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Total Serum Cholesterol Levels of Children 4-17 Years of Age, United States, 1971-74^a

Serum cholesterol levels of children 4-17 years of age in this report were obtained as part of the Health and Nutrition Examination Survey (HANES). HANES is a program of the National Center for Health Statistics in which measures of nutritional status are collected for a scientifically designed sample representative of the civilian noninstitutionalized population of the United States in the broad range of ages 1-74 years.¹

Field data collection operations for the first HANES survey were started in April 1971 and completed in June 1974. Of the 28,043 persons aged 1-74 years who were selected in the national probability sample to represent the 194 million persons in that age in the civilian noninstitutionalized population, 20,749, or 74.0 percent, were examined. When adjustments are made for the differential sampling ratios used for the effect of oversampling among the poor, preschool children, women of childbearing age, and the elderly, this figure corresponds to an effective response rate of 75 percent. Among children 4-17 years of age at interview for whom serum cholesterol determinations were made, there were 5,334 examined out of the probability sample of 6,356 selected to represent the 56 million of this age in the population. This is an unadjusted response rate of 84 percent and an effective adjusted response rate of 84 percent.

Detailed estimates of the distribution of serum cholesterol levels will be described and analyzed in the report "Total Serum Cholesterol Levels of Children 4-17 Years, United States,

1971-1974," *Vital and Health Statistics Series 11*.² Selected data and findings from that report are presented here in tables 1-5 and figures 1-4.

CHOLESTEROL DETERMINATIONS

All serum cholesterol determinations were made in the Lipid Standardization Laboratory of the Center for Disease Control (CDC), Public Health Service, Atlanta, Georgia. The analytical method was based on that of Abell and others³ but was modified for a semiautomated production line. The method described in detail by Eavenson and others⁴ was made possible by the development of a relatively stable Liebermann color reagent and was designed for automatic pipetting units.

The Lipid Laboratory at CDC compared the results obtained with this semiautomated Abell method and those obtained from their standardized version of Abell and others. For examining the bias of the semiautomated method, data were obtained from pools of sera analyzed by the reference method and the semiautomated method. For pools ranging from 134 to 343 mg per 100 ml, there was in 1972 an average positive bias of 4.07 percent for the semiautomated method as compared to the standard method; for the 1971-1974 period the corresponding figure was a positive bias of 4.9 percent. The weighted average bias was 4.5 percent. In this paper the 1971-1974 data are presented without correction for bias so that they provide population reference standards for determinations made by the semiautomated methodology now in use.

^aThis report prepared by Sidney Abraham, Clifford L. Johnson, M.S.P.H., and Margaret D. Carroll, M.S.P.H.

For serum cholesterol measurements, sufficient numbers are available for presenting children in single years of age, from age 4 to 17. All such ages are presented by sex and race. The number of missing serum cholesterol test values was acceptable for children of ages 4 through 17 years. This was not the case for serum cholesterol values for children of ages 1-3 years, which are nevertheless presented, but were not analyzed because of possible bias due to missing values.

