f5 <=10.74 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0100_hgt_f2f5 -144.09) /6.68656716417909)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=10.75 &
subset_data_61$age_f2f5 <=11.24 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0100_hgt_f2f5 -146.68) /7.01492537313435)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=11.25 &
subset_data_61$age_f2f5 <=11.74 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0100_hgt_f2f5 -149.35) /7.35820895522389)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=11.75 &
subset_data_61$age_f2f5 <=12.24 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0100_hgt_f2f5 -152.22) /7.7313432835821)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=12.25 &
subset_data_61$age_f2f5 <=12.74 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0100_hgt_f2f5 -155.43) /8.07462686567164)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=12.75 &
subset_data_61$age_f2f5 <=13.24 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0100_hgt_f2f5 -159.13) /8.40298507462686)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=13.25 &
subset_data_61$age_f2f5 <=13.74 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0100_hgt_f2f5 -163.1) /8.58208955223881)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=13.75 &
subset_data_61$age_f2f5 <=14.24 & subset_data_61$sex_f2f5 == 1

```

```
,((subset_data_61$bdy0100_hgt_f2f5 -166.93) /8.55223880597018)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=14.25 &
subset_data_61$age_f2f5 <=14.74 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0100_hgt_f2f5 -170.35) /8.3283582089552)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=14.75 &
subset_data_61$age_f2f5 <=15.24 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0100_hgt_f2f5 -173.12) /7.97014925373135)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=15.25 &
subset_data_61$age_f2f5 <=15.74 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0100_hgt_f2f5 -175.2) /7.58208955223878)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=15.75 &
subset_data_61$age_f2f5 <=16.24 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0100_hgt_f2f5 -176.66) /7.28358208955223)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=16.25 &
subset_data_61$age_f2f5 <=16.74 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0100_hgt_f2f5 -177.62) /7.07462686567165)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=16.75 &
subset_data_61$age_f2f5 <=17.24 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0100_hgt_f2f5 -178.24) /6.94029850746269)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=17.25 &
subset_data_61$age_f2f5 <=17.74 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0100_hgt_f2f5 -178.68) /6.85074626865672)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=17.75 &
subset_data_61$age_f2f5 <=18.24 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0100_hgt_f2f5 -179.04) /6.76119402985075)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=18.25 &
subset_data_61$sex_f2f5 == 1 ,((subset_data_61$bdy0100_hgt_f2f5 -180) /5.844)
,subset_data_61$prh0100_f2f5)

# percentage men / boys height F2F1
subset_data_61$prh0100_f2f1 <- NA
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=3.75 &
subset_data_61$age_f2f1 <=4.24 & subset_data_61$sex == 1
,((subset_data_61$bdy0100_hgt_f2f1_new -104.56) /4.07462686567165)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=4.25 &
subset_data_61$age_f2f1 <=4.74 & subset_data_61$sex == 1
,((subset_data_61$bdy0100_hgt_f2f1_new -107.94) /4.29850746268656)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=4.75 &
subset_data_61$age_f2f1 <=5.24 & subset_data_61$sex == 1
,((subset_data_61$bdy0100_hgt_f2f1_new -111.23) /4.49253731343284)
```

```

,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=5.25 &
subset_data_61$age_f2f1 <=5.74 & subset_data_61$sex == 1
,((subset_data_61$bdy0100_hgt_f2f1_new -114.51) /4.68656716417911)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=5.75 &
subset_data_61$age_f2f1 <=6.24 & subset_data_61$sex == 1
,((subset_data_61$bdy0100_hgt_f2f1_new -117.78) /4.86567164179105)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=6.25 &
subset_data_61$age_f2f1 <=6.74 & subset_data_61$sex == 1
,((subset_data_61$bdy0100_hgt_f2f1_new -121.13) /5.02985074626864)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=6.75 &
subset_data_61$age_f2f1 <=7.24 & subset_data_61$sex == 1
,((subset_data_61$bdy0100_hgt_f2f1_new -124.51) /5.19402985074627)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=7.25 &
subset_data_61$age_f2f1 <=7.74 & subset_data_61$sex == 1
,((subset_data_61$bdy0100_hgt_f2f1_new -127.77) /5.34328358208955)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=7.75 &
subset_data_61$age_f2f1 <=8.24 & subset_data_61$sex == 1
,((subset_data_61$bdy0100_hgt_f2f1_new -130.79) /5.52238805970148)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=8.25 &
subset_data_61$age_f2f1 <=8.74 & subset_data_61$sex == 1
,((subset_data_61$bdy0100_hgt_f2f1_new -133.62) /5.70149253731342)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=8.75 &
subset_data_61$age_f2f1 <=9.24 & subset_data_61$sex == 1
,((subset_data_61$bdy0100_hgt_f2f1_new -136.35) /5.91044776119404)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=9.25 &
subset_data_61$age_f2f1 <=9.74 & subset_data_61$sex == 1
,((subset_data_61$bdy0100_hgt_f2f1_new -138.98) /6.14925373134325)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=9.75 &
subset_data_61$age_f2f1 <=10.24 & subset_data_61$sex == 1
,((subset_data_61$bdy0100_hgt_f2f1_new -141.55) /6.38805970149254)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=10.25 &
subset_data_61$age_f2f1 <=10.74 & subset_data_61$sex == 1
,((subset_data_61$bdy0100_hgt_f2f1_new -144.09) /6.68656716417909)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=10.75 &
subset_data_61$age_f2f1 <=11.24 & subset_data_61$sex == 1
,((subset_data_61$bdy0100_hgt_f2f1_new -146.68) /7.01492537313435)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=11.25 &
subset_data_61$age_f2f1 <=11.74 & subset_data_61$sex == 1

```

```
,((subset_data_61$bdy0100_hgt_f2f1_new -149.35) /7.35820895522389)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=11.75 &
subset_data_61$age_f2f1 <=12.24 & subset_data_61$sex == 1
,((subset_data_61$bdy0100_hgt_f2f1_new -152.22) /7.7313432835821)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=12.25 &
subset_data_61$age_f2f1 <=12.74 & subset_data_61$sex == 1
,((subset_data_61$bdy0100_hgt_f2f1_new -155.43) /8.07462686567164)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=12.75 &
subset_data_61$age_f2f1 <=13.24 & subset_data_61$sex == 1
,((subset_data_61$bdy0100_hgt_f2f1_new -159.13) /8.40298507462686)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=13.25 &
subset_data_61$age_f2f1 <=13.74 & subset_data_61$sex == 1
,((subset_data_61$bdy0100_hgt_f2f1_new -163.1) /8.58208955223881)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=13.75 &
subset_data_61$age_f2f1 <=14.24 & subset_data_61$sex == 1
,((subset_data_61$bdy0100_hgt_f2f1_new -166.93) /8.55223880597018)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=14.25 &
subset_data_61$age_f2f1 <=14.74 & subset_data_61$sex == 1
,((subset_data_61$bdy0100_hgt_f2f1_new -170.35) /8.3283582089552)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=14.75 &
subset_data_61$age_f2f1 <=15.24 & subset_data_61$sex == 1
,((subset_data_61$bdy0100_hgt_f2f1_new -173.12) /7.97014925373135)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=15.25 &
subset_data_61$age_f2f1 <=15.74 & subset_data_61$sex == 1
,((subset_data_61$bdy0100_hgt_f2f1_new -175.2) /7.58208955223878)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=15.75 &
subset_data_61$age_f2f1 <=16.24 & subset_data_61$sex == 1
,((subset_data_61$bdy0100_hgt_f2f1_new -176.66) /7.28358208955223)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=16.25 &
subset_data_61$age_f2f1 <=16.74 & subset_data_61$sex == 1
,((subset_data_61$bdy0100_hgt_f2f1_new -177.62) /7.07462686567165)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=16.75 &
subset_data_61$age_f2f1 <=17.24 & subset_data_61$sex == 1
,((subset_data_61$bdy0100_hgt_f2f1_new -178.24) /6.94029850746269)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=17.25 &
subset_data_61$age_f2f1 <=17.74 & subset_data_61$sex == 1
,((subset_data_61$bdy0100_hgt_f2f1_new -178.68) /6.85074626865672)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=17.75 &
```

```

subset_data_61$age_f2f1 <=18.24 & subset_data_61$sex == 1
,((subset_data_61$bdy0100_hgt_f2f1_new -179.04) /6.76119402985075)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=18.25 &
subset_data_61$sex == 1 ,((subset_data_61$bdy0100_hgt_f2f1_new -180) /5.844)
,subset_data_61$prh0100_f2f1)

# percentage women height F2F1
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=3.75 &
subset_data_61$age_f2f1 <=4.24 & subset_data_61$sex == 2
,((subset_data_61$bdy0100_hgt_f2f1_new -103.51) /4.01492537313435)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=4.25 &
subset_data_61$age_f2f1 <=4.74 & subset_data_61$sex == 2
,((subset_data_61$bdy0100_hgt_f2f1_new -107.15) /4.23880597014926)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=4.75 &
subset_data_61$age_f2f1 <=5.24 & subset_data_61$sex == 2
,((subset_data_61$bdy0100_hgt_f2f1_new -110.82) /4.46268656716417)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=5.25 &
subset_data_61$age_f2f1 <=5.74 & subset_data_61$sex == 2
,((subset_data_61$bdy0100_hgt_f2f1_new -114.31) /4.65671641791045)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=5.75 &
subset_data_61$age_f2f1 <=6.24 & subset_data_61$sex == 2
,((subset_data_61$bdy0100_hgt_f2f1_new -117.59) /4.85074626865672)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=6.25 &
subset_data_61$age_f2f1 <=6.74 & subset_data_61$sex == 2
,((subset_data_61$bdy0100_hgt_f2f1_new -120.69) /5.02985074626866)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=6.75 &
subset_data_61$age_f2f1 <=7.24 & subset_data_61$sex == 2
,((subset_data_61$bdy0100_hgt_f2f1_new -123.65) /5.22388059701492)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=7.25 &
subset_data_61$age_f2f1 <=7.74 & subset_data_61$sex == 2
,((subset_data_61$bdy0100_hgt_f2f1_new -126.56) /5.43283582089552)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=7.75 &
subset_data_61$age_f2f1 <=8.24 & subset_data_61$sex == 2
,((subset_data_61$bdy0100_hgt_f2f1_new -129.49) /5.65671641791046)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=8.25 &
subset_data_61$age_f2f1 <=8.74 & subset_data_61$sex == 2
,((subset_data_61$bdy0100_hgt_f2f1_new -132.4) /5.89552238805973)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=8.75 &
subset_data_61$age_f2f1 <=9.24 & subset_data_61$sex == 2
,((subset_data_61$bdy0100_hgt_f2f1_new -135.28) /6.13432835820898)

```

```

,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=9.25 &
subset_data_61$age_f2f1 <=9.74 & subset_data_61$sex == 2
,((subset_data_61$bdy0100_hgt_f2f1_new -138.18) /6.35820895522391)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=9.75 &
subset_data_61$age_f2f1 <=10.24 & subset_data_61$sex == 2
,((subset_data_61$bdy0100_hgt_f2f1_new -141.18) /6.56716417910449)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=10.25 &
subset_data_61$age_f2f1 <=10.74 & subset_data_61$sex == 2
,((subset_data_61$bdy0100_hgt_f2f1_new -144.33) /6.73134328358212)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=10.75 &
subset_data_61$age_f2f1 <=11.24 & subset_data_61$sex == 2
,((subset_data_61$bdy0100_hgt_f2f1_new -147.65) /6.85074626865672)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=11.25 &
subset_data_61$age_f2f1 <=11.74 & subset_data_61$sex == 2
,((subset_data_61$bdy0100_hgt_f2f1_new -151.04) /6.91044776119402)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=11.75 &
subset_data_61$age_f2f1 <=12.24 & subset_data_61$sex == 2
,((subset_data_61$bdy0100_hgt_f2f1_new -154.31) /6.88059701492539)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=12.25 &
subset_data_61$age_f2f1 <=12.74 & subset_data_61$sex == 2
,((subset_data_61$bdy0100_hgt_f2f1_new -157.22) /6.82089552238805)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=12.75 &
subset_data_61$age_f2f1 <=13.24 & subset_data_61$sex == 2
,((subset_data_61$bdy0100_hgt_f2f1_new -159.53) /6.71641791044776)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=13.25 &
subset_data_61$age_f2f1 <=13.74 & subset_data_61$sex == 2
,((subset_data_61$bdy0100_hgt_f2f1_new -161.33) /6.62686567164183)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=13.75 &
subset_data_61$age_f2f1 <=14.24 & subset_data_61$sex == 2
,((subset_data_61$bdy0100_hgt_f2f1_new -162.74) /6.56716417910449)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=14.25 &
subset_data_61$age_f2f1 <=14.74 & subset_data_61$sex == 2
,((subset_data_61$bdy0100_hgt_f2f1_new -163.81) /6.5223880597015)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=14.75 &
subset_data_61$age_f2f1 <=15.24 & subset_data_61$sex == 2
,((subset_data_61$bdy0100_hgt_f2f1_new -164.58) /6.49253731343287)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=15.25 &
subset_data_61$age_f2f1 <=15.74 & subset_data_61$sex == 2

```

```
,((subset_data_61$bdy0100_hgt_f2f1_new -165.09) /6.4626865671642)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=15.75 &
subset_data_61$age_f2f1 <=16.24 & subset_data_61$sex == 2
,((subset_data_61$bdy0100_hgt_f2f1_new -165.39) /6.44776119402984)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=16.25 &
subset_data_61$age_f2f1 <=16.74 & subset_data_61$sex == 2
,((subset_data_61$bdy0100_hgt_f2f1_new -165.5) /6.44776119402984)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=16.75 &
subset_data_61$age_f2f1 <=17.24 & subset_data_61$sex == 2
,((subset_data_61$bdy0100_hgt_f2f1_new -165.54) /6.43283582089553)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=17.25 &
subset_data_61$age_f2f1 <=17.74 & subset_data_61$sex == 2
,((subset_data_61$bdy0100_hgt_f2f1_new -165.65) /6.43283582089553)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=17.75 &
subset_data_61$age_f2f1 <=18.24 & subset_data_61$sex == 2
,((subset_data_61$bdy0100_hgt_f2f1_new -165.77) /6.43283582089553)
,subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <- ifelse (subset_data_61$age_f2f1 >=18.25 &
subset_data_61$sex == 2 ,((subset_data_61$bdy0100_hgt_f2f1_new -167) /5.224)
,subset_data_61$prh0100_f2f1)

subset_data_61$prh0100_f2f1 <- pnorm(subset_data_61$prh0100_f2f1)*100
subset_data_61$prh0100_f2f1 <- ifelse(subset_data_61$bdy0100_hgt_f2f1_new <0,
-95, subset_data_61$prh0100_f2f1)
subset_data_61$prh0100_f2f1 <-
ifelse(is.na(subset_data_61$bdy0100_hgt_f2f1_new) |
is.na(subset_data_61$age_f2f1), NA, subset_data_61$prh0100_f2f1)
summary(subset_data_61$prh0100_f2f1)

# percentage men height F2F2
subset_data_61$prh0100_f2f2 <- NA
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=3.75 &
subset_data_61$age_f2f2 <=4.24 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0100_hgt_f2f2_new -104.56) /4.07462686567165)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=4.25 &
subset_data_61$age_f2f2 <=4.74 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0100_hgt_f2f2_new -107.94) /4.29850746268656)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=4.75 &
subset_data_61$age_f2f2 <=5.24 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0100_hgt_f2f2_new -111.23) /4.49253731343284)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=5.25 &
subset_data_61$age_f2f2 <=5.74 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0100_hgt_f2f2_new -114.51) /4.68656716417911)
```

```

,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=5.75 &
subset_data_61$age_f2f2 <=6.24 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0100_hgt_f2f2_new -117.78) /4.86567164179105)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=6.25 &
subset_data_61$age_f2f2 <=6.74 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0100_hgt_f2f2_new -121.13) /5.02985074626864)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=6.75 &
subset_data_61$age_f2f2 <=7.24 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0100_hgt_f2f2_new -124.51) /5.19402985074627)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=7.25 &
subset_data_61$age_f2f2 <=7.74 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0100_hgt_f2f2_new -127.77) /5.34328358208955)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=7.75 &
subset_data_61$age_f2f2 <=8.24 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0100_hgt_f2f2_new -130.79) /5.52238805970148)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=8.25 &
subset_data_61$age_f2f2 <=8.74 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0100_hgt_f2f2_new -133.62) /5.70149253731342)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=8.75 &
subset_data_61$age_f2f2 <=9.24 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0100_hgt_f2f2_new -136.35) /5.91044776119404)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=9.25 &
subset_data_61$age_f2f2 <=9.74 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0100_hgt_f2f2_new -138.98) /6.14925373134325)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=9.75 &
subset_data_61$age_f2f2 <=10.24 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0100_hgt_f2f2_new -141.55) /6.38805970149254)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=10.25 &
subset_data_61$age_f2f2 <=10.74 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0100_hgt_f2f2_new -144.09) /6.68656716417909)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=10.75 &
subset_data_61$age_f2f2 <=11.24 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0100_hgt_f2f2_new -146.68) /7.01492537313435)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=11.25 &
subset_data_61$age_f2f2 <=11.74 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0100_hgt_f2f2_new -149.35) /7.35820895522389)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=11.75 &
subset_data_61$age_f2f2 <=12.24 & subset_data_61$sex_f2f2 == 1

```

```
,((subset_data_61$bdy0100_hgt_f2f2_new -152.22) /7.7313432835821)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=12.25 &
subset_data_61$age_f2f2 <=12.74 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0100_hgt_f2f2_new -155.43) /8.07462686567164)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=12.75 &
subset_data_61$age_f2f2 <=13.24 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0100_hgt_f2f2_new -159.13) /8.40298507462686)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=13.25 &
subset_data_61$age_f2f2 <=13.74 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0100_hgt_f2f2_new -163.1) /8.58208955223881)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=13.75 &
subset_data_61$age_f2f2 <=14.24 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0100_hgt_f2f2_new -166.93) /8.55223880597018)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=14.25 &
subset_data_61$age_f2f2 <=14.74 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0100_hgt_f2f2_new -170.35) /8.3283582089552)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=14.75 &
subset_data_61$age_f2f2 <=15.24 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0100_hgt_f2f2_new -173.12) /7.97014925373135)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=15.25 &
subset_data_61$age_f2f2 <=15.74 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0100_hgt_f2f2_new -175.2) /7.58208955223878)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=15.75 &
subset_data_61$age_f2f2 <=16.24 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0100_hgt_f2f2_new -176.66) /7.28358208955223)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=16.25 &
subset_data_61$age_f2f2 <=16.74 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0100_hgt_f2f2_new -177.62) /7.07462686567165)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=16.75 &
subset_data_61$age_f2f2 <=17.24 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0100_hgt_f2f2_new -178.24) /6.94029850746269)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=17.25 &
subset_data_61$age_f2f2 <=17.74 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0100_hgt_f2f2_new -178.68) /6.85074626865672)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=17.75 &
subset_data_61$age_f2f2 <=18.24 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0100_hgt_f2f2_new -179.04) /6.76119402985075)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=18.25 &
```

```
subset_data_61$sex_f2f2 == 1 , ((subset_data_61$bdy0100_hgt_f2f2_new -180) /5.844) , subset_data_61$prh0100_f2f2)
```

```
# percentage women height F2F2
```

```
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=3.75 &
subset_data_61$age_f2f2 <=4.24 & subset_data_61$sex_f2f2 == 2
, ((subset_data_61$bdy0100_hgt_f2f2_new -103.51) /4.01492537313435)
, subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=4.25 &
subset_data_61$age_f2f2 <=4.74 & subset_data_61$sex_f2f2 == 2
, ((subset_data_61$bdy0100_hgt_f2f2_new -107.15) /4.23880597014926)
, subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=4.75 &
subset_data_61$age_f2f2 <=5.24 & subset_data_61$sex_f2f2 == 2
, ((subset_data_61$bdy0100_hgt_f2f2_new -110.82) /4.46268656716417)
, subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=5.25 &
subset_data_61$age_f2f2 <=5.74 & subset_data_61$sex_f2f2 == 2
, ((subset_data_61$bdy0100_hgt_f2f2_new -114.31) /4.65671641791045)
, subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=5.75 &
subset_data_61$age_f2f2 <=6.24 & subset_data_61$sex_f2f2 == 2
, ((subset_data_61$bdy0100_hgt_f2f2_new -117.59) /4.85074626865672)
, subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=6.25 &
subset_data_61$age_f2f2 <=6.74 & subset_data_61$sex_f2f2 == 2
, ((subset_data_61$bdy0100_hgt_f2f2_new -120.69) /5.02985074626866)
, subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=6.75 &
subset_data_61$age_f2f2 <=7.24 & subset_data_61$sex_f2f2 == 2
, ((subset_data_61$bdy0100_hgt_f2f2_new -123.65) /5.22388059701492)
, subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=7.25 &
subset_data_61$age_f2f2 <=7.74 & subset_data_61$sex_f2f2 == 2
, ((subset_data_61$bdy0100_hgt_f2f2_new -126.56) /5.43283582089552)
, subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=7.75 &
subset_data_61$age_f2f2 <=8.24 & subset_data_61$sex_f2f2 == 2
, ((subset_data_61$bdy0100_hgt_f2f2_new -129.49) /5.65671641791046)
, subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=8.25 &
subset_data_61$age_f2f2 <=8.74 & subset_data_61$sex_f2f2 == 2
, ((subset_data_61$bdy0100_hgt_f2f2_new -132.4) /5.89552238805973)
, subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=8.75 &
subset_data_61$age_f2f2 <=9.24 & subset_data_61$sex_f2f2 == 2
, ((subset_data_61$bdy0100_hgt_f2f2_new -135.28) /6.13432835820898)
, subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=9.25 &
subset_data_61$age_f2f2 <=9.74 & subset_data_61$sex_f2f2 == 2
, ((subset_data_61$bdy0100_hgt_f2f2_new -138.18) /6.35820895522391)
```

```

,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=9.75 &
subset_data_61$age_f2f2 <=10.24 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0100_hgt_f2f2_new -141.18) /6.56716417910449)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=10.25 &
subset_data_61$age_f2f2 <=10.74 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0100_hgt_f2f2_new -144.33) /6.73134328358212)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=10.75 &
subset_data_61$age_f2f2 <=11.24 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0100_hgt_f2f2_new -147.65) /6.85074626865672)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=11.25 &
subset_data_61$age_f2f2 <=11.74 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0100_hgt_f2f2_new -151.04) /6.91044776119402)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=11.75 &
subset_data_61$age_f2f2 <=12.24 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0100_hgt_f2f2_new -154.31) /6.88059701492539)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=12.25 &
subset_data_61$age_f2f2 <=12.74 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0100_hgt_f2f2_new -157.22) /6.82089552238805)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=12.75 &
subset_data_61$age_f2f2 <=13.24 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0100_hgt_f2f2_new -159.53) /6.71641791044776)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=13.25 &
subset_data_61$age_f2f2 <=13.74 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0100_hgt_f2f2_new -161.33) /6.62686567164183)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=13.75 &
subset_data_61$age_f2f2 <=14.24 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0100_hgt_f2f2_new -162.74) /6.56716417910449)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=14.25 &
subset_data_61$age_f2f2 <=14.74 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0100_hgt_f2f2_new -163.81) /6.5223880597015)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=14.75 &
subset_data_61$age_f2f2 <=15.24 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0100_hgt_f2f2_new -164.58) /6.49253731343287)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=15.25 &
subset_data_61$age_f2f2 <=15.74 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0100_hgt_f2f2_new -165.09) /6.4626865671642)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=15.75 &
subset_data_61$age_f2f2 <=16.24 & subset_data_61$sex_f2f2 == 2

```

```

,((subset_data_61$bdy0100_hgt_f2f2_new -165.39) /6.44776119402984)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=16.25 &
subset_data_61$age_f2f2 <=16.74 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0100_hgt_f2f2_new -165.5) /6.44776119402984)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=16.75 &
subset_data_61$age_f2f2 <=17.24 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0100_hgt_f2f2_new -165.54) /6.43283582089553)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=17.25 &
subset_data_61$age_f2f2 <=17.74 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0100_hgt_f2f2_new -165.65) /6.43283582089553)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=17.75 &
subset_data_61$age_f2f2 <=18.24 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0100_hgt_f2f2_new -165.77) /6.43283582089553)
,subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <- ifelse (subset_data_61$age_f2f2 >=18.25 &
subset_data_61$sex_f2f2 == 2 ,((subset_data_61$bdy0100_hgt_f2f2_new -167)
/5.224) ,subset_data_61$prh0100_f2f2)

subset_data_61$prh0100_f2f2 <- pnorm(subset_data_61$prh0100_f2f2)*100
subset_data_61$prh0100_f2f2 <- ifelse(subset_data_61$bdy0100_hgt_f2f2_new <0,
-95, subset_data_61$prh0100_f2f2)
subset_data_61$prh0100_f2f2 <-
ifelse(is.na(subset_data_61$bdy0100_hgt_f2f2_new) |
is.na(subset_data_61$age_f2f2), NA, subset_data_61$prh0100_f2f2)
summary(subset_data_61$prh0100_f2f2)

# percentage men height F2F3
subset_data_61$prh0100_f2f3 <- NA
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=3.75 &
subset_data_61$age_f2f3 <=4.24 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0100_hgt_f2f3_new -104.56) /4.07462686567165)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=4.25 &
subset_data_61$age_f2f3 <=4.74 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0100_hgt_f2f3_new -107.94) /4.29850746268656)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=4.75 &
subset_data_61$age_f2f3 <=5.24 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0100_hgt_f2f3_new -111.23) /4.49253731343284)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=5.25 &
subset_data_61$age_f2f3 <=5.74 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0100_hgt_f2f3_new -114.51) /4.68656716417911)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=5.75 &
subset_data_61$age_f2f3 <=6.24 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0100_hgt_f2f3_new -117.78) /4.86567164179105)

```

