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Blood Pressure of Persons 6-74 Years of Age in the United States[a]

Single blood pressure measurements were obtained among a national probability sample of persons representative of the U.S. civilian noninstitutionalized population 6-74 years of age in the Health and Nutrition Examination Survey (HANES) from April 1971 through June 1974.

This first Health and Nutrition Examination Survey program, in which these data were obtained, was designed to measure the nutritional status of the U.S. population as well as certain aspects of the general health status and medical care needs of the U.S. population. This is the fourth of the Health Examination Survey programs that obtain information on the prevalence of medically defined illness, on unrecognized or undiagnosed conditions, and on a variety of physical, physiological, and psychological measures within the population through direct examinations, tests, and measurements, as described in previous publications.[1-4]

Blood pressure measurements of the persons in this HANES sample were made at 65 preselected locations throughout the country by the survey examining physicians using standardized methods based on the 1951 recommendations of the American Heart Association.[5] Of the 24,513 sample persons selected to represent the 131.4 million persons 6-74 years of age in the U.S. population, 17,796 (or 72.6 percent) were examined. This corresponds to an effective response rate of 74.4 percent when adjustment is made for the effect of oversampling among the poor, preschool children, women of childbearing age, and the elderly. National estimates of the distribution of blood pressure levels, prevalence of hypertension, and related medical history among the U.S. population based on findings from this HANES program have been described and analyzed in the report "Blood Pressure Levels of Persons 6-74 Years: United States, 1971-1974," *Vital and Health Statistics*, Series 11, No. 203[6] (in preparation). Selected data and findings from that report are included here in tables 1-6.

Highlights

Mean systolic blood pressure of the U.S. population increases with age from 103.3 mm.

[a]This report prepared by Jean Roberts and Kurt Maurer, Division of Health Examination Statistics.

Advance Data from Vital and Health Statistics replaces the supplements to the *Monthly Vital Statistics Report* as the means for early release of selected findings from the health and demographic surveys conducted by the NCHS. Most of these releases will be followed by detailed reports in the *Vital and Health Statistics* series.

Provisional vital statistics as well as advance reports of final data for a year will continue to be published in the *Monthly Vital Statistics Report.*

Advance Data is being distributed on the mailing keys for the *Vital and Health Statistics* series, and people who now receive reports from a particular series will also receive all *Advance Data* releases for that series. Temporarily, the mailing list for the *Monthly Vital Statistics Report (MVSR)* is also being used. *MVSR* readers who wish to continue to receive *Advance Data* issues, as well as other persons who wish to receive all issues, should contact: National Center for Health Statistics, Room 8-20, 5600 Fishers Lane, Rockville, Maryland 20852, Phone: (301) 443-1200.

Hg among children age 7-11 years to 150.1 mm. Hg among the oldest adults in the study, those ages 65-74 years. From 12 through 54 years of age the mean levels of systolic pressure among males exceed those for females, but from 55 through 74 years, the mean levels of women are the higher.

Diastolic pressure (mean values) of males increases with age and significantly exceeds mean levels of women from 18 through 54 years then decreases slowly through 74 years, while among women diastolic pressure levels off at ages 65-74 years but does not decrease significantly.

At 25-74 years of age, systolic and diastolic mean pressures for Negro men exceed those for white men, and those for Negro women exceed the mean levels for white women.

Mean systolic and diastolic blood pressures among the population decrease significantly with an increase in family income and education.

While no regional differences in mean diastolic blood pressure is evident, mean systolic blood pressure of persons living in the South is significantly higher for both white and Negro men and women than for those living in the Northeast or West.

There were an estimated 23.4 million persons 12-74 years of age, including 23.2 million or 18.1 per 100 adults ages 18-74 years, in the United States with definite hypertension—that is either systolic blood pressure of at least 160 mm. Hg *or* diastolic blood pressure of at least 95 mm. Hg. The prevalence rate of definite hypertension, as defined here, increases rapidly with age from 0.8 per 100 at ages 12-17 years to 40.7 per 100 at ages 65-74 years. At ages 18-54 years, definite hypertension is more prevalent among men than among women, but at ages 65-74 years the condition is more prevalent among women than among men. About one-fourth of the adults with definite hypertension have diastolic blood pressure of at least 105 mm. Hg.