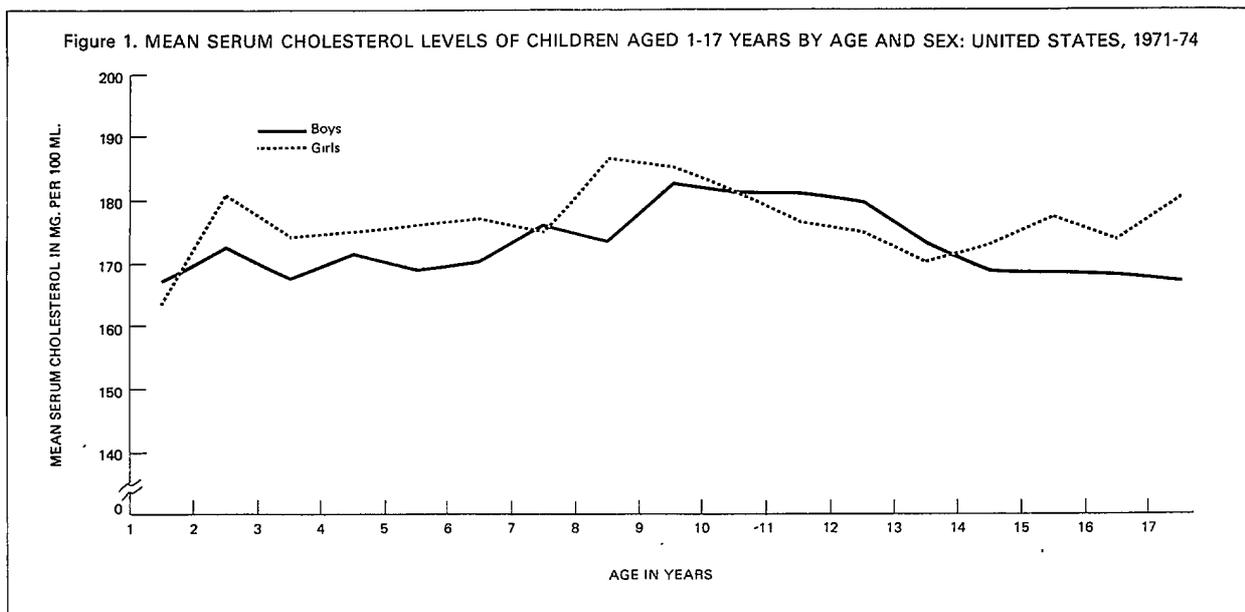
PRINCIPAL FINDINGS

The mean serum cholesterol level of boys in the younger ages from 4 through 11 years tends to increase with age to a high average value of 181.8 mg per 100 ml at ages 9-11 years. Another pattern in mean values is observed from these ages through 17 years, when the mean values consistently declined to a low mean value of 167.5 mg per 100 ml at age 17 years (table 1, figure 1). Table 1 and figure 1 also show that the mean values of girls were relatively stable at ages

4-7 years, ranging from 174.7 to 177.1 mg per 100 ml with the mean values increasing abruptly to 186.5 mg per 100 ml at age 8. From this age on through age 13 years the mean levels consistently decreased from the peak at age 8 to 170.4 mg per 100 ml at age 13 years, a decrease in mean level of 16.1 mg per 100 ml. This direction is not evident at ages 14 through 17 years, when the mean levels increased irregularly each year from 172.8 mg per 100 ml at age 14 years to 180.6 mg per 100 ml at age 17 years.

Overall, the mean serum cholesterol levels for girls increased from 174.7 mg per 100 ml at age 4 years to 180.6 mg per 100 ml at age 17 years, an increase of 5.9 mg per 100 ml. The decrease in mean levels between similar ages for boys is slightly less, 3.8 mg per 100 ml. Girls in each age group except ages 7, 11, 12, and 13 years, had higher mean serum cholesterol levels than boys in the same age group.

The main serum cholesterol patterns observed previously for the total male population aged 4-17 years were similar to those observed



for white boys separately (table 2, figure 2). Mean cholesterol levels of white boys were highest at 9-11 years and decreased with age. For Negro boys the peaks in values were at ages 7-12 years, with the exception of a drop in mean value at age 10 years, and then a decline in mean value from 184.1 mg per 100 ml at age 12 years to a low of 161.8 mg per 100 ml at age 14 years. From 14 years on the mean levels increased rapidly to 178.7 mg per 100 ml at age 16 and then declined (table 2 figure 2). At every age except ages 10, 13, and 14 years Negro boys had higher mean serum cholesterol values than white boys.

The age-cholesterol pattern found for girls in the total population was generally found for white and Negro girls separately. The mean serum cholesterol values of white girls increased irregularly from an average value of 173.5 mg per 100 ml at ages 4-5 years to the highest mean value of 183.6 mg per 100 ml at ages 8-9 years and then declined to 168.3 mg per 100 ml at age

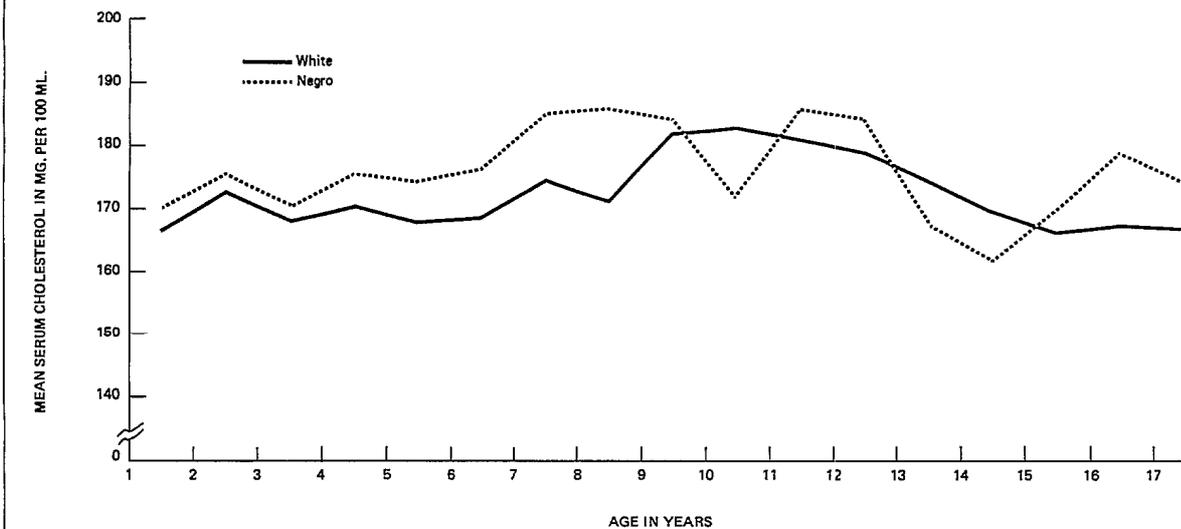
13 years. Thereafter with age there was a general increase in mean level to 180.3 mg per 100 ml at age 17 years (table 2 and figure 3).

