American Population Body Composition Averages from the NHANES-III Data Set

Introduction

The purpose of this document is to provide the statistical averages of the body composition of average Americans and provide reference averages with which an individual may be compared to the population examined in NHANES-III.

Scope

The following tables illustrate the average ranges for various body composition and electrical properties of Americans, as examined in NHANES-III. The tables DO NOT illustrate "ideal" or "target" values. Furthermore, the tables may show values that are considered to be "unhealthy" by medical professionals. The purpose of this document is strictly limited to providing a reference of the population examined in NHANES-III.

Methods

The NHANES-III data set contains (among many other values) height, weight, age, gender, resistance, and reactance data. Using the same methods of Chumlea, et al. [2], these values were used to estimate various body composition and electrical properties of each individual. The formulas used are contained in the “NHANES-III” equation set provided in RJL Systems’ software. [1,2,3]

Usage Instructions

The tables in this document contain the mean (the center of the average range) and standard deviation (the variance, +/-, of the average range) for each value. To find an average range, first find the section for the appropriate gender and age range. (eg: Males aged 20-29) Next, locate the column for the value of interest, (eg: FAT % of weight) and note the mean and standard deviation values. Add the standard deviation to the mean to get the high end of the average range. Subtract the standard deviation from the mean to get the low end. Using the above example, the average range for body fat percentage for 20-29 year old American males is 16.8% - 29.8%.

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[1] Shumei S Sun, W Cameron Chumlea, Steven B Heymsfield, Henry C Lukaski, Dale Schoeller, Karl Friedl, Robert J Kuczmarski, Katherine M Flegal, Clifford L Johnson, and Van S Hubbard *Development of bioelectrical impedance analysis prediction equations for body composition with the use of a multicomponent model for use in epidemiologic surveys*Am J Clin Nutr 2003;77:331-40.

[2] WC Chumlea, SS Guo, RJ Kuczmarski, KM Flegal, CL Johnson, SB Heymsfield, HC Lukaski, K Friedl and VS Hubbard *Body composition estimates from NHANES III bioelectrical impedance data/fRInternational Journal of Obesity (2002) 26, 1596-1609*

[3] Giuseppe Sergi, et. al. *Accuracy of Bioelectrical Impedance Analysis in Estimation of Extracellular Space in Healthy Subjects and in Fluid Retention States.* Annals of Nutrition and Metabolism (1994) 38, 158-165

Male Age Groups 10 19. (n=1379)														
Description:	Age	Height cm	Weight kg	Weight lbs	Resistance	Reactance	Phase Angle	Dissipation	TBW_liters	TBW % Wt	TBW % FFM	ICW_liters	ICW % Wt	ICW % FFM
Means	15.4	168.7	64.3	141.8	514.3	72.5	8.0	7.3	38.1	60.2	74.7	22.9	36.4	45.1
+/- Std Dev	2.3	10.6	17.1	37.7	72.5	10.5	1.0	1.2	8.1	5.9	1.0	4.1	3.9	1.9

Description:	ICW % TBW	ECW_liters	ECW % Wt	ECW % FFM	ECW % TBW	FAT_kg	FAT_lbs	FAT % Wt	FFM_kg	FFM_lbs	FFM % Wt	BMR_Kcal	BMI
Means	60.4	15.3	23.8	29.5	39.6	13.2	29.2	19.4	51.1	112.6	80.6	1693.1	22.4
+/- Std Dev	2.4	4.0	2.6	1.8	2.4	8.3	18.2	7.4	10.9	24.0	7.4	265.2	4.7

Male Age Groups 20 29. (n=1553)														
Description:	Age	Height cm	Weight kg	Weight lbs	Resistance	Reactance	Phase Angle	Dissipation	TBW_liters	TBW % Wt	TBW % FFM	ICW_liters	ICW % Wt	ICW % FFM
Means	24.5	173.8	77.4	170.6	479.9	74.1	8.7	6.6	43.6	57.1	74.5	25.8	33.9	44.3
+/- Std Dev	2.8	7.8	17.3	38.0	61.9	10.9	0.9	0.7	7.3	5.1	0.8	3.7	3.2	1.3

Description:	ICW % TBW	ECW_liters	ECW % Wt	ECW % FFM	ECW % TBW	FAT_kg	FAT_lbs	FAT % Wt	FFM_kg	FFM_lbs	FFM % Wt	BMR_Kcal	BMI
Means	59.4	17.8	23.2	30.2	40.6	18.8	41.3	23.3	58.7	129.3	76.7	1836.9	25.5
+/- Std Dev	1.5	3.6	2.2	1.1	1.5	9.2	20.2	6.5	10.0	22.0	6.5	256.3	4.9