```

,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=6.25 &
subset_data_61$age_f2f3 <=6.74 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0100_hgt_f2f3_new -121.13) /5.02985074626864)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=6.75 &
subset_data_61$age_f2f3 <=7.24 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0100_hgt_f2f3_new -124.51) /5.19402985074627)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=7.25 &
subset_data_61$age_f2f3 <=7.74 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0100_hgt_f2f3_new -127.77) /5.34328358208955)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=7.75 &
subset_data_61$age_f2f3 <=8.24 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0100_hgt_f2f3_new -130.79) /5.52238805970148)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=8.25 &
subset_data_61$age_f2f3 <=8.74 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0100_hgt_f2f3_new -133.62) /5.70149253731342)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=8.75 &
subset_data_61$age_f2f3 <=9.24 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0100_hgt_f2f3_new -136.35) /5.91044776119404)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=9.25 &
subset_data_61$age_f2f3 <=9.74 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0100_hgt_f2f3_new -138.98) /6.14925373134325)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=9.75 &
subset_data_61$age_f2f3 <=10.24 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0100_hgt_f2f3_new -141.55) /6.38805970149254)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=10.25 &
subset_data_61$age_f2f3 <=10.74 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0100_hgt_f2f3_new -144.09) /6.68656716417909)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=10.75 &
subset_data_61$age_f2f3 <=11.24 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0100_hgt_f2f3_new -146.68) /7.01492537313435)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=11.25 &
subset_data_61$age_f2f3 <=11.74 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0100_hgt_f2f3_new -149.35) /7.35820895522389)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=11.75 &
subset_data_61$age_f2f3 <=12.24 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0100_hgt_f2f3_new -152.22) /7.7313432835821)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=12.25 &
subset_data_61$age_f2f3 <=12.74 & subset_data_61$sex_f2f3 == 1

```

```
,((subset_data_61$bdy0100_hgt_f2f3_new -155.43) /8.07462686567164)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=12.75 &
subset_data_61$age_f2f3 <=13.24 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0100_hgt_f2f3_new -159.13) /8.40298507462686)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=13.25 &
subset_data_61$age_f2f3 <=13.74 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0100_hgt_f2f3_new -163.1) /8.58208955223881)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=13.75 &
subset_data_61$age_f2f3 <=14.24 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0100_hgt_f2f3_new -166.93) /8.55223880597018)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=14.25 &
subset_data_61$age_f2f3 <=14.74 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0100_hgt_f2f3_new -170.35) /8.3283582089552)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=14.75 &
subset_data_61$age_f2f3 <=15.24 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0100_hgt_f2f3_new -173.12) /7.97014925373135)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=15.25 &
subset_data_61$age_f2f3 <=15.74 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0100_hgt_f2f3_new -175.2) /7.58208955223878)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=15.75 &
subset_data_61$age_f2f3 <=16.24 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0100_hgt_f2f3_new -176.66) /7.28358208955223)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=16.25 &
subset_data_61$age_f2f3 <=16.74 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0100_hgt_f2f3_new -177.62) /7.07462686567165)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=16.75 &
subset_data_61$age_f2f3 <=17.24 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0100_hgt_f2f3_new -178.24) /6.94029850746269)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=17.25 &
subset_data_61$age_f2f3 <=17.74 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0100_hgt_f2f3_new -178.68) /6.85074626865672)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=17.75 &
subset_data_61$age_f2f3 <=18.24 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0100_hgt_f2f3_new -179.04) /6.76119402985075)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=18.25 &
subset_data_61$sex_f2f3 == 1 ,((subset_data_61$bdy0100_hgt_f2f3_new -180)
/5.844) ,subset_data_61$prh0100_f2f3)
```

percentage women height F2F3

```
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=3.75 &
subset_data_61$age_f2f3 <=4.24 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0100_hgt_f2f3_new -103.51) /4.01492537313435)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=4.25 &
subset_data_61$age_f2f3 <=4.74 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0100_hgt_f2f3_new -107.15) /4.23880597014926)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=4.75 &
subset_data_61$age_f2f3 <=5.24 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0100_hgt_f2f3_new -110.82) /4.46268656716417)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=5.25 &
subset_data_61$age_f2f3 <=5.74 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0100_hgt_f2f3_new -114.31) /4.65671641791045)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=5.75 &
subset_data_61$age_f2f3 <=6.24 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0100_hgt_f2f3_new -117.59) /4.85074626865672)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=6.25 &
subset_data_61$age_f2f3 <=6.74 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0100_hgt_f2f3_new -120.69) /5.02985074626866)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=6.75 &
subset_data_61$age_f2f3 <=7.24 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0100_hgt_f2f3_new -123.65) /5.22388059701492)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=7.25 &
subset_data_61$age_f2f3 <=7.74 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0100_hgt_f2f3_new -126.56) /5.43283582089552)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=7.75 &
subset_data_61$age_f2f3 <=8.24 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0100_hgt_f2f3_new -129.49) /5.65671641791046)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=8.25 &
subset_data_61$age_f2f3 <=8.74 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0100_hgt_f2f3_new -132.4) /5.89552238805973)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=8.75 &
subset_data_61$age_f2f3 <=9.24 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0100_hgt_f2f3_new -135.28) /6.13432835820898)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=9.25 &
subset_data_61$age_f2f3 <=9.74 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0100_hgt_f2f3_new -138.18) /6.35820895522391)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=9.75 &
subset_data_61$age_f2f3 <=10.24 & subset_data_61$sex_f2f3 == 2
```

```
,((subset_data_61$bdy0100_hgt_f2f3_new -141.18) /6.56716417910449)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=10.25 &
subset_data_61$age_f2f3 <=10.74 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0100_hgt_f2f3_new -144.33) /6.73134328358212)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=10.75 &
subset_data_61$age_f2f3 <=11.24 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0100_hgt_f2f3_new -147.65) /6.85074626865672)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=11.25 &
subset_data_61$age_f2f3 <=11.74 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0100_hgt_f2f3_new -151.04) /6.91044776119402)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=11.75 &
subset_data_61$age_f2f3 <=12.24 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0100_hgt_f2f3_new -154.31) /6.88059701492539)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=12.25 &
subset_data_61$age_f2f3 <=12.74 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0100_hgt_f2f3_new -157.22) /6.82089552238805)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=12.75 &
subset_data_61$age_f2f3 <=13.24 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0100_hgt_f2f3_new -159.53) /6.71641791044776)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=13.25 &
subset_data_61$age_f2f3 <=13.74 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0100_hgt_f2f3_new -161.33) /6.62686567164183)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=13.75 &
subset_data_61$age_f2f3 <=14.24 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0100_hgt_f2f3_new -162.74) /6.56716417910449)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=14.25 &
subset_data_61$age_f2f3 <=14.74 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0100_hgt_f2f3_new -163.81) /6.5223880597015)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=14.75 &
subset_data_61$age_f2f3 <=15.24 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0100_hgt_f2f3_new -164.58) /6.49253731343287)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=15.25 &
subset_data_61$age_f2f3 <=15.74 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0100_hgt_f2f3_new -165.09) /6.4626865671642)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=15.75 &
subset_data_61$age_f2f3 <=16.24 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0100_hgt_f2f3_new -165.39) /6.44776119402984)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=16.25 &
```

```

subset_data_61$age_f2f3 <=16.74 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0100_hgt_f2f3_new -165.5) /6.44776119402984)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=16.75 &
subset_data_61$age_f2f3 <=17.24 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0100_hgt_f2f3_new -165.54) /6.43283582089553)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=17.25 &
subset_data_61$age_f2f3 <=17.74 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0100_hgt_f2f3_new -165.65) /6.43283582089553)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=17.75 &
subset_data_61$age_f2f3 <=18.24 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0100_hgt_f2f3_new -165.77) /6.43283582089553)
,subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <- ifelse (subset_data_61$age_f2f3 >=18.25 &
subset_data_61$sex_f2f3 == 2 ,((subset_data_61$bdy0100_hgt_f2f3_new -167)
/5.224) ,subset_data_61$prh0100_f2f3)

subset_data_61$prh0100_f2f3 <- pnorm(subset_data_61$prh0100_f2f3)*100
subset_data_61$prh0100_f2f3 <- ifelse(subset_data_61$bdy0100_hgt_f2f3_new <0,
-95, subset_data_61$prh0100_f2f3)
subset_data_61$prh0100_f2f3 <-
ifelse(is.na(subset_data_61$bdy0100_hgt_f2f3_new) |
is.na(subset_data_61$age_f2f3), NA, subset_data_61$prh0100_f2f3)
summary(subset_data_61$prh0100_f2f3)

# percentage men height F2F4
subset_data_61$prh0100_f2f4 <- NA
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=3.75 &
subset_data_61$age_f2f4 <=4.24 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0100_hgt_f2f4_new -104.56) /4.07462686567165)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=4.25 &
subset_data_61$age_f2f4 <=4.74 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0100_hgt_f2f4_new -107.94) /4.29850746268656)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=4.75 &
subset_data_61$age_f2f4 <=5.24 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0100_hgt_f2f4_new -111.23) /4.49253731343284)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=5.25 &
subset_data_61$age_f2f4 <=5.74 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0100_hgt_f2f4_new -114.51) /4.68656716417911)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=5.75 &
subset_data_61$age_f2f4 <=6.24 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0100_hgt_f2f4_new -117.78) /4.86567164179105)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=6.25 &
subset_data_61$age_f2f4 <=6.74 & subset_data_61$sex_f2f4 == 1

```

```
,((subset_data_61$bdy0100_hgt_f2f4_new -121.13) /5.02985074626864)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=6.75 &
subset_data_61$age_f2f4 <=7.24 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0100_hgt_f2f4_new -124.51) /5.19402985074627)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=7.25 &
subset_data_61$age_f2f4 <=7.74 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0100_hgt_f2f4_new -127.77) /5.34328358208955)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=7.75 &
subset_data_61$age_f2f4 <=8.24 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0100_hgt_f2f4_new -130.79) /5.52238805970148)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=8.25 &
subset_data_61$age_f2f4 <=8.74 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0100_hgt_f2f4_new -133.62) /5.70149253731342)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=8.75 &
subset_data_61$age_f2f4 <=9.24 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0100_hgt_f2f4_new -136.35) /5.91044776119404)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=9.25 &
subset_data_61$age_f2f4 <=9.74 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0100_hgt_f2f4_new -138.98) /6.14925373134325)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=9.75 &
subset_data_61$age_f2f4 <=10.24 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0100_hgt_f2f4_new -141.55) /6.38805970149254)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=10.25 &
subset_data_61$age_f2f4 <=10.74 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0100_hgt_f2f4_new -144.09) /6.68656716417909)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=10.75 &
subset_data_61$age_f2f4 <=11.24 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0100_hgt_f2f4_new -146.68) /7.01492537313435)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=11.25 &
subset_data_61$age_f2f4 <=11.74 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0100_hgt_f2f4_new -149.35) /7.35820895522389)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=11.75 &
subset_data_61$age_f2f4 <=12.24 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0100_hgt_f2f4_new -152.22) /7.7313432835821)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=12.25 &
subset_data_61$age_f2f4 <=12.74 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0100_hgt_f2f4_new -155.43) /8.07462686567164)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=12.75 &
```

```

subset_data_61$age_f2f4 <=13.24 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0100_hgt_f2f4_new -159.13) /8.40298507462686)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=13.25 &
subset_data_61$age_f2f4 <=13.74 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0100_hgt_f2f4_new -163.1) /8.58208955223881)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=13.75 &
subset_data_61$age_f2f4 <=14.24 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0100_hgt_f2f4_new -166.93) /8.55223880597018)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=14.25 &
subset_data_61$age_f2f4 <=14.74 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0100_hgt_f2f4_new -170.35) /8.3283582089552)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=14.75 &
subset_data_61$age_f2f4 <=15.24 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0100_hgt_f2f4_new -173.12) /7.97014925373135)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=15.25 &
subset_data_61$age_f2f4 <=15.74 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0100_hgt_f2f4_new -175.2) /7.58208955223878)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=15.75 &
subset_data_61$age_f2f4 <=16.24 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0100_hgt_f2f4_new -176.66) /7.28358208955223)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=16.25 &
subset_data_61$age_f2f4 <=16.74 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0100_hgt_f2f4_new -177.62) /7.07462686567165)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=16.75 &
subset_data_61$age_f2f4 <=17.24 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0100_hgt_f2f4_new -178.24) /6.94029850746269)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=17.25 &
subset_data_61$age_f2f4 <=17.74 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0100_hgt_f2f4_new -178.68) /6.85074626865672)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=17.75 &
subset_data_61$age_f2f4 <=18.24 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0100_hgt_f2f4_new -179.04) /6.76119402985075)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=18.25 &
subset_data_61$sex_f2f4 == 1 ,((subset_data_61$bdy0100_hgt_f2f4_new -180)
/5.844) ,subset_data_61$prh0100_f2f4)

```

percentage women height F2F4

```

subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=3.75 &
subset_data_61$age_f2f4 <=4.24 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0100_hgt_f2f4_new -103.51) /4.01492537313435)

```

```

,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=4.25 &
subset_data_61$age_f2f4 <=4.74 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0100_hgt_f2f4_new -107.15) /4.23880597014926)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=4.75 &
subset_data_61$age_f2f4 <=5.24 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0100_hgt_f2f4_new -110.82) /4.46268656716417)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=5.25 &
subset_data_61$age_f2f4 <=5.74 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0100_hgt_f2f4_new -114.31) /4.65671641791045)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=5.75 &
subset_data_61$age_f2f4 <=6.24 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0100_hgt_f2f4_new -117.59) /4.85074626865672)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=6.25 &
subset_data_61$age_f2f4 <=6.74 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0100_hgt_f2f4_new -120.69) /5.02985074626866)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=6.75 &
subset_data_61$age_f2f4 <=7.24 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0100_hgt_f2f4_new -123.65) /5.22388059701492)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=7.25 &
subset_data_61$age_f2f4 <=7.74 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0100_hgt_f2f4_new -126.56) /5.43283582089552)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=7.75 &
subset_data_61$age_f2f4 <=8.24 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0100_hgt_f2f4_new -129.49) /5.65671641791046)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=8.25 &
subset_data_61$age_f2f4 <=8.74 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0100_hgt_f2f4_new -132.4) /5.89552238805973)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=8.75 &
subset_data_61$age_f2f4 <=9.24 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0100_hgt_f2f4_new -135.28) /6.13432835820898)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=9.25 &
subset_data_61$age_f2f4 <=9.74 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0100_hgt_f2f4_new -138.18) /6.35820895522391)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=9.75 &
subset_data_61$age_f2f4 <=10.24 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0100_hgt_f2f4_new -141.18) /6.56716417910449)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=10.25 &
subset_data_61$age_f2f4 <=10.74 & subset_data_61$sex_f2f4 == 2

```

```
,((subset_data_61$bdy0100_hgt_f2f4_new -144.33) /6.73134328358212)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=10.75 &
subset_data_61$age_f2f4 <=11.24 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0100_hgt_f2f4_new -147.65) /6.85074626865672)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=11.25 &
subset_data_61$age_f2f4 <=11.74 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0100_hgt_f2f4_new -151.04) /6.91044776119402)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=11.75 &
subset_data_61$age_f2f4 <=12.24 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0100_hgt_f2f4_new -154.31) /6.88059701492539)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=12.25 &
subset_data_61$age_f2f4 <=12.74 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0100_hgt_f2f4_new -157.22) /6.82089552238805)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=12.75 &
subset_data_61$age_f2f4 <=13.24 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0100_hgt_f2f4_new -159.53) /6.71641791044776)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=13.25 &
subset_data_61$age_f2f4 <=13.74 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0100_hgt_f2f4_new -161.33) /6.62686567164183)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=13.75 &
subset_data_61$age_f2f4 <=14.24 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0100_hgt_f2f4_new -162.74) /6.56716417910449)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=14.25 &
subset_data_61$age_f2f4 <=14.74 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0100_hgt_f2f4_new -163.81) /6.5223880597015)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=14.75 &
subset_data_61$age_f2f4 <=15.24 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0100_hgt_f2f4_new -164.58) /6.49253731343287)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=15.25 &
subset_data_61$age_f2f4 <=15.74 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0100_hgt_f2f4_new -165.09) /6.4626865671642)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=15.75 &
subset_data_61$age_f2f4 <=16.24 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0100_hgt_f2f4_new -165.39) /6.44776119402984)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=16.25 &
subset_data_61$age_f2f4 <=16.74 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0100_hgt_f2f4_new -165.5) /6.44776119402984)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=16.75 &
```

```

subset_data_61$age_f2f4 <=17.24 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0100_hgt_f2f4_new -165.54) /6.43283582089553)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=17.25 &
subset_data_61$age_f2f4 <=17.74 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0100_hgt_f2f4_new -165.65) /6.43283582089553)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=17.75 &
subset_data_61$age_f2f4 <=18.24 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0100_hgt_f2f4_new -165.77) /6.43283582089553)
,subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <- ifelse (subset_data_61$age_f2f4 >=18.25 &
subset_data_61$sex_f2f4 == 2 ,((subset_data_61$bdy0100_hgt_f2f4_new -167)
/5.224) ,subset_data_61$prh0100_f2f4)

subset_data_61$prh0100_f2f4 <- pnorm(subset_data_61$prh0100_f2f4)*100
subset_data_61$prh0100_f2f4 <- ifelse(subset_data_61$bdy0100_hgt_f2f4_new <0,
-95, subset_data_61$prh0100_f2f4)
subset_data_61$prh0100_f2f4 <-
ifelse(is.na(subset_data_61$bdy0100_hgt_f2f4_new) |
is.na(subset_data_61$age_f2f4), NA, subset_data_61$prh0100_f2f4)
summary(subset_data_61$prh0100_f2f4)

# percentage women height F2F5
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=3.75 &
subset_data_61$age_f2f5 <=4.24 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0100_hgt_f2f5 -103.51) /4.01492537313435)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=4.25 &
subset_data_61$age_f2f5 <=4.74 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0100_hgt_f2f5 -107.15) /4.23880597014926)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=4.75 &
subset_data_61$age_f2f5 <=5.24 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0100_hgt_f2f5 -110.82) /4.46268656716417)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=5.25 &
subset_data_61$age_f2f5 <=5.74 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0100_hgt_f2f5 -114.31) /4.65671641791045)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=5.75 &
subset_data_61$age_f2f5 <=6.24 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0100_hgt_f2f5 -117.59) /4.85074626865672)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=6.25 &
subset_data_61$age_f2f5 <=6.74 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0100_hgt_f2f5 -120.69) /5.02985074626866)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=6.75 &
subset_data_61$age_f2f5 <=7.24 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0100_hgt_f2f5 -123.65) /5.22388059701492)

```

```

,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=7.25 &
subset_data_61$age_f2f5 <=7.74 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0100_hgt_f2f5 -126.56) /5.43283582089552)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=7.75 &
subset_data_61$age_f2f5 <=8.24 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0100_hgt_f2f5 -129.49) /5.65671641791046)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=8.25 &
subset_data_61$age_f2f5 <=8.74 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0100_hgt_f2f5 -132.4) /5.89552238805973)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=8.75 &
subset_data_61$age_f2f5 <=9.24 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0100_hgt_f2f5 -135.28) /6.13432835820898)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=9.25 &
subset_data_61$age_f2f5 <=9.74 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0100_hgt_f2f5 -138.18) /6.35820895522391)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=9.75 &
subset_data_61$age_f2f5 <=10.24 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0100_hgt_f2f5 -141.18) /6.56716417910449)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=10.25 &
subset_data_61$age_f2f5 <=10.74 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0100_hgt_f2f5 -144.33) /6.73134328358212)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=10.75 &
subset_data_61$age_f2f5 <=11.24 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0100_hgt_f2f5 -147.65) /6.85074626865672)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=11.25 &
subset_data_61$age_f2f5 <=11.74 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0100_hgt_f2f5 -151.04) /6.91044776119402)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=11.75 &
subset_data_61$age_f2f5 <=12.24 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0100_hgt_f2f5 -154.31) /6.88059701492539)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=12.25 &
subset_data_61$age_f2f5 <=12.74 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0100_hgt_f2f5 -157.22) /6.82089552238805)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=12.75 &
subset_data_61$age_f2f5 <=13.24 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0100_hgt_f2f5 -159.53) /6.71641791044776)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=13.25 &
subset_data_61$age_f2f5 <=13.74 & subset_data_61$sex_f2f5 == 2

```

```
,((subset_data_61$bdy0100_hgt_f2f5 -161.33) /6.62686567164183)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=13.75 &
subset_data_61$age_f2f5 <=14.24 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0100_hgt_f2f5 -162.74) /6.56716417910449)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=14.25 &
subset_data_61$age_f2f5 <=14.74 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0100_hgt_f2f5 -163.81) /6.5223880597015)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=14.75 &
subset_data_61$age_f2f5 <=15.24 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0100_hgt_f2f5 -164.58) /6.49253731343287)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=15.25 &
subset_data_61$age_f2f5 <=15.74 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0100_hgt_f2f5 -165.09) /6.4626865671642)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=15.75 &
subset_data_61$age_f2f5 <=16.24 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0100_hgt_f2f5 -165.39) /6.44776119402984)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=16.25 &
subset_data_61$age_f2f5 <=16.74 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0100_hgt_f2f5 -165.5) /6.44776119402984)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=16.75 &
subset_data_61$age_f2f5 <=17.24 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0100_hgt_f2f5 -165.54) /6.43283582089553)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=17.25 &
subset_data_61$age_f2f5 <=17.74 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0100_hgt_f2f5 -165.65) /6.43283582089553)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=17.75 &
subset_data_61$age_f2f5 <=18.24 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0100_hgt_f2f5 -165.77) /6.43283582089553)
,subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse (subset_data_61$age_f2f5 >=18.25 &
subset_data_61$sex_f2f5 == 2 ,((subset_data_61$bdy0100_hgt_f2f5 -167) /5.224)
,subset_data_61$prh0100_f2f5)

subset_data_61$prh0100_f2f5 <- pnorm(subset_data_61$prh0100_f2f5)*100
subset_data_61$prh0100_f2f5 <- ifelse(subset_data_61$bdy0100_hgt_f2f5 <0, -
95, subset_data_61$prh0100_f2f5)
subset_data_61$prh0100_f2f5 <- ifelse(is.na(subset_data_61$bdy0100_hgt_f2f5)
| is.na(subset_data_61$age_f2f5), NA, subset_data_61$prh0100_f2f5)
summary(subset_data_61$prh0100_f2f5)
```

percentage for weight in all waves

```
# percentage men weight F2F1
subset_data_61$prh0200_f2f1 <- NA
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=2.25 &
subset_data_61$age_f2f1 <=2.74 & subset_data_61$sex == 1
,((subset_data_61$bdy0200_wgt_f2f1_new -13.87) /1.49253731343284)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=2.75 &
subset_data_61$age_f2f1 <=3.24 & subset_data_61$sex == 1
,((subset_data_61$bdy0200_wgt_f2f1_new -15.03) /1.62686567164179)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=3.25 &
subset_data_61$age_f2f1 <=3.74 & subset_data_61$sex == 1
,((subset_data_61$bdy0200_wgt_f2f1_new -16.14) /1.7910447761194)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=3.75 &
subset_data_61$age_f2f1 <=4.24 & subset_data_61$sex == 1
,((subset_data_61$bdy0200_wgt_f2f1_new -17.15) /1.94029850746268)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=4.25 &
subset_data_61$age_f2f1 <=4.74 & subset_data_61$sex == 1
,((subset_data_61$bdy0200_wgt_f2f1_new -18.07) /2.07462686567164)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=4.75 &
subset_data_61$age_f2f1 <=5.24 & subset_data_61$sex == 1
,((subset_data_61$bdy0200_wgt_f2f1_new -19.05) /2.25373134328358)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=5.25 &
subset_data_61$age_f2f1 <=5.74 & subset_data_61$sex == 1
,((subset_data_61$bdy0200_wgt_f2f1_new -20.19) /2.46268656716418)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=5.75 &
subset_data_61$age_f2f1 <=6.24 & subset_data_61$sex == 1
,((subset_data_61$bdy0200_wgt_f2f1_new -21.5) /2.71641791044776)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=6.25 &
subset_data_61$age_f2f1 <=6.74 & subset_data_61$sex == 1
,((subset_data_61$bdy0200_wgt_f2f1_new -22.98) /3.02985074626866)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=6.75 &
subset_data_61$age_f2f1 <=7.24 & subset_data_61$sex == 1
,((subset_data_61$bdy0200_wgt_f2f1_new -24.58) /3.38805970149254)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=7.25 &
subset_data_61$age_f2f1 <=7.74 & subset_data_61$sex == 1
,((subset_data_61$bdy0200_wgt_f2f1_new -26.17) /3.76119402985075)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=7.75 &
subset_data_61$age_f2f1 <=8.24 & subset_data_61$sex == 1
,((subset_data_61$bdy0200_wgt_f2f1_new -27.66) /4.1044776119403)
,subset_data_61$prh0200_f2f1)
```

```

subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=8.25 &
subset_data_61$age_f2f1 <=8.74 & subset_data_61$sex == 1
,((subset_data_61$bdy0200_wgt_f2f1_new -29.25) /4.50746268656716)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=8.75 &
subset_data_61$age_f2f1 <=9.24 & subset_data_61$sex == 1
,((subset_data_61$bdy0200_wgt_f2f1_new -31) /4.92537313432836)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=9.25 &
subset_data_61$age_f2f1 <=9.74 & subset_data_61$sex == 1
,((subset_data_61$bdy0200_wgt_f2f1_new -32.84) /5.37313432835822)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=9.75 &
subset_data_61$age_f2f1 <=10.24 & subset_data_61$sex == 1
,((subset_data_61$bdy0200_wgt_f2f1_new -34.79) /5.86567164179104)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=10.25 &
subset_data_61$age_f2f1 <=10.74 & subset_data_61$sex == 1
,((subset_data_61$bdy0200_wgt_f2f1_new -36.81) /6.4179104477612)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=10.75 &
subset_data_61$age_f2f1 <=11.24 & subset_data_61$sex == 1
,((subset_data_61$bdy0200_wgt_f2f1_new -38.88) /7.02985074626866)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=11.25 &
subset_data_61$age_f2f1 <=11.74 & subset_data_61$sex == 1
,((subset_data_61$bdy0200_wgt_f2f1_new -41) /7.65671641791045)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=11.75 &
subset_data_61$age_f2f1 <=12.24 & subset_data_61$sex == 1
,((subset_data_61$bdy0200_wgt_f2f1_new -43.25) /8.32835820895522)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=12.25 &
subset_data_61$age_f2f1 <=12.74 & subset_data_61$sex == 1
,((subset_data_61$bdy0200_wgt_f2f1_new -45.82) /9.04477611940299)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=12.75 &
subset_data_61$age_f2f1 <=13.24 & subset_data_61$sex == 1
,((subset_data_61$bdy0200_wgt_f2f1_new -48.81) /9.76119402985074)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=13.25 &
subset_data_61$age_f2f1 <=13.74 & subset_data_61$sex == 1
,((subset_data_61$bdy0200_wgt_f2f1_new -52.14) /10.4179104477612)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=13.75 &
subset_data_61$age_f2f1 <=14.24 & subset_data_61$sex == 1
,((subset_data_61$bdy0200_wgt_f2f1_new -55.51) /10.8507462686567)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=14.25 &
subset_data_61$age_f2f1 <=14.74 & subset_data_61$sex == 1
,((subset_data_61$bdy0200_wgt_f2f1_new -58.75) /11)

```