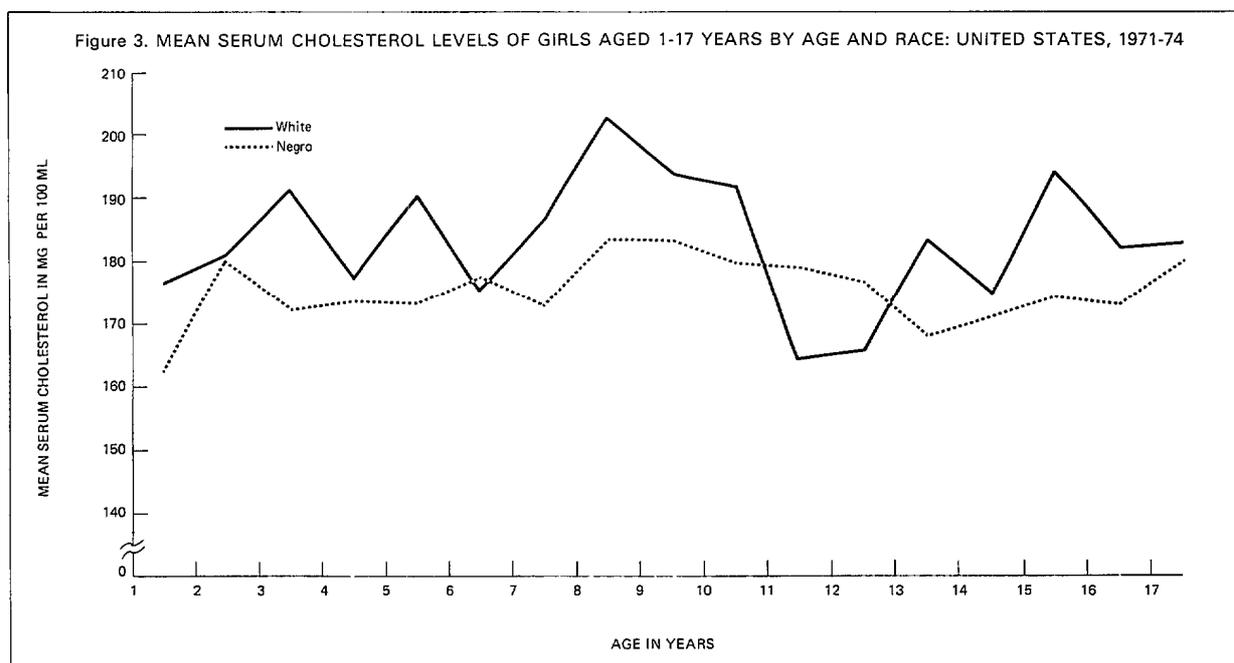
The mean levels of Negro girls also increased irregularly each year from 177.1 mg per 100 ml at age 4 to a peak of 202.8 mg per 100 ml at age 8. From this highest mean level at age 8 there is a decrease in mean values through age 12 and then a general increase to 194.5 mg per 100 ml at age 15. At ages 16 and 17 years the mean cholesterol levels declined from those at age 15 (table 2 and figure 3). At each age, with the exception of ages 6, 11, and 12 years, Negro girls had a higher mean serum cholesterol levels than white girls.

Both white and Negro girls generally had higher mean cholesterol levels than their male counterparts, particularly Negro girls. In addition, Negro boys and girls had generally higher mean serum levels than their white counterparts.

The proportion of children in HANES whose serum cholesterol levels exceeded any specified

Figure 2. MEAN SERUM CHOLESTEROL LEVELS OF BOYS AGED 1-17 YEARS BY AGE AND RACE: UNITED STATES, 1971-74





level may be found in table 3 for boys and in table 4 for girls.

The U.S. estimates of serum cholesterol levels of children aged 4-17 can be compared with those reported in HANES for adults of ages 18-74 years. Table 5 shows the mean serum cholesterol levels of children and adults obtained in 1971-1974 by age and sex with the standard deviations of the population distribution. Figure 4 shows the adult mean levels as a continuation of the mean levels of those presented for children of individual ages of 4-17 years.

