Epidemiology of Resting Pulse Rate of Persons Ages 25-74 —Data from NHANES 1971-74

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Synopsis

Data from the first National Health and Nutrition Examination Survey (NHANES) were examined to produce national estimates for pulse rate distributions, confirm previously reported associations with pulse rate, and to perform analyses of associations of pulse rate with dietary, biochemical, hematological, and other variables that might shed light on the nature of the associations of heart rate with hypertension and mortality.

Among persons 25-74 years in the NHANES Survey, women had slightly higher resting pulse rates than men. Age had no consistent effects. Pulse rate was slightly higher in whites than in blacks among women and 25-44-year-old men. Resting pulse rate was slightly higher in fall and winter than in spring and summer and in the afternoon and evening than in the morning. Blood pressure and body temperature were significantly positively associated with pulse rate independent of multiple confounders. Heart beats per minute as recorded by electrocardiogram were slightly higher among smokers than nonsmokers after adjustment for multiple confounders. Of a large number of dietary, biochemical, and hematological variables, only total white blood cell count, hemoglobin, and serum uric acid showed consistent, independent associations with resting pulse or heart rate; these findings require confirmation in other populations.

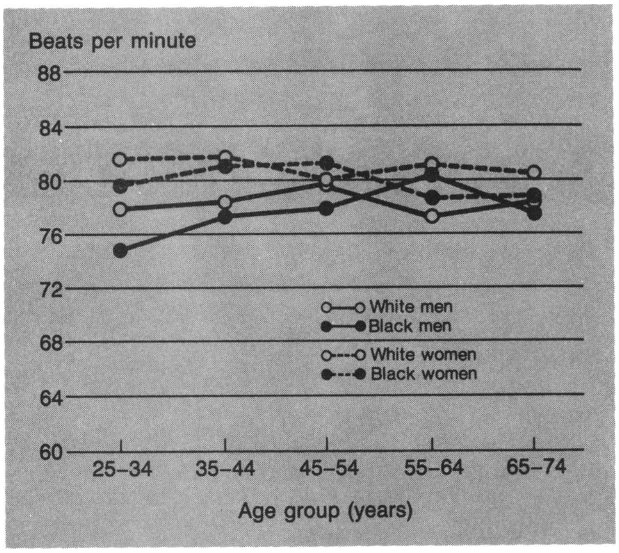
In several studies, elevated resting pulse rate has predicted increased hypertension incidence and increased mortality of white men from sudden coronary deaths and from cancer (*1-3*). The causal nature of these associations is in doubt because of inconsistent findings for various white male populations, the scarcity of replicated studies of women and blacks, and the possibility that pulse rate may be a marker for causes that were not measured. Such causes may include physical activity and diet. Further, the mechanism of any independent association with mortality remains to be determined. Additional epidemiologic studies of pulse rate in unselected populations may contribute to the resolution of these questions.

Data from the first National Health and Nutrition Examination Survey (NHANES I) provided an opportunity (*a*) to produce national estimates for the distribution of pulse rate; (*b*) to confirm previous findings of associations of pulse rates with age, sex, race, and blood pressure; and (*c*) to perform analyses of associations of pulse rate with dietary, biochemical, hematological, and other variables that might shed light on the nature of the associations of heart rate with hypertension and mortality.

Methods

NHANES I was conducted on a nationwide multi-stage probability sample of 28,043 persons. The sample was drawn from the civilian, noninstitutionalized population ages 1-74 years of the United States. Residents of Alaska, Hawaii, and reservation lands of Native Americans were excluded. Of these persons, 20,749 (70.4 percent) were examined between April 1971 and June 1974. This report is restricted to white and black adults ages 25-74 years with valid pulse rate measurements. After exclusion of 98 pregnant women and 3 persons with extreme resting pulse values greater than 148 beats per minute, information about 3,701 white men, 710 black men, 5,482 white women, and 1,200 black women was available for analysis. Numbers of persons in various analyses that follow vary due to differing numbers of missing values for selected variables. Details of the plan, sampling, operation, and response have been published, as

Figure 1. Mean resting pulse rate of persons ages 25–74 years, United States, 1971–74



have procedures used to obtain informed consent and to maintain confidentiality of information obtained (*4,5*). The 48 contiguous States and the District of Columbia were divided into four regions of about equal populations. A list of States included in each region has been published (*4*).

