

TRANSACTIONS OF SOCIETY OF ACTUARIES 1966 REPORTS

III. TABLES SHOWING RELATIONSHIP BETWEEN WEIGHT, HEIGHT, AND GIRTH

A TABLE showing the average relationship between weight, height, and girth was developed in 1929 by Dr. Charles P. Clark and presented to the Association of Life Insurance Medical Directors of America in a paper entitled "Chest and Abdominal Measurements as Related to Height and Weight, with Presentation of Tables of Averages." The principal use made of this table was to check the reasonableness of weights reported on applications for insurance against the reported measurements of height and girth. The table was constructed from data on 9,392 approved applications. It assumed that there was a linear relationship between the ratio of weight to height and the three girth measurements—chest at inspiration, chest at expiration, and abdomen.

After publication of the *Build and Blood Pressure Study, 1959*, the Committee on Mortality under Ordinary Insurance and Annuities decided that it would be helpful to underwriters if new tables indicating the relationship between weight, height, and girth were developed, based on more extensive data and showing a range of credible weights rather than a single weight corresponding to a given height and girth.

CONSTRUCTION OF NEW TABLES

The *Build and Blood Pressure Study, 1959*, included a stratified sample of 290,000 policies on men and 70,000 policies on women with detailed information relating to weight and height. (See Memorandum B, *Build and Blood Pressure Study, 1959*, I, 224.) The sample strata consisted of:

- (i) 2 per cent of standard policies entering into the mortality study;
- (ii) all substandard policies for extreme heights, weights, or blood pressure entering into the mortality study;
- (iii) 20 per cent of other substandard policies entering into the mortality study; and
- (iv) 5 per cent of the policies rated for substandard occupation or impairments other than build or blood pressure.

This sample was used to determine average weights and heights as well as the distribution of weights by height, age, and sex. The same material was selected as the basis for constructing new tables that would indicate the average relationship between weight, height, and girth for *male* lives. More specifically, a stratified subsample of 106,000 policies on male lives was drawn from the 290,000 policies on male lives mentioned above so as

to obtain approximately the same number of cases in each age-height-weight cell. Cards comprising this sample were referred back to the contributing companies for entry of girth measurements—chest at expiration, chest at inspiration, and abdomen. The total number of cards returned with such additional information was 93,423. Because of incomplete data on some cards, only 65,081 cases were finally used in constructing the new tables.

The weight, height, and girth data on the 65,081 cases were reweighted so as to obtain distributions corresponding to the material used to determine average weights and heights in the *Build and Blood Pressure Study, 1959*. The resulting distributions were then used to calculate regression lines for the relationships between weight/height and the sum of the three girth measurements. In computing the standard deviation of these distributions, stratification was disregarded.

Table 1 was developed from two regression lines: one based on data for issue ages 25-29 used to determine the "expected" weights for issue ages under 40 and the other based on data for issue ages 45-49 used to determine the "expected" weights for issue ages 40 and over.

To test the results obtained with confidence limits at the 80 per cent confidence level, a sample of 1,083 policies on medically examined male lives taken from Metropolitan Life Insurance Company's issues of April-May, 1964, was reviewed. It was found that 75 per cent of the stated weights reported on the applications for these policies fell within the range defined by the confidence limits.

It is believed that Table 1 will meet the usual day-to-day underwriting needs for checking reported weights. A corresponding but very much more extensive table combined with Table 1 may be obtained from the office of the Society at a cost of \$1 for each combined set. The extensive table provides a higher degree of predictive accuracy and could be used to check on cases which are borderline by Table 1, particularly in those portions of the table relating to extreme values. The table was constructed from 40 regression lines, one for each of the 40 age-height groups defined in terms of age groups 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, and height groups 62"-64", 65"-67", 68"-70", 71"-73", and 74"-76". For each of these age-height groups different values of \bar{y} , \bar{x} , and b were obtained for the general regression equation

$$y = \bar{y} + b(x - \bar{x}) .$$

COMPARISON WITH 1929 TABLE

Table 2 compares the "expected" weights by Table 1 with those in Dr. Clark's 1929 Table for representative entries. It will be noted that

TABLE 1
 EXPECTED WEIGHTS AND 80 PER CENT CONFIDENCE INTERVALS
 FOR THESE WEIGHTS—AGES UNDER 40

SUM OF 3 MEAS- URES	5 Ft. 0 In.			5 Ft. 1 In.			5 Ft. 2 In.		
	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit
70....	62	73	84	63	74	86	64	75	87
71....	64	75	86	65	76	88	66	77	89
72....	65	77	88	67	78	90	68	79	91
73....	67	79	90	68	80	92	70	81	93
74....	69	81	92	70	82	93	72	83	95
75....	71	83	94	72	84	95	74	85	97
76....	73	84	96	74	86	97	76	87	99
77....	75	86	98	76	88	99	78	89	101
78....	77	88	100	78	90	101	80	91	103
79....	79	90	102	80	92	103	81	93	105
80....	81	92	103	82	94	105	83	95	107
81....	83	94	105	84	96	107	85	97	109
82....	85	96	107	86	98	109	87	99	111
83....	87	98	109	88	99	111	89	101	113
84....	88	100	111	90	101	113	91	103	115
85....	90	102	113	92	103	115	93	105	117
86....	92	104	115	94	105	117	95	107	119
87....	94	106	117	96	107	119	97	109	121
88....	96	107	119	98	109	121	99	111	123
89....	98	109	121	100	111	123	101	113	125
90....	100	111	123	102	113	125	103	115	127
91....	102	113	125	104	115	127	105	117	129
92....	104	115	126	106	117	129	107	119	131
93....	106	117	128	107	119	131	109	121	133
94....	108	119	130	109	121	132	111	123	135
95....	110	121	132	111	123	134	113	125	137
96....	111	123	134	113	125	136	115	127	139
97....	113	125	136	115	127	138	117	129	141
98....	115	127	138	117	129	140	119	131	143
99....	117	129	140	119	131	142	121	133	145
100....	119	130	142	121	133	144	123	135	147
101....	121	132	144	123	135	146	125	137	149
102....	123	134	146	125	137	148	127	139	150
103....	125	136	148	127	139	150	129	141	152
104....	127	138	149	129	140	152	131	143	154
105....	129	140	151	131	142	154	133	145	156
106....	131	142	153	133	144	156	135	147	158
107....	133	144	155	135	146	158	137	149	160
108....	135	146	157	137	148	160	139	151	162
109....	136	148	159	139	150	162	141	153	164
110....	138	150	161	141	152	164	143	155	166
111....	140	152	163	143	154	166	145	157	168
112....	142	154	165	145	156	168	147	159	170
113....	144	155	167	147	158	170	149	161	172
114....	146	157	169	148	160	171	151	163	174
115....	148	159	171	150	162	173	153	165	176
116....	150	161	173	152	164	175	155	167	178
117....	152	163	174	154	166	177	157	169	180
118....	154	165	176	156	168	179	159	171	182
119....	156	167	178	158	170	181	161	173	184

TABLE 1—AGES UNDER 40—Continued

SUM OF 3 MEAS- URES	5 FT. 0 IN.			5 FT. 1 IN.			5 FT. 2 IN.		
	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit
120....	158	169	180	160	172	183	163	174	186
121....	159	171	182	162	174	185	165	176	188
122....	161	173	184	164	176	187	167	178	190
123....	163	175	186	166	178	189	169	180	192
124....	165	177	188	168	179	191	171	182	194
125....	167	178	190	170	181	193	173	184	196
126....	169	180	192	172	183	195	175	186	198
127....	171	182	194	174	185	197	177	188	200
128....	173	184	196	176	187	199	179	190	202
129....	175	186	197	178	189	201	181	192	204
130....	177	188	199	180	191	203	183	194	206
131....	179	190	201	182	193	205	185	196	208
132....	181	192	203	184	195	207	187	198	210
133....	182	194	205	186	197	209	189	200	212
134....	184	196	207	187	199	210	191	202	214
135....	186	198	209	189	201	212	193	204	216
136....	188	200	211	191	203	214	195	206	218
137....	190	201	213	193	205	216	196	208	220
138....	192	203	215	195	207	218	198	210	222
139....	194	205	217	197	209	220	200	212	224
140....	196	207	219	199	211	222	202	214	226
141....	198	209	220	201	213	224	204	216	228
142....	200	211	222	203	215	226	206	218	230
143....	202	213	224	205	217	228	208	220	232
144....	204	215	226	207	218	230	210	222	234
145....	205	217	228	209	220	232	212	224	236
146....	207	219	230	211	222	234	214	226	238
147....	209	221	232	213	224	236	216	228	240
148....	211	223	234	215	226	238	218	230	242
149....	213	224	236	217	228	240	220	232	244
150....	215	226	238	219	230	242	222	234	246
151....	217	228	240	221	232	244	224	236	248
152....	219	230	242	223	234	246	226	238	250
153....	221	232	244	225	236	248	228	240	252
154....	223	234	245	226	238	250	230	242	254
155....	225	236	247	228	240	251	232	244	256
156....	227	238	249	230	242	253	234	246	258
157....	229	240	251	232	244	255	236	248	260
158....	230	242	253	234	246	257	238	250	262
159....	232	244	255	236	248	259	240	252	264
160....	234	246	257	238	250	261	242	254	266
161....	236	248	259	240	252	263	244	256	267
162....	238	249	261	242	254	265	246	258	269
163....	240	251	263	244	256	267	248	260	271
164....	242	253	265	246	257	269	250	262	273
165....	244	255	267	248	259	271	252	264	275
166....	246	257	268	250	261	273	254	266	277
167....	248	259	270	252	263	275	256	268	279
168....	250	261	272	254	265	277	258	270	281
169....	252	263	274	256	267	279	260	272	283
170....	253	265	276	258	269	281	262	274	285
171....	255	267	278	260	271	283	264	276	287
172....	257	269	280	262	273	285	266	278	289
173....	259	271	282	264	275	287	268	280	291
174....	261	272	284	265	277	289	270	282	293
175....	263	274	286	267	279	291	272	284	295

