CANADIAN WEIGHT AND HEIGHT TABLES FOR WHITE SOUTH AFRICANS

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During 1953 a country-wide study was carried out in Canada by the staff of the Nutrition Division, Department of National Health and Welfare, on the heights and weights of Canadians in different parts of the country. The areas were statistically selected so that they were representative of the total Canadian population and within each area individuals were selected by random approaches to schools, homes and business establishments. The resulting figures are believed to represent the population with an accuracy of 5%. Some 22,000 people of all ages were measured.

As far as known to the authors this is the first application of country-wide sampling methods to a height-and-weight study. Other studies on height and weight (e.g. the survey carried out by le Riche[1] on Pretoria White school children) have not been based on a sample of the total population.

The Canadian data are presented in the hope that they will be found interesting and perhaps useful in South Africa.

The primary use of height-and-weight tables in paediatrics is for the study of growth rates in children. Amongst adults such tables are used mainly in relation to overweight and obesity.

The estimation of overweight is now being again reduced to relatively simple terms, using height and weight, and at times perhaps with reference to 3 different types of build. More complicated indices such as Pirquet's index, Brailsford Robertson's formulae and Tuxford's index (Paton and Findlay [2]) as well as the ACH index (Franzen,[3] Franzen and Palmer [4]) are seldom used. Stuart and Meredith's selected percentile tables for children [5] have been used more recently. The Wetzel grid [6] is a lineal descendent of Brailsford Robertson's growth curves. The grid is an interesting restatement of the observation that the growth curve of a healthy child is parallel to the mean curve of the social and racial group to which the particular child belongs.

While studies on body build and body type are interesting from genetic, metabolic and endocrinological points of view,[7, 8] such differences are not easily expressed in simple, measurable terms.

A different approach from that of body type is the use of newer ways of measuring body fatness or leanness in relation to height and weight. Skin-fold measurements were obtained in this Canadian study, and may be reported upon at some future time.

Whether obesity results from hereditary predisposition, or as is more often the case, from overeating, the selection of persons suffering from this condition, is most readily made by using an arbitrary statistical standard. We make the assumption, based on life-insurance experience,[9, 10] that heavy weights in adults, regardless of type and heredity, show an extra mortality. We suggest that for adults the mean weight at ages 25—29, with a variation of 10%, would probably be the most desirable weight. This suggestion is being tested for these Canadian averages by further statistical studies.

TABLE I. AVERAGE HEIGHT AND WEIGHT OF CANADIANS BY AGE AND SEX

(1953 Survey. Nutrition Division, Department of National Health and Welfare, Ottawa. May, 1954)

Age (years)	*Male*		*Female*	
	Average Height (inches)	*Average Weight (Pounds)*	*Average Height (inches)*	*Average Weight (pounds)*
2	34·7	30	33·6	28
3	36·6	32	36·0	31
4	39·2	37	39·2	36
5	41·9	40	41·8	41
6	44·6	46	44·2	44
7	47·0	50	46·5	49
8	49·1	57	48·9	57
9	51·3	63	51·0	62
10	53·5	70	53·3	69
11	55·4	77	55·3	77
12	57·4	84	58·2	92
13	59·3	94	60·4	102
14	62·2	108	61·3	107
15	64·7	119	62·2	112
16—17	66·7	136	62·5	120
18—19	68·0	144	62·6	124
20—24	67·9	154	62·8	124
25—29	68·3	160	62·7	126
30—34	68·0	167	62·8	130
35—44	67·5	167	62·4	135
45—54	66·9	164	61·8	144
55—64	66·0	161	61·3	147
65 and over ..	65·5	155	60·6	138

DISCUSSION

The well-known study by Dublin [11] on 200,000 insured white males shows that death rates for over-weight and obese males increase with weight increase, especially in regard to organic heart diseases, angina pectoris, arterio-sclerosis, acute and chronic nephritis, cerebral haemorrhage, cancer, diabetes, and to a lesser extent for accidents and suicides.