```
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=14.75 &
subset_data_61$age_f2f1 <=15.24 & subset_data_61$sex == 1
,((subset_data_61$bdy0200_wgt_f2f1_new -61.69) /10.8805970149254)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=15.25 &
subset_data_61$age_f2f1 <=15.74 & subset_data_61$sex == 1
,((subset_data_61$bdy0200_wgt_f2f1_new -64.26) /10.6417910447761)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=15.75 &
subset_data_61$age_f2f1 <=16.24 & subset_data_61$sex == 1
,((subset_data_61$bdy0200_wgt_f2f1_new -66.3) /10.4477611940298)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=16.25 &
subset_data_61$age_f2f1 <=16.74 & subset_data_61$sex == 1
,((subset_data_61$bdy0200_wgt_f2f1_new -67.87) /10.3134328358209)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=16.75 &
subset_data_61$age_f2f1 <=17.24 & subset_data_61$sex == 1
,((subset_data_61$bdy0200_wgt_f2f1_new -69.15) /10.2686567164179)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=17.25 &
subset_data_61$age_f2f1 <=17.74 & subset_data_61$sex == 1
,((subset_data_61$bdy0200_wgt_f2f1_new -70.3) /10.2537313432836)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=17.75 &
subset_data_61$age_f2f1 <=18.24 & subset_data_61$sex == 1
,((subset_data_61$bdy0200_wgt_f2f1_new -71.39) /10.2537313432836)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=18.25 &
subset_data_61$sex == 1 ,((subset_data_61$bdy0200_wgt_f2f1_new -86.57442)
/11.6079618077936) ,subset_data_61$prh0200_f2f1)
```

percentage women weight F2F1

```
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=1.75 &
subset_data_61$age_f2f1 <=2.24 & subset_data_61$sex == 2
,((subset_data_61$bdy0200_wgt_f2f1_new -11.95) /1.25373134328358)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=2.25 &
subset_data_61$age_f2f1 <=2.74 & subset_data_61$sex == 2
,((subset_data_61$bdy0200_wgt_f2f1_new -13.18) /1.43283582089552)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=2.75 &
subset_data_61$age_f2f1 <=3.24 & subset_data_61$sex == 2
,((subset_data_61$bdy0200_wgt_f2f1_new -14.42) /1.61194029850746)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=3.25 &
subset_data_61$age_f2f1 <=3.74 & subset_data_61$sex == 2
,((subset_data_61$bdy0200_wgt_f2f1_new -15.54) /1.7910447761194)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=3.75 &
```

```

subset_data_61$age_f2f1 <=4.24 & subset_data_61$sex == 2
,((subset_data_61$bdy0200_wgt_f2f1_new -16.6) /1.97014925373135)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=4.25 &
subset_data_61$age_f2f1 <=4.74 & subset_data_61$sex == 2
,((subset_data_61$bdy0200_wgt_f2f1_new -17.69) /2.16417910447762)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=4.75 &
subset_data_61$age_f2f1 <=5.24 & subset_data_61$sex == 2
,((subset_data_61$bdy0200_wgt_f2f1_new -18.84) /2.35820895522388)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=5.25 &
subset_data_61$age_f2f1 <=5.74 & subset_data_61$sex == 2
,((subset_data_61$bdy0200_wgt_f2f1_new -20.06) /2.58208955223881)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=5.75 &
subset_data_61$age_f2f1 <=6.24 & subset_data_61$sex == 2
,((subset_data_61$bdy0200_wgt_f2f1_new -21.35) /2.83582089552239)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=6.25 &
subset_data_61$age_f2f1 <=6.74 & subset_data_61$sex == 2
,((subset_data_61$bdy0200_wgt_f2f1_new -22.7) /3.11940298507463)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=6.75 &
subset_data_61$age_f2f1 <=7.24 & subset_data_61$sex == 2
,((subset_data_61$bdy0200_wgt_f2f1_new -24.06) /3.41791044776119)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=7.25 &
subset_data_61$age_f2f1 <=7.74 & subset_data_61$sex == 2
,((subset_data_61$bdy0200_wgt_f2f1_new -25.48) /3.7910447761194)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=7.75 &
subset_data_61$age_f2f1 <=8.24 & subset_data_61$sex == 2
,((subset_data_61$bdy0200_wgt_f2f1_new -27.01) /4.19402985074627)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=8.25 &
subset_data_61$age_f2f1 <=8.74 & subset_data_61$sex == 2
,((subset_data_61$bdy0200_wgt_f2f1_new -28.69) /4.67164179104478)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=8.75 &
subset_data_61$age_f2f1 <=9.24 & subset_data_61$sex == 2
,((subset_data_61$bdy0200_wgt_f2f1_new -30.55) /5.23880597014926)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=9.25 &
subset_data_61$age_f2f1 <=9.74 & subset_data_61$sex == 2
,((subset_data_61$bdy0200_wgt_f2f1_new -32.57) /5.86567164179104)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=9.75 &
subset_data_61$age_f2f1 <=10.24 & subset_data_61$sex == 2
,((subset_data_61$bdy0200_wgt_f2f1_new -34.68) /6.52238805970149)
,subset_data_61$prh0200_f2f1)

```

```

subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=10.25 &
subset_data_61$age_f2f1 <=10.74 & subset_data_61$sex == 2
,((subset_data_61$bdy0200_wgt_f2f1_new -36.92) /7.20895522388059)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=10.75 &
subset_data_61$age_f2f1 <=11.24 & subset_data_61$sex == 2
,((subset_data_61$bdy0200_wgt_f2f1_new -39.37) /7.88059701492536)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=11.25 &
subset_data_61$age_f2f1 <=11.74 & subset_data_61$sex == 2
,((subset_data_61$bdy0200_wgt_f2f1_new -42.05) /8.46268656716417)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=11.75 &
subset_data_61$age_f2f1 <=12.24 & subset_data_61$sex == 2
,((subset_data_61$bdy0200_wgt_f2f1_new -44.87) /8.8955223880597)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=12.25 &
subset_data_61$age_f2f1 <=12.74 & subset_data_61$sex == 2
,((subset_data_61$bdy0200_wgt_f2f1_new -47.59) /9.11940298507464)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=12.75 &
subset_data_61$age_f2f1 <=13.24 & subset_data_61$sex == 2
,((subset_data_61$bdy0200_wgt_f2f1_new -50.02) /9.17910447761195)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=13.25 &
subset_data_61$age_f2f1 <=13.74 & subset_data_61$sex == 2
,((subset_data_61$bdy0200_wgt_f2f1_new -52.16) /9.10447761194029)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=13.75 &
subset_data_61$age_f2f1 <=14.24 & subset_data_61$sex == 2
,((subset_data_61$bdy0200_wgt_f2f1_new -54.01) /8.97014925373134)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=14.25 &
subset_data_61$age_f2f1 <=14.74 & subset_data_61$sex == 2
,((subset_data_61$bdy0200_wgt_f2f1_new -55.55) /8.82089552238805)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=14.75 &
subset_data_61$age_f2f1 <=15.24 & subset_data_61$sex == 2
,((subset_data_61$bdy0200_wgt_f2f1_new -56.8) /8.6865671641791)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=15.25 &
subset_data_61$age_f2f1 <=15.74 & subset_data_61$sex == 2
,((subset_data_61$bdy0200_wgt_f2f1_new -57.79) /8.56716417910448)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=15.75 &
subset_data_61$age_f2f1 <=16.24 & subset_data_61$sex == 2
,((subset_data_61$bdy0200_wgt_f2f1_new -58.53) /8.46268656716418)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=16.25 &
subset_data_61$age_f2f1 <=16.74 & subset_data_61$sex == 2
,((subset_data_61$bdy0200_wgt_f2f1_new -59.07) /8.38805970149253)

```

```

,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=16.75 &
subset_data_61$age_f2f1 <=17.24 & subset_data_61$sex == 2
,((subset_data_61$bdy0200_wgt_f2f1_new -59.47) /8.34328358208955)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=17.25 &
subset_data_61$age_f2f1 <=17.74 & subset_data_61$sex == 2
,((subset_data_61$bdy0200_wgt_f2f1_new -59.78) /8.29850746268657)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=17.75 &
subset_data_61$age_f2f1 <=18.24 & subset_data_61$sex == 2
,((subset_data_61$bdy0200_wgt_f2f1_new -60.08) /8.26865671641791)
,subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <- ifelse (subset_data_61$age_f2f1 >=18.25 &
subset_data_61$sex == 2 ,((subset_data_61$bdy0200_wgt_f2f1_new -71.9564089)
/12.7932869768509) ,subset_data_61$prh0200_f2f1)

subset_data_61$prh0200_f2f1 <- pnorm(subset_data_61$prh0200_f2f1)*100
subset_data_61$prh0200_f2f1 <- ifelse(subset_data_61$bdy0200_wgt_f2f1_new <0,
-95, subset_data_61$prh0200_f2f1)
subset_data_61$prh0200_f2f1 <-
ifelse(is.na(subset_data_61$bdy0200_wgt_f2f1_new) |
is.na(subset_data_61$age_f2f1), NA, subset_data_61$prh0200_f2f1)
summary(subset_data_61$prh0200_f2f1)

# percentage men weight F2F2
subset_data_61$prh0200_f2f2 <- NA
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=2.25 &
subset_data_61$age_f2f2 <=2.74 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0200_wgt_f2f2_new -13.87) /1.49253731343284)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=2.75 &
subset_data_61$age_f2f2 <=3.24 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0200_wgt_f2f2_new -15.03) /1.62686567164179)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=3.25 &
subset_data_61$age_f2f2 <=3.74 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0200_wgt_f2f2_new -16.14) /1.7910447761194)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=3.75 &
subset_data_61$age_f2f2 <=4.24 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0200_wgt_f2f2_new -17.15) /1.94029850746268)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=4.25 &
subset_data_61$age_f2f2 <=4.74 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0200_wgt_f2f2_new -18.07) /2.07462686567164)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=4.75 &
subset_data_61$age_f2f2 <=5.24 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0200_wgt_f2f2_new -19.05) /2.25373134328358)
,subset_data_61$prh0200_f2f2)

```

```

subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=5.25 &
subset_data_61$age_f2f2 <=5.74 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0200_wgt_f2f2_new -20.19) /2.46268656716418)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=5.75 &
subset_data_61$age_f2f2 <=6.24 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0200_wgt_f2f2_new -21.5) /2.71641791044776)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=6.25 &
subset_data_61$age_f2f2 <=6.74 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0200_wgt_f2f2_new -22.98) /3.02985074626866)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=6.75 &
subset_data_61$age_f2f2 <=7.24 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0200_wgt_f2f2_new -24.58) /3.38805970149254)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=7.25 &
subset_data_61$age_f2f2 <=7.74 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0200_wgt_f2f2_new -26.17) /3.76119402985075)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=7.75 &
subset_data_61$age_f2f2 <=8.24 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0200_wgt_f2f2_new -27.66) /4.1044776119403)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=8.25 &
subset_data_61$age_f2f2 <=8.74 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0200_wgt_f2f2_new -29.25) /4.50746268656716)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=8.75 &
subset_data_61$age_f2f2 <=9.24 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0200_wgt_f2f2_new -31) /4.92537313432836)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=9.25 &
subset_data_61$age_f2f2 <=9.74 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0200_wgt_f2f2_new -32.84) /5.37313432835822)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=9.75 &
subset_data_61$age_f2f2 <=10.24 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0200_wgt_f2f2_new -34.79) /5.86567164179104)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=10.25 &
subset_data_61$age_f2f2 <=10.74 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0200_wgt_f2f2_new -36.81) /6.4179104477612)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=10.75 &
subset_data_61$age_f2f2 <=11.24 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0200_wgt_f2f2_new -38.88) /7.02985074626866)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=11.25 &
subset_data_61$age_f2f2 <=11.74 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0200_wgt_f2f2_new -41) /7.65671641791045)
,((subset_data_61$bdy0200_wgt_f2f2_new -41) /7.65671641791045)

```

```

,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=11.75 &
subset_data_61$age_f2f2 <=12.24 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0200_wgt_f2f2_new -43.25) /8.32835820895522)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=12.25 &
subset_data_61$age_f2f2 <=12.74 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0200_wgt_f2f2_new -45.82) /9.04477611940299)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=12.75 &
subset_data_61$age_f2f2 <=13.24 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0200_wgt_f2f2_new -48.81) /9.76119402985074)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=13.25 &
subset_data_61$age_f2f2 <=13.74 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0200_wgt_f2f2_new -52.14) /10.4179104477612)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=13.75 &
subset_data_61$age_f2f2 <=14.24 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0200_wgt_f2f2_new -55.51) /10.8507462686567)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=14.25 &
subset_data_61$age_f2f2 <=14.74 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0200_wgt_f2f2_new -58.75) /11)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=14.75 &
subset_data_61$age_f2f2 <=15.24 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0200_wgt_f2f2_new -61.69) /10.8805970149254)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=15.25 &
subset_data_61$age_f2f2 <=15.74 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0200_wgt_f2f2_new -64.26) /10.6417910447761)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=15.75 &
subset_data_61$age_f2f2 <=16.24 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0200_wgt_f2f2_new -66.3) /10.4477611940298)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=16.25 &
subset_data_61$age_f2f2 <=16.74 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0200_wgt_f2f2_new -67.87) /10.3134328358209)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=16.75 &
subset_data_61$age_f2f2 <=17.24 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0200_wgt_f2f2_new -69.15) /10.2686567164179)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=17.25 &
subset_data_61$age_f2f2 <=17.74 & subset_data_61$sex_f2f2 == 1
,((subset_data_61$bdy0200_wgt_f2f2_new -70.3) /10.2537313432836)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=17.75 &
subset_data_61$age_f2f2 <=18.24 & subset_data_61$sex_f2f2 == 1

```

```
,((subset_data_61$bdy0200_wgt_f2f2_new -71.39) /10.2537313432836)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=18.25 &
subset_data_61$sex_f2f2 == 1 ,((subset_data_61$bdy0200_wgt_f2f2_new -
86.57442) /11.6079618077936) ,subset_data_61$prh0200_f2f2)

# percentage women weight F2F2
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=1.75 &
subset_data_61$age_f2f2 <=2.24 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0200_wgt_f2f2_new -11.95) /1.25373134328358)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=2.25 &
subset_data_61$age_f2f2 <=2.74 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0200_wgt_f2f2_new -13.18) /1.43283582089552)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=2.75 &
subset_data_61$age_f2f2 <=3.24 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0200_wgt_f2f2_new -14.42) /1.61194029850746)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=3.25 &
subset_data_61$age_f2f2 <=3.74 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0200_wgt_f2f2_new -15.54) /1.7910447761194)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=3.75 &
subset_data_61$age_f2f2 <=4.24 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0200_wgt_f2f2_new -16.6) /1.97014925373135)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=4.25 &
subset_data_61$age_f2f2 <=4.74 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0200_wgt_f2f2_new -17.69) /2.16417910447762)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=4.75 &
subset_data_61$age_f2f2 <=5.24 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0200_wgt_f2f2_new -18.84) /2.35820895522388)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=5.25 &
subset_data_61$age_f2f2 <=5.74 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0200_wgt_f2f2_new -20.06) /2.58208955223881)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=5.75 &
subset_data_61$age_f2f2 <=6.24 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0200_wgt_f2f2_new -21.35) /2.83582089552239)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=6.25 &
subset_data_61$age_f2f2 <=6.74 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0200_wgt_f2f2_new -22.7) /3.11940298507463)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=6.75 &
subset_data_61$age_f2f2 <=7.24 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0200_wgt_f2f2_new -24.06) /3.41791044776119)
,subset_data_61$prh0200_f2f2)
```

```

subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=7.25 &
subset_data_61$age_f2f2 <=7.74 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0200_wgt_f2f2_new -25.48) /3.7910447761194)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=7.75 &
subset_data_61$age_f2f2 <=8.24 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0200_wgt_f2f2_new -27.01) /4.19402985074627)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=8.25 &
subset_data_61$age_f2f2 <=8.74 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0200_wgt_f2f2_new -28.69) /4.67164179104478)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=8.75 &
subset_data_61$age_f2f2 <=9.24 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0200_wgt_f2f2_new -30.55) /5.23880597014926)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=9.25 &
subset_data_61$age_f2f2 <=9.74 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0200_wgt_f2f2_new -32.57) /5.86567164179104)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=9.75 &
subset_data_61$age_f2f2 <=10.24 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0200_wgt_f2f2_new -34.68) /6.52238805970149)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=10.25 &
subset_data_61$age_f2f2 <=10.74 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0200_wgt_f2f2_new -36.92) /7.20895522388059)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=10.75 &
subset_data_61$age_f2f2 <=11.24 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0200_wgt_f2f2_new -39.37) /7.88059701492536)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=11.25 &
subset_data_61$age_f2f2 <=11.74 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0200_wgt_f2f2_new -42.05) /8.46268656716417)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=11.75 &
subset_data_61$age_f2f2 <=12.24 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0200_wgt_f2f2_new -44.87) /8.8955223880597)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=12.25 &
subset_data_61$age_f2f2 <=12.74 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0200_wgt_f2f2_new -47.59) /9.11940298507464)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=12.75 &
subset_data_61$age_f2f2 <=13.24 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0200_wgt_f2f2_new -50.02) /9.17910447761195)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=13.25 &
subset_data_61$age_f2f2 <=13.74 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0200_wgt_f2f2_new -52.16) /9.10447761194029)

```

```

,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=13.75 &
subset_data_61$age_f2f2 <=14.24 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0200_wgt_f2f2_new -54.01) /8.97014925373134)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=14.25 &
subset_data_61$age_f2f2 <=14.74 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0200_wgt_f2f2_new -55.55) /8.82089552238805)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=14.75 &
subset_data_61$age_f2f2 <=15.24 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0200_wgt_f2f2_new -56.8) /8.6865671641791)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=15.25 &
subset_data_61$age_f2f2 <=15.74 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0200_wgt_f2f2_new -57.79) /8.56716417910448)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=15.75 &
subset_data_61$age_f2f2 <=16.24 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0200_wgt_f2f2_new -58.53) /8.46268656716418)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=16.25 &
subset_data_61$age_f2f2 <=16.74 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0200_wgt_f2f2_new -59.07) /8.38805970149253)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=16.75 &
subset_data_61$age_f2f2 <=17.24 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0200_wgt_f2f2_new -59.47) /8.34328358208955)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=17.25 &
subset_data_61$age_f2f2 <=17.74 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0200_wgt_f2f2_new -59.78) /8.29850746268657)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=17.75 &
subset_data_61$age_f2f2 <=18.24 & subset_data_61$sex_f2f2 == 2
,((subset_data_61$bdy0200_wgt_f2f2_new -60.08) /8.26865671641791)
,subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <- ifelse (subset_data_61$age_f2f2 >=18.25 &
subset_data_61$sex_f2f2 == 2 ,((subset_data_61$bdy0200_wgt_f2f2_new -
71.9564089) /12.7932869768509) ,subset_data_61$prh0200_f2f2)

subset_data_61$prh0200_f2f2 <- pnorm(subset_data_61$prh0200_f2f2)*100
subset_data_61$prh0200_f2f2 <- ifelse(subset_data_61$bdy0200_wgt_f2f2_new <0,
-95, subset_data_61$prh0200_f2f2)
subset_data_61$prh0200_f2f2 <-
ifelse(is.na(subset_data_61$bdy0200_wgt_f2f2_new) |
is.na(subset_data_61$age_f2f2), NA, subset_data_61$prh0200_f2f2)
summary(subset_data_61$prh0200_f2f2)

# percentage men weight F2F3
subset_data_61$prh0200_f2f3 <- NA

```

```

subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=2.25 &
subset_data_61$age_f2f3 <=2.74 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0200_wgt_f2f3_new -13.87) /1.49253731343284)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=2.75 &
subset_data_61$age_f2f3 <=3.24 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0200_wgt_f2f3_new -15.03) /1.62686567164179)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=3.25 &
subset_data_61$age_f2f3 <=3.74 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0200_wgt_f2f3_new -16.14) /1.7910447761194)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=3.75 &
subset_data_61$age_f2f3 <=4.24 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0200_wgt_f2f3_new -17.15) /1.94029850746268)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=4.25 &
subset_data_61$age_f2f3 <=4.74 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0200_wgt_f2f3_new -18.07) /2.07462686567164)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=4.75 &
subset_data_61$age_f2f3 <=5.24 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0200_wgt_f2f3_new -19.05) /2.25373134328358)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=5.25 &
subset_data_61$age_f2f3 <=5.74 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0200_wgt_f2f3_new -20.19) /2.46268656716418)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=5.75 &
subset_data_61$age_f2f3 <=6.24 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0200_wgt_f2f3_new -21.5) /2.71641791044776)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=6.25 &
subset_data_61$age_f2f3 <=6.74 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0200_wgt_f2f3_new -22.98) /3.02985074626866)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=6.75 &
subset_data_61$age_f2f3 <=7.24 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0200_wgt_f2f3_new -24.58) /3.38805970149254)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=7.25 &
subset_data_61$age_f2f3 <=7.74 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0200_wgt_f2f3_new -26.17) /3.76119402985075)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=7.75 &
subset_data_61$age_f2f3 <=8.24 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0200_wgt_f2f3_new -27.66) /4.1044776119403)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=8.25 &
subset_data_61$age_f2f3 <=8.74 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0200_wgt_f2f3_new -29.25) /4.50746268656716)

```

```

,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=8.75 &
subset_data_61$age_f2f3 <=9.24 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0200_wgt_f2f3_new -31) /4.92537313432836)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=9.25 &
subset_data_61$age_f2f3 <=9.74 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0200_wgt_f2f3_new -32.84) /5.37313432835822)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=9.75 &
subset_data_61$age_f2f3 <=10.24 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0200_wgt_f2f3_new -34.79) /5.86567164179104)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=10.25 &
subset_data_61$age_f2f3 <=10.74 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0200_wgt_f2f3_new -36.81) /6.4179104477612)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=10.75 &
subset_data_61$age_f2f3 <=11.24 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0200_wgt_f2f3_new -38.88) /7.02985074626866)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=11.25 &
subset_data_61$age_f2f3 <=11.74 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0200_wgt_f2f3_new -41) /7.65671641791045)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=11.75 &
subset_data_61$age_f2f3 <=12.24 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0200_wgt_f2f3_new -43.25) /8.32835820895522)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=12.25 &
subset_data_61$age_f2f3 <=12.74 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0200_wgt_f2f3_new -45.82) /9.04477611940299)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=12.75 &
subset_data_61$age_f2f3 <=13.24 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0200_wgt_f2f3_new -48.81) /9.76119402985074)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=13.25 &
subset_data_61$age_f2f3 <=13.74 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0200_wgt_f2f3_new -52.14) /10.4179104477612)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=13.75 &
subset_data_61$age_f2f3 <=14.24 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0200_wgt_f2f3_new -55.51) /10.8507462686567)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=14.25 &
subset_data_61$age_f2f3 <=14.74 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0200_wgt_f2f3_new -58.75) /11)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=14.75 &
subset_data_61$age_f2f3 <=15.24 & subset_data_61$sex_f2f3 == 1

```

```
,((subset_data_61$bdy0200_wgt_f2f3_new -61.69) /10.8805970149254)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=15.25 &
subset_data_61$age_f2f3 <=15.74 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0200_wgt_f2f3_new -64.26) /10.6417910447761)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=15.75 &
subset_data_61$age_f2f3 <=16.24 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0200_wgt_f2f3_new -66.3) /10.4477611940298)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=16.25 &
subset_data_61$age_f2f3 <=16.74 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0200_wgt_f2f3_new -67.87) /10.3134328358209)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=16.75 &
subset_data_61$age_f2f3 <=17.24 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0200_wgt_f2f3_new -69.15) /10.2686567164179)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=17.25 &
subset_data_61$age_f2f3 <=17.74 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0200_wgt_f2f3_new -70.3) /10.2537313432836)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=17.75 &
subset_data_61$age_f2f3 <=18.24 & subset_data_61$sex_f2f3 == 1
,((subset_data_61$bdy0200_wgt_f2f3_new -71.39) /10.2537313432836)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=18.25 &
subset_data_61$sex_f2f3 == 1 ,((subset_data_61$bdy0200_wgt_f2f3_new -
86.57442) /11.6079618077936) ,subset_data_61$prh0200_f2f3)

# percentage women weight F2F3
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=1.75 &
subset_data_61$age_f2f3 <=2.24 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0200_wgt_f2f3_new -11.95) /1.25373134328358)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=2.25 &
subset_data_61$age_f2f3 <=2.74 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0200_wgt_f2f3_new -13.18) /1.43283582089552)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=2.75 &
subset_data_61$age_f2f3 <=3.24 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0200_wgt_f2f3_new -14.42) /1.61194029850746)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=3.25 &
subset_data_61$age_f2f3 <=3.74 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0200_wgt_f2f3_new -15.54) /1.7910447761194)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=3.75 &
subset_data_61$age_f2f3 <=4.24 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0200_wgt_f2f3_new -16.6) /1.97014925373135)
,subset_data_61$prh0200_f2f3)
```

```

subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=4.25 &
subset_data_61$age_f2f3 <=4.74 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0200_wgt_f2f3_new -17.69) /2.16417910447762)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=4.75 &
subset_data_61$age_f2f3 <=5.24 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0200_wgt_f2f3_new -18.84) /2.35820895522388)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=5.25 &
subset_data_61$age_f2f3 <=5.74 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0200_wgt_f2f3_new -20.06) /2.58208955223881)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=5.75 &
subset_data_61$age_f2f3 <=6.24 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0200_wgt_f2f3_new -21.35) /2.83582089552239)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=6.25 &
subset_data_61$age_f2f3 <=6.74 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0200_wgt_f2f3_new -22.7) /3.11940298507463)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=6.75 &
subset_data_61$age_f2f3 <=7.24 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0200_wgt_f2f3_new -24.06) /3.41791044776119)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=7.25 &
subset_data_61$age_f2f3 <=7.74 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0200_wgt_f2f3_new -25.48) /3.7910447761194)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=7.75 &
subset_data_61$age_f2f3 <=8.24 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0200_wgt_f2f3_new -27.01) /4.19402985074627)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=8.25 &
subset_data_61$age_f2f3 <=8.74 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0200_wgt_f2f3_new -28.69) /4.67164179104478)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=8.75 &
subset_data_61$age_f2f3 <=9.24 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0200_wgt_f2f3_new -30.55) /5.23880597014926)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=9.25 &
subset_data_61$age_f2f3 <=9.74 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0200_wgt_f2f3_new -32.57) /5.86567164179104)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=9.75 &
subset_data_61$age_f2f3 <=10.24 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0200_wgt_f2f3_new -34.68) /6.52238805970149)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=10.25 &
subset_data_61$age_f2f3 <=10.74 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0200_wgt_f2f3_new -36.92) /7.20895522388059)

```