TABLE 1—AGES UNDER 40—Continued

SUM OF 3 MEAS- URES	5 Ft. 3 In.			5 Ft. 4 In.			5 Ft. 5 In.		
	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit
70....	65	77	88	66	78	90	67	79	91
71....	67	79	90	68	80	92	69	81	93
72....	69	81	92	70	82	94	71	83	95
73....	71	83	95	72	84	96	73	85	98
74....	73	85	97	74	86	98	75	87	100
75....	75	87	99	76	88	100	77	89	102
76....	77	89	101	78	90	102	79	91	104
77....	79	91	103	80	92	104	81	94	106
78....	81	93	105	82	94	106	83	96	108
79....	83	95	107	84	96	108	85	98	110
80....	85	97	109	86	98	110	88	100	112
81....	87	99	111	88	100	112	90	102	114
82....	89	101	113	90	102	114	92	104	116
83....	91	103	115	92	104	116	94	106	118
84....	93	105	117	94	106	119	96	108	120
85....	95	107	119	96	108	121	98	110	122
86....	97	109	121	98	111	123	100	112	125
87....	99	111	123	101	113	125	102	114	127
88....	101	113	125	103	115	127	104	116	129
89....	103	115	127	105	117	129	106	118	131
90....	105	117	129	107	119	131	108	121	133
91....	107	119	131	109	121	133	110	123	135
92....	109	121	133	111	123	135	112	125	137
93....	111	123	135	113	125	137	115	127	139
94....	113	125	137	115	127	139	117	129	141
95....	115	127	139	117	129	141	119	131	143
96....	117	129	141	119	131	143	121	133	145
97....	119	131	143	121	133	145	123	135	147
98....	121	133	145	123	135	147	125	137	149
99....	123	135	147	125	137	149	127	139	152
100....	125	137	149	127	139	151	129	141	154
101....	127	139	151	129	141	153	131	143	156
102....	129	141	153	131	143	155	133	146	158
103....	131	143	155	133	145	157	135	148	160
104....	133	145	157	135	147	159	137	150	162
105....	135	147	159	137	149	161	139	152	164
106....	137	149	161	139	151	164	142	154	166
107....	139	151	163	141	154	166	144	156	168
108....	141	153	165	143	156	168	146	158	170
109....	143	155	167	146	158	170	148	160	172
110....	145	157	169	148	160	172	150	162	174
111....	147	159	171	150	162	174	152	164	176
112....	149	161	173	152	164	176	154	166	179
113....	151	163	175	154	166	178	156	168	181
114....	153	165	177	156	168	180	158	170	183
115....	155	167	179	158	170	182	160	173	185
116....	157	169	181	160	172	184	162	175	187
117....	159	171	183	162	174	186	164	177	189
118....	161	173	185	164	176	188	167	179	191
119....	163	175	187	166	178	190	169	181	193
120....	165	177	189	168	180	192	171	183	195
121....	167	179	191	170	182	194	173	185	197
122....	169	181	193	172	184	196	175	187	199
123....	171	183	195	174	186	198	177	189	201
124....	173	185	197	176	188	200	179	191	204

TABLE 1—AGES UNDER 40—Continued

SUM OF 3 MEAS- URES	5 Fr. 3 In.			5 Fr. 4 In.			5 Fr. 5 In.		
	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit
125.....	175	187	199	178	190	202	181	193	206
126.....	178	189	201	180	192	204	183	195	208
127.....	180	191	203	182	194	207	185	197	210
128.....	182	193	205	184	196	209	187	200	212
129.....	184	195	207	186	199	211	189	202	214
130.....	186	197	209	189	201	213	191	204	216
131.....	188	199	211	191	203	215	194	206	218
132.....	190	201	213	193	205	217	196	208	220
133.....	192	203	215	195	207	219	198	210	222
134.....	194	206	217	197	209	221	200	212	224
135.....	196	208	219	199	211	223	202	214	226
136.....	198	210	221	201	213	225	204	216	228
137.....	200	212	223	203	215	227	206	218	231
138.....	202	214	225	205	217	229	208	220	233
139.....	204	216	227	207	219	231	210	222	235
140.....	206	218	229	209	221	233	212	225	237
141.....	208	220	232	211	223	235	214	227	239
142.....	210	222	234	213	225	237	216	229	241
143.....	212	224	236	215	227	239	218	231	243
144.....	214	226	238	217	229	241	221	233	245
145.....	216	228	240	219	231	243	223	235	247
146.....	218	230	242	221	233	245	225	237	249
147.....	220	232	244	223	235	247	227	239	251
148.....	222	234	246	225	237	250	229	241	253
149.....	224	236	248	227	239	252	231	243	255
150.....	226	238	250	229	242	254	233	245	258
151.....	228	240	252	231	244	256	235	247	260
152.....	230	242	254	234	246	258	237	249	262
153.....	232	244	256	236	248	260	239	252	264
154.....	234	246	258	238	250	262	241	254	266
155.....	236	248	260	240	252	264	243	256	268
156.....	238	250	262	242	254	266	245	258	270
157.....	240	252	264	244	256	268	248	260	272
158.....	242	254	266	246	258	270	250	262	274
159.....	244	256	268	248	260	272	252	264	276
160.....	246	258	270	250	262	274	254	266	278
161.....	248	260	272	252	264	276	256	268	280
162.....	250	262	274	254	266	278	258	270	283
163.....	252	264	276	256	268	280	260	272	285
164.....	254	266	278	258	270	282	262	274	287
165.....	256	268	280	260	272	284	264	276	289
166.....	258	270	282	262	274	286	266	279	291
167.....	260	272	284	264	276	288	268	281	293
168.....	262	274	286	266	278	290	270	283	295
169.....	264	276	288	268	280	293	272	285	297
170.....	266	278	290	270	282	295	275	287	299
171.....	268	280	292	272	284	297	277	289	301
172.....	270	282	294	274	287	299	279	291	303
173.....	272	284	296	276	289	301	281	293	305
174.....	274	286	298	279	291	303	283	295	307
175.....	276	288	300	281	293	305	285	297	310

TABLE 1—AGES UNDER 40—Continued

SUM OF 3 MEAS- URES	5 Ft. 6 In.			5 Ft. 7 In.			5 Ft. 8 In.		
	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit
70....	68	80	93	69	81	94	70	83	95
71....	70	82	95	71	84	96	72	85	98
72....	72	84	97	73	86	98	74	87	100
73....	74	87	99	75	88	101	76	89	102
74....	76	89	101	77	90	103	79	91	104
75....	78	91	103	79	92	105	81	94	106
76....	80	93	105	82	94	107	83	96	109
77....	83	95	107	84	96	109	85	98	111
78....	85	97	110	86	99	111	87	100	113
79....	87	99	112	88	101	113	89	102	115
80....	89	101	114	90	103	116	92	104	117
81....	91	103	116	92	105	118	94	107	119
82....	93	106	118	95	107	120	96	109	122
83....	95	108	120	97	109	122	98	111	124
84....	97	110	122	99	111	124	100	113	126
85....	99	112	124	101	114	126	102	115	128
86....	102	114	126	103	116	128	105	117	130
87....	104	116	129	105	118	130	107	120	132
88....	106	118	131	107	120	133	109	122	135
89....	108	120	133	110	122	135	111	124	137
90....	110	122	135	112	124	137	113	126	139
91....	112	125	137	114	126	139	115	128	141
92....	114	127	139	116	129	141	118	130	143
93....	116	129	141	118	131	143	120	133	145
94....	118	131	143	120	133	145	122	135	148
95....	121	133	145	122	135	148	124	137	150
96....	123	135	148	124	137	150	126	139	152
97....	125	137	150	127	139	152	129	141	154
98....	127	139	152	129	141	154	131	144	156
99....	129	141	154	131	144	156	133	146	159
100....	131	144	156	133	146	158	135	148	161
101....	133	146	158	135	148	160	137	150	163
102....	135	148	160	137	150	163	139	152	165
103....	137	150	162	139	152	165	142	154	167
104....	140	152	164	142	154	167	144	157	169
105....	142	154	167	144	156	169	146	159	172
106....	144	156	169	146	159	171	148	161	174
107....	146	158	171	148	161	173	150	163	176
108....	148	160	173	150	163	175	152	165	178
109....	150	163	175	152	165	178	155	167	180
110....	152	165	177	154	167	180	157	170	182
111....	154	167	179	157	169	182	159	172	185
112....	156	169	181	159	171	184	161	174	187
113....	159	171	183	161	174	186	163	176	189
114....	161	173	186	163	176	188	165	178	191
115....	163	175	188	165	178	190	168	181	193
116....	165	177	190	167	180	193	170	183	196
117....	167	179	192	169	182	195	172	185	198
118....	169	182	194	172	184	197	174	187	200
119....	171	184	196	174	186	199	176	189	202
120....	173	186	198	176	189	201	179	191	204
121....	175	188	200	178	191	203	181	194	206
122....	178	190	202	180	193	205	183	196	209
123....	180	192	205	182	195	208	185	198	211
124....	182	194	207	184	197	210	187	200	213

TABLE I—AGES UNDER 40—Continued

SUM OF 3 MEAS- URES	5 FT. 6 IN.			5 FT. 7 IN.			5 FT. 8 IN.		
	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit
125	184	196	209	187	199	212	189	202	215
126	186	198	211	189	201	214	192	204	217
127	188	201	213	191	204	216	194	207	219
128	190	203	215	193	206	218	196	209	222
129	192	205	217	195	208	220	198	211	224
130	194	207	219	197	210	223	200	213	226
131	197	209	221	199	212	225	202	215	228
132	199	211	224	202	214	227	205	217	230
133	201	213	226	204	216	229	207	220	232
134	203	215	228	206	219	231	209	222	235
135	205	217	230	208	221	233	211	224	237
136	207	220	232	210	223	235	213	226	239
137	209	222	234	212	225	238	216	228	241
138	211	224	236	214	227	240	218	231	243
139	213	226	238	217	229	242	220	233	246
140	215	228	240	219	231	244	222	235	248
141	218	230	243	221	234	246	224	237	250
142	220	232	245	223	236	248	226	239	252
143	222	234	247	225	238	250	229	241	254
144	224	236	249	227	240	253	231	244	256
145	226	239	251	229	242	255	233	246	259
146	228	241	253	232	244	257	235	248	261
147	230	243	255	234	246	259	237	250	263
148	232	245	257	236	249	261	239	252	265
149	234	247	259	238	251	263	242	254	267
150	237	249	262	240	253	265	244	257	269
151	239	251	264	242	255	268	246	259	272
152	241	253	266	244	257	270	248	261	274
153	243	255	268	247	259	272	250	263	276
154	245	258	270	249	261	274	252	265	278
155	247	260	272	251	264	276	255	267	280
156	249	262	274	253	266	278	257	270	283
157	251	264	276	255	268	280	259	272	285
158	253	266	278	257	270	283	261	274	287
159	256	268	281	259	272	285	263	276	289
160	258	270	283	262	274	287	265	278	291
161	260	272	285	264	276	289	268	281	293
162	262	274	287	266	279	291	270	283	296
163	264	276	289	268	281	293	272	285	298
164	266	279	291	270	283	295	274	287	300
165	268	281	293	272	285	298	276	289	302
166	270	283	295	274	287	300	279	291	304
167	272	285	297	277	289	302	281	294	306
168	275	287	300	279	291	304	283	296	309
169	277	289	302	281	294	306	285	298	311
170	279	291	304	283	296	308	287	300	313
171	281	293	306	285	298	311	289	302	315
172	283	295	308	287	300	313	292	304	317
173	285	298	310	289	302	315	294	307	319
174	287	300	312	292	304	317	296	309	322
175	289	302	314	294	306	319	298	311	324