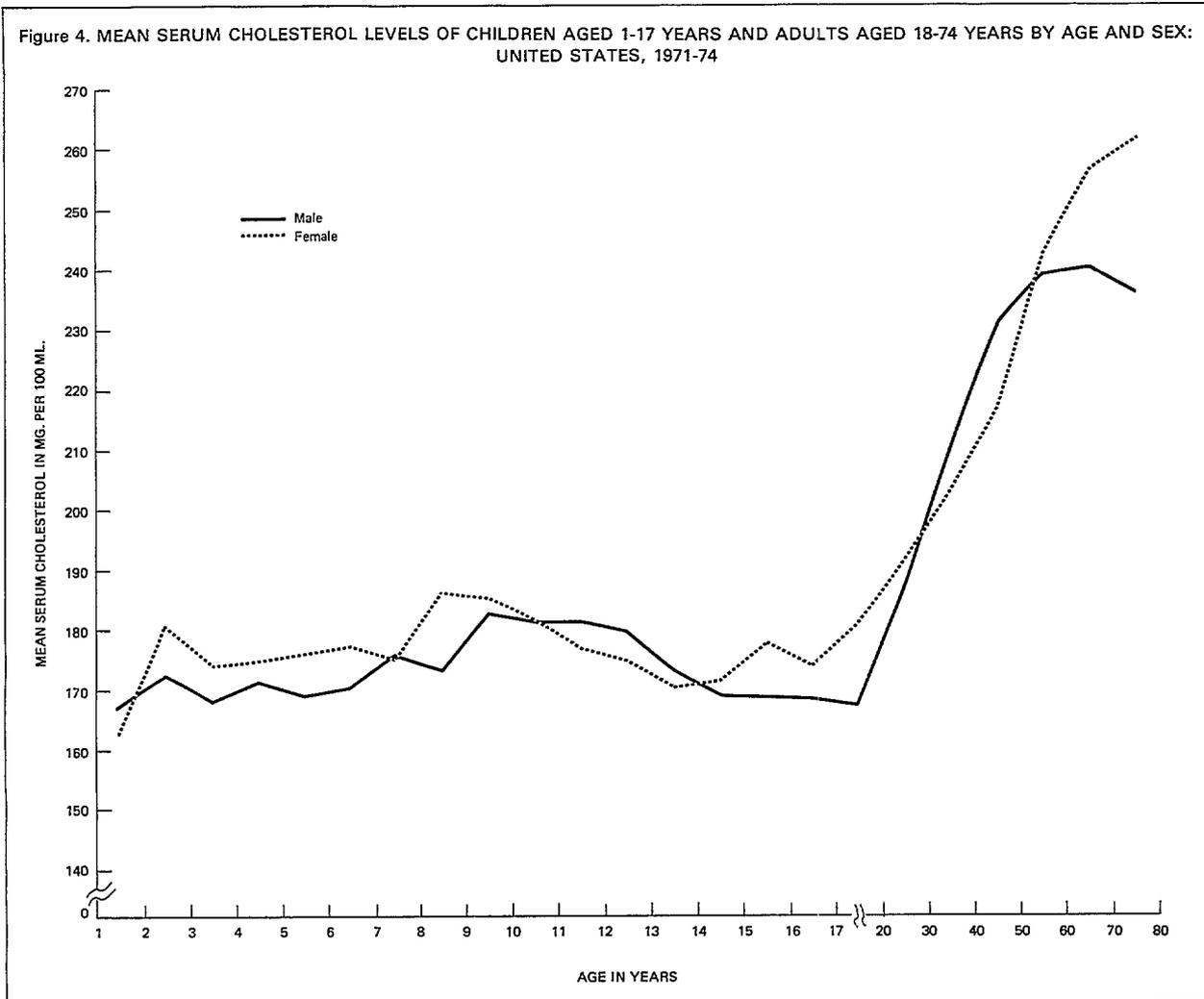
Males show a mean serum level of 167.5 mg per 100 ml at age 17 after a consistent decline from a mean level of 182.5 mg per 100 ml at age 9. The mean levels for adult males in the age group 18-24 is 186.9 mg per 100 ml, an increase of 19.4 mg per 100 ml, or 11.6 percent, from the mean level at age 17. The mean levels for male adults increase rapidly to the age group 35-44 and increase less rapidly in the age groups 45-54 and 55-64 years. A slight decline occurs in the age group 65-74 years.

A similar analysis of the mean level at age 17 for girls with that at ages 18-24 for females also shows a rise in mean levels. The mean level increases to the age group 45-54 years and increases less rapidly in the later age groups. The rise in mean level among men does not start until the early adult ages, 18-24 years, whereas in females the rise begins earlier.

The mean levels for women are higher than those for men in the youngest age group, 18-24 years. The mean levels for women increase less rapidly than those for men in the age groups 25-34 and 35-44 years but increase much more rapidly than men's levels after age 55. The mean levels for women are about the same as those for men in the age group 45-54 years. The mean levels for men peak at ages 55-64 years and then decline, while the mean levels for women continue to rise.