```

,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=10.75 &
subset_data_61$age_f2f3 <=11.24 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0200_wgt_f2f3_new -39.37) /7.88059701492536)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=11.25 &
subset_data_61$age_f2f3 <=11.74 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0200_wgt_f2f3_new -42.05) /8.46268656716417)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=11.75 &
subset_data_61$age_f2f3 <=12.24 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0200_wgt_f2f3_new -44.87) /8.8955223880597)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=12.25 &
subset_data_61$age_f2f3 <=12.74 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0200_wgt_f2f3_new -47.59) /9.11940298507464)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=12.75 &
subset_data_61$age_f2f3 <=13.24 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0200_wgt_f2f3_new -50.02) /9.17910447761195)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=13.25 &
subset_data_61$age_f2f3 <=13.74 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0200_wgt_f2f3_new -52.16) /9.10447761194029)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=13.75 &
subset_data_61$age_f2f3 <=14.24 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0200_wgt_f2f3_new -54.01) /8.97014925373134)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=14.25 &
subset_data_61$age_f2f3 <=14.74 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0200_wgt_f2f3_new -55.55) /8.82089552238805)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=14.75 &
subset_data_61$age_f2f3 <=15.24 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0200_wgt_f2f3_new -56.8) /8.6865671641791)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=15.25 &
subset_data_61$age_f2f3 <=15.74 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0200_wgt_f2f3_new -57.79) /8.56716417910448)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=15.75 &
subset_data_61$age_f2f3 <=16.24 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0200_wgt_f2f3_new -58.53) /8.46268656716418)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=16.25 &
subset_data_61$age_f2f3 <=16.74 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0200_wgt_f2f3_new -59.07) /8.38805970149253)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=16.75 &
subset_data_61$age_f2f3 <=17.24 & subset_data_61$sex_f2f3 == 2

```

```
,((subset_data_61$bdy0200_wgt_f2f3_new -59.47) /8.34328358208955)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=17.25 &
subset_data_61$age_f2f3 <=17.74 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0200_wgt_f2f3_new -59.78) /8.29850746268657)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=17.75 &
subset_data_61$age_f2f3 <=18.24 & subset_data_61$sex_f2f3 == 2
,((subset_data_61$bdy0200_wgt_f2f3_new -60.08) /8.26865671641791)
,subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <- ifelse (subset_data_61$age_f2f3 >=18.25 &
subset_data_61$sex_f2f3 == 2 ,((subset_data_61$bdy0200_wgt_f2f3_new -
71.9564089) /12.7932869768509) ,subset_data_61$prh0200_f2f3)

subset_data_61$prh0200_f2f3 <- pnorm(subset_data_61$prh0200_f2f3)*100
subset_data_61$prh0200_f2f3 <- ifelse(subset_data_61$bdy0200_wgt_f2f3_new <0,
-95, subset_data_61$prh0200_f2f3)
subset_data_61$prh0200_f2f3 <-
ifelse(is.na(subset_data_61$bdy0200_wgt_f2f3_new) |
is.na(subset_data_61$age_f2f3), NA, subset_data_61$prh0200_f2f3)
summary(subset_data_61$prh0200_f2f3)

# percentage men weight F2F4
subset_data_61$prh0200_f2f4 <- NA
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=2.25 &
subset_data_61$age_f2f4 <=2.74 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0200_wgt_f2f4_new -13.87) /1.49253731343284)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=2.75 &
subset_data_61$age_f2f4 <=3.24 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0200_wgt_f2f4_new -15.03) /1.62686567164179)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=3.25 &
subset_data_61$age_f2f4 <=3.74 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0200_wgt_f2f4_new -16.14) /1.7910447761194)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=3.75 &
subset_data_61$age_f2f4 <=4.24 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0200_wgt_f2f4_new -17.15) /1.94029850746268)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=4.25 &
subset_data_61$age_f2f4 <=4.74 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0200_wgt_f2f4_new -18.07) /2.07462686567164)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=4.75 &
subset_data_61$age_f2f4 <=5.24 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0200_wgt_f2f4_new -19.05) /2.25373134328358)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=5.25 &
subset_data_61$age_f2f4 <=5.74 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0200_wgt_f2f4_new -20.19) /2.46268656716418)
,
```

```

,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=5.75 &
subset_data_61$age_f2f4 <=6.24 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0200_wgt_f2f4_new -21.5) /2.71641791044776)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=6.25 &
subset_data_61$age_f2f4 <=6.74 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0200_wgt_f2f4_new -22.98) /3.02985074626866)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=6.75 &
subset_data_61$age_f2f4 <=7.24 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0200_wgt_f2f4_new -24.58) /3.38805970149254)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=7.25 &
subset_data_61$age_f2f4 <=7.74 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0200_wgt_f2f4_new -26.17) /3.76119402985075)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=7.75 &
subset_data_61$age_f2f4 <=8.24 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0200_wgt_f2f4_new -27.66) /4.1044776119403)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=8.25 &
subset_data_61$age_f2f4 <=8.74 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0200_wgt_f2f4_new -29.25) /4.50746268656716)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=8.75 &
subset_data_61$age_f2f4 <=9.24 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0200_wgt_f2f4_new -31) /4.92537313432836)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=9.25 &
subset_data_61$age_f2f4 <=9.74 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0200_wgt_f2f4_new -32.84) /5.37313432835822)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=9.75 &
subset_data_61$age_f2f4 <=10.24 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0200_wgt_f2f4_new -34.79) /5.86567164179104)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=10.25 &
subset_data_61$age_f2f4 <=10.74 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0200_wgt_f2f4_new -36.81) /6.4179104477612)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=10.75 &
subset_data_61$age_f2f4 <=11.24 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0200_wgt_f2f4_new -38.88) /7.02985074626866)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=11.25 &
subset_data_61$age_f2f4 <=11.74 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0200_wgt_f2f4_new -41) /7.65671641791045)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=11.75 &
subset_data_61$age_f2f4 <=12.24 & subset_data_61$sex_f2f4 == 1

```

```
,((subset_data_61$bdy0200_wgt_f2f4_new -43.25) /8.32835820895522)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=12.25 &
subset_data_61$age_f2f4 <=12.74 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0200_wgt_f2f4_new -45.82) /9.04477611940299)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=12.75 &
subset_data_61$age_f2f4 <=13.24 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0200_wgt_f2f4_new -48.81) /9.76119402985074)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=13.25 &
subset_data_61$age_f2f4 <=13.74 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0200_wgt_f2f4_new -52.14) /10.4179104477612)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=13.75 &
subset_data_61$age_f2f4 <=14.24 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0200_wgt_f2f4_new -55.51) /10.8507462686567)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=14.25 &
subset_data_61$age_f2f4 <=14.74 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0200_wgt_f2f4_new -58.75) /11)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=14.75 &
subset_data_61$age_f2f4 <=15.24 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0200_wgt_f2f4_new -61.69) /10.8805970149254)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=15.25 &
subset_data_61$age_f2f4 <=15.74 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0200_wgt_f2f4_new -64.26) /10.6417910447761)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=15.75 &
subset_data_61$age_f2f4 <=16.24 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0200_wgt_f2f4_new -66.3) /10.4477611940298)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=16.25 &
subset_data_61$age_f2f4 <=16.74 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0200_wgt_f2f4_new -67.87) /10.3134328358209)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=16.75 &
subset_data_61$age_f2f4 <=17.24 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0200_wgt_f2f4_new -69.15) /10.2686567164179)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=17.25 &
subset_data_61$age_f2f4 <=17.74 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0200_wgt_f2f4_new -70.3) /10.2537313432836)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=17.75 &
subset_data_61$age_f2f4 <=18.24 & subset_data_61$sex_f2f4 == 1
,((subset_data_61$bdy0200_wgt_f2f4_new -71.39) /10.2537313432836)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=18.25 &
```

```

subset_data_61$sex_f2f4 == 1 , ((subset_data_61$bdy0200_wgt_f2f4_new -
86.57442) / 11.6079618077936) , subset_data_61$prh0200_f2f4)

# percentage women weight F2F4
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=1.75 &
subset_data_61$age_f2f4 <=2.24 & subset_data_61$sex_f2f4 == 2
, ((subset_data_61$bdy0200_wgt_f2f4_new -11.95) / 1.25373134328358)
, subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=2.25 &
subset_data_61$age_f2f4 <=2.74 & subset_data_61$sex_f2f4 == 2
, ((subset_data_61$bdy0200_wgt_f2f4_new -13.18) / 1.43283582089552)
, subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=2.75 &
subset_data_61$age_f2f4 <=3.24 & subset_data_61$sex_f2f4 == 2
, ((subset_data_61$bdy0200_wgt_f2f4_new -14.42) / 1.61194029850746)
, subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=3.25 &
subset_data_61$age_f2f4 <=3.74 & subset_data_61$sex_f2f4 == 2
, ((subset_data_61$bdy0200_wgt_f2f4_new -15.54) / 1.7910447761194)
, subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=3.75 &
subset_data_61$age_f2f4 <=4.24 & subset_data_61$sex_f2f4 == 2
, ((subset_data_61$bdy0200_wgt_f2f4_new -16.6) / 1.97014925373135)
, subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=4.25 &
subset_data_61$age_f2f4 <=4.74 & subset_data_61$sex_f2f4 == 2
, ((subset_data_61$bdy0200_wgt_f2f4_new -17.69) / 2.16417910447762)
, subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=4.75 &
subset_data_61$age_f2f4 <=5.24 & subset_data_61$sex_f2f4 == 2
, ((subset_data_61$bdy0200_wgt_f2f4_new -18.84) / 2.35820895522388)
, subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=5.25 &
subset_data_61$age_f2f4 <=5.74 & subset_data_61$sex_f2f4 == 2
, ((subset_data_61$bdy0200_wgt_f2f4_new -20.06) / 2.58208955223881)
, subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=5.75 &
subset_data_61$age_f2f4 <=6.24 & subset_data_61$sex_f2f4 == 2
, ((subset_data_61$bdy0200_wgt_f2f4_new -21.35) / 2.83582089552239)
, subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=6.25 &
subset_data_61$age_f2f4 <=6.74 & subset_data_61$sex_f2f4 == 2
, ((subset_data_61$bdy0200_wgt_f2f4_new -22.7) / 3.11940298507463)
, subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=6.75 &
subset_data_61$age_f2f4 <=7.24 & subset_data_61$sex_f2f4 == 2
, ((subset_data_61$bdy0200_wgt_f2f4_new -24.06) / 3.41791044776119)
, subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=7.25 &
subset_data_61$age_f2f4 <=7.74 & subset_data_61$sex_f2f4 == 2
, ((subset_data_61$bdy0200_wgt_f2f4_new -25.48) / 3.7910447761194)

```

```

,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=7.75 &
subset_data_61$age_f2f4 <=8.24 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0200_wgt_f2f4_new -27.01) /4.19402985074627)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=8.25 &
subset_data_61$age_f2f4 <=8.74 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0200_wgt_f2f4_new -28.69) /4.67164179104478)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=8.75 &
subset_data_61$age_f2f4 <=9.24 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0200_wgt_f2f4_new -30.55) /5.23880597014926)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=9.25 &
subset_data_61$age_f2f4 <=9.74 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0200_wgt_f2f4_new -32.57) /5.86567164179104)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=9.75 &
subset_data_61$age_f2f4 <=10.24 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0200_wgt_f2f4_new -34.68) /6.52238805970149)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=10.25 &
subset_data_61$age_f2f4 <=10.74 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0200_wgt_f2f4_new -36.92) /7.20895522388059)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=10.75 &
subset_data_61$age_f2f4 <=11.24 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0200_wgt_f2f4_new -39.37) /7.88059701492536)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=11.25 &
subset_data_61$age_f2f4 <=11.74 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0200_wgt_f2f4_new -42.05) /8.46268656716417)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=11.75 &
subset_data_61$age_f2f4 <=12.24 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0200_wgt_f2f4_new -44.87) /8.8955223880597)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=12.25 &
subset_data_61$age_f2f4 <=12.74 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0200_wgt_f2f4_new -47.59) /9.11940298507464)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=12.75 &
subset_data_61$age_f2f4 <=13.24 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0200_wgt_f2f4_new -50.02) /9.17910447761195)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=13.25 &
subset_data_61$age_f2f4 <=13.74 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0200_wgt_f2f4_new -52.16) /9.10447761194029)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=13.75 &
subset_data_61$age_f2f4 <=14.24 & subset_data_61$sex_f2f4 == 2

```

```

,((subset_data_61$bdy0200_wgt_f2f4_new -54.01) /8.97014925373134)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=14.25 &
subset_data_61$age_f2f4 <=14.74 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0200_wgt_f2f4_new -55.55) /8.82089552238805)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=14.75 &
subset_data_61$age_f2f4 <=15.24 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0200_wgt_f2f4_new -56.8) /8.6865671641791)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=15.25 &
subset_data_61$age_f2f4 <=15.74 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0200_wgt_f2f4_new -57.79) /8.56716417910448)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=15.75 &
subset_data_61$age_f2f4 <=16.24 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0200_wgt_f2f4_new -58.53) /8.46268656716418)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=16.25 &
subset_data_61$age_f2f4 <=16.74 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0200_wgt_f2f4_new -59.07) /8.38805970149253)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=16.75 &
subset_data_61$age_f2f4 <=17.24 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0200_wgt_f2f4_new -59.47) /8.34328358208955)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=17.25 &
subset_data_61$age_f2f4 <=17.74 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0200_wgt_f2f4_new -59.78) /8.29850746268657)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=17.75 &
subset_data_61$age_f2f4 <=18.24 & subset_data_61$sex_f2f4 == 2
,((subset_data_61$bdy0200_wgt_f2f4_new -60.08) /8.26865671641791)
,subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <- ifelse (subset_data_61$age_f2f4 >=18.25 &
subset_data_61$sex_f2f4 == 2 ,((subset_data_61$bdy0200_wgt_f2f4_new -
71.9564089) /12.7932869768509) ,subset_data_61$prh0200_f2f4)

subset_data_61$prh0200_f2f4 <- pnorm(subset_data_61$prh0200_f2f4)*100
subset_data_61$prh0200_f2f4 <- ifelse(subset_data_61$bdy0200_wgt_f2f4_new <0,
-95, subset_data_61$prh0200_f2f4)
subset_data_61$prh0200_f2f4 <-
ifelse(is.na(subset_data_61$bdy0200_wgt_f2f4_new) |
is.na(subset_data_61$age_f2f4), NA, subset_data_61$prh0200_f2f4)
summary(subset_data_61$prh0200_f2f4)

# percentage men weight F2F4
subset_data_61$prh0200_f2f5 <- NA
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=2.25 &
subset_data_61$age_f2f5 <=2.74 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0200_wgt_f2f5 -13.87) /1.49253731343284)

```

```

,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=2.75 &
subset_data_61$age_f2f5 <=3.24 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0200_wgt_f2f5 -15.03) /1.62686567164179)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=3.25 &
subset_data_61$age_f2f5 <=3.74 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0200_wgt_f2f5 -16.14) /1.7910447761194)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=3.75 &
subset_data_61$age_f2f5 <=4.24 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0200_wgt_f2f5 -17.15) /1.94029850746268)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=4.25 &
subset_data_61$age_f2f5 <=4.74 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0200_wgt_f2f5 -18.07) /2.07462686567164)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=4.75 &
subset_data_61$age_f2f5 <=5.24 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0200_wgt_f2f5 -19.05) /2.25373134328358)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=5.25 &
subset_data_61$age_f2f5 <=5.74 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0200_wgt_f2f5 -20.19) /2.46268656716418)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=5.75 &
subset_data_61$age_f2f5 <=6.24 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0200_wgt_f2f5 -21.5) /2.71641791044776)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=6.25 &
subset_data_61$age_f2f5 <=6.74 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0200_wgt_f2f5 -22.98) /3.02985074626866)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=6.75 &
subset_data_61$age_f2f5 <=7.24 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0200_wgt_f2f5 -24.58) /3.38805970149254)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=7.25 &
subset_data_61$age_f2f5 <=7.74 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0200_wgt_f2f5 -26.17) /3.76119402985075)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=7.75 &
subset_data_61$age_f2f5 <=8.24 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0200_wgt_f2f5 -27.66) /4.1044776119403)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=8.25 &
subset_data_61$age_f2f5 <=8.74 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0200_wgt_f2f5 -29.25) /4.50746268656716)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=8.75 &
subset_data_61$age_f2f5 <=9.24 & subset_data_61$sex_f2f5 == 1

```

```
,((subset_data_61$bdy0200_wgt_f2f5 -31) /4.92537313432836)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=9.25 &
subset_data_61$age_f2f5 <=9.74 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0200_wgt_f2f5 -32.84) /5.37313432835822)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=9.75 &
subset_data_61$age_f2f5 <=10.24 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0200_wgt_f2f5 -34.79) /5.86567164179104)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=10.25 &
subset_data_61$age_f2f5 <=10.74 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0200_wgt_f2f5 -36.81) /6.4179104477612)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=10.75 &
subset_data_61$age_f2f5 <=11.24 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0200_wgt_f2f5 -38.88) /7.02985074626866)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=11.25 &
subset_data_61$age_f2f5 <=11.74 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0200_wgt_f2f5 -41) /7.65671641791045)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=11.75 &
subset_data_61$age_f2f5 <=12.24 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0200_wgt_f2f5 -43.25) /8.32835820895522)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=12.25 &
subset_data_61$age_f2f5 <=12.74 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0200_wgt_f2f5 -45.82) /9.04477611940299)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=12.75 &
subset_data_61$age_f2f5 <=13.24 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0200_wgt_f2f5 -48.81) /9.76119402985074)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=13.25 &
subset_data_61$age_f2f5 <=13.74 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0200_wgt_f2f5 -52.14) /10.4179104477612)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=13.75 &
subset_data_61$age_f2f5 <=14.24 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0200_wgt_f2f5 -55.51) /10.8507462686567)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=14.25 &
subset_data_61$age_f2f5 <=14.74 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0200_wgt_f2f5 -58.75) /11) ,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=14.75 &
subset_data_61$age_f2f5 <=15.24 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0200_wgt_f2f5 -61.69) /10.8805970149254)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=15.25 &
subset_data_61$age_f2f5 <=15.74 & subset_data_61$sex_f2f5 == 1
```

```
,((subset_data_61$bdy0200_wgt_f2f5 -64.26) /10.6417910447761)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=15.75 &
subset_data_61$age_f2f5 <=16.24 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0200_wgt_f2f5 -66.3) /10.4477611940298)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=16.25 &
subset_data_61$age_f2f5 <=16.74 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0200_wgt_f2f5 -67.87) /10.3134328358209)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=16.75 &
subset_data_61$age_f2f5 <=17.24 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0200_wgt_f2f5 -69.15) /10.2686567164179)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=17.25 &
subset_data_61$age_f2f5 <=17.74 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0200_wgt_f2f5 -70.3) /10.2537313432836)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=17.75 &
subset_data_61$age_f2f5 <=18.24 & subset_data_61$sex_f2f5 == 1
,((subset_data_61$bdy0200_wgt_f2f5 -71.39) /10.2537313432836)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=18.25 &
subset_data_61$sex_f2f5 == 1 ,((subset_data_61$bdy0200_wgt_f2f5 -86.57442)
/11.6079618077936) ,subset_data_61$prh0200_f2f5)

# percentage women weight F2F4
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=1.75 &
subset_data_61$age_f2f5 <=2.24 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0200_wgt_f2f5 -11.95) /1.25373134328358)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=2.25 &
subset_data_61$age_f2f5 <=2.74 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0200_wgt_f2f5 -13.18) /1.43283582089552)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=2.75 &
subset_data_61$age_f2f5 <=3.24 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0200_wgt_f2f5 -14.42) /1.61194029850746)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=3.25 &
subset_data_61$age_f2f5 <=3.74 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0200_wgt_f2f5 -15.54) /1.7910447761194)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=3.75 &
subset_data_61$age_f2f5 <=4.24 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0200_wgt_f2f5 -16.6) /1.97014925373135)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=4.25 &
subset_data_61$age_f2f5 <=4.74 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0200_wgt_f2f5 -17.69) /2.16417910447762)
,subset_data_61$prh0200_f2f5)
```

```

subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=4.75 &
subset_data_61$age_f2f5 <=5.24 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0200_wgt_f2f5 -18.84) /2.35820895522388)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=5.25 &
subset_data_61$age_f2f5 <=5.74 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0200_wgt_f2f5 -20.06) /2.58208955223881)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=5.75 &
subset_data_61$age_f2f5 <=6.24 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0200_wgt_f2f5 -21.35) /2.83582089552239)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=6.25 &
subset_data_61$age_f2f5 <=6.74 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0200_wgt_f2f5 -22.7) /3.11940298507463)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=6.75 &
subset_data_61$age_f2f5 <=7.24 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0200_wgt_f2f5 -24.06) /3.41791044776119)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=7.25 &
subset_data_61$age_f2f5 <=7.74 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0200_wgt_f2f5 -25.48) /3.7910447761194)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=7.75 &
subset_data_61$age_f2f5 <=8.24 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0200_wgt_f2f5 -27.01) /4.19402985074627)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=8.25 &
subset_data_61$age_f2f5 <=8.74 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0200_wgt_f2f5 -28.69) /4.67164179104478)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=8.75 &
subset_data_61$age_f2f5 <=9.24 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0200_wgt_f2f5 -30.55) /5.23880597014926)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=9.25 &
subset_data_61$age_f2f5 <=9.74 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0200_wgt_f2f5 -32.57) /5.86567164179104)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=9.75 &
subset_data_61$age_f2f5 <=10.24 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0200_wgt_f2f5 -34.68) /6.52238805970149)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=10.25 &
subset_data_61$age_f2f5 <=10.74 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0200_wgt_f2f5 -36.92) /7.20895522388059)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=10.75 &
subset_data_61$age_f2f5 <=11.24 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0200_wgt_f2f5 -39.37) /7.88059701492536)

```

```

,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=11.25 &
subset_data_61$age_f2f5 <=11.74 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0200_wgt_f2f5 -42.05) /8.46268656716417)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=11.75 &
subset_data_61$age_f2f5 <=12.24 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0200_wgt_f2f5 -44.87) /8.8955223880597)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=12.25 &
subset_data_61$age_f2f5 <=12.74 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0200_wgt_f2f5 -47.59) /9.11940298507464)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=12.75 &
subset_data_61$age_f2f5 <=13.24 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0200_wgt_f2f5 -50.02) /9.17910447761195)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=13.25 &
subset_data_61$age_f2f5 <=13.74 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0200_wgt_f2f5 -52.16) /9.10447761194029)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=13.75 &
subset_data_61$age_f2f5 <=14.24 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0200_wgt_f2f5 -54.01) /8.97014925373134)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=14.25 &
subset_data_61$age_f2f5 <=14.74 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0200_wgt_f2f5 -55.55) /8.82089552238805)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=14.75 &
subset_data_61$age_f2f5 <=15.24 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0200_wgt_f2f5 -56.8) /8.6865671641791)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=15.25 &
subset_data_61$age_f2f5 <=15.74 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0200_wgt_f2f5 -57.79) /8.56716417910448)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=15.75 &
subset_data_61$age_f2f5 <=16.24 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0200_wgt_f2f5 -58.53) /8.46268656716418)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=16.25 &
subset_data_61$age_f2f5 <=16.74 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0200_wgt_f2f5 -59.07) /8.38805970149253)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=16.75 &
subset_data_61$age_f2f5 <=17.24 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0200_wgt_f2f5 -59.47) /8.34328358208955)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=17.25 &
subset_data_61$age_f2f5 <=17.74 & subset_data_61$sex_f2f5 == 2

```

```
,((subset_data_61$bdy0200_wgt_f2f5 -59.78) /8.29850746268657)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=17.75 &
subset_data_61$age_f2f5 <=18.24 & subset_data_61$sex_f2f5 == 2
,((subset_data_61$bdy0200_wgt_f2f5 -60.08) /8.26865671641791)
,subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse (subset_data_61$age_f2f5 >=18.25 &
subset_data_61$sex_f2f5 == 2 ,((subset_data_61$bdy0200_wgt_f2f5 -71.9564089)
/12.7932869768509) ,subset_data_61$prh0200_f2f5)

subset_data_61$prh0200_f2f5 <- pnorm(subset_data_61$prh0200_f2f5)*100
subset_data_61$prh0200_f2f5 <- ifelse(subset_data_61$bdy0200_wgt_f2f5 <0, -
95, subset_data_61$prh0200_f2f5)
subset_data_61$prh0200_f2f5 <- ifelse(is.na(subset_data_61$bdy0200_wgt_f2f5)
| is.na(subset_data_61$age_f2f5), NA, subset_data_61$prh0200_f2f5)
summary(subset_data_61$prh0200_f2f5)
```

x

```
# setting missings automatically, if person exceed their cutoff (PR1 + 2SD or
PR99+2SD) for their age group - males
```

```
library(haven)
subset_data_62 <- zap_labels(subset_data_61)
```

```
library(dplyr)
```

```
suffixes <- c("f2f1", "f2f2", "f2f3", "f2f4", "f2f5")
```

```
for (s in suffixes) {
  age_var <- paste0("age_", s)
  sex_var <- paste0("sex_", s)
  height_var <- paste0("bdy0100_hgt_", s, "_new")
  flag_var <- paste0("bdy1001_", s, "_new") # Variable to set to 9 when
height is -82
  if (s == "f2f5"){
    height_var <- paste0("bdy0100_hgt_", s)
    flag_var <- paste0("bdy1001_", s) # Variable to set to 9 when height is -
82
  }
  subset_data_62 <- subset_data_62 %>%
  mutate(
    !!height_var := case_when(
      !is.na(.data[[age_var]]) & !is.na(.data[[sex_var]]) &
      .data[[sex_var]] == 1 & !is.na(.data[[height_var]]) & (.data[[height_var]]
      >=0 &
      ((.data[[age_var]] >= 3.75 & .data[[age_var]] <= 4.24 &
      (.data[[height_var]] < 86.93186 | .data[[height_var]] > 122.1881)) |
      (.data[[age_var]] >= 4.25 & .data[[age_var]] <= 4.74 &
      (.data[[height_var]] < 89.34319 | .data[[height_var]] > 126.5368)) |
      (.data[[age_var]] >= 4.75 & .data[[age_var]] <= 5.24 &
      (.data[[height_var]] < 91.79388 | .data[[height_var]] > 130.6661)) |
```