Demographic, medical history, and behavioral information was collected prior to the examination by household interview of participants (*4,5*). Examinations were carried out in a mobile examination center (*4–6*). At the beginning of the examination, the physician counted the radial pulse for at least 30 seconds with the examinee sitting and recorded it on the standard examination form as beats per minute (*4*). Methods have been detailed elsewhere for hematological, biochemical, and nutrition measures (*4–12*).

A subsample of approximately 20 percent of persons ages 25–74 years in the initial sample (locations 1–65) received a more detailed examination (*4,5*). An additional sample of 3,059 persons ages 25–74 years was selected for detailed examination between July 1974 and September 1975 (locations 66–100) (*13*). Supplemental questionnaires included smoking history. A technician performed a 12-lead electrocardiogram with results recorded on magnetic tape. There was considerable trouble with the recording equipment in the field, leading to the loss of 574 electrocardiograms, 8.3 percent of the examined sample. Measurement and interpretation of the electrocardiograms were done by Phone-A-Gram Systems Incorporated using a computer program called ECAN. In these analyses, the average of heart rates measured on the 12 individual leads was used. Excluded were 30 persons with a computer electrocardiogram (ECG) diagnosis of atrial fibrillation and 1 person with a diagnosis of probable high degree A-V block (rate under 40, P wave present). The numbers of participants with valid ECG heart rate data were as follows: white men, 2,526; black men, 314; white women, 2,936; black women, 421. The difference between the pulse rate with the subject sitting at the beginning of the examination and the ECG heart rate with the subject supine was computed as was the difference between the blood pressure when supine and when sitting. Biochemical laboratory methods were published in detail elsewhere (*8*).

Descriptive statistics and measures of association were computed initially using unweighted data (*14*). Population estimates of means and percentiles for pulse rate and heart rate as well as statistical tests of weighted proportions were produced using the SESUDAAN and the PCTL procedures available through the Statistical Analysis System (SAS) (*15*). Weighted Pearson product-moment correlation was used to assess the association of pulse rate or heart rate with other variables (*16*). All parameter estimates shown are from weighted analyses. Associations of pulse rate with other variables were statistically tested using the SURREGR procedure for linear regression models (*17*).

Results

Age and sex. In all sex-race groups, mean and median resting pulse rate differed little among the 10-year age groups (figs. 1–3 and table 1). These patterns were maintained when persons on regular blood pressure or heart medication were excluded. Distributions were generally skewed toward higher values (figs. 2 and 3). In whites 95 percent of the population ages 25–34 had resting pulse rates between 60 and 100 in men and between 64 and 100 in women. Corresponding levels of the 5th and 95th percentiles for other age groups were as follows: 35–44 years, men 60, 98, women 64, 104; 45–54 years, men 60, 100, women 64, 104; 55–64 years, men 60, 100, women 60, 104; 65–74 years, men 60, 102, women 60, 100. These levels are generally consistent with clinical definitions of bradycardia (resting pulse rate less than 60 beats per minute) and tachycardia (resting pulse rate greater than 100 beats per minute) (*18*). In blacks, the levels of the 5th and 95th percentiles were as follows: 25–44 years, men 60, 96,women 62, 104; 45–64 years, men 58, 104, women 60, 100; 65–74 years, men 58, 100, women 60, 104. The proportion of persons with pulse rates greater than 100 was not significantly different in those under age 55 compared with those 55 years or older in men or in women. Figures 4 and 5 show mean resting pulse rate in persons ages 1-74 years, summarizing growth, development, and aging trends.

In whites, mean and median pulse rates were slightly higher in women than in men at all ages except 45-54 years (figs. 1-3). In blacks, mean and median pulse rates were slightly higher in women than in men at all ages except 55-64 years. In whites, 5.7 percent of women and 4.1 percent of men had resting pulse rates greater than 100 ($z=3.34$, $P=0.001$). In blacks, 4.7 percent of women and 3.4 percent of men had resting pulse rates greater than 100 ($z=0.77$, $P=0.44$).