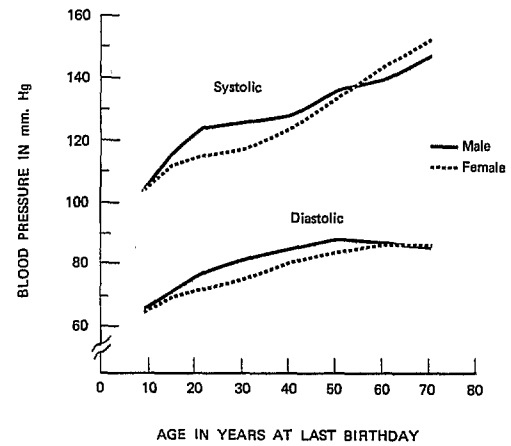
Hypertension is substantially more prevalent among Negro adults than among white adults in the United States.

More than half of the adults with definite hypertension have never been told by their doctors that they have this condition or high blood pressure. One-fourth of those with definite hypertension have been taking medication regularly or occasionally for high blood pressure within the preceding 6 months.

Mean systolic blood pressure levels of U.S. children and youths as determined in the present 1971-74 study are substantially lower and the mean diastolic pressures somewhat lower than those national estimates for children from the Health Examination Survey of 1963-65 and for youths from the Health Examination Survey of 1966-70, apparently because of survey differences that have been analyzed in detail.[6]

Among adults 18-74 years, national estimates of mean systolic and diastolic blood pressure levels from the Health and Nutrition Examination Survey of 1971-74 are in closer agreement with those from the Health Examination Survey of 1960-62 than with those for children and youths at the two available points in time. Mean systolic blood pressure level estimates for U.S. adults ages 18-54 years are nearly identical from both surveys, but from 55 through 74 years they are lower by an average of 4-8 mm. Hg in 1971-74 than in 1960-62. The diastolic pressure levels from the more recent survey are consistently higher (by an average of 3 mm. Hg) across the age range 18-74 years.

MEAN SYSTOLIC AND DIASTOLIC BLOOD PRESSURE OF PERSONS 7-74 YEARS BY AGE AND SEX: UNITED STATES, 1971-74



TECHNICAL NOTES

The sampling plan for the 65 examination locations in the Health and Nutrition Examination Survey of 1971-74 followed a 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. The sample was stratified by geographic region, population density, and rate of population change between 1960 and 1970. Within each stratum, cluster type sampling was used for selecting households and sample persons to be included in each examination location. The sample design provided for oversampling among persons living in poverty areas, preschool age children, and women 20-44 years of age.

The blood pressure level and related data in this report are shown as population estimates, that is, the examination 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 a poststratified ratio adjustment were also made so that the final sample estimates of the population size agree exactly with independent U.S. Bureau of Census estimates for the civilian noninstitutionalized population of the United States as of November 1, 1972, by color, sex, and age.

The tables in this report contain, for the various statistics presented, estimates of their sample variability (standard or sampling errors of the mean) which have been specially derived by a pseudoreplication method adapted specifically to the sample design used in the Health and Nutrition Examination Survey.[7] Data in the tables exclude 6-year-olds because no measurements were obtained for about one-fourth of this group, and the estimates for them are consequently less reliable than for those 7-74 years of age.[6]

REFERENCES

[1]National Center for Health Statistics: Plan and initial program of the Health Examination Survey. *Vital and Health Statistics.* PHS Pub. No. 1000-Series 1-No. 4. Public Health Service. Washington. U.S. Government Printing Office, July 1965.