Male Age Groups 30 39. (n=1383)														
Description:	Age	Height cm	Weight kg	Weight lbs	Resistance	Reactance	Phase Angle	Dissipation	TBW_liters	TBW % Wt	TBW % FFM	ICW_liters	ICW % Wt	ICW % FFM
Means	34.3	174.8	81.6	180.0	469.2	70.7	8.5	6.8	45.4	56.2	74.4	26.7	33.2	43.9
+/- Std Dev	2.8	7.6	17.0	37.6	63.3	10.6	0.9	0.7	7.5	4.8	0.8	3.8	3.0	1.2

Description:	ICW % TBW	ECW_liters	ECW % Wt	ECW % FFM	ECW % TBW	FAT_kg	FAT_lbs	FAT % Wt	FFM_kg	FFM_lbs	FFM % Wt	BMR_Kcal	BMI
Means	59.0	18.7	23.1	30.5	41.0	20.5	45.2	24.4	61.1	134.8	75.6	1833.9	26.6
+/- Std Dev	1.4	3.7	2.1	1.1	1.4	8.7	19.2	6.2	10.3	22.8	6.2	253.7	5.0

Male Age Groups 40 49. (n=1155)														
Description:	Age	Height cm	Weight kg	Weight lbs	Resistance	Reactance	Phase Angle	Dissipation	TBW_liters	TBW % Wt	TBW % FFM	ICW_liters	ICW % Wt	ICW % FFM
Means	43.9	174.3	83.7	184.4	462.5	67.1	8.2	7.1	46.0	55.5	74.4	26.9	32.6	43.7
+/- Std Dev	2.8	7.6	16.7	36.8	62.3	10.9	1.0	0.8	7.4	4.6	0.8	3.7	2.8	1.2

Description:	ICW % TBW	ECW_liters	ECW % Wt	ECW % FFM	ECW % TBW	FAT_kg	FAT_lbs	FAT % Wt	FFM_kg	FFM_lbs	FFM % Wt	BMR_Kcal	BMI
Means	58.7	19.1	22.9	30.7	41.3	21.8	48.0	25.4	61.9	136.4	74.6	1794.2	27.5
+/- Std Dev	1.5	3.7	2.0	1.1	1.5	8.5	18.6	5.8	10.2	22.4	5.8	250.8	4.9

Male Age Groups 50 59. (n=792)														
Description:	Age	Height cm	Weight kg	Weight lbs	Resistance	Reactance	Phase Angle	Dissipation	TBW_liters	TBW % Wt	TBW % FFM	ICW_liters	ICW % Wt	ICW % FFM
Means	54.4	174.5	84.1	185.5	463.6	62.6	7.6	7.6	46.1	55.3	74.3	26.8	32.2	43.3
+/- Std Dev	2.8	6.9	16.3	36.0	66.1	10.8	0.9	1.0	7.3	4.6	0.8	3.6	2.8	1.2

Description:	ICW % TBW	ECW_liters	ECW % Wt	ECW % FFM	ECW % TBW	FAT_kg	FAT_lbs	FAT % Wt	FFM_kg	FFM_lbs	FFM % Wt	BMR_Kcal	BMI
Means	58.3	19.3	23.1	31.0	41.7	22.1	48.7	25.6	62.0	136.8	74.4	1729.7	27.6
+/- Std Dev	1.6	3.7	2.1	1.2	1.6	8.3	18.3	5.8	9.9	21.8	5.8	243.7	4.8

Male Age Groups 60 69. (n=1055)														
Description:	Age	Height cm	Weight kg	Weight lbs	Resistance	Reactance	Phase Angle	Dissipation	TBW_liters	TBW % Wt	TBW % FFM	ICW_liters	ICW % Wt	ICW % FFM
Means	64.3	172.5	81.7	180.2	471.3	59.6	7.1	8.2	44.6	55.0	74.4	25.9	32.0	43.3
+/- Std Dev	2.9	7.1	15.0	33.1	69.4	10.8	0.9	1.1	7.0	4.6	0.9	3.5	2.7	1.3

Description:	ICW % TBW	ECW_liters	ECW % Wt	ECW % FFM	ECW % TBW	FAT_kg	FAT_lbs	FAT % Wt	FFM_kg	FFM_lbs	FFM % Wt	BMR_Kcal	BMI
Means	58.2	18.7	23.0	31.1	41.8	21.8	48.1	26.1	59.9	132.1	73.9	1619.5	27.4
+/- Std Dev	1.6	3.6	2.2	1.3	1.6	7.7	16.9	5.8	9.4	20.8	5.8	227.6	4.4