Race. In men, mean and median pulse rates were generally similar in blacks and whites over age 45 (figs. 1 and 3). Among those younger than age 45, whites had slightly higher mean pulse rates than blacks (table 1). In women, mean and median pulse rates were slightly higher in whites than in blacks at all ages except 45-54 years (figs. 1 and 2). The 90th and 95th percentile values were also higher in whites than in blacks at ages 35-64. Nine white women but no black women had resting pulse rates greater than 130 beats per minute. Overall, there was no significant difference between blacks and whites in the percent of persons with resting pulses greater than 100 beats per minute in men or in women. However, in 25-34-year-old men, significantly more whites (4.1 percent) than blacks (0.2 percent) had such elevations ($z=3.83$, $P=0.001$).

Other demographic variables. Pulse rates of whites tended to be slightly higher for persons with family incomes less than $4,000 than in those with higher incomes; otherwise consistent relationships with pulse rate were lacking for most demographic variables (table 2). Among whites, pulse rate tended to be highest in residents of the south region in nearly all age-sex groups. No consistent regional trend across subgroups was seen among blacks.

In most subgroups, pulse rate tended to be higher in the fall and winter (September through March) than in the spring and summer. Since examinations in the North tended to be performed in summer and in the South in the winter, this may explain regional differences or vice versa. Among all subgroups, pulse rate tended to be 1-5 beats per minute higher in those examined after noon than in those examined before noon. In most age-sex-race groups, hour of the day (range 0800 to 2100) was significantly correlated with pulse rate (table 2). Parity was not associated with pulse rate in any age-race group of women. At ages 45-64 years, menopause was not associated with pulse rate. Among 25-44-year-old women, pulse rate was not related to oral contraceptive use.

Figure 2. Selected percentiles of resting pulse rate in women ages 25-74 years, United States, 1971-74

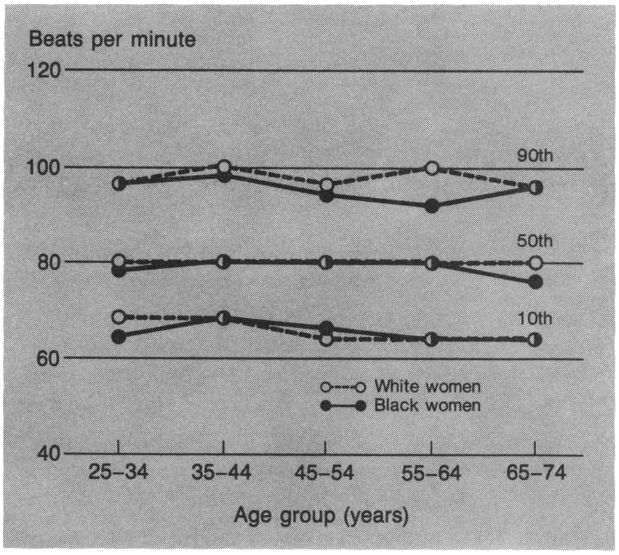
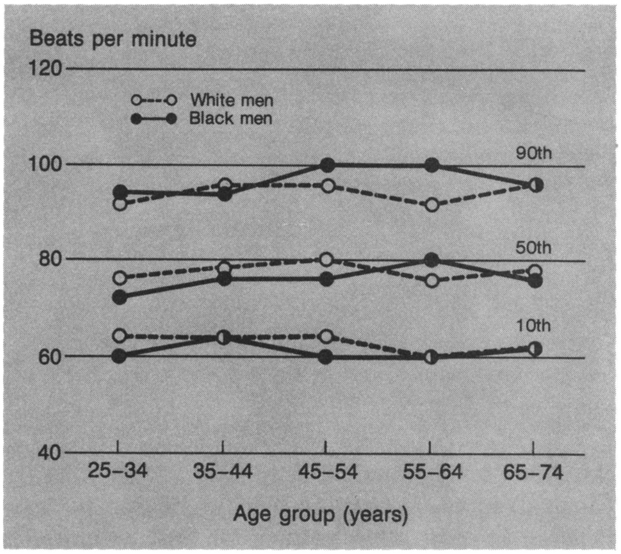