TABLE 1—AGES UNDER 40—Continued

SUM OF 3 MEAS- URES	5 Ft. 9 In.			5 Ft. 10 In.			5 Ft. 11 In.		
	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit
70	71	84	97	72	85	98	73	86	100
71	73	86	99	74	87	101	75	89	102
72	75	88	101	76	90	103	77	91	104
73	77	90	104	79	92	105	80	93	107
74	80	93	106	81	94	107	82	95	109
75	82	95	108	83	96	109	84	98	111
76	84	97	110	85	99	112	87	100	113
77	86	99	112	88	101	114	89	102	116
78	88	102	115	90	103	116	91	104	118
79	91	104	117	92	105	118	93	107	120
80	93	106	119	94	107	121	96	109	122
81	95	108	121	96	110	123	98	111	125
82	97	110	123	99	112	125	100	114	127
83	100	113	126	101	114	127	102	116	129
84	102	115	128	103	116	130	105	118	131
85	104	117	130	105	119	132	107	120	134
86	106	119	132	108	121	134	109	123	136
87	108	121	134	110	123	136	111	125	138
88	111	124	137	112	125	139	114	127	141
89	113	126	139	114	128	141	116	129	143
90	115	128	141	117	130	143	118	132	145
91	117	130	143	119	132	145	121	134	147
92	119	132	145	121	134	148	123	136	150
93	122	135	148	123	137	150	125	139	152
94	124	137	150	126	139	152	127	141	154
95	126	139	152	128	141	154	130	143	156
96	128	141	154	130	143	156	132	145	159
97	130	143	156	132	146	159	134	148	161
98	133	146	159	135	148	161	136	150	163
99	135	148	161	137	150	163	139	152	166
100	137	150	163	139	152	165	141	154	168
101	139	152	165	141	154	168	143	157	170
102	141	154	167	144	157	170	146	159	172
103	144	157	170	146	159	172	148	161	175
104	146	159	172	148	161	174	150	163	177
105	148	161	174	150	163	177	152	166	179
106	150	163	176	152	166	179	155	168	181
107	152	166	179	155	168	181	157	170	184
108	155	168	181	157	170	183	159	173	186
109	157	170	183	159	172	186	161	175	188
110	159	172	185	161	175	188	164	177	191
111	161	174	187	164	177	190	166	179	193
112	164	177	190	166	179	192	168	182	195
113	166	179	192	168	181	195	171	184	197
114	168	181	194	170	184	197	173	186	200
115	170	183	196	173	186	199	175	188	202
116	172	185	198	175	188	201	177	191	204
117	175	188	201	177	190	203	180	193	206
118	177	190	203	179	193	206	182	195	209
119	179	192	205	182	195	208	184	198	211
120	181	194	207	184	197	210	186	200	213
121	183	196	209	186	199	212	189	202	215
122	186	199	212	188	201	215	191	204	218
123	188	201	214	191	204	217	193	207	220
124	190	203	216	193	206	219	196	209	222

TABLE 1—AGES UNDER 40—Continued

SUM OF 3 MEAS- URES	5 FT. 9 IN.			5 FT. 10 IN.			5 FT. 11 IN.		
	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit
125....	192	205	218	195	208	221	198	211	225
126....	194	207	220	197	210	224	200	213	227
127....	197	210	223	199	213	226	202	216	229
128....	199	212	225	202	215	228	205	218	231
129....	201	214	227	204	217	230	207	220	234
130....	203	216	229	206	219	233	209	223	236
131....	205	218	231	208	222	235	211	225	238
132....	208	221	234	211	224	237	214	227	240
133....	210	223	236	213	226	239	216	229	243
134....	212	225	238	215	228	242	218	232	245
135....	214	227	240	217	231	244	220	234	247
136....	216	229	243	220	233	246	223	236	250
137....	219	232	245	222	235	248	225	238	252
138....	221	234	247	224	237	251	227	241	254
139....	223	236	249	226	240	253	230	243	256
140....	225	238	251	229	242	255	232	245	259
141....	227	241	254	231	244	257	234	247	261
142....	230	243	256	233	246	259	236	250	263
143....	232	245	258	235	248	262	239	252	265
144....	234	247	260	238	251	264	241	254	268
145....	236	249	262	240	253	266	243	257	270
146....	239	252	265	242	255	268	245	259	272
147....	241	254	267	244	257	271	248	261	275
148....	243	256	269	246	260	273	250	263	277
149....	245	258	271	249	262	275	252	266	279
150....	247	260	273	251	264	277	255	268	281
151....	250	263	276	253	266	280	257	270	284
152....	252	265	278	255	269	282	259	272	286
153....	254	267	280	258	271	284	261	275	288
154....	256	269	282	260	273	286	264	277	290
155....	258	271	284	262	275	289	266	279	293
156....	261	274	287	264	278	291	268	282	295
157....	263	276	289	267	280	293	270	284	297
158....	265	278	291	269	282	295	273	286	300
159....	267	280	293	271	284	298	275	288	302
160....	269	282	295	273	287	300	277	291	304
161....	272	285	298	276	289	302	279	293	306
162....	274	287	300	278	291	304	282	295	309
163....	276	289	302	280	293	306	284	297	311
164....	278	291	304	282	295	309	286	300	313
165....	280	293	307	284	298	311	289	302	315
166....	283	296	309	287	300	313	291	304	318
167....	285	298	311	289	302	315	293	307	320
168....	287	300	313	291	304	318	295	309	322
169....	289	302	315	293	307	320	298	311	324
170....	291	305	318	296	309	322	300	313	327
171....	294	307	320	298	311	324	302	316	329
172....	296	309	322	300	313	327	304	318	331
173....	298	311	324	302	316	329	307	320	334
174....	300	313	326	305	318	331	309	322	336
175....	302	316	329	307	320	333	311	325	338

TABLE 1—AGES UNDER 40—Continued

SUM OF 3 MEAS- URES	6 Ft. 0 In.			6 Ft. 1 In.			6 Ft. 2 In.		
	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit
70....	74	88	101	75	89	103	76	90	104
71....	76	90	103	77	91	105	78	92	106
72....	79	92	106	80	93	107	81	95	109
73....	81	94	108	82	96	110	83	97	111
74....	83	97	110	84	98	112	85	99	113
75....	85	99	113	87	100	114	88	102	116
76....	88	101	115	89	103	117	90	104	118
77....	90	104	117	91	105	119	93	107	120
78....	92	106	120	94	107	121	95	109	123
79....	95	108	122	96	110	124	97	111	125
80....	97	111	124	98	112	126	100	114	128
81....	99	113	126	101	114	128	102	116	130
82....	102	115	129	103	117	131	104	118	132
83....	104	117	131	105	119	133	107	121	135
84....	106	120	133	108	121	135	109	123	137
85....	108	122	136	110	124	138	111	125	139
86....	111	124	138	112	126	140	114	128	142
87....	113	127	140	115	128	142	116	130	144
88....	115	129	143	117	131	145	119	133	146
89....	118	131	145	119	133	147	121	135	149
90....	120	134	147	122	135	149	123	137	151
91....	122	136	149	124	138	152	126	140	154
92....	125	138	152	126	140	154	128	142	156
93....	127	140	154	129	142	156	130	144	158
94....	129	143	156	131	145	159	133	147	161
95....	131	145	159	133	147	161	135	149	163
96....	134	147	161	136	149	163	138	151	165
97....	136	150	163	138	152	166	140	154	168
98....	138	152	166	140	154	168	142	156	170
99....	141	154	168	143	156	170	145	159	173
100....	143	157	170	145	159	173	147	161	175
101....	145	159	172	147	161	175	149	163	177
102....	148	161	175	150	163	177	152	166	180
103....	150	163	177	152	166	180	154	168	182
104....	152	166	179	154	168	182	156	170	184
105....	155	168	182	157	170	184	159	173	187
106....	157	170	184	159	173	187	161	175	189
107....	159	173	186	161	175	189	164	177	191
108....	161	175	189	164	177	191	166	180	194
109....	164	177	191	166	180	194	168	182	196
110....	166	180	193	168	182	196	171	185	199
111....	168	182	195	171	184	198	173	187	201
112....	171	184	198	173	187	201	175	189	203
113....	173	187	200	175	189	203	178	192	206
114....	175	189	202	178	191	205	180	194	208
115....	178	191	205	180	194	208	182	196	210
116....	180	193	207	182	196	210	185	199	213
117....	182	196	209	185	198	212	187	201	215
118....	184	198	212	187	201	215	190	204	217
119....	187	200	214	189	203	217	192	206	220
120....	189	203	216	192	205	219	194	208	222
121....	191	205	219	194	208	222	197	211	225
122....	194	207	221	196	210	224	199	213	227
123....	196	210	223	199	212	226	201	215	229
124....	198	212	225	201	215	229	204	218	232