```
(.data[[age_var]] >= 5.25 & .data[[age_var]] <= 5.74 &
(.data[[height_var]] < 94.23457 | .data[[height_var]] > 134.7854)) |
(.data[[age_var]] >= 5.75 & .data[[age_var]] <= 6.24 &
(.data[[height_var]] < 96.72929 | .data[[height_var]] > 138.8307)) |
(.data[[age_var]] >= 6.25 & .data[[age_var]] <= 6.74 &
(.data[[height_var]] < 99.36934 | .data[[height_var]] > 142.8907)) |
(.data[[age_var]] >= 6.75 & .data[[age_var]] <= 7.24 &
(.data[[height_var]] < 102.03895 | .data[[height_var]] > 146.9811)) |
(.data[[age_var]] >= 7.25 & .data[[age_var]] <= 7.74 &
(.data[[height_var]] < 104.65303 | .data[[height_var]] > 150.887)) |
(.data[[age_var]] >= 7.75 & .data[[age_var]] <= 8.24 &
(.data[[height_var]] < 106.89818 | .data[[height_var]] > 154.6818)) |
(.data[[age_var]] >= 8.25 & .data[[age_var]] <= 8.74 &
(.data[[height_var]] < 108.95333 | .data[[height_var]] > 158.2867)) |
(.data[[age_var]] >= 8.75 & .data[[age_var]] <= 9.24 &
(.data[[height_var]] < 110.77955 | .data[[height_var]] > 161.9204)) |
(.data[[age_var]] >= 9.25 & .data[[age_var]] <= 9.74 &
(.data[[height_var]] < 112.37599 | .data[[height_var]] > 165.584)) |
(.data[[age_var]] >= 9.75 & .data[[age_var]] <= 10.24 &
(.data[[height_var]] < 113.91329 | .data[[height_var]] > 169.1867)) |
(.data[[age_var]] >= 10.25 & .data[[age_var]] <= 10.74 &
(.data[[height_var]] < 115.16187 | .data[[height_var]] > 173.0181)) |
(.data[[age_var]] >= 10.75 & .data[[age_var]] <= 11.24 &
(.data[[height_var]] < 116.3311 | .data[[height_var]] > 177.0289)) |
(.data[[age_var]] >= 11.25 & .data[[age_var]] <= 11.74 &
(.data[[height_var]] < 117.51587 | .data[[height_var]] > 181.1841)) |
(.data[[age_var]] >= 11.75 & .data[[age_var]] <= 12.24 &
(.data[[height_var]] < 118.77171 | .data[[height_var]] > 185.6683)) |
(.data[[age_var]] >= 12.25 & .data[[age_var]] <= 12.74 &
(.data[[height_var]] < 120.49647 | .data[[height_var]] > 190.3635)) |
(.data[[age_var]] >= 12.75 & .data[[age_var]] <= 13.24 &
(.data[[height_var]] < 122.77613 | .data[[height_var]] > 195.4839)) |
(.data[[age_var]] >= 13.25 & .data[[age_var]] <= 13.74 &
(.data[[height_var]] < 125.97128 | .data[[height_var]] > 200.2287)) |
(.data[[age_var]] >= 13.75 & .data[[age_var]] <= 14.24 &
(.data[[height_var]] < 129.93021 | .data[[height_var]] > 203.9298)) |
(.data[[age_var]] >= 14.25 & .data[[age_var]] <= 14.74 &
(.data[[height_var]] < 134.31888 | .data[[height_var]] > 206.3811)) |
(.data[[age_var]] >= 14.75 & .data[[age_var]] <= 15.24 &
(.data[[height_var]] < 138.63857 | .data[[height_var]] > 207.6014)) |
(.data[[age_var]] >= 15.25 & .data[[age_var]] <= 15.74 &
(.data[[height_var]] < 142.39763 | .data[[height_var]] > 208.0024)) |
(.data[[age_var]] >= 15.75 & .data[[age_var]] <= 16.24 &
(.data[[height_var]] < 145.14905 | .data[[height_var]] > 208.171)) |
(.data[[age_var]] >= 16.25 & .data[[age_var]] <= 16.74 &
(.data[[height_var]] < 147.01282 | .data[[height_var]] > 208.2272)) |
(.data[[age_var]] >= 16.75 & .data[[age_var]] <= 17.24 &
(.data[[height_var]] < 148.21428 | .data[[height_var]] > 208.2657)) |
(.data[[age_var]] >= 17.25 & .data[[age_var]] <= 17.74 &
(.data[[height_var]] < 149.04149 | .data[[height_var]] > 208.3185)) |
(.data[[age_var]] >= 17.75 & .data[[age_var]] <= 18.24 &
```

```

(.data[[height_var]] < 149.7887 | .data[[height_var]] > 208.2913)) |
  (.data[[age_var]] >= 18.25 & (.data[[height_var]] < 154.71682 |
.data[[height_var]] > 205.2832))
  ) ~ -81,
  TRUE ~ .data[[height_var]]
),
)
}

for (s in suffixes) {
  age_var <- paste0("age_", s)
  sex_var <- paste0("sex_", s)
  height_var <- paste0("bdy0100_hgt_", s, "_new")
  flag_var <- paste0("bdy1001_", s, "_new") # Variable to set to 9 when
height is -82

  if (s == "f2f5") {
    height_var <- paste0("bdy0100_hgt_", s)
    flag_var <- paste0("bdy1001_", s)
  }

  subset_data_62 <- subset_data_62 %>%
    mutate(
      !!height_var := case_when(
        !is.na(.data[[age_var]]) & !is.na(.data[[sex_var]]) &
.data[[sex_var]] == 2 & !is.na(.data[[height_var]]) & (.data[[height_var]])
>= 0 &
        ((.data[[age_var]] >= 3.75 & .data[[age_var]] <= 4.24 &
(.data[[height_var]] < 86.02069 | .data[[height_var]] > 120.88)) |
        (.data[[age_var]] >= 4.25 & .data[[age_var]] <= 4.74 &
(.data[[height_var]] < 88.69206 | .data[[height_var]] > 125.4885)) |
        (.data[[age_var]] >= 4.75 & .data[[age_var]] <= 5.24 &
(.data[[height_var]] < 91.45324 | .data[[height_var]] > 130.1271)) |
        (.data[[age_var]] >= 5.25 & .data[[age_var]] <= 5.74 &
(.data[[height_var]] < 94.10386 | .data[[height_var]] > 134.4566)) |
        (.data[[age_var]] >= 5.75 & .data[[age_var]] <= 6.24 &
(.data[[height_var]] < 96.57408 | .data[[height_var]] > 138.576)) |
        (.data[[age_var]] >= 6.25 & .data[[age_var]] <= 6.74 &
(.data[[height_var]] < 98.92922 | .data[[height_var]] > 142.4509)) |
        (.data[[age_var]] >= 6.75 & .data[[age_var]] <= 7.24 &
(.data[[height_var]] < 101.10944 | .data[[height_var]] > 146.2503)) |
        (.data[[age_var]] >= 7.25 & .data[[age_var]] <= 7.74 &
(.data[[height_var]] < 103.23473 | .data[[height_var]] > 150.0643)) |
        (.data[[age_var]] >= 7.75 & .data[[age_var]] <= 8.24 &
(.data[[height_var]] < 105.28571 | .data[[height_var]] > 153.9629)) |
        (.data[[age_var]] >= 8.25 & .data[[age_var]] <= 8.74 &
(.data[[height_var]] < 107.28196 | .data[[height_var]] > 157.9061)) |
        (.data[[age_var]] >= 8.75 & .data[[age_var]] <= 9.24 &
(.data[[height_var]] < 109.18862 | .data[[height_var]] > 161.8192)) |
        (.data[[age_var]] >= 9.25 & .data[[age_var]] <= 9.74 &
(.data[[height_var]] < 111.08999 | .data[[height_var]] > 165.6878)) |

```

```

      (.data[[age_var]] >= 9.75 & .data[[age_var]] <= 10.24 &
(.data[[height_var]] < 113.12649 | .data[[height_var]] > 169.5918)) |
      (.data[[age_var]] >= 10.25 & .data[[age_var]] <= 10.74 &
(.data[[height_var]] < 115.29755 | .data[[height_var]] > 173.4521)) |
      (.data[[age_var]] >= 10.75 & .data[[age_var]] <= 11.24 &
(.data[[height_var]] < 117.68298 | .data[[height_var]] > 177.2887)) |
      (.data[[age_var]] >= 11.25 & .data[[age_var]] <= 11.74 &
(.data[[height_var]] < 120.24749 | .data[[height_var]] > 180.937)) |
      (.data[[age_var]] >= 11.75 & .data[[age_var]] <= 12.24 &
(.data[[height_var]] < 122.84074 | .data[[height_var]] > 184.0779)) |
      (.data[[age_var]] >= 12.25 & .data[[age_var]] <= 12.74 &
(.data[[height_var]] < 125.20302 | .data[[height_var]] > 186.7296)) |
      (.data[[age_var]] >= 12.75 & .data[[age_var]] <= 13.24 &
(.data[[height_var]] < 127.09948 | .data[[height_var]] > 188.5876)) |
      (.data[[age_var]] >= 13.25 & .data[[age_var]] <= 13.74 &
(.data[[height_var]] < 128.74961 | .data[[height_var]] > 190.0001)) |
      (.data[[age_var]] >= 13.75 & .data[[age_var]] <= 14.24 &
(.data[[height_var]] < 130.35809 | .data[[height_var]] > 191.1518)) |
      (.data[[age_var]] >= 14.25 & .data[[age_var]] <= 14.74 &
(.data[[height_var]] < 131.98006 | .data[[height_var]] > 192.0281)) |
      (.data[[age_var]] >= 14.75 & .data[[age_var]] <= 15.24 &
(.data[[height_var]] < 133.5359 | .data[[height_var]] > 192.669)) |
      (.data[[age_var]] >= 15.25 & .data[[age_var]] <= 15.74 &
(.data[[height_var]] < 134.89154 | .data[[height_var]] > 193.0498)) |
      (.data[[age_var]] >= 18.25 & (.data[[height_var]] < 143.15916 |
.data[[height_var]] > 189.6008))) ~ -81,
      TRUE ~ .data[[height_var]]
    )
  )
}

```

Load relevant libraries

```

library(haven)
library(dplyr)
library(stringr)
library(foreign)
library(openxlsx)

```

#v9.0.0 final corrections

```

subset_data_63 <- subset_data_62
# correction of typing errors
# setting implausible values manually to -81
control <- 0

```

```

if (control == 0){

```

#xxx

```

subset_data_63$bdy0100_hgt_f2f1_new[subset_data_63$pid_suf ==129136300] <-165
subset_data_63$bdy0100_hgt_f2f1_new[subset_data_63$pid_suf ==140958200] <-158
subset_data_63$bdy0100_hgt_f2f1_new[subset_data_63$pid_suf ==142393300] <-163
subset_data_63$bdy0100_hgt_f2f1_new[subset_data_63$pid_suf ==146089300] <-168
subset_data_63$bdy0100_hgt_f2f1_new[subset_data_63$pid_suf ==148028300] <-190
subset_data_63$bdy0100_hgt_f2f1_new[subset_data_63$pid_suf ==166685400] <-206
subset_data_63$bdy0100_hgt_f2f1_new[subset_data_63$pid_suf ==167743002] <-142
subset_data_63$bdy0100_hgt_f2f1_new[subset_data_63$pid_suf ==170315300] <-143
subset_data_63$bdy0100_hgt_f2f1_new[subset_data_63$pid_suf ==172966300] <-165
subset_data_63$bdy0100_hgt_f2f1_new[subset_data_63$pid_suf ==174643400] <-206
subset_data_63$bdy0100_hgt_f2f1_new[subset_data_63$pid_suf ==182479200] <- -
81
subset_data_63$bdy0100_hgt_f2f1_new[subset_data_63$pid_suf ==189897400] <-154
subset_data_63$bdy0100_hgt_f2f1_new[subset_data_63$pid_suf ==195502001] <- -
81
subset_data_63$bdy0100_hgt_f2f1_new[subset_data_63$pid_suf ==246909200] <- -
81
subset_data_63$bdy0100_hgt_f2f1_new[subset_data_63$pid_suf ==254379400] <-150
subset_data_63$bdy0100_hgt_f2f1_new[subset_data_63$pid_suf ==262672300] <- -
81
subset_data_63$bdy0100_hgt_f2f1_new[subset_data_63$pid_suf ==265589002] <- -
81
subset_data_63$bdy0100_hgt_f2f1_new[subset_data_63$pid_suf ==265589001] <- -
81
subset_data_63$bdy0100_hgt_f2f1_new[subset_data_63$pid_suf ==283641300] <-160
subset_data_63$bdy0100_hgt_f2f1_new[subset_data_63$pid_suf ==286228400] <-152
subset_data_63$bdy0100_hgt_f2f1_new[subset_data_63$pid_suf ==328670300] <- -
81
subset_data_63$bdy0100_hgt_f2f1_new[subset_data_63$pid_suf ==371407001] <- -
81
subset_data_63$bdy0100_hgt_f2f1_new[subset_data_63$pid_suf ==373339002] <-146
subset_data_63$bdy0100_hgt_f2f1_new[subset_data_63$pid_suf ==378238001] <-173
subset_data_63$bdy0100_hgt_f2f1_new[subset_data_63$pid_suf ==388532001] <-166
subset_data_63$bdy0100_hgt_f2f1_new[subset_data_63$pid_suf ==388972200] <-208
subset_data_63$bdy0100_hgt_f2f1_new[subset_data_63$pid_suf ==433249002] <-171
subset_data_63$bdy0100_hgt_f2f1_new[subset_data_63$pid_suf ==450567001] <- -
81
subset_data_63$bdy0100_hgt_f2f1_new[subset_data_63$pid_suf ==453292001] <- -
81
subset_data_63$bdy0100_hgt_f2f1_new[subset_data_63$pid_suf ==466941110] <-142
subset_data_63$bdy0100_hgt_f2f1_new[subset_data_63$pid_suf ==470896300] <-140
subset_data_63$bdy0100_hgt_f2f1_new[subset_data_63$pid_suf ==475291002] <-175
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==137011200] <-145
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==139324200] <-132
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==141415001] <- -
81
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==141415002] <- -
81
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==148028300] <-190
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==151635200] <-145
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==163716400] <-175

```

```
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==164528400] <-178
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==166025200] <-130
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==166685400] <-206
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==167021200] <-155
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==167743002] <-160
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==170315300] <-143
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==172745001] <- -
81
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==172745002] <- -
81
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==174643400] <-206
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==184568200] <-152
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==188672200] <-155
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==189897400] <-154
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==199655400] <-186
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==214345002] <-155
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==214347002] <-163
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==214570400] <- -
81
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==226177001] <-162
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==227424001] <-159
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==231642400] <-150
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==232735001] <-161
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==232735002] <-159
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==240822001] <-164
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==251082002] <-125
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==251236300] <- -
81
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==251843300] <-172
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==251961002] <- -
81
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==257141002] <-140
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==262571001] <-170
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==263068002] <-160
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==264761002] <-142
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==264889001] <-169
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==266121002] <-158
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==274037002] <-153
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==282021002] <-158
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==286228400] <-152
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==287877001] <- -
81
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==288444001] <-158
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==292289200] <-145
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==295728300] <-158
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==315834002] <-178
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==321808002] <-196
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==339555001] <-166
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==340621200] <-187
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==354919400] <-149
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==386425001] <- -
```

```

81
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==390135002] <- -
81
subset_data_63$bdy0100_hgt_f2f2_new[subset_data_63$pid_suf ==398482001] <-165
subset_data_63$bdy0100_hgt_f2f3_new[subset_data_63$pid_suf ==135179002] <-137
subset_data_63$bdy0100_hgt_f2f3_new[subset_data_63$pid_suf ==154492001] <- -
81
subset_data_63$bdy0100_hgt_f2f3_new[subset_data_63$pid_suf ==157488200] <- -
81
subset_data_63$bdy0100_hgt_f2f3_new[subset_data_63$pid_suf ==167743002] <-174
subset_data_63$bdy0100_hgt_f2f3_new[subset_data_63$pid_suf ==169199200] <- -
81
subset_data_63$bdy0100_hgt_f2f3_new[subset_data_63$pid_suf ==197500001] <-132
subset_data_63$bdy0100_hgt_f2f3_new[subset_data_63$pid_suf ==197500002] <-133
subset_data_63$bdy0100_hgt_f2f4_new[subset_data_63$pid_suf ==122107200] <- -
81
subset_data_63$bdy0100_hgt_f2f4_new[subset_data_63$pid_suf ==148028300] <-190
subset_data_63$bdy0100_hgt_f2f4_new[subset_data_63$pid_suf ==158546002] <- -
81
subset_data_63$bdy0100_hgt_f2f4_new[subset_data_63$pid_suf ==163861001] <- -
81
subset_data_63$bdy0100_hgt_f2f4_new[subset_data_63$pid_suf ==163861002] <- -
81
subset_data_63$bdy0100_hgt_f2f4_new[subset_data_63$pid_suf ==166685400] <-206
subset_data_63$bdy0100_hgt_f2f4_new[subset_data_63$pid_suf ==167743002] <-191
subset_data_63$bdy0100_hgt_f2f4_new[subset_data_63$pid_suf ==168642001] <- -
81
subset_data_63$bdy0100_hgt_f2f4_new[subset_data_63$pid_suf ==168642002] <- -
81
subset_data_63$bdy0100_hgt_f2f4_new[subset_data_63$pid_suf ==169135200] <- -
81
subset_data_63$bdy0100_hgt_f2f4_new[subset_data_63$pid_suf ==170315300] <-143
subset_data_63$bdy0100_hgt_f2f4_new[subset_data_63$pid_suf ==171885300] <-165
subset_data_63$bdy0100_hgt_f2f4_new[subset_data_63$pid_suf ==186238300] <- -
81
subset_data_63$bdy0100_hgt_f2f4_new[subset_data_63$pid_suf ==187849300] <-158
subset_data_63$bdy0100_hgt_f2f4_new[subset_data_63$pid_suf ==189897400] <-154
subset_data_63$bdy0100_hgt_f2f4_new[subset_data_63$pid_suf ==233608200] <-206
subset_data_63$bdy0100_hgt_f2f4_new[subset_data_63$pid_suf ==286228400] <-152
subset_data_63$bdy0100_hgt_f2f4_new[subset_data_63$pid_suf ==286379300] <-
163
subset_data_63$bdy0100_hgt_f2f4_new[subset_data_63$pid_suf ==293101400] <- -
81
subset_data_63$bdy0100_hgt_f2f4_new[subset_data_63$pid_suf ==317790400] <-170
subset_data_63$bdy0100_hgt_f2f4_new[subset_data_63$pid_suf ==363967400] <- -
81
subset_data_63$bdy0100_hgt_f2f4_new[subset_data_63$pid_suf ==372428300] <- -
81
subset_data_63$bdy0100_hgt_f2f4_new[subset_data_63$pid_suf ==377052300] <- -
81
subset_data_63$bdy0100_hgt_f2f4_new[subset_data_63$pid_suf ==380165300] <- -

```

```

81
subset_data_63$bdy0100_hgt_f2f4_new[subset_data_63$pid_suf ==492853200] <-
169
subset_data_63$bdy0100_hgt_f2f5[subset_data_63$pid_suf ==114028001] <- -81
subset_data_63$bdy0100_hgt_f2f5[subset_data_63$pid_suf ==116689300] <- -81
subset_data_63$bdy0100_hgt_f2f5[subset_data_63$pid_suf ==166685400] <- -206
subset_data_63$bdy0100_hgt_f2f5[subset_data_63$pid_suf ==170315300] <- -143
subset_data_63$bdy0100_hgt_f2f5[subset_data_63$pid_suf ==175592300] <- -165
subset_data_63$bdy0100_hgt_f2f5[subset_data_63$pid_suf ==183824002] <- -81
subset_data_63$bdy0100_hgt_f2f5[subset_data_63$pid_suf ==186238400] <- -81
subset_data_63$bdy0100_hgt_f2f5[subset_data_63$pid_suf ==189897400] <- -154
subset_data_63$bdy0100_hgt_f2f5[subset_data_63$pid_suf ==233608200] <- -206
subset_data_63$bdy0100_hgt_f2f5[subset_data_63$pid_suf ==263068002] <- -165
subset_data_63$bdy0100_hgt_f2f5[subset_data_63$pid_suf ==286228400] <- -151
subset_data_63$bdy0100_hgt_f2f5[subset_data_63$pid_suf ==318987002] <- -176
subset_data_63$bdy0100_hgt_f2f5[subset_data_63$pid_suf ==336095001] <- -81
subset_data_63$bdy0100_hgt_f2f5[subset_data_63$pid_suf ==431159400] <- -81
subset_data_63$bdy0100_hgt_f2f5[subset_data_63$pid_suf ==456065002] <- -81
subset_data_63$bdy0100_hgt_f2f5[subset_data_63$pid_suf ==487011300] <- 179

```

####weight####

```

subset_data_63$bdy0200_wgt_f2f1_new[subset_data_63$pid_suf ==114097001] <- -
81
subset_data_63$bdy0200_wgt_f2f1_new[subset_data_63$pid_suf ==115568002] <- -
81
subset_data_63$bdy0200_wgt_f2f1_new[subset_data_63$pid_suf ==115584002] <- -
81
subset_data_63$bdy0200_wgt_f2f1_new[subset_data_63$pid_suf ==126339001] <- -
81
subset_data_63$bdy0200_wgt_f2f1_new[subset_data_63$pid_suf ==164528001] <- -
81
subset_data_63$bdy0200_wgt_f2f1_new[subset_data_63$pid_suf ==173154001] <- -
81
subset_data_63$bdy0200_wgt_f2f1_new[subset_data_63$pid_suf ==221865002] <- -
81
subset_data_63$bdy0200_wgt_f2f1_new[subset_data_63$pid_suf ==272800002] <- -
81
subset_data_63$bdy0200_wgt_f2f1_new[subset_data_63$pid_suf ==289480200] <- 36
subset_data_63$bdy0200_wgt_f2f1_new[subset_data_63$pid_suf ==299846002] <- 28
subset_data_63$bdy0200_wgt_f2f1_new[subset_data_63$pid_suf ==352132002] <- 60
subset_data_63$bdy0200_wgt_f2f1_new[subset_data_63$pid_suf ==399208400] <- 82
subset_data_63$bdy0200_wgt_f2f1_new[subset_data_63$pid_suf ==423467001] <- 52
subset_data_63$bdy0200_wgt_f2f1_new[subset_data_63$pid_suf ==433249002] <- -
81
subset_data_63$bdy0200_wgt_f2f1_new[subset_data_63$pid_suf ==472760400] <- 86
subset_data_63$bdy0200_wgt_f2f1_new[subset_data_63$pid_suf ==498367300] <- 58
subset_data_63$bdy0200_wgt_f2f2_new[subset_data_63$pid_suf ==154461002] <- -
81
subset_data_63$bdy0200_wgt_f2f2_new[subset_data_63$pid_suf ==159070001] <- 30

```

```

subset_data_63$bdy0200_wgt_f2f2_new[subset_data_63$pid_suf ==173501001] <- -
81
subset_data_63$bdy0200_wgt_f2f2_new[subset_data_63$pid_suf ==174018002] <- -
81
subset_data_63$bdy0200_wgt_f2f2_new[subset_data_63$pid_suf ==218748400] <- -
81
subset_data_63$bdy0200_wgt_f2f2_new[subset_data_63$pid_suf ==221518001] <- 58
subset_data_63$bdy0200_wgt_f2f2_new[subset_data_63$pid_suf ==221518002] <- 50
subset_data_63$bdy0200_wgt_f2f2_new[subset_data_63$pid_suf ==249311002] <- 51
subset_data_63$bdy0200_wgt_f2f2_new[subset_data_63$pid_suf ==256281001] <- 58
subset_data_63$bdy0200_wgt_f2f2_new[subset_data_63$pid_suf ==264021002] <- 45
subset_data_63$bdy0200_wgt_f2f2_new[subset_data_63$pid_suf ==268513002] <- 65
subset_data_63$bdy0200_wgt_f2f2_new[subset_data_63$pid_suf ==285302001] <- 50
subset_data_63$bdy0200_wgt_f2f2_new[subset_data_63$pid_suf ==291543002] <- 56
subset_data_63$bdy0200_wgt_f2f2_new[subset_data_63$pid_suf ==323960002] <- 71
subset_data_63$bdy0200_wgt_f2f2_new[subset_data_63$pid_suf ==346234002] <- 70
subset_data_63$bdy0200_wgt_f2f2_new[subset_data_63$pid_suf ==370522001] <- 65
subset_data_63$bdy0200_wgt_f2f2_new[subset_data_63$pid_suf ==435519400] <- 70
subset_data_63$bdy0200_wgt_f2f2_new[subset_data_63$pid_suf ==464666002] <- -
81
subset_data_63$bdy0200_wgt_f2f3_new[subset_data_63$pid_suf ==126339001] <- -
81
subset_data_63$bdy0200_wgt_f2f3_new[subset_data_63$pid_suf ==126339002] <- -
81
subset_data_63$bdy0200_wgt_f2f3_new[subset_data_63$pid_suf ==126339202] <- -
81
subset_data_63$bdy0200_wgt_f2f3_new[subset_data_63$pid_suf ==148195001] <- 40
subset_data_63$bdy0200_wgt_f2f3_new[subset_data_63$pid_suf ==157488200] <- 45
subset_data_63$bdy0200_wgt_f2f3_new[subset_data_63$pid_suf ==170132002] <- 28
subset_data_63$bdy0200_wgt_f2f3_new[subset_data_63$pid_suf ==195364002] <- 33
subset_data_63$bdy0200_wgt_f2f4_new[subset_data_63$pid_suf ==113159200] <- -
81
subset_data_63$bdy0200_wgt_f2f4_new[subset_data_63$pid_suf ==133053200] <- -
81
subset_data_63$bdy0200_wgt_f2f4_new[subset_data_63$pid_suf ==142393400] <- -
81
subset_data_63$bdy0200_wgt_f2f4_new[subset_data_63$pid_suf ==169135200] <- -
81
subset_data_63$bdy0200_wgt_f2f4_new[subset_data_63$pid_suf ==169561200] <- -
81
subset_data_63$bdy0200_wgt_f2f4_new[subset_data_63$pid_suf ==172728001] <- -
81
subset_data_63$bdy0200_wgt_f2f4_new[subset_data_63$pid_suf ==172728002] <- -
81
subset_data_63$bdy0200_wgt_f2f4_new[subset_data_63$pid_suf ==178029300] <- 70
subset_data_63$bdy0200_wgt_f2f4_new[subset_data_63$pid_suf ==214570002] <- -
81
subset_data_63$bdy0200_wgt_f2f4_new[subset_data_63$pid_suf ==245714001] <- -
81
subset_data_63$bdy0200_wgt_f2f4_new[subset_data_63$pid_suf ==259506002] <- -
81

```

}

```
calculate_bmi <- function(hgt, wgt) {  
  if (all(c(hgt, wgt) >= 0 & !is.na(c(hgt, wgt)))) {  
    return(round(wgt / ((hgt / 100)^2), 1))  
  } else if (any(c(hgt, wgt) < 0, na.rm = TRUE)) {  
    return(min(c(hgt, wgt)[c(hgt, wgt) < 0], na.rm = TRUE))  
  } else {  
    return(NA_real_)  
  }  
}
```

#Flags

```
subset_data_7 <- subset_data_65 %>%
  mutate(bdy1001_f2f5 = ifelse(is.na(bdy0100_hgt_f2f5), NA,
    ifelse(bdy0100_hgt_f2f5 < 0, bdy0100_hgt_f2f5, 0)))
table(subset_data_7$bdy0100_hgt_f2f5)
```

```

# Assign 3 to cases where the informant difference is more than 5 but Less
than or equal to 10
subset_data_7$bdy1001_f2f5[abs(subset_data_7$bdy0100_dht_f2f5) > 5 &
abs(subset_data_7$bdy0100_dht_f2f5) <= 10] <- 3
##### flags for weight#####!!!

