

Estimated Height – Young and Mid-aged

An examination of reported heights at the first 3 surveys showed implausible inconsistencies for all 3 age cohorts, with only 10.6% (n=1 439), 29.3% (n=4 005) and 16.4% (n=2 031) of younger, mid-age and older women respectively reporting the same height at all 3 surveys. While a reduction in height may be expected among the older women this is not true for the other two age cohorts and so a single estimate for height was developed for these women, making use of all the available data. Heights for the older cohort remain as reported.

Defining Consistency in reported heights for Younger and Mid-age Women

Rules for consistency were based on differences in the height reported at each of the 3 surveys (Table 2) and a difference of up to 5cm was considered to be sufficiently consistent as to represent a report of the same height. For example, reported heights of 175cm at Survey 1 and 180cm at Survey 2, a difference of 5, were considered consistent; however a height of 175cm at Survey 1 was considered inconsistent with a height of 183cm at Survey 2, a difference of 8cm.

Table 2 Descriptive statistics for differences in reported height (cm)

	Number	Mean	Std Dev	Median	Minimum	Maximum
Younger						
Surveys 1 & 2	8 139	-0.111	4.49	0	-45	51
Surveys 3 & 2	6 280	-0.038	4.39	0	-39	43
Surveys 3 & 1	7 247	-0.236	4.27	0	-32	33
Mid-age						
Surveys 1 & 2	10 660	-0.112	3.24	0	-41	43
Surveys 3 & 2	9 310	-0.161	3.60	0	-33	43
Surveys 3 & 1	10 297	-0.252	3.62	0	-33	50
Older						
Surveys 1 & 2	9 354	-0.753	4.95	0	-41	33
Surveys 3 & 2	7 314	-0.872	5.90	0	-43	51
Surveys 3 & 1	7 732	-1.680	5.44	0	-41	53

Calculation of Height for Younger and Mid-age Women

Rules for the estimation of Height were based on the patterns of responses at 3 surveys (Table 3). A value for height could not be assigned to the following three response patterns:

1. Height not reported at any of the first three surveys.
2. Height reported at only two of the first three surveys, and the two reports differ by more than 5 cm.
3. Height reported at Surveys 1, 2 and 3; no two heights are equal and the range in reported height exceeds 10 cm.

Table 4 shows the reported and estimated heights for the Younger and Mid-age women

Table 3 Number and percent for each unique data-pattern and the method used to estimate height for 14 247 Younger and 13 716 Mid-age women providing contact details for longitudinal follow-up

Method for estimating height applied to various data-patterns	Younger		Mid-age	
	Number	Percent	Number	Percent
Height is the single height reported				
Height reported at Survey 1 only	3 486	24.5	1 474	10.7
Height reported at Survey 2 only	215	1.5	67	0.5
Height reported at Survey 3 only	130	0.9	75	0.5
Height is the mean of 3 reported heights				
Heights reported at 3 surveys are equal.	1 439	10.1	4 005	29.2
Height is reported at all 3 surveys and no differences between them exceeds 5cm	925	6.5	609	4.4
Height is reported at all 3 surveys; none of the data patterns shown below are appropriate and no differences between these heights exceeds 10cm	295	2.1	199	1.5
Height is the mean of two equal heights				
Heights reported at Surveys 1 & 2 are equal; height reported at Survey 3 does not equal this value	769	5.4	1 484	10.8
Heights reported at Surveys 1 & 3 are equal; height reported at Survey 2 does not equal this value	680	4.8	1212	8.8
Heights reported at Surveys 2 & 3 are equal; height reported at Survey 1 does not equal this value	1 269	8.9	1 389	10.1
Height is the mean of the 2 heights reported				
<i>Survey 1 height is missing</i>				
Heights reported at Surveys 2 & 3 are equal	120	0.8	76	0.6
Heights reported at Surveys 2 & 3 are within 5cm of one another	196	1.4	83	0.6
<i>Survey 2 height is missing</i>				
Heights reported at Surveys 1 & 3 are equal	489	3.4	584	4.3
Heights reported at Surveys 1 & 3 are within 5cm of one another	733	5.1	497	3.6
<i>Continued over</i>				

Table 3 (continued)

Method for estimating height applied to various data-patterns	Younger		Mid-age	
	Number	Percent	Number	Percent
<i>Survey 3 height is missing</i>				
Heights reported at Surveys 1 & 2 are equal	796	5.6	843	6.1
Heights reported at Surveys 1 & 2 are within 5cm of one another	1 159	8.1	603	4.4
Height is the mean of 2 heights with a difference not exceeding 5cm				
Difference between Surveys 1 & 2 does not exceed 5 cm	146	1.0	90	0.7
Difference between Surveys 2 & 3 does not exceed 5 cm	140	1.0	59	0.4
Difference between Surveys 1 & 3 does not exceed 5 cm	136	1.0	59	0.4
Height is not estimated (Set to missing)				
Inconsistencies – not matching any of the above patterns	515	3.6	124	0.9
All three heights are missing.	609	4.3	184	1.3

Table 4 Descriptive statistics for reported and estimated height (cm)

Height cm	Number	Mean	Std Dev	Median	Minimum	Maximum
Younger						
Survey 1	13 494	165.97	7.63	165	120	198
Survey 2	8 779	165.80	7.58	165	120	198
Survey 3	7 802	165.89	7.48	165	126	196
Estimated	13 600	165.89	7.45	165	120	198
Mid-age						
Survey 1	13 655	163.07	6.89	163	122	190
Survey 2	10 905	163.03	6.91	163	122	188
Survey 3	10 550	162.92	7.06	163	122	188
Estimated	13 764	163.03	6.75	163	122	188
Older						
Survey 1	12 362	161.18	6.91	160	120	188
Survey 2	9 704	160.51	7.34	160	120	188
Survey 3	7 987	159.67	7.56	160	122	188

The SAS code for estimated height in the Mid-age cohort is:

```
data middata.m123AvHt;
merge middata.wha1midb(in=ins1)
      middata.wha2midb(in=ins2)
      middata.wha3midb(in=ins3) ;
by IDalias ;

m1htr = round(m1htcm,1);
m2htr = round(m2htcm,1);
m3htr = round(m3htcm,1);

array hts{3} m1htr m2htr m3htr ;

/* Calculate difference between maximum and minimum height */
maxdiff = max(of hts{*})- min(of hts{*}) ;

/* Calculate differences in heights */
diff1=abs(m1htr-m2htr) ;
diff2=abs(m1htr-m3htr) ;
diff3=abs(m2htr-m3htr) ;

/* Calculate the 'average' height */
if nmiss(of hts{*})=3 then ht = . ;
else if nmiss(of hts{*})=1 and maxdiff>5 then ht=. ;
else if diff3=0 or ((diff1>5 and diff2>5) and diff3<=5) then
    ht=mean(m2htr,m3htr) ;
else if diff2=0 or ((diff1>5 and diff3>5) and diff2<=5) then
    ht=mean(m1htr,m3htr) ;
else if diff1=0 or ((diff2>5 and diff3>5) and diff1<=5) then
    ht=mean(m1htr,m2htr) ;
else if maxdiff>10 then ht=. ;
else ht = mean(of hts{*}) ;

m123AvHt=round(ht,1) ;
```