TABLE 1—AGES UNDER 40—Continued

SUM OF 3 MEAS- URES	6 Ft. 0 In.			6 Ft. 1 In.			6 Ft. 2 In.		
	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit
125....	201	214	228	203	217	231	206	220	234
126....	203	216	230	206	219	233	208	222	236
127....	205	219	232	208	222	236	211	225	239
128....	207	221	235	210	224	238	213	227	241
129....	210	223	237	213	226	240	216	230	244
130....	212	226	239	215	229	243	218	232	246
131....	214	228	242	217	231	245	220	234	248
132....	217	230	244	220	233	247	223	237	251
133....	219	233	246	222	236	250	225	239	253
134....	221	235	248	224	238	252	227	241	255
135....	224	237	251	227	240	254	230	244	258
136....	226	239	253	229	243	257	232	246	260
137....	228	242	255	231	245	259	235	248	262
138....	230	244	258	234	247	261	237	251	265
139....	233	246	260	236	250	264	239	253	267
140....	235	249	262	238	252	266	242	256	270
141....	237	251	265	241	254	268	244	258	272
142....	240	253	267	243	257	271	246	260	274
143....	242	256	269	245	259	273	249	263	277
144....	244	258	271	248	261	275	251	265	279
145....	247	260	274	250	264	278	253	267	281
146....	249	262	276	252	266	280	256	270	284
147....	251	265	278	255	268	282	258	272	286
148....	253	267	281	257	271	285	261	275	288
149....	256	269	283	259	273	287	263	277	291
150....	258	272	285	262	275	289	265	279	293
151....	260	274	288	264	278	292	268	282	296
152....	263	276	290	266	280	294	270	284	298
153....	265	279	292	269	282	296	272	286	300
154....	267	281	295	271	285	299	275	289	303
155....	270	283	297	273	287	301	277	291	305
156....	272	286	299	276	289	303	279	293	307
157....	274	288	301	278	292	306	282	296	310
158....	277	290	304	280	294	308	284	298	312
159....	279	292	306	283	296	310	287	301	315
160....	281	295	308	285	299	313	289	303	317
161....	283	297	311	287	301	315	291	305	319
162....	286	299	313	290	303	317	294	308	322
163....	288	302	315	292	306	320	296	310	324
164....	290	304	318	294	308	322	298	312	326
165....	293	306	320	297	310	324	301	315	329
166....	295	309	322	299	313	327	303	317	331
167....	297	311	324	301	315	329	305	319	333
168....	300	313	327	304	317	331	308	322	336
169....	302	315	329	306	320	334	310	324	338
170....	304	318	331	308	322	336	313	327	341
171....	306	320	334	311	324	338	315	329	343
172....	309	322	336	313	327	341	317	331	345
173....	311	325	338	315	329	343	320	334	348
174....	313	327	341	318	331	345	322	336	350
175....	316	329	343	320	334	348	324	338	352

TABLE 1—AGES UNDER 40—Continued

SUM OF 3 MEAS- URES	6 FT. 3 IN.			6 FT. 4 IN.			6 FT. 5 IN.		
	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit
70.....	77	91	105	78	92	107	79	94	108
71.....	79	94	108	80	95	109	82	96	111
72.....	82	96	110	83	97	112	84	99	113
73.....	84	98	113	85	100	114	86	101	116
74.....	87	101	115	88	102	116	89	103	118
75.....	89	103	117	90	105	119	91	106	120
76.....	91	106	120	93	107	121	94	108	123
77.....	94	108	122	95	109	124	96	111	125
78.....	96	110	125	97	112	126	99	113	128
79.....	99	113	127	100	114	129	101	116	130
80.....	101	115	129	102	117	131	104	118	133
81.....	103	118	132	105	119	133	106	121	135
82.....	106	120	134	107	122	136	109	123	138
83.....	108	122	136	110	124	138	111	126	140
84.....	111	125	139	112	126	141	114	128	143
85.....	113	127	141	114	129	143	116	131	145
86.....	115	130	144	117	131	146	118	133	148
87.....	118	132	146	119	134	148	121	135	150
88.....	120	134	148	122	136	150	123	138	152
89.....	123	137	151	124	139	153	126	140	155
90.....	125	139	153	127	141	155	128	143	157
91.....	127	142	156	129	143	158	131	145	160
92.....	130	144	158	132	146	160	133	148	162
93.....	132	146	160	134	148	163	136	150	165
94.....	135	149	163	136	151	165	138	153	167
95.....	137	151	165	139	153	167	141	155	170
96.....	139	154	168	141	156	170	143	158	172
97.....	142	156	170	144	158	172	146	160	175
98.....	144	158	172	146	160	175	148	163	177
99.....	147	161	175	149	163	177	150	165	180
100.....	149	163	177	151	165	180	153	167	182
101.....	151	166	180	153	168	182	155	170	184
102.....	154	168	182	156	170	184	158	172	187
103.....	156	170	184	158	173	187	160	175	189
104.....	159	173	187	161	175	189	163	177	192
105.....	161	175	189	163	177	192	165	180	194
106.....	163	177	192	166	180	194	168	182	197
107.....	166	180	194	168	182	197	170	185	199
108.....	168	182	196	170	185	199	173	187	202
109.....	171	185	199	173	187	201	175	190	204
110.....	173	187	201	175	190	204	178	192	207
111.....	175	189	204	178	192	206	180	195	209
112.....	178	192	206	180	194	209	182	197	212
113.....	180	194	208	183	197	211	185	199	214
114.....	183	197	211	185	199	214	187	202	216
115.....	185	199	213	187	202	216	190	204	219
116.....	187	201	216	190	204	219	192	207	221
117.....	190	204	218	192	207	221	195	209	224
118.....	192	206	220	195	209	223	197	212	226
119.....	195	209	223	197	211	226	200	214	229
120.....	197	211	225	200	214	228	202	217	231
121.....	199	213	228	202	216	231	205	219	234
122.....	202	216	230	204	219	233	207	222	236
123.....	204	218	232	207	221	236	210	224	239
124.....	207	221	235	209	224	238	212	227	241

TABLE 1—AGES UNDER 40—Continued

SUM OF 3 MEAS- URES	6 Ft. 3 In.			6 Ft. 4 In.			6 Ft. 5 In.		
	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit
125....	209	223	237	212	226	240	214	229	244
126....	211	225	240	214	228	243	217	231	246
127....	214	228	242	217	231	245	219	234	248
128....	216	230	244	219	233	248	222	236	251
129....	219	233	247	221	236	250	224	239	253
130....	221	235	249	224	238	253	227	241	256
131....	223	237	252	226	241	255	229	244	258
132....	226	240	254	229	243	257	232	246	261
133....	228	242	256	231	245	260	234	249	263
134....	230	245	259	234	248	262	237	251	266
135....	233	247	261	236	250	265	239	254	268
136....	235	249	264	238	253	267	242	256	271
137....	238	252	266	241	255	270	244	259	273
138....	240	254	268	243	258	272	246	261	276
139....	242	257	271	246	260	274	249	263	278
140....	245	259	273	248	262	277	251	266	280
141....	247	261	276	251	265	279	254	268	283
142....	250	264	278	253	267	282	256	271	285
143....	252	266	280	255	270	284	259	273	288
144....	254	269	283	258	272	287	261	276	290
145....	257	271	285	260	275	289	264	278	293
146....	259	273	288	263	277	291	266	281	295
147....	262	276	290	265	280	294	269	283	298
148....	264	278	292	268	282	296	271	286	300
149....	266	281	295	270	284	299	274	288	303
150....	269	283	297	272	287	301	276	291	305
151....	271	285	300	275	289	304	278	293	308
152....	274	288	302	277	292	306	281	295	310
153....	276	290	304	280	294	308	283	298	313
154....	278	293	307	282	297	311	286	300	315
155....	281	295	309	285	299	313	288	303	317
156....	283	297	312	287	301	316	291	305	320
157....	286	300	314	289	304	318	293	308	322
158....	288	302	316	292	306	321	296	310	325
159....	290	305	319	294	309	323	298	313	327
160....	293	307	321	297	311	325	301	315	330
161....	295	309	324	299	314	328	303	318	332
162....	298	312	326	302	316	330	306	320	335
163....	300	314	328	304	318	333	308	323	337
164....	302	317	331	306	321	335	310	325	340
165....	305	319	333	309	323	338	313	328	342
166....	307	321	336	311	326	340	315	330	345
167....	310	324	338	314	328	342	318	332	347
168....	312	326	340	316	331	345	320	335	349
169....	314	329	343	319	333	347	323	337	352
170....	317	331	345	321	335	350	325	340	354
171....	319	333	348	323	338	352	328	342	357
172....	322	336	350	326	340	355	330	345	359
173....	324	338	352	328	343	357	333	347	362
174....	326	341	355	331	345	360	335	350	364
175....	329	343	357	333	348	362	338	352	367

TABLE 1—Continued

EXPECTED WEIGHTS AND 80 PER CENT CONFIDENCE INTERVALS
FOR THESE WEIGHTS—AGES 40 AND OVER

SUM OF 3 MEAS- URES	5 Ft. 0 In.			5 Ft. 1 In.			5 Ft. 2 In.		
	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit
70....	64	75	87	65	77	88	66	78	90
71....	66	77	89	67	78	90	68	80	92
72....	67	79	91	68	80	92	70	82	94
73....	69	81	92	70	82	94	71	83	95
74....	71	83	94	72	84	96	73	85	97
75....	73	84	96	74	86	98	75	87	99
76....	74	86	98	76	88	99	77	89	101
77....	76	88	100	78	89	101	79	91	103
78....	78	90	101	79	91	103	81	93	105
79....	80	92	103	81	93	105	83	95	107
80....	82	93	105	83	95	107	84	96	108
81....	83	95	107	85	97	109	86	98	110
82....	85	97	109	87	99	110	88	100	112
83....	87	99	110	89	100	112	90	102	114
84....	89	101	112	90	102	114	92	104	116
85....	91	102	114	92	104	116	94	106	118
86....	92	104	116	94	106	118	96	108	120
87....	94	106	118	96	108	119	97	109	121
88....	96	108	119	98	109	121	99	111	123
89....	98	109	121	99	111	123	101	113	125
90....	100	111	123	101	113	125	103	115	127
91....	101	113	125	103	115	127	105	117	129
92....	103	115	127	105	117	129	107	119	131
93....	105	117	128	107	119	130	109	121	133
94....	107	118	130	109	120	132	110	122	134
95....	109	120	132	110	122	134	112	124	136
96....	110	122	134	112	124	136	114	126	138
97....	112	124	135	114	126	138	116	128	140
98....	114	126	137	116	128	140	118	130	142
99....	116	127	139	118	130	141	120	132	144
100....	118	129	141	120	131	143	122	134	146
101....	119	131	143	121	133	145	123	135	147
102....	121	133	144	123	135	147	125	137	149
103....	123	135	146	125	137	149	127	139	151
104....	125	136	148	127	139	151	129	141	153
105....	127	138	150	129	141	152	131	143	155
106....	128	140	152	131	142	154	133	145	157
107....	130	142	153	132	144	156	135	147	159
108....	132	144	155	134	146	158	136	148	160
109....	134	145	157	136	148	160	138	150	162
110....	136	147	159	138	150	161	140	152	164
111....	137	149	161	140	152	163	142	154	166
112....	139	151	162	142	153	165	144	156	168
113....	141	153	164	143	155	167	146	158	170
114....	143	154	166	145	157	169	148	160	172
115....	145	156	168	147	159	171	149	161	173
116....	146	158	170	149	161	172	151	163	175
117....	148	160	171	151	162	174	153	165	177
118....	150	162	173	152	164	176	155	167	179
119....	152	163	175	154	166	178	157	169	181