#assign existing custom missing code to flag
subset_data_7 <- subset_data_7 %>%
  mutate(bdy1002_f2f5 = ifelse(is.na(bdy0200_wgt_f2f5), NA,
ifelse(bdy0200_wgt_f2f5 < 0, bdy0200_wgt_f2f5, 0)))

subset_data_7 <- subset_data_7 %>%
  mutate(
    bdy1002_f2f5 = case_when(
      # Informant difference: flag 3 if the absolute difference is between 5
and 10
      !is.na(bdy0200_dwt_f2f5) & abs(bdy0200_dwt_f2f5) > 5 &
abs(bdy0200_dwt_f2f5) <= 10 ~ 3,
      # Default value when no conditions are met
      TRUE ~ bdy1002_f2f5
    )
  )

# Generation of flags for BMI
subset_data_8 <- subset_data_7

subset_data_8$bdy1003_f2f5 <- 0

subset_data_8 <- subset_data_8 %>%
  mutate(
    bdy1003_f2f5 = case_when(
      !is.na(bdy0300_f2f5) & !is.na(age_f2f5) & bdy0300_f2f5 >= 0 &
bdy0300_f2f5 < 14 & age_f2f5 > 12 ~ 4,
      !is.na(bdy0300_f2f5) & !is.na(age_f2f5) & bdy0300_f2f5 >= 0 &
bdy0300_f2f5 < 13 & age_f2f5 > 10 & age_f2f5 <= 12 ~ 4,
      !is.na(bdy0300_f2f5) & !is.na(age_f2f5) & bdy0300_f2f5 >= 0 &
bdy0300_f2f5 < 12 & age_f2f5 <= 11 ~ 4,
      !is.na(bdy0300_f2f5) & bdy0300_f2f5 < 0 ~ bdy0300_f2f5,
      is.na(bdy0200_wgt_f2f5) & is.na(bdy0100_hgt_f2f5) ~ NA_real_,
      TRUE ~ bdy1003_f2f5
    )
  )

subset_data_9 <- subset_data_8

#####
### Generation of new Flags - F2F4
#####

```

```

# Flag generation
# Start with all values in bdy1001_f2f4_new set to 0 "no problem apparent"
subset_data_9 <- subset_data_9 %>%
  mutate(bdy1001_f2f4_new = ifelse(is.na(bdy0100_hgt_f2f4_new), NA,
ifelse(bdy0100_hgt_f2f4_new < 0, bdy0100_hgt_f2f4_new, 0)))

# Assign 3 to cases where the informant difference is more than 5 but less
than or equal to 10
subset_data_9$bdy1001_f2f4_new[abs(subset_data_9$bdy0100_dht_f2f4_new) > 5 &
abs(subset_data_9$bdy0100_dht_f2f4_new) <= 10] <- 3

##### weight flags#####!!!
# initialize flag
subset_data_9 <- subset_data_9 %>%
  mutate(bdy1002_f2f4_new = ifelse(is.na(bdy0200_wgt_f2f4_new), NA,
ifelse(bdy0200_wgt_f2f4_new < 0, bdy0200_wgt_f2f4_new, 0)))

#set missing when:
subset_data_9 <- subset_data_9 %>%
  mutate(
    bdy1002_f2f4_new = case_when(
      # Informant difference: flag 3 if the absolute difference is between 5
and 10
      !is.na(bdy0200_dwt_f2f4_new) & abs(bdy0200_dwt_f2f4_new) > 5 &
abs(bdy0200_dwt_f2f4_new) <= 10 ~ 3,
      # Default value when no conditions are met
      TRUE ~ bdy1002_f2f4_new
    )
  )

#BMI flags
subset_data_9$bdy1003_f2f4_new <- 0
# flag very low BMIs
subset_data_9 <- subset_data_9 %>%
  mutate(
    bdy1003_f2f4_new = case_when(
      !is.na(bdy0300_f2f4_new) & !is.na(age_f2f4) & bdy0300_f2f4_new >= 0 &
bdy0300_f2f4_new < 14 & age_f2f4 > 12 ~ 4,
      !is.na(bdy0300_f2f4_new) & !is.na(age_f2f4) & bdy0300_f2f4_new >= 0 &
bdy0300_f2f4_new < 13 & age_f2f4 > 10 & age_f2f4 <= 12 ~ 4,
      !is.na(bdy0300_f2f4_new) & !is.na(age_f2f4) & bdy0300_f2f4_new >= 0 &
bdy0300_f2f4_new < 12 & age_f2f4 <= 10 ~ 4,
      !is.na(bdy0300_f2f4_new) & bdy0300_f2f4_new < 0 ~ bdy0300_f2f4_new,
      is.na(bdy0200_wgt_f2f4_new) & is.na(bdy0100_hgt_f2f4_new) ~ NA_real_,
      TRUE ~ bdy1003_f2f4_new
    )
  )

```

[illegible]

```

# Flag generation
# Start with all values in bdy1001_f2f2_new set to 0
subset_data_9 <- subset_data_9 %>%
  mutate(bdy1001_f2f2_new = ifelse(is.na(bdy0100_hgt_f2f2_new), NA,
    ifelse(bdy0100_hgt_f2f2_new < 0, bdy0100_hgt_f2f2_new, 0)))

# Assign 3 to cases where the informant difference is more than 5 but less
than or equal to 10
subset_data_9$bdy1001_f2f2_new[abs(subset_data_9$bdy0100_dht_f2f2_new) > 5 &
abs(subset_data_9$bdy0100_dht_f2f2_new) <= 10] <- 3

#####weight flags#####!!!
#initialize flags
subset_data_9 <- subset_data_9 %>%
  mutate(bdy1002_f2f2_new = ifelse(is.na(bdy0200_wgt_f2f2_new), NA,
    ifelse(bdy0200_wgt_f2f2_new < 0, bdy0200_wgt_f2f2_new, 0)))

#set missings
subset_data_9 <- subset_data_9 %>%
  mutate(
    bdy1002_f2f2_new = case_when(
      # Informant difference: flag 3 if the absolute difference is between 5
and 10
      !is.na(bdy0200_dwt_f2f2_new) & abs(bdy0200_dwt_f2f2_new) > 5 &
abs(bdy0200_dwt_f2f2_new) <= 10 ~ 3,
      # Default value when no conditions are met
      TRUE ~ bdy1002_f2f2_new
    )
  )

#bmi flags

subset_data_9$bdy1003_f2f2_new <- 0

subset_data_9 <- subset_data_9 %>%
  mutate(
    bdy1003_f2f2_new = case_when(
      !is.na(bdy0300_f2f2_new) & !is.na(age_f2f2) & bdy0300_f2f2_new >= 0 &
bdy0300_f2f2_new < 14 & age_f2f2 > 12 ~ 4,
      !is.na(bdy0300_f2f2_new) & !is.na(age_f2f2) & bdy0300_f2f2_new >= 0 &
bdy0300_f2f2_new < 13 & age_f2f2 > 10 & age_f2f2 <= 12 ~ 4,
      !is.na(bdy0300_f2f2_new) & !is.na(age_f2f2) & bdy0300_f2f2_new >= 0 &
bdy0300_f2f2_new < 12 & age_f2f2 <= 10 ~ 4,
      !is.na(bdy0300_f2f2_new) & bdy0300_f2f2_new < 0 ~ bdy0300_f2f2_new,
      is.na(bdy0200_wgt_f2f2_new) & is.na(bdy0100_hgt_f2f2_new) ~ NA_real_,
      TRUE ~ bdy1003_f2f2_new
    )
  )

```

[illegible]

```

subset_data_95 <- subset_data_9
subset_data_95$bdy1001_f2f1_new <-
ifelse(!is.na(subset_data_95$bdy0100_dht_f2f1_new) &
(subset_data_95$bdy0100_dht_f2f1_new) >10, 9,
subset_data_95$bdy1001_f2f1_new)
subset_data_95$bdy1001_f2f2_new <-
ifelse(!is.na(subset_data_95$bdy0100_dht_f2f2_new) &
(subset_data_95$bdy0100_dht_f2f2_new) > 10, 9,
subset_data_95$bdy1001_f2f2_new)
subset_data_95$bdy1001_f2f3_new <-
ifelse(!is.na(subset_data_95$bdy0100_dht_f2f3_new) &
(subset_data_95$bdy0100_dht_f2f3_new) > 10, 9,
subset_data_95$bdy1001_f2f3_new)
subset_data_95$bdy1001_f2f4_new <-
ifelse(!is.na(subset_data_95$bdy0100_dht_f2f4_new) &
(subset_data_95$bdy0100_dht_f2f4_new) > 10, 9,
subset_data_95$bdy1001_f2f4_new)
subset_data_95$bdy1001_f2f5 <- ifelse(!is.na(subset_data_95$bdy0100_dht_f2f5)
& (subset_data_95$bdy0100_dht_f2f5) > 10, 9, subset_data_95$bdy1001_f2f5)

subset_data_95$bdy1001_f2f1_new <-
ifelse(!is.na(subset_data_95$bdy0100_hgt_f2f1_new) &
(subset_data_95$bdy0100_hgt_f2f1_new) == -81, 9,
subset_data_95$bdy1001_f2f1_new)
subset_data_95$bdy1001_f2f2_new <-
ifelse(!is.na(subset_data_95$bdy0100_hgt_f2f2_new) &
(subset_data_95$bdy0100_hgt_f2f2_new) == -81, 9,
subset_data_95$bdy1001_f2f2_new)
subset_data_95$bdy1001_f2f3_new <-
ifelse(!is.na(subset_data_95$bdy0100_hgt_f2f3_new) &
(subset_data_95$bdy0100_hgt_f2f3_new) == -81, 9,
subset_data_95$bdy1001_f2f3_new)
subset_data_95$bdy1001_f2f4_new <-
ifelse(!is.na(subset_data_95$bdy0100_hgt_f2f4_new) &
(subset_data_95$bdy0100_hgt_f2f4_new) == -81, 9,
subset_data_95$bdy1001_f2f4_new)
subset_data_95$bdy1001_f2f5 <- ifelse(!is.na(subset_data_95$bdy0100_hgt_f2f5)
& (subset_data_95$bdy0100_hgt_f2f5) == -81, 9, subset_data_95$bdy1001_f2f5)

subset_data_95$bdy1002_f2f1_new <-
ifelse(!is.na(subset_data_95$bdy0200_dwt_f2f1_new) &
(subset_data_95$bdy0200_dwt_f2f1_new) >10, 9,
subset_data_95$bdy1002_f2f1_new)
subset_data_95$bdy1002_f2f2_new <-
ifelse(!is.na(subset_data_95$bdy0200_dwt_f2f2_new) &
(subset_data_95$bdy0200_dwt_f2f2_new) > 10, 9,
subset_data_95$bdy1002_f2f2_new)
subset_data_95$bdy1002_f2f3_new <-
ifelse(!is.na(subset_data_95$bdy0200_dwt_f2f3_new) &
(subset_data_95$bdy0200_dwt_f2f3_new) > 10, 9,

```

```
subset_data_95$bdy1002_f2f3_new)
subset_data_95$bdy1002_f2f4_new <-
ifelse(!is.na(subset_data_95$bdy0200_dwt_f2f4_new) &
(subset_data_95$bdy0200_dwt_f2f4_new) > 10, 9,
subset_data_95$bdy1002_f2f4_new)
subset_data_95$bdy1002_f2f5 <- ifelse(!is.na(subset_data_95$bdy0200_dwt_f2f5)
& (subset_data_95$bdy0200_dwt_f2f5) > 10, 9, subset_data_95$bdy1002_f2f5)
```

Not needed for data generation - only relevant for checking the data

Generating of flag variables that serve for data checking but are not part of the final data delivery

```
if (control == 1){  
#5555555555555555555555555555555555555555555555555555555555555555  
# Flag generation  
#5555555555555555555555555555555555555555555555555555555555555555  
subset_data_7 <- NA  
subset_data_7 <- subset_data_95  
  
# Initialize height_diff as NA  
subset_data_7$height_diff_f2f5 <- NA  
  
# Calculate height differences, checking each measurement point in descending  
order, newest time point as reference  
subset_data_7$height_diff_f2f5 <- with(subset_data_7,  
  ifelse(!is.na(bdy0100_hgt_f2f5) & !is.na(bdy0100_hgt_f2f4_new) &  
bdy0100_hgt_f2f5 >= 0 & bdy0100_hgt_f2f4_new >= 0, bdy0100_hgt_f2f5 -  
bdy0100_hgt_f2f4_new,  
  ifelse(!is.na(bdy0100_hgt_f2f5) & !is.na(bdy0100_hgt_f2f3_new) &  
bdy0100_hgt_f2f5 >= 0 & bdy0100_hgt_f2f3_new >= 0, bdy0100_hgt_f2f5 -  
bdy0100_hgt_f2f3_new,  
  ifelse(!is.na(bdy0100_hgt_f2f5) & !is.na(bdy0100_hgt_f2f2_new) &  
bdy0100_hgt_f2f5 >= 0 & bdy0100_hgt_f2f2_new >= 0, bdy0100_hgt_f2f5 -  
bdy0100_hgt_f2f2_new,  
  ifelse(!is.na(bdy0100_hgt_f2f5) & !is.na(bdy0100_hgt_f2f1_new) &  
bdy0100_hgt_f2f5 >= 0 & bdy0100_hgt_f2f1_new >= 0, bdy0100_hgt_f2f5 -  
bdy0100_hgt_f2f1_new,  
  NA))))))  
  
# Assign 4 for people over age 22 who grew more than 5 cm or shrank more than  
5 cm  
subset_data_7 <- subset_data_7 %>%  
  mutate(bdy1001_f2f5 = ifelse(age_f2f4 >= 20 & height_diff_f2f5 > 5 &  
!is.na(height_diff_f2f5), 4, bdy1001_f2f5),  
    bdy1001_f2f5 = ifelse(age_f2f4 >= 20 & height diff f2f5 < -5 &
```

```

!is.na(height_diff_f2f5), 5, bdy1001_f2f5))

# Assign 6 for boys under 16 and girls under 14 with no height increase
subset_data_7 <- subset_data_7 %>%
  mutate(bdy1001_f2f5 = ifelse(sex == 1 & ((age_f2f4 < 16 & height_diff_f2f5
< 0) | (age_f2f4 < 14 & height_diff_f2f5 <= 0)) & !is.na(height_diff_f2f5),
6, bdy1001_f2f5),
        bdy1001_f2f5 = ifelse(((age_f2f4 < 14 & height_diff_f2f5 < 0) |
(age_f2f4 < 12 & height_diff_f2f5 <= 0)) & sex == 2 &
!is.na(height_diff_f2f5), 6, bdy1001_f2f5))

# Assign 6 for ages between 16/18 and 22 who shrank more than 5 cm
subset_data_7 <- subset_data_7 %>%
  mutate(bdy1001_f2f5 = ifelse(
    height_diff_f2f5 < -5 &
    age_f2f4 < 20 &
    ((age_f2f4 >= 16 & sex == 1) | (age_f2f4 >= 14 & sex == 2))
    & !is.na(height_diff_f2f5),
    6, bdy1001_f2f5
  ))

# Calculate growth rate
subset_data_7 <- subset_data_7 %>%
  mutate(
    growth_f2f5 = case_when(
      # F2F5 and F2F4 available (using new height variable for F2F4)
      !is.na(age_f2f5) & !is.na(age_f2f4) &
      !is.na(bdy0100_hgt_f2f5) & !is.na(bdy0100_hgt_f2f4_new) &
      bdy0100_hgt_f2f5 >= 0 & bdy0100_hgt_f2f4_new >= 0 ~
      (bdy0100_hgt_f2f5 - bdy0100_hgt_f2f4_new) / ((age_f2f5 - age_f2f4) *
12),

      # F2F5 and F2F3 available (using new height variable for F2F3)
      !is.na(age_f2f5) & !is.na(age_f2f3) &
      !is.na(bdy0100_hgt_f2f5) & !is.na(bdy0100_hgt_f2f3_new) &
      bdy0100_hgt_f2f5 >= 0 & bdy0100_hgt_f2f3_new >= 0 ~
      (bdy0100_hgt_f2f5 - bdy0100_hgt_f2f3_new) / ((age_f2f5 - age_f2f3) *
12),

      # F2F5 and F2F2 available (using new height variable for F2F2)
      !is.na(age_f2f5) & !is.na(age_f2f2) &
      !is.na(bdy0100_hgt_f2f5) & !is.na(bdy0100_hgt_f2f2_new) &
      bdy0100_hgt_f2f5 >= 0 & bdy0100_hgt_f2f2_new >= 0 ~
      (bdy0100_hgt_f2f5 - bdy0100_hgt_f2f2_new) / ((age_f2f5 - age_f2f2) *
12),

      # F2F5 and F2F1 available (using new height variable for F2F1)
      !is.na(age_f2f5) & !is.na(age_f2f1) &
      !is.na(bdy0100_hgt_f2f5) & !is.na(bdy0100_hgt_f2f1_new) &
      bdy0100_hgt_f2f5 >= 0 & bdy0100_hgt_f2f1_new >= 0 ~
      (bdy0100_hgt_f2f5 - bdy0100_hgt_f2f1_new) / ((age_f2f5 - age_f2f1) *

```

```

12),

  # Default to NA if none of the conditions are met
  TRUE ~ NA_real_
)
)

# Assign 7 for unusual growth rates
subset_data_7 <- subset_data_7 %>%
  mutate(bdy1001_f2f5 = ifelse(age_f2f4 < 16 & growth_f2f5 > 1.5 &
!is.na(growth_f2f5), 7, bdy1001_f2f5),
        bdy1001_f2f5 = ifelse(age_f2f4 > 15 & age_f2f4 < 22 & growth_f2f5 >
1 & !is.na(growth_f2f5), 7, bdy1001_f2f5))

##### flags for weight#####!!!

#calculate weight difference between data collections
subset_data_7$weight_diff_f2f5 <- with(subset_data_7,
  ifelse(!is.na(bdy0200_wgt_f2f5) & !is.na(bdy0200_wgt_f2f4_new) &
bdy0200_wgt_f2f5 >= 0 & bdy0200_wgt_f2f4_new >= 0, bdy0200_wgt_f2f5 -
bdy0200_wgt_f2f4_new,
  ifelse(!is.na(bdy0200_wgt_f2f5) & !is.na(bdy0200_wgt_f2f3_new) &
bdy0200_wgt_f2f5 >= 0 & bdy0200_wgt_f2f3_new >= 0, bdy0200_wgt_f2f5 -
bdy0200_wgt_f2f3_new,
  ifelse(!is.na(bdy0200_wgt_f2f5) & !is.na(bdy0200_wgt_f2f2_new) &
bdy0200_wgt_f2f5 >= 0 & bdy0200_wgt_f2f2_new >= 0, bdy0200_wgt_f2f5 -
bdy0200_wgt_f2f2_new,
  ifelse(!is.na(bdy0200_wgt_f2f5) & !is.na(bdy0200_wgt_f2f1_new) &
bdy0200_wgt_f2f5 >= 0 & bdy0200_wgt_f2f1_new >= 0, bdy0200_wgt_f2f5 -
bdy0200_wgt_f2f1_new,
  NA))))

#set reference data collection
subset_data_7$wid_compare_f2f5<- with(subset_data_7,
  ifelse(!is.na(bdy0200_wgt_f2f5) & !is.na(bdy0200_wgt_f2f4_new) &
bdy0200_wgt_f2f5 >= 0 & bdy0200_wgt_f2f4_new >= 0, 4,
  ifelse(!is.na(bdy0200_wgt_f2f5) & !is.na(bdy0200_wgt_f2f3_new) &
bdy0200_wgt_f2f5 >= 0 & bdy0200_wgt_f2f3_new >= 0, 3,
  ifelse(!is.na(bdy0200_wgt_f2f5) & !is.na(bdy0200_wgt_f2f2_new) &
bdy0200_wgt_f2f5 >= 0 & bdy0200_wgt_f2f2_new >= 0, 2,
  ifelse(!is.na(bdy0200_wgt_f2f5) & !is.na(bdy0200_wgt_f2f1_new) &
bdy0200_wgt_f2f5 >= 0 & bdy0200_wgt_f2f1_new >= 0, 1,
  NA))))

```

```

subset_data_7 <- subset_data_7 %>%
  mutate(
    bdy1002_f2f5 = case_when(
      # Informant difference: flag 3 if the absolute difference is between 5
      and 10
      !is.na(weight_diff_f2f5) & abs(bdy0200_dwt_f2f5) > 5 &
      abs(bdy0200_dwt_f2f5) <= 10 ~ 3,
      # Significant weight change for children under 12: flag 4 if the
      difference is 20kg or more
      !is.na(weight_diff_f2f5) & wid_compare_f2f5 == 4 &
      abs(weight_diff_f2f5) >= 20 & age_f2f4 < 12 ~ 4,

      # Significant weight change for children under 12: flag 4 if the
      difference is 20kg or more
      !is.na(weight_diff_f2f5) & wid_compare_f2f5 == 3 &
      abs(weight_diff_f2f5) >= 30 & age_f2f4 < 12 ~ 4,

      # If F2F3 data is missing, check F2F2: flag 4 if difference is 30kg or
      more for children under 12
      !is.na(weight_diff_f2f5) & wid_compare_f2f5 == 2 &
      abs(weight_diff_f2f5) >= 40 & age_f2f4 < 12 ~ 4,

      # If both F2F3 and F2F2 data are missing, check F2F1: flag 4 if
      difference is 40kg or more for children under 12
      !is.na(weight_diff_f2f5) & wid_compare_f2f5 == 1 &
      abs(weight_diff_f2f5) >= 50 & age_f2f4 < 12 ~ 4,

      # Significant weight change for teenagers and adults: flag 5 if
      difference is 30kg or more
      !is.na(weight_diff_f2f5) & wid_compare_f2f5 == 4 &
      abs(weight_diff_f2f5) >= 30 & age_f2f4 > 11 ~ 5,

      # Significant weight change for teenagers and adults: flag 5 if
      difference is 30kg or more
      !is.na(weight_diff_f2f5) & wid_compare_f2f5 == 3 &
      abs(weight_diff_f2f5) >= 40 & age_f2f4 > 11 ~ 5,

      # If F2F3 data is missing, check F2F2: flag 5 if difference is 40kg or
      more for teenagers and adults
      !is.na(weight_diff_f2f5) & wid_compare_f2f5 == 2 &
      abs(weight_diff_f2f5) >= 50 & age_f2f4 > 11 ~ 5,

      # If both F2F3 and F2F2 data are missing, check F2F1: flag 5 if
      difference is 50kg or more for teenagers and adults
      !is.na(weight_diff_f2f5) & wid_compare_f2f5 == 1 &
      abs(weight_diff_f2f5) >= 60 & age_f2f4 > 11 ~ 5,

      # Weight should not decrease or remain constant for children

```

```

under 16, especially for those expected to grow: flag 6
  !is.na(weight_diff_f2f5) & (weight_diff_f2f5) <= 0 & age_f2f4 < 16 &
sex == 1 ~ 6,
  !is.na(weight_diff_f2f5) & (weight_diff_f2f5) <= 0 & age_f2f4 < 14 &
sex == 2 ~ 6,

  # Default value when no conditions are met
  TRUE ~ bdy1002_f2f5
)
)
}

if (control == 1){
subset_data_9 <- NA
subset_data_9 <- subset_data_7
}

if (control == 1){
#####
### Generation of new Flags - F2F4
#####

# Initialize height_diff as NA
subset_data_9$height_diff_f2f4 <- NA

# Calculate height differences, checking each measurement point in descending
order
subset_data_9$height_diff_f2f4 <- with(subset_data_9,
  ifelse(!is.na(bdy0100_hgt_f2f4_new) & !is.na(bdy0100_hgt_f2f3_new) &
bdy0100_hgt_f2f4_new >= 0 & bdy0100_hgt_f2f3_new >= 0, bdy0100_hgt_f2f4_new -
bdy0100_hgt_f2f3_new,
  ifelse(!is.na(bdy0100_hgt_f2f4_new) & !is.na(bdy0100_hgt_f2f2_new) &
bdy0100_hgt_f2f4_new >= 0 & bdy0100_hgt_f2f2_new >= 0, bdy0100_hgt_f2f4_new -
bdy0100_hgt_f2f2_new,
  ifelse(!is.na(bdy0100_hgt_f2f4_new) & !is.na(bdy0100_hgt_f2f1_new) &
bdy0100_hgt_f2f4_new >= 0 & bdy0100_hgt_f2f1_new >= 0, bdy0100_hgt_f2f4_new -
bdy0100_hgt_f2f1_new,
    NA))))

# Assign 4 for people over age 22 who grew more than 5 cm or shrank more than
5 cm
subset_data_9 <- subset_data_9 %>%
  mutate(bdy1001_f2f4_new = ifelse(age_f2f3 >= 20 & height_diff_f2f4 > 5 &
!is.na(height_diff_f2f4), 4, bdy1001_f2f4_new),
    bdy1001_f2f4_new = ifelse(age_f2f3 >= 20 & height_diff_f2f4 < -5 &
!is.na(height_diff_f2f4), 5, bdy1001_f2f4_new))

# Assign 6 for boys under 16 and girls under 14 with no height increase

```

```

subset_data_9 <- subset_data_9 %>%
  mutate(bdy1001_f2f4_new = ifelse(((age_f2f3 < 16 & height_diff_f2f4 < 0) |
(age_f2f3 < 14 & height_diff_f2f4 <= 0)) & sex == 1 &
!is.na(height_diff_f2f4), 6, bdy1001_f2f4_new),
        bdy1001_f2f4_new = ifelse(((age_f2f3 < 14 & height_diff_f2f4 < 0) |
(age_f2f3 < 12 & height_diff_f2f4 <= 0)) & sex == 2 &
!is.na(height_diff_f2f4), 6, bdy1001_f2f4_new))