The mean levels in adults are consistently higher than those in children aged 4-17 years. Table 5 shows that the distributions have greater variability in adults than in children of ages 4-17 years.

Figure 4. MEAN SERUM CHOLESTEROL LEVELS OF CHILDREN AGED 1-17 YEARS AND ADULTS AGED 18-74 YEARS BY AGE AND SEX: UNITED STATES, 1971-74



DISCUSSION AND CONCLUSION

The level of serum cholesterol has been identified as one of the multiple risk factors in the development of coronary heart disease. The results of epidemiological studies based on adult data from longitudinal studies such as the Framingham Heart Study⁶ have demonstrated that persons with elevated serum cholesterol values developed coronary heart disease with greater frequency. Similar longitudinal data obtained from adolescents that relate serum cholesterol

levels in younger ages to future morbidity or mortality are not available. There is some evidence, however, that atherosclerosis, more frequently manifested by coronary heart disease, may originate in childhood. Holman and others reported finding evidence of atherosclerosis in post mortems of children.⁶ Enos and others reported gross evidence of coronary atherosclerosis in 77 percent of American soldiers, average age of 22 years, killed in the Korean War.⁷

Reference data of levels of children 4-17 years of age were presented and analyzed by age,

sex, and race because of the medical interest in such data. There are no such previous data for the general population of ages 4-17 years. Such data as are available are taken from selected segments of the population and special study groups. Such estimates could not be generalized to the U.S. population. HANES, on the other hand, provided cross-sectional data of serum cholesterol levels obtained on different age cohorts representative of the U.S. population. The age trends represented mean levels for successive cohorts of persons of different age groups. The limitation of cross-sectional data are recognized in considering group changes because they reflect effects of environment as well as developmental and hereditary influences.

Girls in most ages had higher mean serum cholesterol levels than boys. By race and sex, white girls generally had higher mean serum cholesterol levels than white boys of comparable ages. Similarly, among Negroes, girls had higher mean levels than boys. For both whites and Negroes, only boys of ages 11 and 12 years had higher mean serum cholesterol levels than girls of comparable age.

At each age group, with few exceptions, Ne-

gro boys had higher mean levels than white boys. This pattern is also evident for Negro girls as compared to white girls. The differences in mean levels between white and Negro were greater for girls than for boys. The average differences between the mean levels of whites and Negroes over the 14 ages was 7.1 mg per 100 ml for females and 3.8 mg per 100 ml for males.

The mean serum cholesterol level obtained for males age 17 years is consistent with the finding that serum cholesterol levels rise sharply with age for young men. Similar analysis of the mean cholesterol level for females age 17 years with those of females age 18-24 years shows that the mean values rise less rapidly than those of males. The increase in mean cholesterol levels observed in the data for females between the ages of 16 and 17 years is followed by an increase during the age group 18-24 years and a continued rise in serum cholesterol level among females in the 25-34 and 35-44 age groups, whereas in adult males the rise is not only more rapid but it begins earlier. Not only are the mean serum cholesterol levels higher in adults than in children but also the distributions have greater variability in adults than in children aged 4-17.

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Table 1. Serum cholesterol levels of children 1-17 years by sex and age with mean, standard deviation, and standard error of mean: United States, 1971-74

Age	Both sexes			Boys			Girls		
	Mean ¹	Standard deviation	Standard error of mean	Mean ¹	Standard deviation	Standard error of mean	Mean ¹	Standard deviation	Standard error of mean
1 year.....	165.4	34.9	†	167.2	38.5	†	163.2	29.6	†
2 years.....	176.6	33.7	†	172.5	36.2	†	180.6	30.6	†
3 years.....	170.8	31.6	†	167.7	29.3	†	174.3	33.6	†
4 years.....	172.9	30.2	2.08	171.3	28.7	1.97	174.7	31.7	3.52
5 years.....	172.6	36.2	1.84	168.9	35.8	2.66	176.0	36.1	2.80
6 years.....	173.6	30.0	2.22	170.1	26.8	2.07	177.1	32.5	3.93
7 years.....	175.4	30.7	2.81	175.8	28.1	4.45	175.0	33.4	2.95
8 years.....	180.0	30.1	2.21	173.4	27.6	2.63	186.5	31.2	3.14
9 years.....	183.9	35.2	2.49	182.5	36.6	3.43	185.2	33.8	3.00
10 years.....	181.5	32.6	2.48	181.4	25.4	2.43	181.6	38.2	4.24
11 years.....	179.2	32.8	2.74	181.4	32.4	3.16	176.8	33.0	3.49
12 years.....	177.7	33.3	2.54	179.9	37.0	3.95	175.0	27.9	3.51
13 years.....	171.8	37.7	2.67	173.3	40.4	4.45	170.4	35.2	3.16
14 years.....	171.0	34.7	1.83	169.1	36.8	2.80	172.8	32.4	2.82
15 years.....	173.2	35.2	2.59	168.8	33.9	3.08	177.8	35.9	4.12
16 years.....	171.3	32.0	1.87	168.6	29.3	2.89	174.0	34.3	3.04
17 years.....	173.3	33.7	2.64	167.5	30.9	3.18	180.6	35.7	3.44

¹Mg per 100 ml.