Male Age Groups 70 79. (n=724)														
Description:	Age	Height cm	Weight kg	Weight lbs	Resistance	Reactance	Phase Angle	Dissipation	TBW_liters	TBW % Wt	TBW % FFM	ICW_liters	ICW % Wt	ICW % FFM
Means	73.6	171.2	77.5	170.9	480.4	55.1	6.4	9.1	42.9	55.7	74.5	24.7	32.2	43.1
+/- Std Dev	2.6	7.1	14.1	31.2	67.9	11.2	1.0	1.5	6.7	4.6	0.9	3.3	2.7	1.4

Description:	ICW % TBW	ECW_liters	ECW % Wt	ECW % FFM	ECW % TBW	FAT_kg	FAT_lbs	FAT % Wt	FFM_kg	FFM_lbs	FFM % Wt	BMR_Kcal	BMI
Means	57.9	18.1	23.5	31.4	42.1	20.0	44.1	25.3	57.5	126.8	74.7	1491.9	26.4
+/- Std Dev	1.9	3.5	2.3	1.4	1.9	7.0	15.5	5.8	9.1	20.0	5.8	216.3	4.2

Male Age Groups 80 89. (n=472)														
Description:	Age	Height cm	Weight kg	Weight lbs	Resistance	Reactance	Phase Angle	Dissipation	TBW_liters	TBW % Wt	TBW % FFM	ICW_liters	ICW % Wt	ICW % FFM
Means	82.8	169.5	72.6	160.1	494.3	50.2	5.7	10.2	40.6	56.4	74.6	23.3	32.4	42.9
+/- Std Dev	2.5	6.8	12.3	27.0	70.9	9.8	0.9	1.6	6.0	4.9	1.0	2.9	2.7	1.4

Description:	ICW % TBW	ECW_liters	ECW % Wt	ECW % FFM	ECW % TBW	FAT_kg	FAT_lbs	FAT % Wt	FFM_kg	FFM_lbs	FFM % Wt	BMR_Kcal	BMI
Means	57.5	17.3	24.0	31.7	42.5	18.1	39.9	24.4	54.5	120.1	75.6	1352.6	25.2
+/- Std Dev	1.9	3.2	2.6	1.6	1.9	6.6	14.5	6.1	8.0	17.6	6.1	190.6	3.8

Male Age Groups 90 99. (n=32)														
Description:	Age	Height cm	Weight kg	Weight lbs	Resistance	Reactance	Phase Angle	Dissipation	TBW_liters	TBW % Wt	TBW % FFM	ICW_liters	ICW % Wt	ICW % FFM
Means	90.0	167.1	65.1	143.5	517.2	49.6	5.4	10.9	37.5	58.1	74.7	21.6	33.6	43.2
+/- Std Dev	0.0	8.6	12.1	26.7	84.0	11.3	1.2	1.9	6.0	6.0	1.6	3.0	3.7	1.9

Description:	ICW % TBW	ECW_liters	ECW % Wt	ECW % FFM	ECW % TBW	FAT_kg	FAT_lbs	FAT % Wt	FFM_kg	FFM_lbs	FFM % Wt	BMR_Kcal	BMI
Means	57.8	15.9	24.5	31.5	42.2	15.0	33.0	22.2	50.2	110.6	77.8	1188.4	23.3
+/- Std Dev	2.1	3.1	2.9	1.7	2.1	6.6	14.6	7.2	8.0	17.7	7.2	190.3	3.6

Female Age Groups 10 19. (n=1448)														
Description:	Age	Height cm	Weight kg	Weight lbs	Resistance	Reactance	Phase Angle	Dissipation	TBW_liters	TBW % Wt	TBW % FFM	ICW_liters	ICW % Wt	ICW % FFM
Means	15.3	160.6	59.5	131.2	606.5	81.4	7.5	7.7	30.0	51.6	74.3	16.4	28.4	40.8
+/- Std Dev	2.3	7.2	15.0	33.0	76.5	12.6	0.8	1.4	4.5	6.3	1.5	1.9	4.1	1.7

Description:	ICW % TBW	ECW_liters	ECW % Wt	ECW % FFM	ECW % TBW	FAT_kg	FAT_lbs	FAT % Wt	FFM_kg	FFM_lbs	FFM % Wt	BMR_Kcal	BMI
Means	54.9	13.6	23.2	33.5	45.1	19.2	42.3	30.6	40.3	88.9	69.4	1443.7	23.0
+/- Std Dev	2.1	2.7	2.4	1.8	2.1	9.9	21.9	8.2	6.0	13.3	8.2	147.4	5.2