TABLE 1—AGES 40 AND OVER—Continued

SUM OF 3 MEAS- URES	5 Fr. 0 In.			5 Fr. 1 In.			5 Fr. 2 In.		
	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit
120	154	165	177	156	168	180	159	171	183
121	155	167	179	158	170	182	161	173	185
122	157	169	180	160	172	183	162	174	186
123	159	171	182	162	173	185	164	176	188
124	161	172	184	163	175	187	166	178	190
125	163	174	186	165	177	189	168	180	192
126	164	176	188	167	179	191	170	182	194
127	166	178	189	169	181	193	172	184	196
128	168	180	191	171	183	194	174	186	198
129	170	181	193	173	184	196	175	187	199
130	172	183	195	174	186	198	177	189	201
131	173	185	197	176	188	200	179	191	203
132	175	187	198	178	190	202	181	193	205
133	177	189	200	180	192	204	183	195	207
134	179	190	202	182	194	205	185	197	209
135	181	192	204	184	195	207	187	199	211
136	182	194	206	185	197	209	188	200	212
137	184	196	207	187	199	211	190	202	214
138	186	198	209	189	201	213	192	204	216
139	188	199	211	191	203	214	194	206	218
140	190	201	213	193	204	216	196	208	220
141	191	203	215	194	206	218	198	210	222
142	193	205	216	196	208	220	200	212	224
143	195	207	218	198	210	222	201	213	225
144	197	208	220	200	212	224	203	215	227
145	198	210	222	202	214	225	205	217	229
146	200	212	224	204	215	227	207	219	231
147	202	214	225	205	217	229	209	221	233
148	204	216	227	207	219	231	211	223	235
149	206	217	229	209	221	233	213	225	237
150	207	219	231	211	223	235	214	226	238
151	209	221	233	213	225	236	216	228	240
152	211	223	234	215	226	238	218	230	242
153	213	224	236	216	228	240	220	232	244
154	215	226	238	218	230	242	222	234	246
155	216	228	240	220	232	244	224	236	248
156	218	230	242	222	234	246	226	238	250
157	220	232	243	224	236	247	227	239	251
158	222	233	245	226	237	249	229	241	253
159	224	235	247	227	239	251	231	243	255
160	225	237	249	229	241	253	233	245	257
161	227	239	251	231	243	255	235	247	259
162	229	241	252	233	245	257	237	249	261
163	231	242	254	235	246	258	239	251	263
164	233	244	256	236	248	260	240	252	264
165	234	246	258	238	250	262	242	254	266
166	236	248	260	240	252	264	244	256	268
167	238	250	261	242	254	266	246	258	270
168	240	251	263	244	256	267	248	260	272
169	242	253	265	246	257	269	250	262	274
170	243	255	267	247	259	271	251	264	276
171	245	257	268	249	261	273	253	265	277
172	247	259	270	251	263	275	255	267	279
173	249	260	272	253	265	277	257	269	281
174	251	262	274	255	267	278	259	271	283
175	252	264	276	257	268	280	261	273	285

TABLE 1—AGES 40 AND OVER—Continued

SUM OF 3 MEAS- URES	5 Ft. 3 In.			5 Ft. 4 In.			5 Ft. 5 In.		
	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit
70	67	79	91	68	80	93	69	82	94
71	69	81	93	70	82	95	71	84	96
72	71	83	95	72	84	97	73	86	98
73	73	85	97	74	86	99	75	87	100
74	74	87	99	76	88	100	77	89	102
75	76	89	101	78	90	102	79	91	104
76	78	90	103	79	92	104	81	93	106
77	80	92	105	81	94	106	83	95	108
78	82	94	106	83	96	108	85	97	110
79	84	96	108	85	98	110	87	99	112
80	86	98	110	87	100	112	88	101	114
81	88	100	112	89	101	114	90	103	116
82	90	102	114	91	103	116	92	105	118
83	91	104	116	93	105	118	94	107	120
84	93	106	118	95	107	120	96	109	121
85	95	107	120	97	109	122	98	111	123
86	97	109	122	99	111	123	100	113	125
87	99	111	123	101	113	125	102	115	127
88	101	113	125	102	115	127	104	117	129
89	103	115	127	104	117	129	106	119	131
90	105	117	129	106	119	131	108	121	133
91	107	119	131	108	121	133	110	123	135
92	108	121	133	110	123	135	112	124	137
93	110	123	135	112	124	137	114	126	139
94	112	124	137	114	126	139	116	128	141
95	114	126	138	116	128	141	118	130	143
96	116	128	140	118	130	143	120	132	145
97	118	130	142	120	132	145	122	134	147
98	120	132	144	122	134	146	124	136	149
99	122	134	146	124	136	148	125	138	151
100	124	136	148	125	138	150	127	140	153
101	125	138	150	127	140	152	129	142	155
102	127	139	152	129	142	154	131	144	157
103	129	141	154	131	144	156	133	146	158
104	131	143	155	133	146	158	135	148	160
105	133	145	157	135	147	160	137	150	162
106	135	147	159	137	149	162	139	152	164
107	137	149	161	139	151	164	141	154	166
108	139	151	163	141	153	166	143	156	168
109	140	153	165	143	155	168	145	158	170
110	142	155	167	145	157	169	147	159	172
111	144	156	169	147	159	171	149	161	174
112	146	158	171	148	161	173	151	163	176
113	148	160	172	150	163	175	153	165	178
114	150	162	174	152	165	177	155	167	180
115	152	164	176	154	167	179	157	169	182
116	154	166	178	156	169	181	159	171	184
117	156	168	180	158	170	183	161	173	186
118	157	170	182	160	172	185	162	175	188
119	159	172	184	162	174	187	164	177	190
120	161	173	186	164	176	189	166	179	192
121	163	175	188	166	178	191	168	181	193
122	165	177	189	168	180	192	170	183	195
123	167	179	191	170	182	194	172	185	197
124	169	181	193	171	184	196	174	187	199

TABLE 1—AGES 40 AND OVER—Continued

SUM OF 3 MEAS- URES	5 Ft. 3 In.			5 Ft. 4 In.			5 Ft. 5 In.		
	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit
125....	171	183	195	173	186	198	176	189	201
126....	173	185	197	175	188	200	178	191	203
127....	174	187	199	177	190	202	180	193	205
128....	176	189	201	179	192	204	182	195	207
129....	178	190	203	181	193	206	184	196	209
130....	180	192	205	183	195	208	186	198	211
131....	182	194	206	185	197	210	188	200	213
132....	184	196	208	187	199	212	190	202	215
133....	186	198	210	189	201	214	192	204	217
134....	188	200	212	191	203	215	194	206	219
135....	190	202	214	193	205	217	196	208	221
136....	191	204	216	194	207	219	198	210	223
137....	193	206	218	196	209	221	199	212	225
138....	195	207	220	198	211	223	201	214	227
139....	197	209	222	200	213	225	203	216	229
140....	199	211	223	202	215	227	205	218	230
141....	201	213	225	204	216	229	207	220	232
142....	203	215	227	206	218	231	209	222	234
143....	205	217	229	208	220	233	211	224	236
144....	207	219	231	210	222	235	213	226	238
145....	208	221	233	212	224	237	215	228	240
146....	210	223	235	214	226	238	217	230	242
147....	212	224	237	216	228	240	219	232	244
148....	214	226	238	217	230	242	221	233	246
149....	216	228	240	219	232	244	223	235	248
150....	218	230	242	221	234	246	225	237	250
151....	220	232	244	223	236	248	227	239	252
152....	222	234	246	225	238	250	229	241	254
153....	223	236	248	227	239	252	231	243	256
154....	225	238	250	229	241	254	233	245	258
155....	227	239	252	231	243	256	234	247	260
156....	229	241	254	233	245	258	236	249	262
157....	231	243	255	235	247	260	238	251	264
158....	233	245	257	237	249	261	240	253	266
159....	235	247	259	239	251	263	242	255	267
160....	237	249	261	240	253	265	244	257	269
161....	239	251	263	242	255	267	246	259	271
162....	240	253	265	244	257	269	248	261	273
163....	242	255	267	246	259	271	250	263	275
164....	244	256	269	248	261	273	252	265	277
165....	246	258	271	250	262	275	254	267	279
166....	248	260	272	252	264	277	256	269	281
167....	250	262	274	254	266	279	258	270	283
168....	252	264	276	256	268	281	260	272	285
169....	254	266	278	258	270	283	262	274	287
170....	256	268	280	260	272	284	264	276	289
171....	257	270	282	262	274	286	266	278	291
172....	259	272	284	263	276	288	268	280	293
173....	261	273	286	265	278	290	269	282	295
174....	263	275	288	267	280	292	271	284	297
175....	265	277	289	269	282	294	273	286	299

TABLE 1—AGES 40 AND OVER—Continued

SUM OF 3 MEAS- URES	5 FT. 6 IN.			5 FT. 7 IN.			5 FT. 8 IN.		
	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit
70....	70	83	96	71	84	97	72	85	99
71....	72	85	98	73	86	99	74	87	101
72....	74	87	100	75	88	101	76	89	103
73....	76	89	102	77	90	103	78	92	105
74....	78	91	104	79	92	105	80	94	107
75....	80	93	106	81	94	107	82	96	109
76....	82	95	108	83	96	109	84	98	111
77....	84	97	110	85	98	111	86	100	113
78....	86	99	111	87	100	113	89	102	115
79....	88	101	113	89	102	115	91	104	117
80....	90	103	115	91	104	117	93	106	119
81....	92	105	117	93	106	119	95	108	121
82....	94	107	119	95	108	121	97	110	123
83....	96	109	121	97	110	123	99	112	125
84....	98	111	123	99	112	125	101	114	127
85....	100	113	125	101	114	127	103	116	129
86....	102	115	127	103	116	129	105	118	131
87....	104	116	129	105	118	131	107	120	133
88....	106	118	131	107	120	133	109	122	135
89....	108	120	133	109	122	135	111	124	137
90....	110	122	135	111	124	137	113	126	139
91....	112	124	137	113	126	139	115	128	141
92....	114	126	139	115	128	141	117	130	143
93....	116	128	141	117	130	143	119	132	145
94....	118	130	143	119	132	145	121	134	147
95....	120	132	145	121	134	147	123	136	149
96....	121	134	147	123	136	149	125	138	152
97....	123	136	149	125	138	151	127	140	154
98....	125	138	151	127	140	153	129	142	156
99....	127	140	153	129	142	155	131	144	158
100....	129	142	155	131	144	157	133	146	160
101....	131	144	157	133	146	159	135	149	162
102....	133	146	159	135	148	161	137	151	164
103....	135	148	161	137	150	163	139	153	166
104....	137	150	163	139	152	165	141	155	168
105....	139	152	165	141	154	167	144	157	170
106....	141	154	167	143	156	169	146	159	172
107....	143	156	169	145	158	171	148	161	174
108....	145	158	171	147	160	173	150	163	176
109....	147	160	173	149	162	175	152	165	178
110....	149	162	175	151	164	177	154	167	180
111....	151	164	177	153	166	179	156	169	182
112....	153	166	179	155	168	181	158	171	184
113....	155	168	181	157	170	183	160	173	186
114....	157	170	183	159	172	185	162	175	188
115....	159	172	185	161	174	187	164	177	190
116....	161	174	187	163	176	189	166	179	192
117....	163	176	189	165	178	191	168	181	194
118....	165	178	191	167	180	193	170	183	196
119....	167	180	193	169	182	195	172	185	198
120....	169	182	194	171	184	197	174	187	200
121....	171	184	196	173	186	199	176	189	202
122....	173	186	198	176	188	201	178	191	204
123....	175	188	200	178	190	203	180	193	206
124....	177	190	202	180	192	205	182	195	209