[2]National Center for Health Statistics: Plan, operation, and response results of a program of children's examinations. *Vital and Health Statistics.* PHS Pub. No. 1000-Series 1-No. 5. Public Health Service. Washington. U.S. Government Printing Office, Oct. 1967.

[3]National Center for Health Statistics: Plan and operation of a Health Examination Survey of U.S. youths 12-17 years of age. *Vital and Health Statistics.* PHS Pub. No. 1000-Series 1-No. 8. Public Health Service. Washington. U.S. Government Printing Office, Sept. 1969.

[4]National Center for Health Statistics: Plan and operation of the Health and Nutrition Examination Survey, United States, 1971-73. *Vital and Health Statistics.* Series 1-Nos. 10a and 10b. DHEW Pub. No. (HSM) 73-1310. Washington. U.S. Government Printing Office, Feb. 1973.

[5]Committee to Revise Standardization of High Blood Pressure Readings: Recommendations for human blood pressure determinations by sphygmomanometers. New York. American Heart Association. Oct. 1951.

[6]National Center for Health Statistics: Blood pressure levels of persons 6-74 years of age in the United States. *Vital and Health Statistics.* Series 11-No. 203. DHEW, Rockville, Md. In preparation.

[7]National Center for Health Statistics: Replication: An approach to the analyses of data from complex surveys. *Vital and Health Statistics.* PHS Pub. No. 1000-Series 2-No. 14. Public Health Service. Washington. U.S. Government Printing Office, Apr. 1966.

Table 1. Systolic and diastolic blood pressure of persons 7-74 years by age and sex, with means, standard deviations, and standard error of means: United States, 1971-74

Blood pressure and age	Both sexes			Male			Female		
	Mean	Standard deviation	Standard error of mean	Mean	Standard deviation	Standard error of mean	Mean	Standard deviation	Standard error of mean
SYSTOLIC	Blood pressure in mm. Hg								
7-11 years	103.3	12.1	0.68	103.3	12.0	0.65	103.3	12.3	0.93
12-17 years	113.4	13.7	0.55	114.9	13.8	0.65	111.9	13.4	0.57
18-24 years	119.0	13.8	0.47	123.5	13.0	0.67	114.8	13.1	0.59
25-34 years	120.9	14.7	0.46	125.5	13.9	0.64	116.7	14.1	0.45
35-44 years	125.6	17.6	0.57	127.7	15.4	0.81	123.6	19.2	0.64
45-54 years	134.1	22.7	1.03	135.3	20.7	1.23	132.9	24.4	1.28
55-64 years	142.0	23.5	0.79	139.7	20.8	1.16	144.0	25.6	0.94
65-74 years	150.1	25.2	0.83	146.9	24.7	1.05	152.5	25.2	0.98
DIASTOLIC									
7-11 years	64.7	9.8	0.61	65.1	9.6	0.57	64.3	10.0	0.78
12-17 years	69.8	9.9	0.40	70.5	10.0	0.38	69.0	9.7	0.58
18-24 years	73.8	10.4	0.41	76.3	10.0	0.52	71.5	10.2	0.52
25-34 years	77.8	10.9	0.30	81.1	10.3	0.48	74.9	10.6	0.30
35-44 years	82.4	12.2	0.39	84.8	11.5	0.55	80.2	12.5	0.46
45-54 years	85.7	13.6	0.60	87.9	13.1	0.68	83.6	13.7	0.67
55-64 years	86.7	12.5	0.47	86.8	12.3	0.68	86.6	12.7	0.55
65-74 years	85.7	13.0	0.50	85.4	13.2	0.57	85.9	12.9	0.57

Table 2. Systolic and diastolic blood pressure of white and Negro persons 7-74 years by age and sex, with means and standard error of means: United States, 1971-74