Whether these conditions are merely associated with obesity, or whether there are causative factors—as yet unknown, conjectural or partly known—which cause both obesity and these diseases are questions which cannot at present be answered. What we do know is that evidence is accumulating that dietary control can improve life expectancy for at least a certain number of these conditions.

For instance, experience in Leningrad during severe

TABLE II. CANADIAN AVERAGE WEIGHTS FOR HEIGHT AND AGE

(In ordinary indoor clothing, without shoes)

(Nutrition Division, Department of National Health and Welfare, Ottawa, Canada, June, 1954)

MEN

Height Ft.	ins.	15 yrs.	16—17 yrs.	18—19 yrs.	20—24 yrs.	25—29 yrs.	30—34 yrs.	35—44 yrs.	45—54 yrs.	55—64 yrs.	65 yrs. and over
4	11	92	99	116	121	128	134	135	127	138	126
5	0	97	103	119	124	132	138	139	132	141	130
	1	102	108	122	127	135	141	142	136	144	135
	2	106	113	125	131	139	145	146	141	148	140
	3	111	118	128	134	142	148	150	146	151	144
	4	116	122	131	138	146	152	153	150	154	149
	5	121	127	134	142	149	156	157	155	157	154
	6	125	132	138	145	153	159	161	160	160	158
	7	130	136	141	149	156	163	164	165	163	163
	8	135	141	144	152	160	166	168	169	166	167
	9	139	146	147	156	163	170	172	174	169	172
	10	144	151	150	159	167	173	175	179	172	177
	11	148	155	153	163	170	177	179	183	176	181
6	0	153	160	156	166	174	181	183	188	179	186
	1	158	165	160	170	177	184	186	193	182	191
	2	163	169	163	173	181	188	190	197	185	195
	3	167	174	166	177	184	191	194	202	188	200

WOMEN

Height Ft.	ins.	15 yrs.	16—17 yrs.	18—19 yrs.	20—24 yrs.	25—29 yrs.	30—34 yrs.	35—44 yrs.	45—54 yrs.	55—64 yrs.	65 yrs. and over
4	8	96	105	100	106	110	115	126	130	134	120
	9	99	107	103	108	112	117	127	132	137	124
	10	101	110	107	111	114	119	128	134	139	128
	11	104	112	110	113	117	122	130	137	141	132
5	0	107	115	114	116	119	124	131	139	144	136
	1	109	117	118	118	122	126	133	142	146	140
	2	112	120	121	121	124	129	134	144	148	144
	3	115	122	125	123	127	131	135	146	151	148
	4	117	125	129	126	129	133	137	149	153	152
	5	120	127	132	128	132	136	138	151	155	157
	6	123	130	136	131	134	138	140	153	158	161
	7	126	132	140	133	137	140	141	156	160	165
	8	128	135	143	136	139	143	143	158	162	169
	9	131	137	147	138	141	145	144	160	165	173
	10	134	140	151	141	144	147	145	163	167	177
	11	136	142	154	143	146	150	147	165	169	181

dietary limitation from September 1941 to March 1942, showed marked decrease in angina pectoris and myocardial infarction (Brozek, Chapman and Keys [12]). On the other hand, periods of hypertension may follow on recovery from starvation. These authors state that there was virtually an epidemic of hypertension in Leningrad during this period of recovery. An interesting speculation is whether part of this epidemic was not due to the stresses endured by the population which resulted in somatic manifestations that had been masked by starvation. Thus evidence suggests that environment, whether in terms of food or possibly in terms of psychic tension, profoundly influences the reaction of the cardiovascular system.

More direct evidence of improved life expectancy when overweight people reduce their weight is afforded by Fellows's study.[12] This and some later evidence is summarized by Armstrong [10].

While heredity does play an important rôle in developing diabetes mellitus [13], obesity at or prior to onset is one of the most stable characteristics in the medical history of many of these patients. It is interesting to note [14] that annual death rates between 1938 and 1944 from diabetes mellitus fell in a group of German towns

from 23·32 per 100,000 to 15·54, coincidently with a marked deterioration in food supplies.

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