Female Age Groups 20 29. (n=1511)														
Description:	Age	Height cm	Weight kg	Weight lbs	Resistance	Reactance	Phase Angle	Dissipation	TBW_liters	TBW % Wt	TBW % FFM	ICW_liters	ICW % Wt	ICW % FFM
Means	24.5	161.6	66.1	145.8	585.2	81.6	7.8	7.4	31.7	49.0	74.4	17.1	26.7	40.4
+/- Std Dev	2.9	7.0	15.9	35.0	79.6	12.7	0.8	0.8	4.8	5.8	1.4	2.0	3.7	1.5

Description:	ICW % TBW	ECW_liters	ECW % Wt	ECW % FFM	ECW % TBW	FAT_kg	FAT_lbs	FAT % Wt	FFM_kg	FFM_lbs	FFM % Wt	BMR_Kcal	BMI
Means	54.3	14.6	22.4	34.0	45.7	23.5	51.8	34.1	42.6	94.0	65.9	1465.3	25.3
+/- Std Dev	1.9	2.8	2.3	1.6	1.9	10.7	23.6	7.7	6.3	13.9	7.7	156.6	5.8

Female Age Groups 30 39. (n=1632)														
Description:	Age	Height cm	Weight kg	Weight lbs	Resistance	Reactance	Phase Angle	Dissipation	TBW_liters	TBW % Wt	TBW % FFM	ICW_liters	ICW % Wt	ICW % FFM
Means	34.5	161.7	73.0	160.9	556.4	76.9	7.7	7.5	33.6	47.3	74.6	17.9	25.4	39.9
+/- Std Dev	2.9	7.1	19.4	42.8	77.9	12.5	0.9	0.8	5.5	6.1	1.2	2.3	3.9	1.6

Description:	ICW % TBW	ECW_liters	ECW % Wt	ECW % FFM	ECW % TBW	FAT_kg	FAT_lbs	FAT % Wt	FFM_kg	FFM_lbs	FFM % Wt	BMR_Kcal	BMI
Means	53.5	15.7	21.9	34.7	46.5	27.9	61.6	36.6	45.1	99.4	63.4	1484.7	27.9
+/- Std Dev	2.0	3.3	2.3	1.6	2.0	13.1	28.8	8.0	7.4	16.4	8.0	189.7	7.2

Female Age Groups 40 49. (n=1248)														
Description:	Age	Height cm	Weight kg	Weight lbs	Resistance	Reactance	Phase Angle	Dissipation	TBW_liters	TBW % Wt	TBW % FFM	ICW_liters	ICW % Wt	ICW % FFM
Means	43.8	161.5	74.7	164.6	555.8	75.3	7.6	7.6	33.8	46.2	74.5	17.9	24.6	39.6
+/- Std Dev	2.8	6.6	17.8	39.2	84.1	13.2	0.8	0.9	5.4	5.1	1.3	2.2	3.3	1.5

Description:	ICW % TBW	ECW_liters	ECW % Wt	ECW % FFM	ECW % TBW	FAT_kg	FAT_lbs	FAT % Wt	FFM_kg	FFM_lbs	FFM % Wt	BMR_Kcal	BMI
Means	53.2	15.9	21.6	34.9	46.8	29.3	64.6	38.0	45.4	100.1	62.0	1457.0	28.6
+/- Std Dev	1.9	3.2	2.0	1.6	1.9	11.7	25.8	6.8	7.1	15.8	6.8	174.5	6.6

Female Age Groups 50 59. (n=907)														
Description:	Age	Height cm	Weight kg	Weight lbs	Resistance	Reactance	Phase Angle	Dissipation	TBW_liters	TBW % Wt	TBW % FFM	ICW_liters	ICW % Wt	ICW % FFM
Means	54.3	160.8	75.4	166.2	553.0	70.2	7.1	8.2	33.8	45.8	74.6	17.8	24.2	39.4
+/- Std Dev	2.8	6.6	17.9	39.5	83.6	12.5	0.9	1.0	5.4	5.2	1.3	2.2	3.4	1.5

Description:	ICW % TBW	ECW_liters	ECW % Wt	ECW % FFM	ECW % TBW	FAT_kg	FAT_lbs	FAT % Wt	FFM_kg	FFM_lbs	FFM % Wt	BMR_Kcal	BMI
Means	52.8	16.1	21.6	35.2	47.2	30.1	66.3	38.6	45.3	99.9	61.4	1412.9	29.1
+/- Std Dev	2.0	3.2	2.0	1.7	2.0	11.8	26.0	7.0	7.1	15.7	7.0	176.1	6.6