†Standard error of mean not included because of possible bias due to missing values.

SYMBOLS	
Data not available-----	---
Category not applicable-----	...
Quantity zero-----	-
Quantity more than 0 but less than 0.05----	0.0
Figure does not meet standards of reliability or precision-----	*

Table 2. Serum cholesterol levels of white and Negro children 1-17 years by sex and age with mean, standard deviation, and standard error of mean. United States, 1971-74

Age	White						Negro					
	Boys			Girls			Boys			Girls		
	Mean ¹	Standard deviation	Standard error of mean	Mean ¹	Standard deviation	Standard error of mean	Mean ¹	Standard deviation	Standard error of mean	Mean ¹	Standard deviation	Standard error of mean
1 year	166.5	40.2	†	162.4	30.0	†	170.5	28.2	†	176.6	19.4	†
2 years	172.8	36.3	†	180.3	30.1	†	175.6	31.5	†	181.4	33.0	†
3 years	168.0	29.2	†	172.2	33.3	†	170.6	30.0	†	192.4	29.0	†
4 years	170.5	28.4	2.27	173.8	32.6	3.93	175.6	30.5	5.50	177.1	25.4	5.03
5 years	168.0	35.7	2.69	173.2	35.6	3.35	174.3	36.2	8.84	190.3	35.9	6.46
6 years	168.7	26.9	2.41	177.8	31.7	3.96	176.3	25.7	5.15	175.3	35.2	6.60
7 years	174.5	27.6	4.64	172.8	32.8	3.44	185.1	29.9	6.21	186.9	34.5	6.82
8 years	171.5	26.8	3.15	183.6	30.5	3.35	186.0	28.5	4.97	202.8	29.7	7.52
9 years	182.0	35.9	4.07	183.6	33.9	3.46	184.5	39.1	6.89	194.1	29.5	5.71
10 years	182.9	25.1	2.57	179.9	39.8	4.83	172.0	26.2	5.59	192.2	25.0	5.18
11 years	180.8	31.7	3.49	179.0	31.3	3.34	185.7	36.9	8.04	164.6	38.7	10.29
12 years	179.0	37.2	4.34	177.1	26.9	4.19	184.1	36.1	6.61	166.0	31.1	7.50
13 years	174.3	40.2	5.14	168.3	35.7	3.52	167.2	41.1	7.90	183.6	28.9	5.98
14 years	169.6	35.8	3.17	171.4	30.8	3.03	161.8	40.7	8.66	175.1	38.0	7.58
15 years	166.3	28.1	2.70	174.4	33.6	3.55	169.7	29.4	3.49	194.5	41.5	12.36
16 years	167.2	28.8	3.28	173.3	34.4	3.50	178.7	30.7	5.62	182.4	31.7	8.44
17 years	166.9	30.8	3.61	180.3	35.8	3.93	173.8	32.2	7.92	183.3	36.3	7.10

¹Mg per 100 ml.

†Standard error of mean not included because of possible bias due to missing values.

Table 3. Cumulative percent distribution of serum cholesterol levels of boys aged 1-17 years by age: United States, 1971-74