TABLE 1—AGES 40 AND OVER—Continued

SUM OF 3 MEAS- URES	5 Ft. 6 In.			5 Ft. 7 In.			5 Ft. 8 In.		
	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit
125	179	192	204	182	194	207	184	197	211
126	181	194	206	184	197	209	186	199	213
127	183	196	208	186	199	211	188	201	215
128	185	198	210	188	201	213	190	204	217
129	187	200	212	190	203	216	192	206	219
130	189	201	214	192	205	218	194	208	221
131	191	203	216	194	207	220	196	210	223
132	193	205	218	196	209	222	198	212	225
133	195	207	220	198	211	224	201	214	227
134	197	209	222	200	213	226	203	216	229
135	199	211	224	202	215	228	205	218	231
136	201	213	226	204	217	230	207	220	233
137	203	215	228	206	219	232	209	222	235
138	205	217	230	208	221	234	211	224	237
139	206	219	232	210	223	236	213	226	239
140	208	221	234	212	225	238	215	228	241
141	210	223	236	214	227	240	217	230	243
142	212	225	238	216	229	242	219	232	245
143	214	227	240	218	231	244	221	234	247
144	216	229	242	220	233	246	223	236	249
145	218	231	244	222	235	248	225	238	251
146	220	233	246	224	237	250	227	240	253
147	222	235	248	226	239	252	229	242	255
148	224	237	250	228	241	254	231	244	257
149	226	239	252	230	243	256	233	246	259
150	228	241	254	232	245	258	235	248	261
151	230	243	256	234	247	260	237	250	264
152	232	245	258	236	249	262	239	252	266
153	234	247	260	238	251	264	241	254	268
154	236	249	262	240	253	266	243	256	270
155	238	251	264	242	255	268	245	258	272
156	240	253	266	244	257	270	247	261	274
157	242	255	268	246	259	272	249	263	276
158	244	257	270	248	261	274	251	265	278
159	246	259	272	250	263	276	253	267	280
160	248	261	274	252	265	278	255	269	282
161	250	263	276	254	267	280	258	271	284
162	252	265	278	256	269	282	260	273	286
163	254	267	280	258	271	284	262	275	288
164	256	269	281	260	273	286	264	277	290
165	258	271	283	262	275	288	266	279	292
166	260	273	285	264	277	290	268	281	294
167	262	275	287	266	279	292	270	283	296
168	264	277	289	268	281	294	272	285	298
169	266	279	291	270	283	296	274	287	300
170	268	281	293	272	285	298	276	289	302
171	270	283	295	274	287	300	278	291	304
172	272	284	297	276	289	302	280	293	306
173	274	286	299	278	291	304	282	295	308
174	276	288	301	280	293	306	284	297	310
175	278	290	303	282	295	308	286	299	312

TABLE 1—AGES 40 AND OVER—Continued

SUM OF 3 MEAS- URES	5 Ft. 9 In.			5 Ft. 10 In.			5 Ft. 11 In.		
	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit
70....	73	87	100	74	88	101	75	89	103
71....	75	89	102	76	90	104	78	91	105
72....	77	91	104	79	92	106	80	93	107
73....	79	93	106	81	94	108	82	96	109
74....	82	95	108	83	96	110	84	98	111
75....	84	97	110	85	98	112	86	100	114
76....	86	99	112	87	100	114	88	102	116
77....	88	101	114	89	103	116	90	104	118
78....	90	103	117	91	105	118	92	106	120
79....	92	105	119	93	107	120	95	108	122
80....	94	107	121	95	109	122	97	110	124
81....	96	109	123	97	111	125	99	113	126
82....	98	111	125	99	113	127	101	115	128
83....	100	114	127	102	115	129	103	117	131
84....	102	116	129	104	117	131	105	119	133
85....	104	118	131	106	119	133	107	121	135
86....	106	120	133	108	121	135	109	123	137
87....	108	122	135	110	124	137	112	125	139
88....	110	124	137	112	126	139	114	127	141
89....	113	126	139	114	128	141	116	130	143
90....	115	128	141	116	130	143	118	132	145
91....	117	130	143	118	132	145	120	134	148
92....	119	132	145	120	134	148	122	136	150
93....	121	134	148	123	136	150	124	138	152
94....	123	136	150	125	138	152	126	140	154
95....	125	138	152	127	140	154	129	142	156
96....	127	140	154	129	142	156	131	144	158
97....	129	142	156	131	145	158	133	147	160
98....	131	145	158	133	147	160	135	149	162
99....	133	147	160	135	149	162	137	151	165
100....	135	149	162	137	151	164	139	153	167
101....	137	151	164	139	153	166	141	155	169
102....	139	153	166	141	155	169	143	157	171
103....	141	155	168	144	157	171	146	159	173
104....	144	157	170	146	159	173	148	161	175
105....	146	159	172	148	161	175	150	164	177
106....	148	161	174	150	163	177	152	166	179
107....	150	163	176	152	165	179	154	168	182
108....	152	165	179	154	168	181	156	170	184
109....	154	167	181	156	170	183	158	172	186
110....	156	169	183	158	172	185	160	174	188
111....	158	171	185	160	174	187	163	176	190
112....	160	173	187	162	176	190	165	178	192
113....	162	176	189	164	178	192	167	181	194
114....	164	178	191	167	180	194	169	183	196
115....	166	180	193	169	182	196	171	185	199
116....	168	182	195	171	184	198	173	187	201
117....	170	184	197	173	186	200	175	189	203
118....	172	186	199	175	189	202	177	191	205
119....	175	188	201	177	191	204	180	193	207
120....	177	190	203	179	193	206	182	195	209
121....	179	192	205	181	195	208	184	198	211
122....	181	194	207	183	197	210	186	200	213
123....	183	196	210	185	199	213	188	202	216
124....	185	198	212	188	201	215	190	204	218

TABLE 1—AGES 40 AND OVER—Continued

SUM OF 3 MEAS- URES	5 Ft. 9 In.			5 Ft. 10 In.			5 Ft. 11 In.		
	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit
125....	187	200	214	190	203	217	192	206	220
126....	189	202	216	192	205	219	194	208	222
127....	191	204	218	194	207	221	197	210	224
128....	193	207	220	196	209	223	199	212	226
129....	195	209	222	198	212	225	201	215	228
130....	197	211	224	200	214	227	203	217	230
131....	199	213	226	202	216	229	205	219	233
132....	201	215	228	204	218	231	207	221	235
133....	203	217	230	206	220	234	209	223	237
134....	206	219	232	209	222	236	211	225	239
135....	208	221	234	211	224	238	214	227	241
136....	210	223	236	213	226	240	216	229	243
137....	212	225	238	215	228	242	218	232	245
138....	214	227	241	217	230	244	220	234	248
139....	216	229	243	219	233	246	222	236	250
140....	218	231	245	221	235	248	224	238	252
141....	220	233	247	223	237	250	226	240	254
142....	222	235	249	225	239	252	228	242	256
143....	224	237	251	227	241	255	231	244	258
144....	226	240	253	229	243	257	233	247	260
145....	228	242	255	232	245	259	235	249	262
146....	230	244	257	234	247	261	237	251	265
147....	232	246	259	236	249	263	239	253	267
148....	234	248	261	238	251	265	241	255	269
149....	237	250	263	240	254	267	243	257	271
150....	239	252	265	242	256	269	245	259	273
151....	241	254	267	244	258	271	248	261	275
152....	243	256	269	246	260	273	250	264	277
153....	245	258	272	248	262	275	252	266	279
154....	247	260	274	250	264	278	254	268	282
155....	249	262	276	253	266	280	256	270	284
156....	251	264	278	255	268	282	258	272	286
157....	253	266	280	257	270	284	260	274	288
158....	255	268	282	259	272	286	262	276	290
159....	257	271	284	261	274	288	265	278	292
160....	259	273	286	263	277	290	267	281	294
161....	261	275	288	265	279	292	269	283	296
162....	263	277	290	267	281	294	271	285	299
163....	265	279	292	269	283	296	273	287	301
164....	267	281	294	271	285	299	275	289	303
165....	270	283	296	273	287	301	277	291	305
166....	272	285	298	276	289	303	279	293	307
167....	274	287	300	278	291	305	282	295	309
168....	276	289	303	280	293	307	284	298	311
169....	278	291	305	282	295	309	286	300	313
170....	280	293	307	284	298	311	288	302	316
171....	282	295	309	286	300	313	290	304	318
172....	284	297	311	288	302	315	292	306	320
173....	286	299	313	290	304	317	294	308	322
174....	288	302	315	292	306	320	296	310	324
175....	290	304	317	294	308	322	299	312	326