Female Age Groups 60 69. (n=1031)														
Description:	Age	Height cm	Weight kg	Weight lbs	Resistance	Reactance	Phase Angle	Dissipation	TBW_liters	TBW % Wt	TBW % FFM	ICW_liters	ICW % Wt	ICW % FFM
Means	64.3	159.0	71.7	158.0	564.2	68.0	6.7	8.6	32.5	46.1	74.7	17.1	24.4	39.5
+/- Std Dev	2.8	6.9	15.6	34.5	84.8	12.9	0.9	1.3	4.9	4.9	1.5	2.1	3.1	1.5

Description:	ICW % TBW	ECW_liters	ECW % Wt	ECW % FFM	ECW % TBW	FAT_kg	FAT_lbs	FAT % Wt	FFM_kg	FFM_lbs	FFM % Wt	BMR_Kcal	BMI
Means	52.9	15.4	21.7	35.2	47.1	28.2	62.2	38.3	43.4	95.8	61.7	1327.0	28.4
+/- Std Dev	2.0	2.9	2.0	1.7	2.0	10.3	22.6	6.6	6.5	14.3	6.6	155.0	5.9

Female Age Groups 70 79. (n=817)														
Description:	Age	Height cm	Weight kg	Weight lbs	Resistance	Reactance	Phase Angle	Dissipation	TBW_liters	TBW % Wt	TBW % FFM	ICW_liters	ICW % Wt	ICW % FFM
Means	73.9	157.5	68.2	150.4	562.7	62.4	6.2	9.4	31.8	47.4	75.0	16.7	25.0	39.5
+/- Std Dev	2.8	6.6	14.7	32.4	83.0	12.2	1.0	1.4	4.9	5.3	1.4	2.0	3.3	1.6

Description:	ICW % TBW	ECW_liters	ECW % Wt	ECW % FFM	ECW % TBW	FAT_kg	FAT_lbs	FAT % Wt	FFM_kg	FFM_lbs	FFM % Wt	BMR_Kcal	BMI
Means	52.7	15.1	22.4	35.4	47.3	25.8	56.9	36.8	42.4	93.4	63.2	1245.8	27.5
+/- Std Dev	2.0	2.9	2.3	1.7	2.0	9.6	21.1	6.9	6.4	14.1	6.9	147.4	5.5

Female Age Groups 80 89. (n=477)														
Description:	Age	Height cm	Weight kg	Weight lbs	Resistance	Reactance	Phase Angle	Dissipation	TBW_liters	TBW % Wt	TBW % FFM	ICW_liters	ICW % Wt	ICW % FFM
Means	83.0	155.1	61.8	136.2	579.6	58.1	5.6	10.4	29.8	48.9	75.2	15.7	25.9	39.7
+/- Std Dev	2.6	6.8	11.7	25.8	80.1	11.9	0.9	1.6	4.1	5.2	1.6	1.7	3.2	1.6

Description:	ICW % TBW	ECW_liters	ECW % Wt	ECW % FFM	ECW % TBW	FAT_kg	FAT_lbs	FAT % Wt	FFM_kg	FFM_lbs	FFM % Wt	BMR_Kcal	BMI
Means	52.9	14.1	23.0	35.5	47.1	22.2	48.9	35.0	39.6	87.3	65.0	1137.1	25.7
+/- Std Dev	2.0	2.5	2.4	1.8	2.0	7.7	17.0	6.9	5.3	11.8	6.9	118.8	4.5

Female Age Groups 90 99. (N=44)														
Description:	Age	Height cm	Weight kg	Weight lbs	Resistance	Reactance	Phase Angle	Dissipation	TBW_liters	TBW % Wt	TBW % FFM	ICW_liters	ICW % Wt	ICW % FFM
Means	90.0	153.5	53.7	118.4	597.2	53.7	5.0	11.6	28.0	52.6	75.2	14.8	27.9	39.9
+/- Std Dev	0.0	5.2	8.3	18.3	85.6	11.0	0.7	1.7	3.5	5.8	1.9	1.5	3.2	1.3

Description:	ICW % TBW	ECW_liters	ECW % Wt	ECW % FFM	ECW % TBW	FAT_kg	FAT_lbs	FAT % Wt	FFM_kg	FFM_lbs	FFM % Wt	BMR_Kcal	BMI
Means	53.0	13.2	24.7	35.4	47.0	16.6	36.6	30.1	37.1	81.8	69.9	1023.9	22.8
+/- Std Dev	2.1	2.1	3.0	2.1	2.1	6.1	13.5	7.4	4.2	9.2	7.4	82.9	3.5