Serum cholesterol level (mg/100 ml)	1 year	2 years	3 years	4 years	5 years	6 years	7 years	8 years	9 years	10 years	11 years	12 years	13 years	14 years	15 years	16 years	17 years
	Cumulative percent distribution																
Under 100	3.78	1.62	0.0	1.59	0.42	0.0	0.0	0.0	0.0	0.0	0.0	0.19	0.16	0.26	0.30	0.0	0.0
Under 110	5.01	1.74	0.71	2.24	1.08	0.0	0.12	1.78	0.63	0.0	0.50	2.13	1.10	3.28	0.51	0.0	0.98
Under 120	6.72	4.59	2.39	3.30	2.87	0.67	1.42	3.14	0.63	0.45	2.40	2.13	1.37	5.14	3.21	0.16	3.32
Under 130	12.61	6.76	7.46	6.85	11.84	3.28	3.18	6.09	2.89	2.55	9.74	3.13	7.49	10.42	7.06	2.97	8.44
Under 140	22.93	12.08	17.12	12.86	18.46	10.80	5.62	10.86	9.25	3.91	19.18	7.55	16.68	22.58	15.53	16.13	19.35
Under 150	33.45	21.21	28.11	21.55	28.63	19.88	19.61	16.22	16.35	8.75	27.94	17.01	27.93	31.83	24.64	33.46	35.20
Under 160	43.83	35.17	41.90	31.84	43.53	38.67	28.47	28.59	27.17	18.45	36.57	27.13	42.73	43.37	40.13	43.33	45.19
Under 170	56.36	52.27	55.34	45.22	57.35	50.47	42.43	48.85	35.25	32.38	50.79	44.05	53.00	55.75	57.34	55.76	57.51
Under 180	68.71	67.00	69.01	63.60	66.71	71.91	61.58	62.10	47.67	51.60	62.00	54.15	63.45	64.09	69.08	73.14	67.01
Under 190	77.05	77.49	79.05	79.19	74.37	81.56	71.38	74.59	62.25	64.43	70.20	67.42	74.11	77.38	82.48	78.24	76.97
Under 200	81.27	83.48	86.50	85.44	81.05	89.02	81.96	84.64	74.71	78.37	78.91	78.85	77.54	82.47	89.35	88.01	81.37
Under 210	90.07	86.53	89.72	91.78	90.26	96.14	87.04	87.96	85.51	86.03	85.24	84.75	85.15	88.09	93.75	89.63	87.63
Under 220	91.70	93.98	94.74	95.49	93.73	97.64	91.92	94.96	92.36	92.22	93.93	89.44	91.16	91.31	94.72	91.75	95.21
Under 230	94.52	96.01	96.18	96.78	95.71	98.26	96.20	97.22	94.54	95.18	96.75	94.25	94.58	93.88	95.41	95.03	95.93
Under 240	96.76	97.06	98.72	97.69	96.69	98.62	99.71	99.37	94.75	98.08	97.72	95.89	95.64	95.39	95.80	95.70	99.07
Under 250	97.60	97.71	99.53	99.93	97.57	98.77	99.71	99.65	94.87	99.88	98.66	96.33	97.62	97.09	97.57	99.03	100.00
Under 260	99.16	97.71	100.00	100.00	98.86	98.77	99.71	99.65	94.87	99.88	98.66	98.12	97.84	98.40	98.40	99.72	100.00
Under 270	99.16	97.82	100.00	100.00	99.53	98.77	99.81	100.00	96.40	100.00	99.35	98.25	97.84	98.51	98.40	99.72	100.00
270 and over	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Examined children	133	168	224	304	273	179	164	152	169	184	178	200	174	174	171	169	176
Estimated population in thousands	793	1,042	1,254	1,707	1,720	1,783	1,879	1,977	2,032	2,054	2,095	2,136	2,125	2,111	2,106	2,072	2,007

Table 4. Cumulative percent distribution of serum cholesterol levels of girls aged 1-17 years by age: United States, 1971-74

Serum cholesterol level (mg/100 ml)	1 year	2 years	3 years	4 years	5 years	6 years	7 years	8 years	9 years	10 years	11 years	12 years	13 years	14 years	15 years	16 years	17 years
Cumulative percent distribution																	
Under 100	2.85	0.0	1.04	1.25	0.0	2.01	0.26	0.0	0.0	2.79	1.45	0.14	0.0	0.0	0.0	0.0	0.0
Under 110	3.50	0.26	1.86	1.60	1.11	2.01	0.49	1.44	0.0	2.79	1.45	0.14	1.41	0.59	0.0	0.75	0.0
Under 120	4.81	2.75	2.78	1.88	4.06	2.81	0.49	2.41	2.74	3.61	4.56	2.23	4.73	3.60	0.88	6.67	1.79
Under 130	13.59	6.57	6.63	3.63	8.91	6.83	4.25	4.22	3.59	5.61	5.94	3.27	6.84	7.12	4.50	9.17	2.59
Under 140	23.09	6.77	14.72	14.87	15.30	14.27	15.13	6.14	4.81	7.60	10.52	6.22	13.57	10.78	13.11	12.06	8.98
Under 150	36.51	9.85	25.47	22.07	22.78	21.29	24.93	8.13	12.45	17.36	16.20	16.70	26.52	21.54	23.39	25.67	18.78
Under 160	43.07	22.65	33.31	29.18	31.75	30.68	33.87	17.11	22.78	22.70	28.63	27.11	39.92	40.09	29.99	30.62	31.19
Under 170	49.11	36.64	46.77	47.18	44.36	38.86	44.77	28.57	33.22	33.26	45.77	50.53	53.71	52.45	42.34	46.86	42.25
Under 180	67.02	52.00	55.74	57.01	58.55	56.64	59.09	43.65	46.72	53.00	56.65	61.04	65.96	63.84	56.85	59.91	53.23
Under 190	78.29	67.05	67.66	69.84	72.97	66.73	69.96	51.06	59.22	65.25	66.60	70.37	76.58	70.37	73.16	71.40	67.13
Under 200	91.36	74.70	81.27	77.50	79.38	72.11	79.02	69.80	68.38	75.22	76.20	78.84	85.82	81.87	77.99	80.06	75.91
Under 210	94.71	87.68	86.55	86.96	83.53	83.45	85.16	79.72	80.92	81.92	87.61	89.48	91.14	87.82	82.82	86.04	81.91
Under 220	98.27	90.68	90.40	90.89	86.37	88.71	90.91	88.61	84.18	87.88	91.31	95.07	94.67	90.86	89.53	92.37	86.77
Under 230	99.48	93.80	94.56	96.74	93.89	95.67	91.80	91.27	88.68	93.96	92.58	97.35	97.23	94.82	93.90	94.51	90.08
Under 240	100.00	97.31	95.44	97.72	94.44	99.10	95.63	95.34	93.70	95.77	95.08	97.54	97.52	97.18	95.34	94.77	91.40
Under 250	100.00	97.31	98.95	99.62	95.43	100.00	97.81	96.91	96.67	96.84	97.88	97.54	97.73	98.38	95.34	96.81	95.26
Under 260	100.00	97.60	99.54	99.73	95.93	100.00	97.81	98.52	97.69	97.03	97.88	99.85	98.08	98.38	95.34	99.19	95.48
Under 270	100.00	99.23	99.54	99.73	98.05	100.00	99.19	98.52	97.87	97.03	99.23	99.85	98.66	99.18	96.84	99.81	97.96
270 and over	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Examined children	109	158	204	281	314	176	169	152	171	197	166	177	198	184	171	175	157
Estimated population in thousands	757	998	1,206	1,642	1,657	1,718	1,812	1,906	1,958	1,980	2,018	2,059	2,054	2,040	2,038	2,012	1,985