# Assign 6 for ages between 14/16 and 22 who shrank more than 5 cm
subset_data_9 <- subset_data_9 %>%
  mutate(bdy1001_f2f4_new = ifelse(
    height_diff_f2f4 < -5 &
    age_f2f3 < 20 &
    ((age_f2f3 >= 16 & sex == 1) | (age_f2f3 >= 14 & sex == 2))
    & !is.na(height_diff_f2f4),
    6, bdy1001_f2f4_new
  ))

# Calculate growth rate
subset_data_9 <- subset_data_9 %>%
  mutate(
    growth_f2f4 = case_when(
      # F2F4 and F2F3 available (using new height variable for F2F3)
      !is.na(age_f2f4) & !is.na(age_f2f3) &
      !is.na(bdy0100_hgt_f2f4) & !is.na(bdy0100_hgt_f2f3_new) &
      bdy0100_hgt_f2f4 >= 0 & bdy0100_hgt_f2f3_new >= 0 ~
      (bdy0100_hgt_f2f4 - bdy0100_hgt_f2f3_new) / ((age_f2f4 - age_f2f3) *
12),

      # F2F4 and F2F2 available (using new height variable for F2F2)
      !is.na(age_f2f4) & !is.na(age_f2f2) &
      !is.na(bdy0100_hgt_f2f4) & !is.na(bdy0100_hgt_f2f2_new) &
      bdy0100_hgt_f2f4 >= 0 & bdy0100_hgt_f2f2_new >= 0 ~
      (bdy0100_hgt_f2f4 - bdy0100_hgt_f2f2_new) / ((age_f2f4 - age_f2f2) *
12),

      # F2F4 and F2F1 available (using new height variable for F2F1)
      !is.na(age_f2f4) & !is.na(age_f2f1) &
      !is.na(bdy0100_hgt_f2f4) & !is.na(bdy0100_hgt_f2f1_new) &
      bdy0100_hgt_f2f4 >= 0 & bdy0100_hgt_f2f1_new >= 0 ~
      (bdy0100_hgt_f2f4 - bdy0100_hgt_f2f1_new) / ((age_f2f4 - age_f2f1) *
12),

      # Default to NA if none of the conditions are met
      TRUE ~ NA_real_
    )
  )

# Assign 7 for unusual growth rates

```

```

subset_data_9 <- subset_data_9 %>%
  mutate(bdy1001_f2f4_new = ifelse(age_f2f3 < 16 & growth_f2f4 > 1.5 &
    !is.na(growth_f2f4), 7, bdy1001_f2f4_new),
    bdy1001_f2f4_new = ifelse(age_f2f3 > 15 & age_f2f3 < 22 &
    growth_f2f4 > 1 & !is.na(growth_f2f4), 7, bdy1001_f2f4_new))

##### weight flags#####!!!
#calculate weight difference
subset_data_9$weight_diff_f2f4_new <- with(subset_data_9,
  ifelse(!is.na(bdy0200_wgt_f2f4_new) & !is.na(bdy0200_wgt_f2f3_new) &
    bdy0200_wgt_f2f4_new >= 0 & bdy0200_wgt_f2f3_new >= 0, bdy0200_wgt_f2f4_new -
    bdy0200_wgt_f2f3_new,
    ifelse(!is.na(bdy0200_wgt_f2f4_new) & !is.na(bdy0200_wgt_f2f2_new) &
    bdy0200_wgt_f2f4_new >= 0 & bdy0200_wgt_f2f2_new >= 0, bdy0200_wgt_f2f4_new -
    bdy0200_wgt_f2f2_new,
    ifelse(!is.na(bdy0200_wgt_f2f4_new) & !is.na(bdy0200_wgt_f2f1_new) &
    bdy0200_wgt_f2f4_new >= 0 & bdy0200_wgt_f2f1_new >= 0, bdy0200_wgt_f2f4_new -
    bdy0200_wgt_f2f1_new,
    NA)))
#set reference time point
subset_data_9$wid_compare_f2f4_new <- with(subset_data_9,
  ifelse(!is.na(bdy0200_wgt_f2f4_new) & !is.na(bdy0200_wgt_f2f3_new) &
    bdy0200_wgt_f2f4_new >= 0 & bdy0200_wgt_f2f3_new >= 0, 3,
    ifelse(!is.na(bdy0200_wgt_f2f4_new) & !is.na(bdy0200_wgt_f2f2_new) &
    bdy0200_wgt_f2f4_new >= 0 & bdy0200_wgt_f2f2_new >= 0, 2,
    ifelse(!is.na(bdy0200_wgt_f2f4_new) & !is.na(bdy0200_wgt_f2f1_new) &
    bdy0200_wgt_f2f4_new >= 0 & bdy0200_wgt_f2f1_new >= 0, 1,
    NA)))
#set missing when:
subset_data_9 <- subset_data_9 %>%
  mutate(
    bdy1002_f2f4_new = case_when(
      # Informant difference: flag 3 if the absolute difference is between 5
      and 10
      !is.na(weight_diff_f2f4_new) & abs(bdy0200_dwt_f2f4_new) > 5 &
      abs(bdy0200_dwt_f2f4_new) <= 10 ~ 3,
      # Significant weight change for children under 12: flag 4 if the
      difference is 20kg or more
      !is.na(weight_diff_f2f4_new) & wid_compare_f2f4_new == 3 &
      abs(weight_diff_f2f4_new) >= 20 & age_f2f3 < 12 ~ 4,

      # If F2F3 data is missing, check F2F2: flag 4 if difference is 30kg or
      more for children under 12
      !is.na(weight_diff_f2f4_new) & wid_compare_f2f4_new == 2 &
      abs(weight_diff_f2f4_new) >= 30 & age_f2f3 < 12 ~ 4,

      # If both F2F3 and F2F2 data are missing, check F2F1: flag 4 if
      difference is 40kg or more for children under 12

```

```
!is.na(weight_diff_f2f4_new) & wid_compare_f2f4_new == 1 &  
abs(weight_diff_f2f4_new) >= 40 & age_f2f3 < 12 ~ 4,  
  
# Significant weight change for teenagers and adults: flag 5 if  
difference is 30kg or more  
!is.na(weight_diff_f2f4_new) & wid_compare_f2f4_new == 3 &  
abs(weight_diff_f2f4_new) >= 30 & age_f2f3 > 11 ~ 5,  
  
# If F2F3 data is missing, check F2F2: flag 5 if difference is 40kg or  
more for teenagers and adults  
!is.na(weight_diff_f2f4_new) & wid_compare_f2f4_new == 2 &  
abs(weight_diff_f2f4_new) >= 40 & age_f2f3 > 11 ~ 5,  
  
# If both F2F3 and F2F2 data are missing, check F2F1: flag 5 if  
difference is 50kg or more for teenagers and adults  
!is.na(weight_diff_f2f4_new) & wid_compare_f2f4_new == 1 &  
abs(weight_diff_f2f4_new) >= 50 & age_f2f3 > 11 ~ 5,  
  
# Weight should not decrease or remain constant for children  
under 16, especially for those expected to grow: flag 6  
!is.na(weight_diff_f2f4_new) & (weight_diff_f2f4_new) <= 0 & age_f2f3 <  
16 & sex == 1 ~ 6,  
!is.na(weight_diff_f2f4_new) & (weight_diff_f2f4_new) <= 0 & age_f2f3 <  
14 & sex == 2 ~ 6,  
  
# Default value when no conditions are met  
TRUE ~ bdy1002_f2f4_new  
)  
)  
  
}  
  
if (control == 1){  
  
##### Generation of new Flags - F2F3  
#####  
  
# Initialize height_diff as NA  
subset_data_9$height_diff_f2f3 <- NA  
  
# Calculate height differences, checking each measurement point in descending  
order  
subset_data_9$height_diff_f2f3 <- with(subset_data_9,  
  ifelse(!is.na(bdy0100_hgt_f2f3_new) & !is.na(bdy0100_hgt_f2f2_new) &  
    bdy0100_hgt_f2f3_new >= 0 & bdy0100_hgt_f2f2_new >= 0, bdy0100_hgt_f2f3_new -  
    bdy0100_hgt_f2f2_new,
```

```

    ifelse(!is.na(bdy0100_hgt_f2f3_new) & !is.na(bdy0100_hgt_f2f1_new) &
bdy0100_hgt_f2f3_new >= 0 & bdy0100_hgt_f2f1_new >= 0, bdy0100_hgt_f2f3_new -
bdy0100_hgt_f2f1_new,
    NA)))

# Assign 4 for people over age 22 who grew more than 5 cm or shrank more than
5 cm
subset_data_9 <- subset_data_9 %>%
  mutate(bdy1001_f2f3_new = ifelse(age_f2f2 >= 20 & height_diff_f2f3 > 5 &
!is.na(height_diff_f2f3), 4, bdy1001_f2f3_new),
    bdy1001_f2f3_new = ifelse(age_f2f2 >= 20 & height_diff_f2f3 < -5 &
!is.na(height_diff_f2f3), 5, bdy1001_f2f3_new))

# Assign 6 for boys under 16 and girls under 14 with no height increase
subset_data_9 <- subset_data_9 %>%
  mutate(bdy1001_f2f3_new = ifelse(((age_f2f2 < 16 & height_diff_f2f3 < 0) |
(age_f2f2 < 14 & height_diff_f2f3 <= 0)) & sex == 1 &
!is.na(height_diff_f2f3), 6, bdy1001_f2f3_new),
    bdy1001_f2f3_new = ifelse(((age_f2f2 < 14 & height_diff_f2f3 < 0) |
(age_f2f2 < 12 & height_diff_f2f3 <= 0)) & sex == 2 &
!is.na(height_diff_f2f3), 6, bdy1001_f2f3_new))

# Assign 6 for ages between 14/16 and 22 who shrank more than 5 cm
subset_data_9 <- subset_data_9 %>%
  mutate(bdy1001_f2f3_new = ifelse(
    height_diff_f2f3 < -5 &
    age_f2f2 < 20 &
    ((age_f2f2 >= 16 & sex == 1) | (age_f2f2 >= 14 & sex == 2))
    & !is.na(height_diff_f2f3),
    6, bdy1001_f2f3_new
  ))

# Calculate growth rate
subset_data_9 <- subset_data_9 %>%
  mutate(
    growth_f2f3 = case_when(
      # F2F3 and F2F2 available (using new height variable for F2F2)
      !is.na(age_f2f3) & !is.na(age_f2f2) &
      !is.na(bdy0100_hgt_f2f3) & !is.na(bdy0100_hgt_f2f2_new) &
      bdy0100_hgt_f2f3 >= 0 & bdy0100_hgt_f2f2_new >= 0 ~
      (bdy0100_hgt_f2f3 - bdy0100_hgt_f2f2_new) / ((age_f2f3 - age_f2f2) *
12),

      # F2F3 and F2F1 available (using new height variable for F2F1)
      !is.na(age_f2f3) & !is.na(age_f2f1) &
      !is.na(bdy0100_hgt_f2f3) & !is.na(bdy0100_hgt_f2f1_new) &
      bdy0100_hgt_f2f3 >= 0 & bdy0100_hgt_f2f1_new >= 0 ~
      (bdy0100_hgt_f2f3 - bdy0100_hgt_f2f1_new) / ((age_f2f3 - age_f2f1) *
12),

```

```

    # Default to NA if none of the conditions are met
    TRUE ~ NA_real_
  )
)

# Assign 7 for unusual growth rates
subset_data_9 <- subset_data_9 %>%
  mutate(bdy1001_f2f3_new = ifelse(age_f2f2 < 16 & growth_f2f3 > 1.5 &
    !is.na(growth_f2f3), 7, bdy1001_f2f3_new),
    bdy1001_f2f3_new = ifelse(age_f2f2 > 15 & age_f2f2 < 22 &
    growth_f2f3 > 1 & !is.na(growth_f2f3), 7, bdy1001_f2f3_new))

##### weight flags#####!!!
#calculate weight difference
subset_data_9$weight_diff_f2f3_new <- with(subset_data_9,
  ifelse(!is.na(bdy0200_wgt_f2f3_new) & !is.na(bdy0200_wgt_f2f2_new) &
    bdy0200_wgt_f2f3_new >= 0 & bdy0200_wgt_f2f2_new >= 0, bdy0200_wgt_f2f3_new -
    bdy0200_wgt_f2f2_new,
    ifelse(!is.na(bdy0200_wgt_f2f3_new) & !is.na(bdy0200_wgt_f2f1_new) &
    bdy0200_wgt_f2f3_new >= 0 & bdy0200_wgt_f2f1_new >= 0, bdy0200_wgt_f2f3_new -
    bdy0200_wgt_f2f1_new,
    NA)))
#set reference period
subset_data_9$wid_compare_f2f3_new<- with(subset_data_9,
  ifelse(!is.na(bdy0200_wgt_f2f3_new) & !is.na(bdy0200_wgt_f2f2_new) &
    bdy0200_wgt_f2f3_new >= 0 & bdy0200_wgt_f2f2_new >= 0, 2,
    ifelse(!is.na(bdy0200_wgt_f2f3_new) & !is.na(bdy0200_wgt_f2f1_new) &
    bdy0200_wgt_f2f3_new >= 0 & bdy0200_wgt_f2f1_new >= 0, 1,
    NA)))
#set missings
subset_data_9 <- subset_data_9 %>%
  mutate(
    bdy1002_f2f3_new = case_when(
      # Informant difference: flag 3 if the absolute difference is between 5
      and 10
      !is.na(weight_diff_f2f3_new) & abs(bdy0200_dwt_f2f3_new) > 5 &
      abs(bdy0200_dwt_f2f3_new) <= 10 ~ 3,

      # If F2F3 data is missing, check F2F2: flag 4 if difference is 30kg or
      more for children under 12
      !is.na(weight_diff_f2f3_new) & wid_compare_f2f3_new == 2 &
      abs(weight_diff_f2f3_new) >= 20 & age_f2f2 < 12 ~ 4,

      # If both F2F3 and F2F2 data are missing, check F2F1: flag 4 if
      difference is 40kg or more for children under 12

```

[illegible]

```

subset_data_9 <- subset_data_9 %>%
  mutate(bdy1001_f2f2_new = ifelse(age_f2f1 >= 20 & !is.na(height_diff_f2f2)
& height_diff_f2f2 > 5, 4, bdy1001_f2f2_new),
        bdy1001_f2f2_new = ifelse(age_f2f1 >= 20 & !is.na(height_diff_f2f2)
& height_diff_f2f2 < -5, 5, bdy1001_f2f2_new))

# Assign 6 for boys under 16 and girls under 14 with no height increase
subset_data_9 <- subset_data_9 %>%
  mutate(bdy1001_f2f2_new = ifelse(((age_f2f1 < 16 & height_diff_f2f2 < 0) |
(age_f2f1 < 14 & height_diff_f2f2 <= 0)) & sex == 1 &
!is.na(height_diff_f2f2), 6, bdy1001_f2f2_new),
        bdy1001_f2f2_new = ifelse(((age_f2f1 < 14 & height_diff_f2f2 < 0) |
(age_f2f1 < 12 & height_diff_f2f2 <= 0)) & sex == 2 &
!is.na(height_diff_f2f2), 6, bdy1001_f2f2_new))

# Assign 6 for ages between 14/16 and 22 who shrank more than 5 cm
subset_data_9 <- subset_data_9 %>%
  mutate(bdy1001_f2f2_new = ifelse(
    !is.na(height_diff_f2f2) &
    height_diff_f2f2 < -5 &
    age_f2f1 < 20 &
    ((age_f2f1 >= 16 & sex == 1) | (age_f2f1 >= 14 & sex == 2)),
    6, bdy1001_f2f2_new
  ))

# Calculate growth rate
subset_data_9 <- subset_data_9 %>%
  mutate(
    growth_f2f2 = case_when(
      # F2F2 and F2F1 available (using new height variable for F2F1)
      !is.na(age_f2f2) & !is.na(age_f2f1) &
      !is.na(bdy0100_hgt_f2f2) & !is.na(bdy0100_hgt_f2f1_new) &
      bdy0100_hgt_f2f2 >= 0 & bdy0100_hgt_f2f1_new >= 0 ~
        (bdy0100_hgt_f2f2 - bdy0100_hgt_f2f1_new) / ((age_f2f2 - age_f2f1) *
12),

      # Default to NA if none of the conditions are met
      TRUE ~ NA_real_
    )
  )

# Assign 7 for unusual growth rates
subset_data_9 <- subset_data_9 %>%
  mutate(bdy1001_f2f2_new = ifelse(age_f2f1 < 16 & !is.na(growth_f2f2) &
growth_f2f2 > 1.5, 7, bdy1001_f2f2_new),
        bdy1001_f2f2_new = ifelse(age_f2f1 > 15 & !is.na(growth_f2f2) &
age_f2f1 < 22 & growth_f2f2 > 1, 7, bdy1001_f2f2_new))

```

#####weight flags#####!!!

#calculate weight difference

```
subset_data_9$weight_diff_f2f2_new <- with(subset_data_9,  
  ifelse(!is.na(bdy0200_wgt_f2f2_new) & !is.na(bdy0200_wgt_f2f1_new) &  
bdy0200_wgt_f2f2_new >= 0 & bdy0200_wgt_f2f1_new >= 0, bdy0200_wgt_f2f2_new -  
bdy0200_wgt_f2f1_new,  
    NA))
```

#set reference point

```
subset_data_9$wid_compare_f2f2_new<- with(subset_data_9,  
  ifelse(!is.na(bdy0200_wgt_f2f2_new) & !is.na(bdy0200_wgt_f2f1_new) &  
bdy0200_wgt_f2f2_new >= 0 & bdy0200_wgt_f2f1_new >= 0, 1,  
    NA))
```

#set missings

```
subset_data_9 <- subset_data_9 %>%
```

```
  mutate(  
    bdy1002_f2f2_new = case_when(  
      # Informant difference: flag 3 if the absolute difference is between 5  
and 10
```

```
      !is.na(bdy0200_dwt_f2f2_new) & abs(bdy0200_dwt_f2f2_new) > 5 &  
abs(bdy0200_dwt_f2f2_new) <= 10 ~ 3,
```

```
      # If both F2F3 and F2F2 data are missing, check F2F1: flag 4 if  
difference is 40kg or more for children under 12
```

```
      !is.na(bdy0200_dwt_f2f2_new) & wid_compare_f2f2_new == 1 &  
abs(weight_diff_f2f2_new) >= 20 & age_f2f1 < 12 ~ 4,
```

```
      # If both F2F3 and F2F2 data are missing, check F2F1: flag 5 if  
difference is 50kg or more for teenagers and adults
```

```
      !is.na(bdy0200_dwt_f2f2_new) & wid_compare_f2f2_new == 1 &  
abs(weight_diff_f2f2_new) >= 30 & age_f2f1 > 11 ~ 5,
```

```
      # Weight should not decrease or remain constant for children  
under 16, especially for those expected to grow: flag 6
```

```
      !is.na(bdy0200_dwt_f2f2_new) & (weight_diff_f2f2_new) <= 0 & age_f2f1 <  
16 & sex == 1 ~ 6,
```

```
      !is.na(bdy0200_dwt_f2f2_new) & (weight_diff_f2f2_new) <= 0 & age_f2f1 <  
14 & sex == 2 ~ 6,
```

```
      # Default value when no conditions are met
```

```
      TRUE ~ bdy1002_f2f2_new
```

```
    )  
  )  
}
```

#v9.0.0 final flags

#set custom flags for the manual data corrections

```
if (control ==1) {  
  subset_data_100 <- subset_data_9}
```

```

if (control ==0){
subset_data_100 <- subset_data_95
#xxx
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==129136300] <-1
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==140318200] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==140958200] <-1
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==142393300] <-1
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==146089300] <-1
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==148028300] <-1
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==151639200] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==153821400] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==166685400] <-1
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==167743002] <-1
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==169778001] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==170315300] <-1
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==171267001] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==171267002] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==172966300] <-1
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==174643400] <-1
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==182479200] <-9
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==184840200] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==186238001] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==187390001] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==187390002] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==187830200] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==188007200] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==189897400] <-1
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==195502001] <-9
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==211961400] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==212386200] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==216760002] <-1
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==222625001] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==222625002] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==224547001] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==224547002] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==224547200] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==224613200] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==225009300] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==231642400] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==233231001] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==233231002] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==239500200] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==243019300] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==246909200] <-9
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==249535300] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==253357001] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==254379400] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==257903002] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==261945300] <-8

```

```
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==262270200] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==262672300] <-9
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==262672400] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==263863400] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==264761002] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==265589001] <-9
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==265589002] <-9
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==272800300] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==276874200] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==278287001] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==280816300] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==283490500] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==283641300] <-1
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==283671200] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==286228400] <-1
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==286228200] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==286672200] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==287010400] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==291384300] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==291384400] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==310546300] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==311010300] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==317273400] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==321808002] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==323512400] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==327984400] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==328670300] <-9
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==329634001] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==335058001] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==341612001] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==348778001] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==353107200] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==353790300] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==354919400] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==356297002] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==357692400] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==365861001] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==371407001] <-9
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==371848001] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==371848002] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==373339002] <-1
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==377052400] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==378238001] <-2
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==382340400] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==383383001] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==385113400] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==387395001] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==388532001] <-2
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==388972200] <-1
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==390237200] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==391105001] <-8
```

```
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==391273002] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==396327002] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==397633002] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==414849002] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==420235002] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==425287300] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==427378001] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==430661001] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==433249002] <-2
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==437865200] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==440425400] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==442068200] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==443136002] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==449916300] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==450567001] <-9
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==451024400] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==453292001] <-9
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==461526300] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==465557001] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==466941110] <-1
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==469598120] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==470896300] <-1
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==471553002] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==473571400] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==475291002] <-2
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==477315002] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==477384200] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==481109300] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==484611110] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==490504400] <-8
subset_data_100$bdy1001_f2f1_new[subset_data_100$pid_suf ==498152400] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==111920001] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==117408201] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==126022001] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==129164200] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==129353300] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==129353400] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==129516002] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==137011200] <-2
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==139324200] <-2
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==140318200] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==141415001] <-9
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==141415002] <-9
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==144667200] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==148028300] <-1
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==150584001] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==151635200] <-2
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==151639200] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==158546001] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==163716400] <-1
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==164528400] <-1
```

```
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==166025200] <-1
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==166685400] <-1
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==167021200] <-2
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==167743002] <-1
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==169135200] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==169561400] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==169731002] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==169778001] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==170315300] <-1
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==171267001] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==171267002] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==172745001] <-9
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==172745002] <-9
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==174018300] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==174643400] <-1
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==176731400] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==177291001] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==177291002] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==184568200] <-2
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==184840200] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==186238001] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==187390001] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==187390002] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==187830200] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==188007200] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==188672200] <-2
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==189897400] <-1
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==190610200] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==192663300] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==194419200] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==199655400] <-1
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==211961400] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==212386200] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==214345002] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==214347002] <-2
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==214570400] <-9
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==216760002] <-1
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==222088400] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==222625001] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==222625002] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==224547001] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==224547002] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==224547200] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==224613200] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==225009300] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==225130001] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==226177001] <-2
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==227424001] <-2
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==231642400] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==232735001] <-2
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==232735002] <-2
```

```
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==233231001] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==233231002] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==233452200] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==239500200] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==240822001] <-2
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==247060200] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==250627002] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==251082002] <-1
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==251236300] <-9
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==251843300] <-1
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==251961001] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==251961002] <-9
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==253357001] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==254379400] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==257141002] <-2
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==257903002] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==261945300] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==262270200] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==262571001] <-2
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==262672400] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==263068002] <-2
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==264761002] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==264889001] <-2
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==266121002] <-2
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==272800300] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==274037002] <-2
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==276874200] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==278287001] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==280816300] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==282021002] <-1
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==283490500] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==283671200] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==284375200] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==286228400] <-1
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==286228200] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==286672200] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==287010400] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==287877001] <-9
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==288444001] <-2
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==291384300] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==291384400] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==292289200] <-2
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==293855400] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==295728300] <-1
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==299661200] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==310546300] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==311010300] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==315834002] <-1
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==317273400] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==318028001] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==319225002] <-8
```

```
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==321808002] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==323512400] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==327984400] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==332561001] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==335058001] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==339555001] <-1
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==340621200] <-1
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==344107002] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==353107200] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==354919400] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==356297002] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==357692400] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==365861001] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==371848001] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==374296200] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==377052400] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==383383001] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==385113400] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==385621400] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==386425001] <-9
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==386425002] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==387395001] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==390135002] <-9
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==390237200] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==391105001] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==391273002] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==397051200] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==398482001] <-1
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==419679110] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==420235002] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==427378001] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==430661001] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==443136002] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==451024400] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==454709001] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==471553002] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==473571400] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==477315002] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==477384200] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==481109300] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==484611110] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==487809400] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==490504400] <-8
subset_data_100$bdy1001_f2f2_new[subset_data_100$pid_suf ==498152400] <-8
subset_data_100$bdy1001_f2f3_new[subset_data_100$pid_suf ==110137200] <-8
subset_data_100$bdy1001_f2f3_new[subset_data_100$pid_suf ==111920001] <-8
subset_data_100$bdy1001_f2f3_new[subset_data_100$pid_suf ==112133001] <-8
subset_data_100$bdy1001_f2f3_new[subset_data_100$pid_suf ==112133002] <-8
subset_data_100$bdy1001_f2f3_new[subset_data_100$pid_suf ==117408201] <-8
subset_data_100$bdy1001_f2f3_new[subset_data_100$pid_suf ==118124002] <-8
subset_data_100$bdy1001_f2f3_new[subset_data_100$pid_suf ==118161001] <-8
```

[illegible]

[illegible]

```
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==214473002] <-8
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==220414400] <-8
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==222088400] <-8
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==233608200] <-1
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==234013300] <-8
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==236509200] <-8
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==252574001] <-8
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==253910200] <-8
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==261505200] <-8
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==262672400] <-8
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==263863400] <-8
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==264761201] <-8
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==280816300] <-8
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==286228400] <-1
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==286379300] <-1
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==293101400] <-9
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==294080200] <-8
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==297248200] <-8
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==317790400] <-1
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==319225002] <-8
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==323512400] <-8
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==329634001] <-8
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==335058001] <-8
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==335549400] <-8
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==342655120] <-8
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==353790300] <-8
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==363967400] <-9
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==370008001] <-8
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==372428300] <-9
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==377052300] <-9
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==380165300] <-9
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==382340400] <-8
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==383383001] <-8
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==387395001] <-8
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==416518001] <-8
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==427378001] <-8
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==430661001] <-8
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==435081200] <-8
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==457571300] <-8
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==458058120] <-8
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==461526300] <-8
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==469598120] <-8
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==471553002] <-8
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==479915110] <-8
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==487809400] <-8
subset_data_100$bdy1001_f2f4_new[subset_data_100$pid_suf ==492853200] <-1
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==114028001] <-9
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==116689300] <-9
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==121039002] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==125196001] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==125196002] <-8
```