TABLE 1—AGES 40 AND OVER—Continued

SUM OF 3 MEAS- URES	6 Ft. 0 In.			6 Ft. 1 In.			6 Ft. 2 In.		
	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit
70....	76	90	104	78	92	106	79	93	107
71....	79	93	107	80	94	108	81	95	109
72....	81	95	109	82	96	110	83	97	112
73....	83	97	111	84	98	112	85	100	114
74....	85	99	113	86	100	115	87	102	116
75....	87	101	115	88	103	117	90	104	118
76....	89	103	117	91	105	119	92	106	121
77....	92	106	119	93	107	121	94	108	123
78....	94	108	122	95	109	123	96	111	125
79....	96	110	124	97	111	125	99	113	127
80....	98	112	126	99	114	128	101	115	129
81....	100	114	128	102	116	130	103	117	132
82....	102	116	130	104	118	132	105	120	134
83....	104	118	132	106	120	134	107	122	136
84....	107	121	135	108	122	136	110	124	138
85....	109	123	137	110	124	139	112	126	141
86....	111	125	139	113	127	141	114	128	143
87....	113	127	141	115	129	143	116	131	145
88....	115	129	143	117	131	145	118	133	147
89....	117	131	145	119	133	147	121	135	149
90....	120	134	147	121	135	150	123	137	152
91....	122	136	150	123	138	152	125	139	154
92....	124	138	152	126	140	154	127	142	156
93....	126	140	154	128	142	156	130	144	158
94....	128	142	156	130	144	158	132	146	160
95....	130	144	158	132	146	160	134	148	163
96....	133	146	160	134	149	163	136	151	165
97....	135	149	163	137	151	165	138	153	167
98....	137	151	165	139	153	167	141	155	169
99....	139	153	167	141	155	169	143	157	172
100....	141	155	169	143	157	171	145	159	174
101....	143	157	171	145	159	174	147	162	176
102....	145	159	173	147	162	176	150	164	178
103....	148	162	176	150	164	178	152	166	180
104....	150	164	178	152	166	180	154	168	183
105....	152	166	180	154	168	182	156	170	185
106....	154	168	182	156	170	185	158	173	187
107....	156	170	184	158	173	187	161	175	189
108....	158	172	186	161	175	189	163	177	191
109....	161	175	188	163	177	191	165	179	194
110....	163	177	191	165	179	193	167	182	196
111....	165	179	193	167	181	195	169	184	198
112....	167	181	195	169	183	198	172	186	200
113....	169	183	197	172	186	200	174	188	203
114....	171	185	199	174	188	202	176	190	205
115....	174	187	201	176	190	204	178	193	207
116....	176	190	204	178	192	206	181	195	209
117....	178	192	206	180	194	209	183	197	211
118....	180	194	208	182	197	211	185	199	214
119....	182	196	210	185	199	213	187	202	216
120....	184	198	212	187	201	215	189	204	218
121....	186	200	214	189	203	217	192	206	220
122....	189	203	216	191	205	219	194	208	222
123....	191	205	219	193	208	222	196	210	225
124....	193	207	221	196	210	224	198	213	227

TABLE 1—AGES 40 AND OVER—Continued

SUM OF 3 MEAS- URES	6 FT. 0 IN.			6 FT. 1 IN.			6 FT. 2 IN.		
	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit
125 . . .	195	209	223	198	212	226	200	215	229
126 . . .	197	211	225	200	214	228	203	217	231
127 . . .	199	213	227	202	216	230	205	219	234
128 . . .	202	215	229	204	218	233	207	221	236
129 . . .	204	218	232	207	221	235	209	224	238
130 . . .	206	220	234	209	223	237	212	226	240
131 . . .	208	222	236	211	225	239	214	228	242
132 . . .	210	224	238	213	227	241	216	230	245
133 . . .	212	226	240	215	229	244	218	233	247
134 . . .	214	228	242	217	232	246	220	235	249
135 . . .	217	231	245	220	234	248	223	237	251
136 . . .	219	233	247	222	236	250	225	239	254
137 . . .	221	235	249	224	238	252	227	241	256
138 . . .	223	237	251	226	240	254	229	244	258
139 . . .	225	239	253	228	243	257	232	246	260
140 . . .	227	241	255	231	245	259	234	248	262
141 . . .	230	244	257	233	247	261	236	250	265
142 . . .	232	246	260	235	249	263	238	252	267
143 . . .	234	248	262	237	251	265	240	255	269
144 . . .	236	250	264	239	253	268	243	257	271
145 . . .	238	252	266	241	256	270	245	259	273
146 . . .	240	254	268	244	258	272	247	261	276
147 . . .	242	256	270	246	260	274	249	264	278
148 . . .	245	259	273	248	262	276	251	266	280
149 . . .	247	261	275	250	264	279	254	268	282
150 . . .	249	263	277	252	267	281	256	270	285
151 . . .	251	265	279	255	269	283	258	272	287
152 . . .	253	267	281	257	271	285	260	275	289
153 . . .	255	269	283	259	273	287	263	277	291
154 . . .	258	272	286	261	275	289	265	279	293
155 . . .	260	274	288	263	278	292	267	281	296
156 . . .	262	276	290	266	280	294	269	284	298
157 . . .	264	278	292	268	282	296	271	286	300
158 . . .	266	280	294	270	284	298	274	288	302
159 . . .	268	282	296	272	286	300	276	290	305
160 . . .	271	284	298	274	288	303	278	292	307
161 . . .	273	287	301	276	291	305	280	295	309
162 . . .	275	289	303	279	293	307	282	297	311
163 . . .	277	291	305	281	295	309	285	299	313
164 . . .	279	293	307	283	297	311	287	301	316
165 . . .	281	295	309	285	299	314	289	303	318
166 . . .	283	297	311	287	302	316	291	306	320
167 . . .	286	300	314	290	304	318	294	308	322
168 . . .	288	302	316	292	306	320	296	310	324
169 . . .	290	304	318	294	308	322	298	312	327
170 . . .	292	306	320	296	310	324	300	315	329
171 . . .	294	308	322	298	312	327	302	317	331
172 . . .	296	310	324	300	315	329	305	319	333
173 . . .	299	313	327	303	317	331	307	321	336
174 . . .	301	315	329	305	319	333	309	323	338
175 . . .	303	317	331	307	321	335	311	326	340

TABLE 1—AGES 40 AND OVER—Continued

SUM OF 3 MEAS- URES	6 Ft. 3 In.			6 Ft. 4 In.			6 Ft. 5 In.		
	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit
70	80	94	109	81	95	110	82	97	112
71	82	96	111	83	98	112	84	99	114
72	84	99	113	85	100	115	86	101	116
73	86	101	115	88	102	117	89	104	119
74	89	103	118	90	105	119	91	106	121
75	91	105	120	92	107	122	93	108	123
76	93	108	122	94	109	124	96	111	125
77	95	110	124	97	111	126	98	113	128
78	98	112	127	99	114	128	100	115	130
79	100	114	129	101	116	131	103	117	132
80	102	117	131	103	118	133	105	120	135
81	104	119	133	106	120	135	107	122	137
82	107	121	136	108	123	137	109	124	139
83	109	123	138	110	125	140	112	127	142
84	111	126	140	113	127	142	114	129	144
85	113	128	142	115	130	144	116	131	146
86	116	130	145	117	132	147	119	134	149
87	118	132	147	119	134	149	121	136	151
88	120	135	149	122	136	151	123	138	153
89	122	137	151	124	139	153	126	141	155
90	125	139	154	126	141	156	128	143	158
91	127	141	156	129	143	158	130	145	160
92	129	144	158	131	146	160	133	147	162
93	131	146	160	133	148	163	135	150	165
94	134	148	163	135	150	165	137	152	167
95	136	150	165	138	152	167	139	154	169
96	138	153	167	140	155	169	142	157	172
97	140	155	169	142	157	172	144	159	174
98	143	157	172	144	159	174	146	161	176
99	145	159	174	147	161	176	149	164	178
100	147	162	176	149	164	178	151	166	181
101	149	164	178	151	166	181	153	168	183
102	152	166	181	154	168	183	156	170	185
103	154	168	183	156	171	185	158	173	188
104	156	171	185	158	173	188	160	175	190
105	158	173	187	160	175	190	162	177	192
106	161	175	190	163	177	192	165	180	195
107	163	177	192	165	180	194	167	182	197
108	165	180	194	167	182	197	169	184	199
109	167	182	196	169	184	199	172	187	202
110	170	184	199	172	186	201	174	189	204
111	172	186	201	174	189	203	176	191	206
112	174	189	203	176	191	206	179	194	208
113	176	191	205	179	193	208	181	196	211
114	178	193	208	181	196	210	183	198	213
115	181	195	210	183	198	213	186	200	215
116	183	198	212	185	200	215	188	203	218
117	185	200	214	188	202	217	190	205	220
118	187	202	217	190	205	219	192	207	222
119	190	204	219	192	207	222	195	210	225
120	192	206	221	195	209	224	197	212	227
121	194	209	223	197	212	226	199	214	229
122	196	211	226	199	214	229	202	217	232
123	199	213	228	201	216	231	204	219	234
124	201	215	230	204	218	233	206	221	236

TABLE 1—AGES 40 AND OVER—Continued

SUM OF 3 MEAS- URES	6 Ft. 3 In.			6 Ft. 4 In.			6 Ft. 5 In.		
	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit	Lower Limit	Expected Weight	Upper Limit
125....	203	218	232	206	221	235	209	224	238
126....	205	220	234	208	223	238	211	226	241
127....	208	222	237	210	225	240	213	228	243
128....	210	224	239	213	227	242	216	230	245
129....	212	227	241	215	230	244	218	233	248
130....	214	229	243	217	232	247	220	235	250
131....	217	231	246	220	234	249	222	237	252
132....	219	233	248	222	237	251	225	240	255
133....	221	236	250	224	239	254	227	242	257
134....	223	238	252	226	241	256	229	244	259
135....	226	240	255	229	243	258	232	247	262
136....	228	242	257	231	246	260	234	249	264
137....	230	245	259	233	248	263	236	251	266
138....	232	247	261	235	250	265	239	254	268
139....	235	249	264	238	252	267	241	256	271
140....	237	251	266	240	255	269	243	258	273
141....	239	254	268	242	257	272	245	260	275
142....	241	256	270	245	259	274	248	263	278
143....	244	258	273	247	262	276	250	265	280
144....	246	260	275	249	264	279	252	267	282
145....	248	263	277	251	266	281	255	270	285
146....	250	265	279	254	268	283	257	272	287
147....	253	267	282	256	271	285	259	274	289
148....	255	269	284	258	273	288	262	277	291
149....	257	272	286	261	275	290	264	279	294
150....	259	274	288	263	278	292	266	281	296
151....	262	276	291	265	280	295	269	283	298
152....	264	278	293	267	282	297	271	286	301
153....	266	281	295	270	284	299	273	288	303
154....	268	283	297	272	287	301	275	290	305
155....	271	285	300	274	289	304	278	293	308
156....	273	287	302	276	291	306	280	295	310
157....	275	290	304	279	293	308	282	297	312
158....	277	292	306	281	296	310	285	300	315
159....	280	294	309	283	298	313	287	302	317
160....	282	296	311	286	300	315	289	304	319
161....	284	299	313	288	303	317	292	307	321
162....	286	301	315	290	305	320	294	309	324
163....	289	303	318	292	307	322	296	311	326
164....	291	305	320	295	309	324	299	313	328
165....	293	308	322	297	312	326	301	316	331
166....	295	310	324	299	314	329	303	318	333
167....	297	312	327	301	316	331	305	320	335
168....	300	314	329	304	318	333	308	323	338
169....	302	317	331	306	321	336	310	325	340
170....	304	319	333	308	323	338	312	327	342
171....	306	321	336	311	325	340	315	330	345
172....	309	323	338	313	328	342	317	332	347
173....	311	326	340	315	330	345	319	334	349
174....	313	328	342	317	332	347	322	337	351
175....	315	330	345	320	334	349	324	339	354

for extreme values Table 1 shows "expected" weights significantly different from those in the older table. Since these portions of the older table were based on rather limited data, Table 1 can be regarded as more reliable.