Blood pressure and age	White						Negro					
	Both sexes		Male		Female		Both sexes		Male		Female	
	Mean	Standard error of mean	Mean	Standard error of mean	Mean	Standard error of mean	Mean	Standard error of mean	Mean	Standard error of mean	Mean	Standard error of mean
SYSTOLIC	Blood pressure in mm. Hg											
7-11 years	103.3	0.70	103.6	0.67	103.1	0.99	103.2	1.18	102.1	1.32	104.2	1.34
12-17 years	113.6	0.54	115.1	0.67	112.0	0.59	112.0	1.17	112.5	1.46	111.6	1.22
18-24 years	119.3	0.51	123.7	0.75	115.1	0.61	117.5	1.26	122.9	2.20	113.2	1.11
25-34 years	120.4	0.49	125.2	0.67	116.2	0.51	125.2	0.88	129.3	1.61	121.5	0.96
35-44 years	124.8	0.61	127.0	0.88	122.6	0.68	132.8	1.19	136.7	2.29	130.5	1.52
45-54 years	132.8	1.04	134.7	1.15	131.1	1.30	146.4	4.24	141.7	4.23	150.8	5.69
55-64 years	141.3	0.78	139.6	1.08	143.0	1.00	149.7	2.97	144.2	3.57	153.4	4.44
65-74 years	149.2	0.85	146.0	1.06	151.6	1.07	159.3	2.69	156.6	3.57	161.3	2.88
DIASTOLIC												
7-11 years	64.8	0.64	65.3	0.57	64.2	0.86	64.3	0.83	63.8	1.20	64.8	0.89
12-17 years	69.7	0.40	70.4	0.43	69.0	0.60	70.2	0.82	71.1	0.95	69.3	1.02
18-24 years	73.8	0.43	76.4	0.57	71.3	0.53	74.2	0.78	76.2	1.03	72.7	1.02
25-34 years	77.5	0.35	80.8	0.57	74.6	0.31	81.0	0.86	84.3	1.60	78.0	0.95
35-44 years	81.7	0.40	84.2	0.57	79.3	0.51	88.5	0.97	91.2	1.43	86.9	1.29
45-54 years	84.9	0.61	87.5	0.68	82.6	0.68	92.7	1.82	91.9	2.45	93.5	2.20
55-64 years	86.3	0.45	86.4	0.66	86.2	0.53	91.7	1.77	93.4	2.23	90.6	2.23
65-74 years	85.2	0.55	84.9	0.61	85.4	0.64	90.6	0.96	90.9	1.20	90.4	1.31

Table 3. Systolic and diastolic blood pressure of persons 7-74 years by geographic region, annual family income, and sex, with means, age-adjusted means, and standard error of means: United States, 1971-74

Blood pressure, region, and annual family income	Both sexes 7-74 years			Male 7-74 years			Female 7-74 years		
	Mean	Age-adjusted mean	Standard error of mean	Mean	Age-adjusted mean	Standard error of mean	Mean	Age-adjusted mean	Standard error of mean
GEOGRAPHIC REGION	Blood pressure in mm. Hg								
Systolic:									
Northeast	123.4	123.1	0.91	124.0	124.1	0.81	122.8	122.0	1.15
Midwest	124.2	124.7	0.65	125.8	126.0	0.75	122.5	123.2	0.79
South	127.6	127.0	0.86	127.5	127.2	1.12	127.7	127.0	0.89
West	122.5	122.7	0.94	124.4	124.4	1.14	120.7	121.3	0.99
Diastolic:									
Northeast	77.3	77.2	0.72	78.3	78.4	0.62	76.3	75.9	0.95
Midwest	78.2	78.4	0.37	79.7	79.7	0.34	76.6	77.0	0.51
South	78.8	78.5	0.57	79.7	79.6	0.69	77.9	77.6	0.62
West	77.0	77.2	0.80	78.8	78.8	0.79	75.3	75.7	0.97
ANNUAL FAMILY INCOME									
Systolic:									
Less than $5,000	130.4	126.4	0.74	128.6	126.6	1.23	131.6	126.3	0.82
$5,000-$9,999	124.2	124.7	0.63	125.4	125.6	0.60	123.1	124.0	0.84
$10,000 or more	122.0	123.3	0.40	124.3	124.8	0.46	119.5	121.8	0.54
Diastolic:									
Less than $5,000	79.6	78.5	0.53	79.6	79.5	0.77	79.7	77.9	0.55
$5,000-$9,999	77.9	78.3	0.41	79.1	79.4	0.40	76.8	77.2	0.56
$10,000 or more	77.1	77.3	0.31	79.1	78.8	0.35	74.9	75.6	0.41