```
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==128206002] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==128538002] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==136569001] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==136569002] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==158148001] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==158148002] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==166685400] <-1
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==166852300] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==170315300] <-1
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==175592300] <-1
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==178062400] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==178946001] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==178946002] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==180951001] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==181283001] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==182975200] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==183824002] <-9
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==186238400] <-9
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==187830200] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==189897400] <-1
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==194461001] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==212386001] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==214473002] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==233608200] <-1
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==252574001] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==253910200] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==261505200] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==263068002] <-1
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==280816300] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==286228400] <-1
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==297248200] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==318987002] <-1
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==323512400] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==335058001] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==336095001] <-9
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==342655120] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==348778001] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==383383001] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==387395001] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==398820002] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==419679110] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==427378001] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==431159400] <-9
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==435081200] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==437865200] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==440425400] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==442068200] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==449916300] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==454103002] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==456065002] <-9
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==458058120] <-8
```

```
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==467878002] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==467878300] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==471553002] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==471883001] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==479915110] <-8
subset_data_100$bdy1001_f2f5[subset_data_100$pid_suf ==487011300] <-1
```

####weight####

```
subset_data_100$bdy1002_f2f1_new[subset_data_100$pid_suf ==114097001] <-9
subset_data_100$bdy1002_f2f1_new[subset_data_100$pid_suf ==115568002] <-9
subset_data_100$bdy1002_f2f1_new[subset_data_100$pid_suf ==115584002] <-9
subset_data_100$bdy1002_f2f1_new[subset_data_100$pid_suf ==126339001] <-9
subset_data_100$bdy1002_f2f1_new[subset_data_100$pid_suf ==164528001] <-9
subset_data_100$bdy1002_f2f1_new[subset_data_100$pid_suf ==173154001] <-9
subset_data_100$bdy1002_f2f1_new[subset_data_100$pid_suf ==221865002] <-9
subset_data_100$bdy1002_f2f1_new[subset_data_100$pid_suf ==272800002] <-9
subset_data_100$bdy1002_f2f1_new[subset_data_100$pid_suf ==289480200] <-1
subset_data_100$bdy1002_f2f1_new[subset_data_100$pid_suf ==299846002] <-1
subset_data_100$bdy1002_f2f1_new[subset_data_100$pid_suf ==352132002] <-1
subset_data_100$bdy1002_f2f1_new[subset_data_100$pid_suf ==399208400] <-1
subset_data_100$bdy1002_f2f1_new[subset_data_100$pid_suf ==423467001] <-1
subset_data_100$bdy1002_f2f1_new[subset_data_100$pid_suf ==433249002] <-9
subset_data_100$bdy1002_f2f1_new[subset_data_100$pid_suf ==472760400] <-1
subset_data_100$bdy1002_f2f1_new[subset_data_100$pid_suf ==498367300] <-1
subset_data_100$bdy1002_f2f2_new[subset_data_100$pid_suf ==154461002] <-9
subset_data_100$bdy1002_f2f2_new[subset_data_100$pid_suf ==159070001] <-1
subset_data_100$bdy1002_f2f2_new[subset_data_100$pid_suf ==173501001] <-9
subset_data_100$bdy1002_f2f2_new[subset_data_100$pid_suf ==174018002] <-9
subset_data_100$bdy1002_f2f2_new[subset_data_100$pid_suf ==218748400] <-9
subset_data_100$bdy1002_f2f2_new[subset_data_100$pid_suf ==221518001] <-2
subset_data_100$bdy1002_f2f2_new[subset_data_100$pid_suf ==221518002] <-2
subset_data_100$bdy1002_f2f2_new[subset_data_100$pid_suf ==249311002] <-2
subset_data_100$bdy1002_f2f2_new[subset_data_100$pid_suf ==256281001] <-1
subset_data_100$bdy1002_f2f2_new[subset_data_100$pid_suf ==264021002] <-2
subset_data_100$bdy1002_f2f2_new[subset_data_100$pid_suf ==268513002] <-2
subset_data_100$bdy1002_f2f2_new[subset_data_100$pid_suf ==285302001] <-2
subset_data_100$bdy1002_f2f2_new[subset_data_100$pid_suf ==291543002] <-2
subset_data_100$bdy1002_f2f2_new[subset_data_100$pid_suf ==323960002] <-1
subset_data_100$bdy1002_f2f2_new[subset_data_100$pid_suf ==346234002] <-1
subset_data_100$bdy1002_f2f2_new[subset_data_100$pid_suf ==370522001] <-1
subset_data_100$bdy1002_f2f2_new[subset_data_100$pid_suf ==435519400] <-1
subset_data_100$bdy1002_f2f2_new[subset_data_100$pid_suf ==464666002] <-9
subset_data_100$bdy1002_f2f3_new[subset_data_100$pid_suf ==126339001] <-9
subset_data_100$bdy1002_f2f3_new[subset_data_100$pid_suf ==126339002] <-9
subset_data_100$bdy1002_f2f3_new[subset_data_100$pid_suf ==126339202] <-9
subset_data_100$bdy1002_f2f3_new[subset_data_100$pid_suf ==148195001] <-1
subset_data_100$bdy1002_f2f3_new[subset_data_100$pid_suf ==157488200] <-1
subset_data_100$bdy1002_f2f3_new[subset_data_100$pid_suf ==170132002] <-1
subset_data_100$bdy1002_f2f3_new[subset_data_100$pid_suf ==195364002] <-1
subset_data_100$bdy1002_f2f4_new[subset_data_100$pid_suf ==113159200] <-9
```

```

subset_data_100$bdy1002_f2f4_new[subset_data_100$pid_suf ==133053200] <-9
subset_data_100$bdy1002_f2f4_new[subset_data_100$pid_suf ==142393400] <-9
subset_data_100$bdy1002_f2f4_new[subset_data_100$pid_suf ==169135200] <-9
subset_data_100$bdy1002_f2f4_new[subset_data_100$pid_suf ==169561200] <-9
subset_data_100$bdy1002_f2f4_new[subset_data_100$pid_suf ==172728001] <-9
subset_data_100$bdy1002_f2f4_new[subset_data_100$pid_suf ==172728002] <-9
subset_data_100$bdy1002_f2f4_new[subset_data_100$pid_suf ==178029300] <-1
subset_data_100$bdy1002_f2f4_new[subset_data_100$pid_suf ==214570002] <-9
subset_data_100$bdy1002_f2f4_new[subset_data_100$pid_suf ==245714001] <-9
subset_data_100$bdy1002_f2f4_new[subset_data_100$pid_suf ==259506002] <-9
subset_data_100$bdy1002_f2f4_new[subset_data_100$pid_suf ==269058300] <-1
subset_data_100$bdy1002_f2f4_new[subset_data_100$pid_suf ==274341300] <-9
subset_data_100$bdy1002_f2f4_new[subset_data_100$pid_suf ==293077300] <-9
subset_data_100$bdy1002_f2f4_new[subset_data_100$pid_suf ==349119400] <-9
subset_data_100$bdy1002_f2f4_new[subset_data_100$pid_suf ==413591002] <-9
subset_data_100$bdy1002_f2f4_new[subset_data_100$pid_suf ==436021002] <-1
subset_data_100$bdy1002_f2f5[subset_data_100$pid_suf ==242922300] <-1

}

subset_data_11 <- subset_data_100
# if one value was set missing (flag 9) by hand, then also the BMI should be
marked as missing
subset_data_11$bdy1003_f2f5[!is.na(subset_data_11$bdy1001_f2f5) &
subset_data_11$bdy1001_f2f5 == 9 |
!is.na(subset_data_11$bdy1002_f2f5) &
subset_data_11$bdy1002_f2f5 == 9] <- 9

subset_data_11$bdy1003_f2f4_new[!is.na(subset_data_11$bdy1001_f2f4_new) &
subset_data_11$bdy1001_f2f4_new == 9 |
!is.na(subset_data_11$bdy1002_f2f4_new) &
subset_data_11$bdy1002_f2f4_new == 9] <- 9

subset_data_11$bdy1003_f2f3_new[!is.na(subset_data_11$bdy1001_f2f3_new) &
subset_data_11$bdy1001_f2f3_new == 9 |
!is.na(subset_data_11$bdy1002_f2f3_new) &
subset_data_11$bdy1002_f2f3_new == 9] <- 9

subset_data_11$bdy1003_f2f2_new[!is.na(subset_data_11$bdy1001_f2f2_new) &
subset_data_11$bdy1001_f2f2_new == 9 |
!is.na(subset_data_11$bdy1002_f2f2_new) &
subset_data_11$bdy1002_f2f2_new == 9] <- 9

subset_data_11$bdy1003_f2f1_new[!is.na(subset_data_11$bdy1001_f2f1_new) &
subset_data_11$bdy1001_f2f1_new == 9 |
!is.na(subset_data_11$bdy1002_f2f1_new) &
subset_data_11$bdy1002_f2f1_new == 9] <- 9

#creating helper variables for data checks
# Concatenate age variables row-wise, replacing NAs with an empty space

```

```

subset_data_11$concat_age <- apply(subset_data_11[, c("age_f2f1", "age_f2f2",
"age_f2f3", "age_f2f4", "age_f2f5")], 1, function(x) {
  paste(ifelse(is.na(x) | x < 0, "**.*", round(x, 1)), collapse = " | ")
})

# Concatenate BMI variables row-wise, replacing NAs with an empty space
subset_data_11$concat_BMI <- apply(subset_data_11[, c("bdy0300_f2f1_new",
"bdy0300_f2f2_new", "bdy0300_f2f3_new", "bdy0300_f2f4_new", "bdy0300_f2f5")],
1, function(x) {
  paste(ifelse(is.na(x) | x < 0, "**.*", round(x, 0)), collapse = " | ")
})

# Concatenate height flags row-wise, replacing NAs with an empty space
subset_data_11$concat_bdy1001 <- apply(subset_data_11[, c("bdy1001_f2f1_new",
"bdy1001_f2f2_new", "bdy1001_f2f3_new", "bdy1001_f2f4_new", "bdy1001_f2f5")],
1, function(x) {
  paste(ifelse(is.na(x) | x < 0, "*", x), collapse = " | ")
})

# Concatenate weight flags row-wise, replacing NAs with an empty space
subset_data_11$concat_bdy1002 <- apply(subset_data_11[, c("bdy1002_f2f1_new",
"bdy1002_f2f2_new", "bdy1002_f2f3_new", "bdy1002_f2f4_new", "bdy1002_f2f5")],
1, function(x) {
  paste(ifelse(is.na(x) | x < 0, "*", x), collapse = " | ")
})

# Concatenate BMI flags row-wise, replacing NAs with an empty space
subset_data_11$concat_bdy1003 <- apply(subset_data_11[, c("bdy1003_f2f1_new",
"bdy1003_f2f2_new", "bdy1003_f2f3_new", "bdy1003_f2f4_new", "bdy1003_f2f5")],
1, function(x) {
  paste(ifelse(is.na(x) | x < 0, "*", x), collapse = " | ")
})

# Concatenate height variables (bdy0100_hgt) row-wise, replacing NAs with an
empty space
subset_data_11$concat_bdy0100_hgt <- apply(subset_data_11[,
c("bdy0100_hgt_f2f1_new", "bdy0100_hgt_f2f2_new", "bdy0100_hgt_f2f3_new",
"bdy0100_hgt_f2f4_new", "bdy0100_hgt_f2f5")], 1, function(x) {
  paste(ifelse(is.na(x) | (x < 0 & (x != -81 | x != -80 | x != -82 | x != -83)),
"****", round(x, 1)), collapse = " | ")
})

# Concatenate weight variables (bdy0200_wgt) row-wise, replacing NAs with an
empty space
subset_data_11$concat_bdy0200_wgt <- apply(subset_data_11[,
c("bdy0200_wgt_f2f1_new", "bdy0200_wgt_f2f2_new", "bdy0200_wgt_f2f3_new",
"bdy0200_wgt_f2f4_new", "bdy0200_wgt_f2f5")], 1, function(x) {
  paste(ifelse(is.na(x) | (x < 0 & (x != -81 | x != -80 | x != -82 | x != -
83)), "**", round(x, 1)), collapse = " | ")
})

```

```

# Concatenate PR height variables, omitting NAs
subset_data_11$concat_height_PR <- apply(subset_data_11[, c("prh0100_f2f1",
"prh0100_f2f2", "prh0100_f2f3", "prh0100_f2f4", "prh0100_f2f5")], 1,
function(x) {
  paste(ifelse(!is.na(x) & x >= -80, floor(x), "***"), collapse = " | ")
})

# Concatenate PR weight variables, omitting NAs
subset_data_11$concat_weight_PR <- apply(subset_data_11[, c("prh0200_f2f1",
"prh0200_f2f2", "prh0200_f2f3", "prh0200_f2f4", "prh0200_f2f5")], 1,
function(x) {
  paste(ifelse(!is.na(x) & x >= -80, floor(x), "***"), collapse = " | ")
})

if (control ==1){
#filtering for cases with flags

# Define base names and suffixes
base_names <- c("bdy1001", "bdy1002", "bdy1003")
suffixes <- paste0("_f2f", 1:5)

# Create all combinations of base names and suffixes
combinations <- expand.grid(base = base_names, suffix = suffixes)

# Concatenate base and suffix
combinations$combined <- paste0(combinations$base, combinations$suffix)

# Create the "_new" variant for all except "_f2f5"
combinations$combined_new <- ifelse(
  combinations$suffix != "_f2f5",
  paste0(combinations$combined, "_new"),
  NA
)

# Combine the original and new variants into a single vector, removing NAs
all_combinations <- c(combinations$combined,
na.omit(combinations$combined_new))

# View the results
all_combinations
}

if (control ==1){
subset_data_12 <- subset_data_11
#defining suspicious cases in "partic"
subset_data_12$partic <- apply(subset_data_12[all_combinations], 1,
function(row) any(row > 0 & !is.na(row) & row !=3))
subset_data_12$partic <- ifelse(subset_data_12$partic == TRUE, 1,0)

```

```

#cases with very high or low values are marked also as partic
subset_data_12 <- subset_data_12 %>%
  rowwise() %>%
  mutate(
    partic = if_else(
      any(c_across(c(bdy0100_hgt_f2f1_new, bdy0100_hgt_f2f2_new,
                    bdy0100_hgt_f2f3_new, bdy0100_hgt_f2f4_new,
                    bdy0100_hgt_f2f5)) %in% c(-1:90, 211:1000), na.rm =
TRUE),
      1,
      partic
    ),
    partic = if_else(
      any(c_across(c(bdy0200_wgt_f2f1_new, bdy0200_wgt_f2f2_new,
                    bdy0200_wgt_f2f3_new, bdy0200_wgt_f2f4_new,
                    bdy0200_wgt_f2f5)) %in% c(-1:9, 151:1000), na.rm =
TRUE),
      1,
      partic
    ),
    partic = if_else(
      any(c_across(c(bdy0300_f2f1_new, bdy0300_f2f2_new,
                    bdy0300_f2f3_new, bdy0300_f2f4_new,
                    bdy0300_f2f5)) %in% c(60:1000), na.rm = TRUE),
      1,
      partic
    ),
  ) %>%
  ungroup()

```

```
table(subset_data_12$partic)
```

```
names(subset_data_12)
}
```

```

if (control ==1){
#reorderign the data so the check variables are up front
subset_data_12$hgt_corr <- NA
subset_data_12$bdy1001_corr <- NA
subset_data_12$f2f_hgt_corr <- NA
subset_data_12$wgt_corr <- NA
subset_data_12$bdy1002_corr <- NA
subset_data_12$f2f_wgt_corr <- NA

```

```

new_order <- c("pid_suf", "partic", "cgr", "sex", "concat_age", "hgt_values"
, "concat_bdy0100_hgt", "concat_bdy1001", "concat_height_PR", "hgt_corr",
"bdy1001_corr", "f2f_hgt_corr",

```

```

"wgt_values", "concat_bdy0200_wgt", "concat_bdy1002"
, "concat_weight_PR", "wgt_corr", "bdy1002_corr", "f2f_wgt_corr", "concat_BMI",
"concat_bdy1003")
subset_data_12 <- subset_data_12[, c(new_order ,
setdiff(names(subset_data_12), new_order))]

```

```

library(openxlsx)

```

```

write.xlsx(subset_data_12, "subset_data_12_unaltered_new04022025.xlsx")
}

```

```

if (control==0){
#reordering the data so the check variables are up front
subset_data_11$sus_height <- ifelse(grepl("1|2|8|9",
subset_data_11$concat_bdy1001), 1, 0)
subset_data_11$sus_weight <- ifelse(grepl("1|2|8|9",
subset_data_11$concat_bdy1002), 1, 0)

```

```

new_order_height <- c("pid_suf", "cgr", "sex", "concat_age", "hgt_values" ,
"concat_height_PR", "concat_bdy1001", "bdy0100_hgt_f2f1_new",
"bdy0100_hgt_f2f2_new", "bdy0100_hgt_f2f3_new", "bdy0100_hgt_f2f4_new",
"bdy0100_hgt_f2f5", "bdy1001_f2f1_new", "bdy1001_f2f2_new",
"bdy1001_f2f3_new", "bdy1001_f2f4_new", "bdy1001_f2f5")
check_data_height <- subset(subset_data_11, sus_height == 1, select =
new_order_height)
check_data_height$bdy0100_hgt_f2f1_new <-
ifelse(check_data_height$bdy1001_f2f1_new %in% c(0,3) |
check_data_height$bdy0100_hgt_f2f1_new < -81, NA,
check_data_height$bdy0100_hgt_f2f1_new)
check_data_height$bdy0100_hgt_f2f2_new <-
ifelse(check_data_height$bdy1001_f2f2_new %in% c(0,3) |
check_data_height$bdy0100_hgt_f2f2_new < -81, NA,
check_data_height$bdy0100_hgt_f2f2_new)
check_data_height$bdy0100_hgt_f2f3_new <-
ifelse(check_data_height$bdy1001_f2f3_new %in% c(0,3) |
check_data_height$bdy0100_hgt_f2f3_new < -81, NA,
check_data_height$bdy0100_hgt_f2f3_new)
check_data_height$bdy0100_hgt_f2f4_new <-
ifelse(check_data_height$bdy1001_f2f4_new %in% c(0,3) |
check_data_height$bdy0100_hgt_f2f4_new < -81, NA,
check_data_height$bdy0100_hgt_f2f4_new)
check_data_height$bdy0100_hgt_f2f5 <- ifelse(check_data_height$bdy1001_f2f5
%in% c(0,3) | check_data_height$bdy0100_hgt_f2f5 < -81, NA,
check_data_height$bdy0100_hgt_f2f5)
new_order_height_1 <- c("pid_suf", "cgr", "sex", "concat_age", "hgt_values" ,
"concat_height_PR", "concat_bdy1001", "bdy0100_hgt_f2f1_new",
"bdy0100_hgt_f2f2_new", "bdy0100_hgt_f2f3_new", "bdy0100_hgt_f2f4_new",
"bdy0100_hgt_f2f5")

```

```

check_data_height <- check_data_height[, new_order_height_1]

new_order_weight <- c("pid_suf", "cgr", "sex", "concat_age", "wgt_values",
"concat_weight_PR", "concat_bdy1002", "bdy0200_wgt_f2f1_new",
"bdy0200_wgt_f2f2_new", "bdy0200_wgt_f2f3_new", "bdy0200_wgt_f2f4_new",
"bdy0200_wgt_f2f5", "bdy1002_f2f1_new", "bdy1002_f2f2_new",
"bdy1002_f2f3_new", "bdy1002_f2f4_new", "bdy1002_f2f5")
check_data_weight <- subset(subset_data_11, sus_weight == 1, select =
new_order_weight)
check_data_weight$bdy0200_wgt_f2f1_new <-
ifelse(check_data_weight$bdy1002_f2f1_new %in% c(0,3) |
check_data_weight$bdy0200_wgt_f2f1_new < -81, NA,
check_data_weight$bdy0200_wgt_f2f1_new)
check_data_weight$bdy0200_wgt_f2f2_new <-
ifelse(check_data_weight$bdy1002_f2f2_new %in% c(0,3) |
check_data_weight$bdy0200_wgt_f2f2_new < -81, NA,
check_data_weight$bdy0200_wgt_f2f2_new)
check_data_weight$bdy0200_wgt_f2f3_new <-
ifelse(check_data_weight$bdy1002_f2f3_new %in% c(0,3) |
check_data_weight$bdy0200_wgt_f2f3_new < -81, NA,
check_data_weight$bdy0200_wgt_f2f3_new)
check_data_weight$bdy0200_wgt_f2f4_new <-
ifelse(check_data_weight$bdy1002_f2f4_new %in% c(0,3) |
check_data_weight$bdy0200_wgt_f2f4_new < -81, NA,
check_data_weight$bdy0200_wgt_f2f4_new)
check_data_weight$bdy0200_wgt_f2f5 <- ifelse(check_data_weight$bdy1002_f2f5
%in% c(0,3) | check_data_weight$bdy0200_wgt_f2f5 < -81, NA,
check_data_weight$bdy0200_wgt_f2f5)
new_order_weight_1 <- c("pid_suf", "cgr", "sex", "concat_age", "wgt_values",
"concat_weight_PR", "concat_bdy1002", "bdy0200_wgt_f2f1_new",
"bdy0200_wgt_f2f2_new", "bdy0200_wgt_f2f3_new", "bdy0200_wgt_f2f4_new",
"bdy0200_wgt_f2f5" )
check_data_weight <- check_data_weight[, new_order_weight_1]
library(openxlsx)

write.xlsx(check_data_height, "check_data_height.xlsx")
write.xlsx(check_data_weight, "check_data_weight.xlsx")
}

var_keep_bdy_f2f1 <- search_var_function(subset_data_11, stamm="bdy", suffix
= ".*", zeitpunkt="f2f1(_new)?")

var_keep_end <- c("pid_suf", "cgr", "sex", "ptyp_f2f1", "age_f2f1")

f2f1_update <- subset(subset_data_11, select= c(var_keep_end,
sort(var_keep_bdy_f2f1)))
if (control == 1){
f2f1_update_check <- f2f1_update

```

```

write.dta(f2f1_update_check, "f2f1_update_check.dta")
}

if (control == 0){
f2f1_update <- f2f1_update[, grepl("pid_suf$|_new$", names(f2f1_update))]
names(f2f1_update) <- sub("_f2f1_new$", "", names(f2f1_update))
f2f1_update <- f2f1_update[rowSums(!is.na(f2f1_update[, -
which(names(f2f1_update) == "pid_suf")])) > 0, ]
View(f2f1_update)
f2f1_update$wid <- 1
write.dta(f2f1_update, "f2f1_update.dta")
}

var_keep_bdy_f2f2 <- search_var_function(subset_data_11, stamm="bdy", suffix
= ".*", zeitpunkt="f2f2(_new)?")

var_keep_end <- c("pid_suf", "cgr", "sex_f2f2", "ptyp_f2f2", "age_f2f2")

f2f2_update <- subset(subset_data_11, select= c(var_keep_end,
sort(var_keep_bdy_f2f2)))
if (control == 1){
f2f2_update_check <- f2f2_update
write.dta(f2f2_update_check, "f2f2_update_check.dta")
}

if (control == 0){
f2f2_update <- f2f2_update[, grepl("pid_suf$|_new$", names(f2f2_update))]
names(f2f2_update) <- sub("_f2f2_new$", "", names(f2f2_update))
f2f2_update <- f2f2_update[rowSums(!is.na(f2f2_update[, -
which(names(f2f2_update) == "pid_suf")])) > 0, ]
View(f2f2_update)
f2f2_update$wid <- 3
write.dta(f2f2_update, "f2f2_update.dta")
}

var_keep_bdy_f2f3 <- search_var_function(subset_data_11, stamm="bdy", suffix
= ".*", zeitpunkt="f2f3(_new)?")

var_keep_end <- c("pid_suf", "cgr", "sex_f2f3", "ptyp_f2f3", "age_f2f3")

f2f3_update <- subset(subset_data_11, select= c(var_keep_end,
sort(var_keep_bdy_f2f3)))
if (control == 1){
f2f3_update_check <- f2f3_update

```

```

write.dta(f2f3_update_check, "f2f3_update_check.dta")
}

if (control == 0){

f2f3_update <- f2f3_update[, grepl("pid_suf$|_new$", names(f2f3_update))]
names(f2f3_update) <- sub("_f2f3_new$", "", names(f2f3_update))
f2f3_update <- f2f3_update[rowSums(!is.na(f2f3_update[, -
which(names(f2f3_update) == "pid_suf")])) > 0, ]
View(f2f3_update)
f2f3_update$wid <- 5
write.dta(f2f3_update, "f2f3_update.dta")

}

var_keep_bdy_f2f4 <- search_var_function(subset_data_11, stamm="bdy", suffix
= ".*", zeitpunkt="f2f4(_new)?")

var_keep_end <- c("pid_suf", "cgr", "sex_f2f4", "ptyp_f2f4", "age_f2f4")

f2f4_update <- subset(subset_data_11, select= c(var_keep_end,
sort(var_keep_bdy_f2f4)))
if (control == 1){
f2f4_update_check <- f2f4_update
write.dta(f2f4_update_check, "f2f4_update_check.dta")
}

if (control == 0){
f2f4_update <- f2f4_update[, grepl("pid_suf$|_new$", names(f2f4_update))]
names(f2f4_update) <- sub("_f2f4_new$", "", names(f2f4_update))
f2f4_update <- f2f4_update[rowSums(!is.na(f2f4_update[, -
which(names(f2f4_update) == "pid_suf")])) > 0, ]
View(f2f4_update)
f2f4_update$wid <- 7
write.dta(f2f4_update, "f2f4_update.dta")

}

var_keep_bdy_f2f5 <- columns_f2f5 <- c("bdy0100_nht_f2f5",
"bdy0100_dht_f2f5", "bdy0200_nwt_f2f5", "bdy0200_dwt_f2f5",
"bdy0100_hgt_f2f5", "bdy0200_wgt_f2f5", "bdy0300_f2f5",
"bdy1001_f2f5",
"bdy1002_f2f5", "bdy1003_f2f5")

var_keep_end <- c("pid_suf")

```

```
f2f5_update <- subset(subset_data_11, select= c(var_keep_end,
sort(var_keep_bdy_f2f5)))
names(f2f5_update ) <- sub("_f2f5$", "", names(f2f5_update ))
f2f5_update <- f2f5_update[rowSums(!is.na(f2f5_update[, -
which(names(f2f5_update) == "pid_suf")])) > 0, ]
View(f2f5_update)
f2f5_update$wid <- 9
write.dta(f2f5_update, "f2f5_update.dta")
```