These "expected" weights corresponding to specific height and girth measurements were computed from the following two regression equations:

1. *Ages under 40*

$$y = W/H = 2.3420 + 0.0319773 (x - 105.23) ;$$

2. *Ages 40 and over*

$$y = W/H = 2.4660 + 0.0299479 (x - 110.41) ;$$

where $y = W/H$ ratio, $W =$ weight, $H =$ height, and $x =$ sum of three body measurements.

The confidence limits at the 80 per cent confidence level were calculated for each regression line and tabulated alongside the "expected" weights. These confidence limits are shown in Table 1. For each age, height, and sum of girth measurements the confidence limits show the range of weights in

TABLE 2
COMPARISON OF CLARK TABLE AND TABLE 1

SUM OF THREE MEASUREMENTS	EXCESS OF EXPECTED WEIGHTS ON TABLE 1 OVER EXPECTED WEIGHTS ON CLARK TABLE		
	5 Ft. 3 In.	5 Ft. 9 In.	6 Ft. 3 In.
	Ages under 40		
90.....	5	6	6
100.....	1	1	1
110.....	- 4	- 4	- 5
120.....	- 9	- 9	-10
130.....	-13	-15	-16
	Ages 40 and Over		
90.....	5	6	6
100.....	0	0	0
110.....	- 6	- 7	- 8
120.....	-13	-13	-15
130.....	-18	-20	-22

which 80 out of every 100 randomly drawn sample measurements might be expected to fall.¹ For any large group of applicants of a particular age having a particular height and sum of girth measurements, 80 per cent may in the long run be expected to have weights within these confidence limits and 20 per cent may similarly be expected to have weights outside this range. Consequently, if an underwriter finds that a reported weight is below the lower limit indicated in Table 1, he can assume that there is only a 10 per cent chance that the weight is as low as reported. The standard formulas used in calculating these confidence limits are given in the Appendix. Also shown in the Appendix are values for the several parameters in the formulas, which can be used to calculate confidence limits at other confidence levels.

TEST OF TABLE 1

A sample of approximately 200 applications on medically examined lives was drawn from the files of the Metropolitan Life Insurance Company to test Table 1 in comparison with the 1929 Clark Table. Based on Metropolitan Life's ratings for weight by age and height, each application was assigned underwriting classifications based on (a) the reported weight, (b) the expected weight based on the Clark Table, and (c) the "expected" weight based on Table 1. The results of this test turned out to be as follows:

	Per Cent
1. Rating for reported weight same as for expected weights on both Clark Table and Table 1	67.4%
2. Rating for reported weight same as for expected weight on Table 1 but lower than on Clark Table	14.1
3. Rating for reported weight same as for expected weight on Clark Table but higher than on Table 1	4.4
4. Rating for reported weight lower than on Clark Table but higher than on Table 1	1.5
5. Rating for reported weight lower than both Clark Table and Table 1	7.3
6. Rating for reported weight higher than both Clark Table and Table 1	5.3
	100.0%

¹ Strictly speaking, the confidence limits here used define a range extending above and below the "expected" weight, and the confidence level may be considered for practical purposes as indicating the probability that the "true" value of the "expected" weight for a given age, height, and the sum of girth measurements will in repeated sampling be enclosed within the range covered by the confidence limits.

If rechecks of the reported weight were ordered on all cases where the rating for the reported weight was more favorable than for the "expected" weight, the Clark Table would call for a recheck of 22.9 per cent (14.1 + 1.5 + 7.3) of the cases, whereas Table 1 would call for a recheck of only 7.3 per cent.

Alternatively, rechecks of the reported weight might reasonably be ordered only on cases where the reported weight fell outside the confidence limits at the 80 per cent confidence level shown in Table 1 and the "expected" weight required a higher rating. Cases falling within the range of the confidence limits shown in Table 1 could then be accepted. The table below summarizes the results of reviewing the sample on this basis.

	Per Cent
Cases within confidence limits	80.6%
Cases outside confidence limits	19.4
Cases where rating for "expected" weight is higher than for reported weight on which rechecks would be requested	3.9

The 80.6 per cent of the cases falling within range of the confidence limits indicate the sample distribution conforms to the 80 per cent confidence level.

The alternate procedure would call for a recheck of only 3.9 per cent of the cases as compared with 7.3 per cent under the first procedure. This difference is due largely to the fact that under the alternate procedure cases with reported weights falling within range are considered acceptable, even though the rating for the reported weight might be less than the rating for the "expected" weight.

It should be noted that the percentage of recheck cases would drop below 3.9 per cent if a company did not normally recheck weights when the examiner states that he actually weighed the applicant.

APPENDIX

The upper and lower limits shown in Table 1 were calculated by using the following formula for the confidence interval of the W/H ratios based on the regression line of the W/H ratios on the sums of the three body measurements.

The confidence interval for y

$$= a + bx \pm t_a \hat{\sigma}_{xy} \left[1 + \frac{1}{N} + \frac{(x - \bar{x})^2}{N s_x^2} \right]^{1/2} \quad (\text{where } y = a + bx)$$

$$= \bar{y} + b(x - \bar{x}) \pm t_a \left[\frac{N s_y^2 (1 - r^2)}{N - 2} \right]^{1/2} \left[1 + \frac{1}{N} + \frac{(x - \bar{x})^2}{N s_x^2} \right]^{1/2},$$

where

x = Sum of three body measurements,

y = W/H ratio,

$$\bar{x} = \frac{1}{N} \sum x_i,$$

$$\bar{y} = \frac{1}{N} \sum y_i,$$

$$s_x^2 = \frac{1}{N} \sum (x_i - \bar{x})^2,$$

$$s_y^2 = \frac{1}{N} \sum (y_i - \bar{y})^2,$$

$$s_{xy} = \frac{1}{N} \sum (x_i - \bar{x})(y_i - \bar{y})$$

$$r = \frac{s_{xy}}{s_x s_y},$$

$$b = r \frac{s_y}{s_x},$$

$$\hat{\sigma}_{xy} = \left[\frac{N s_y^2 (1 - r^2)}{N - 2} \right]^{1/2}.$$

By definition

$$t = \frac{\bar{x} - \mu}{s / \sqrt{N - 1}}$$

and is distributed as

$$f_n(t) = \frac{1}{\sqrt{n} B(n/2, \frac{1}{2})} \left(1 + \frac{t^2}{n} \right)^{-(n+1)/2},$$

where $n = N - 1$ is the number of degrees of freedom, and B is the Beta function. Let

$$P_n(t) = 2 \int_0^t f_n(t) dt.$$

Then the probability of occurrence of deviations outside $\pm t$ is $1 - P(t)$. If we choose t_a so that

$$\int_{-\infty}^{-t_a} f_n(t) dt = \int_{t_a}^{\infty} f_n(t) dt = \frac{\alpha}{2},$$

we have

$$\text{Prob. } \{-t_a \leq t \leq t_a\} = 1 - \alpha,$$

which is equivalent to

$$\text{Prob. } \left\{ \bar{x} - \frac{st_a}{\sqrt{N-1}} \leq \mu \leq \bar{x} + \frac{st_a}{\sqrt{N-1}} \right\} = 1 - \alpha.$$

The confidence interval is a function of the sample values only, once α is given. If $\alpha = 10$ per cent, a 90 per cent confidence limit is obtained (see Fig. 1).

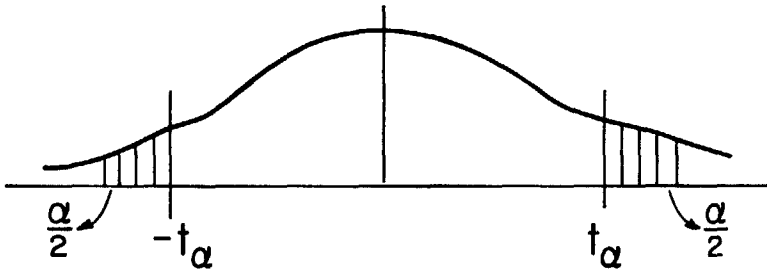


FIG. 1

For $N > 30$, tables of the normal curve can be used because the distribution approaches the normal form as $n \rightarrow \infty$.

The value of t_a at the 80 per cent confidence level = 1.282. Values of t_a for other confidence levels are:

Confidence Level	t_a
90%	1.645
95	1.960
98	2.326
99	2.576

The formula given above was transformed algebraically into the following formula in order to simplify its use in calculating upper and lower limits at levels other than the 80 per cent shown in Table 1.

The confidence interval for y

$$= \bar{y} + b(x - \bar{x}) \pm t_a \left[\frac{b^2}{N-2} \left(\frac{1-r^2}{r^2} \right) \right]^{1/2} [(N+1)s_x^2 + (x - \bar{x})^2]^{1/2}.$$

The following constants can be used in this formula to calculate the ranges of expected weights for various confidence levels:

$$i = \bar{y},$$

$$ii = b,$$

$$iii = \bar{x},$$

$$iv = \left[\frac{b^2}{N-2} \left(\frac{1-r^2}{r^2} \right) \right]^{1/2},$$

$$v = (N+1)s_x^2.$$

TABLE 1		
	Ages under 40	Ages 40 and Over
i	2 3420	2 4660
ii	0.0319773	0.0299479
iii	105.23	110.41
iv	0.000179	0.000219
v	674,695.81	477,402.48

Example.—For Table 1, age under 40, t_a at 80 per cent, the range of expected W/H ratios is:

$$W/H = 2.3420 + (0.0319773)(x - 105.23) \\ \pm (1.282)(0.000179)[674,695.81 + (x - 105.23)^2]^{1/2}.$$

Thus for any given height (H) and sum of three measurements (x), a range of expected weights (W) can be calculated.

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