Table 4. Prevalence rates of definite hypertension among persons 18-74 years by age and sex, with standard errors, population estimates, and proportion with this condition not previously diagnosed: United States, 1971-74

Condition and age	Both sexes			Men			Women		
	Rate per 100 population	Standard error of rate	Population estimate in thousands	Rate per 100 population	Standard error of rate	Population estimate in thousands	Rate per 100 population	Standard error of rate	Population estimate in thousands
DEFINITE HYPERTENSION, TOTAL[1]	18.1	0.58	23,171	19.2	0.77	11,656	17.1	0.76	11,515
18-24 years	3.1	0.58	738	4.8	1.10	544	1.6	0.31	194
25-34 years	6.6	0.67	1,777	9.1	1.34	1,159	4.4	0.51	618
35-44 years	15.5	1.12	3,492	18.9	1.92	2,043	12.3	1.01	1,449
45-54 years	24.2	1.64	5,702	26.8	2.12	3,022	21.9	1.91	2,680
55-64 years	33.2	1.66	6,257	32.3	2.18	2,875	34.0	2.08	3,382
65-74 years	40.7	1.60	5,205	36.6	1.74	2,014	43.9	2.03	3,191
DEFINITE HYPERTENSION NOT PREVIOUSLY DIAGNOSED, TOTAL[2]	54.9	1.29	12,712	62.9	1.76	7,333	46.7	1.67	5,379
18-24 years	68.5	9.45	505	69.5	12.62	378	65.5	9.27	127
25-34 years	65.5	5.24	1,165	66.9	7.57	776	63.0	5.33	389
35-44 years	57.9	3.13	2,021	61.6	5.18	1,258	52.6	4.03	763
45-54 years	60.6	3.22	3,458	65.1	3.82	1,967	55.6	4.42	1,491
55-64 years	48.6	3.10	3,039	60.4	4.13	1,738	38.5	4.49	1,301
65-74 years	48.5	1.76	2,525	60.5	2.24	1,216	41.0	2.30	1,308

[1] Systolic blood pressure of at least 160 mm. Hg or diastolic blood pressure of at least 95 mm. Hg.
[2] Proportion of persons with definite hypertension, as defined in footnote 1, who have never been told by their doctors that they had high blood pressure; standard error of proportions and population estimates.

Table 5. Prevalence rates of definite hypertension among white and Negro persons 18-74 years by age and sex, with standard errors and proportion with this condition not previously diagnosed: United States, 1971-74