Table 5. Serum cholesterol levels of persons by sex and age, with number of persons examined, mean, and standard deviation: United States, 1971-74

Age	Male			Female		
	Number examined	Mean ¹	Standard Deviation	Number examined	Mean ¹	Standard Deviation
15 years.....	171	168.8	33.9	171	177.8	35.9
16 years.....	169	168.6	29.3	175	174.0	34.3
17 years.....	176	167.5	30.9	157	180.6	35.7
18-24 years.....	772	186.9	36.7	1,524	191.7	41.0
18 years.....	124	178.6	29.2	144	175.4	34.1
19 years.....	135	174.4	36.4	137	186.3	36.9
20 years.....	104	183.1	35.7	236	188.6	38.2
21 years.....	112	186.2	34.4	257	198.1	45.8
22 years.....	107	190.7	38.3	249	197.9	40.1
23 years.....	94	200.5	34.1	253	198.0	44.3
24 years.....	96	195.4	39.6	248	196.7	39.6
25-34 years.....	804	210.3	44.0	1,896	203.2	42.2
35-44 years.....	665	231.3	45.9	1,663	216.5	43.5
45-54 years.....	765	239.4	47.0	836	242.6	52.0
55-64 years.....	597	240.2	51.2	670	256.8	48.2
65-74 years.....	1,657	236.2	53.8	1,822	261.6	51.9

¹Mg per 100 ml.

STATISTICAL NOTES

The sampling plan for the 65 preselected examination locations in the Health and Nutrition Examination Survey followed a highly stratified multistage probability design in which a sample of the civilian noninstitutionalized population of the conterminous United States 1-74 years of age was selected. Successive elements dealt with in the process of sampling were the primary sampling unit, census enumeration district, segment (a cluster of households), household, eligible person, and finally, sample person. The sampling design provided for oversampling among persons living in poverty areas, preschool children, women of childbearing age, and the elderly.

The serum cholesterol determinations are shown as population estimates; that is, the serum cholesterol findings for each individual have been "weighted" by the reciprocal of the probability of selecting the person. An adjustment for persons in the sample who were not examined and poststratified ratio adjustments were also made, and so the final sampling estimates of the population size were brought into closer alignment with the independent U.S. Bureau of the Census estimates for the civilian noninstitutionalized population of the United States as of November 1, 1972, by race, sex, and age.

Previous issues of *Advance Data From Vital and Health Statistics*

- No. 1. Blood Pressure of Persons 6-74 Years of Age in the United States (Issued: October 18, 1976)
- No. 2. Hypertension: United States, 1974 (Issued: November 8, 1976)
- No. 3. Height and Weight of Adults 18-74 Years in the United States (Issued: November 19, 1976)
- No. 4. Prevalence of Dermatological Diseases Among Persons 1-74 Years of Age, United States (Issued: January 26, 1977)
- No. 5. A Comparison of Levels of Serum Cholesterol of Adults 18-74 Years of Age in the United States in 1960-62 and 1971-74 (Issued: February 22, 1977)
- No. 6. Dietary Intake of Persons 1-74 Years of Age in the United States (Issued: March 30, 1977)
- No. 7. Total Serum Cholesterol Levels of Adults 18-74 Years of Age, United States, 1971-74 (Issued: May 25, 1977)