Condition and age	White						Negro					
	Both sexes		Men		Women		Both sexes		Men		Women	
	Rate per 100 population	Standard error of rate	Rate per 100 population	Standard error of rate	Rate per 100 population	Standard error of rate	Rate per 100 population	Standard error of rate	Rate per 100 population	Standard error of rate	Rate per 100 population	Standard error of rate
DEFINITE HYPERTENSION, TOTAL[1]	17.0	0.57	18.5	0.84	15.7	0.72	28.2	1.75	27.8	2.33	28.6	2.28
18-24 years	3.1	0.65	4.9	1.29	1.4	0.30	3.7	1.06	4.6	1.77	2.9	1.06
25-34 years	5.8	0.65	8.2	1.28	3.7	0.57	13.7	2.86	17.7	5.98	10.2	1.95
35-44 years	13.6	1.09	17.3	1.97	10.1	0.94	32.0	3.85	38.2	6.55	28.3	4.71
45-54 years	22.2	1.59	25.8	2.06	18.9	1.86	44.0	6.31	36.8	7.95	50.9	7.69
55-64 years	31.4	1.59	31.1	2.14	31.7	2.02	52.6	5.24	49.9	7.86	54.5	7.11
65-74 years	39.3	1.72	35.3	1.85	42.3	2.26	55.1	3.87	50.1	4.28	58.8	4.73
DEFINITE HYPERTENSION NOT PREVIOUSLY DIAGNOSED, TOTAL[2]	56.6	1.51	64.5	2.00	48.2	1.86	47.2	3.87	54.9	5.13	41.2	4.66
18-24 years	66.9	10.86	67.0	13.68	66.4	12.00	78.1	8.91	90.4	16.94	62.6	18.33
25-34 years	69.1	6.02	71.1	8.84	65.0	6.67	54.0	11.52	52.0	18.35	57.0	12.55
35-44 years	63.3	4.02	66.8	6.48	57.5	4.57	39.6	4.94	38.2	8.82	40.8	6.79
45-54 years	61.9	3.22	64.3	3.74	58.9	4.71	55.6	8.45	71.8	10.26	44.3	10.03
55-64 years	50.4	3.18	62.1	4.34	39.9	4.71	39.2	7.35	48.9	12.99	33.0	8.36
65-74 years	49.2	1.95	61.9	2.32	41.2	2.56	43.7	4.67	51.0	4.70	39.1	5.58

[1]Systolic blood pressure of at least 160 mm. Hg or diastolic blood pressure of at least 95 mm. Hg.
[2]Proportion of persons with definite hypertension, as defined in footnote 1, who have never been told by their doctors that they had high blood pressure; standard error of proportions and population estimates.

NOTE: There are an estimated 19.4 million white persons at ages 18-74 years out of 113.6 million and 3.7 million Negro persons at ages 18-74 years out of 13.0 million that have definite hypertension as defined in footnote 1.

Table 6. Responses to selected medical history items by hypertensive status for persons 18-74 years; population in thousands and percent: United States, 1971-74

Medical history items	Definite hypertension		Borderline hypertension		Normotension		At least 105 mm. Hg diastolic	
	Population in thousands	Percent	Population in thousands	Percent	Population in thousands	Percent	Population in thousands	Percent
Total 18-74 years	23,171	100.0	23,413	100.0	81,353	100.0	6,172	100.0
Has a Doctor Ever Told You That You Have High Blood Pressure?								
Yes, still have it	7,701	33.2	3,421	14.6	2,997	3.7	2,731	44.2
Yes, not now	1,846	8.0	1,598	6.8	2,371	2.9	444	7.2
Yes, don't know now	904	3.9	562	2.4	596	0.7	277	4.5
No	12,712	54.9	17,810	76.1	75,282	92.5	2,716	44.0
Unknown	7	0.0	21	0.1	107	0.1	4	0.1
If Yes, How Many Years Ago Did You First Have It?								
Less than 1 year	177	0.8	65	0.3	54	0.1	97	1.6
1-5 years	5,343	23.0	3,241	13.8	3,616	4.4	1,550	25.1
6-70 years	4,874	21.0	2,241	9.6	2,259	2.8	1,793	29.0
Not applicable, unknown	12,777	55.1	17,866	76.3	75,424	92.7	2,732	44.3
During the Past 6 Months, Have You Ever Used Any Medicine, Pills, or Drugs for High Blood Pressure?								
Regularly	4,893	21.1	2,084	8.9	1,670	2.0	1,471	23.8
Occasionally	831	3.6	309	1.3	233	0.3	307	5.0
No	17,421	75.2	20,992	89.7	79,338	97.5	4,390	71.1
Unknown	27	0.1	28	0.1	112	0.1	4	0.1

Prevalence estimates of hypertension in the civilian noninstitutionalized population 17 years of age and over in 1974, based on household interview findings from a special supplement used in the Health Interview Survey, will be reported in *Advance Data* (HRA) 77-1250, No. 2.

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	*

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