Figure 3. Selected percentiles of resting pulse rate in men ages 25-74 years, United States, 1971-74



Body size and obesity. Height and weight were inconsistently correlated with pulse (table 2). Correlations and plots indicate a positive linear association of body mass index and pulse in 25-44-year-olds

Figure 4. Mean resting pulse rate of males ages 1–74 years, United States, 1971–74

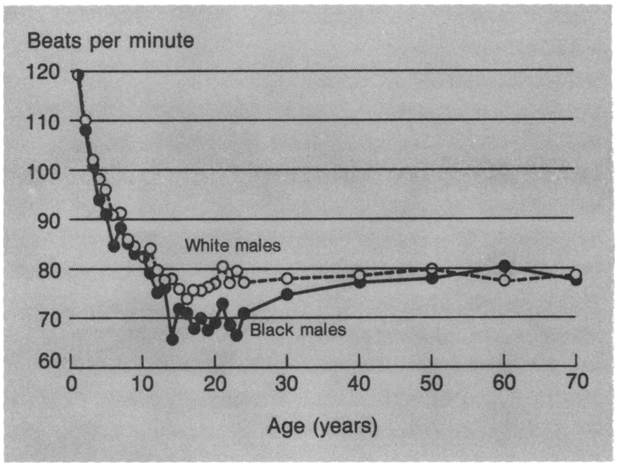
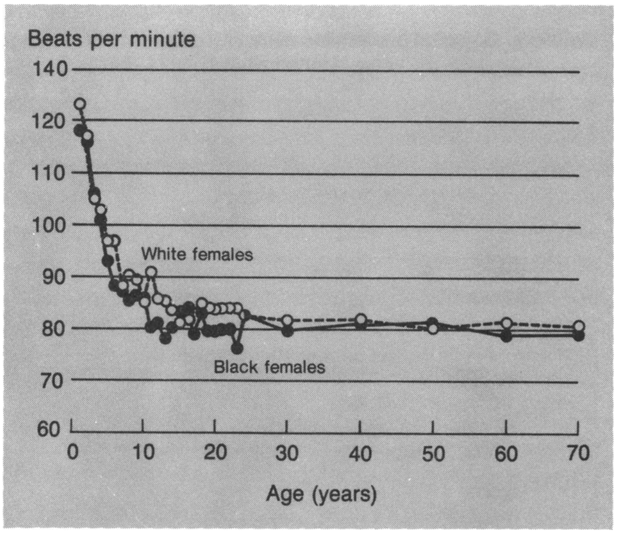


Figure 5. Mean resting pulse rate of females ages 1–74 years, United States, 1971–74



of both sexes, possible nonlinear associations (U-shaped) in 45–74-year-old black men, and no association in most other groups. Obesity, as indicated by skinfold thickness, was consistently positively associated with pulse rate only at ages 25-44 years (table 2).

Blood pressure and exercise. Blood pressure was positively correlated with pulse rate; correlations were more consistent across groups for diastolic blood pressure than for systolic (table 2). Plots of mean systolic and diastolic blood pressure by quartile of pulse rate revealed linear relationships. Mean systolic blood pressure was 7–14 mmHg higher in the highest quartile compared with the lowest at ages 25–64 and 4–10 mmHg higher, at ages 65–74. Mean diastolic blood pressure was 5–7 mmHg higher for all age groups 25 through 74 years in the highest quartile compared with the lowest quartile.

Correlations with the three-level scores for usual exercise pattern (1 very active, 2 moderately active, 3 inactive) were generally positive indicating slower pulse rates in more active persons. Results were more consistent for nonrecreational activity than for recreational exercise (table 2). Within age groups, men reporting high levels of both types of activity had pulse rates 6–8 beats per minute lower than the most inactive men. Differences were only 1–4 beats per minute for women. Body temperature was positively correlated with pulse rate (table 2).

Nutrition and hematology. Blood hemoglobin concentration and hematocrit were positively correlated with pulse rate in whites ages 25–64 and in black men ages 45–74 (table 2). Pulse rate was positively correlated with total white blood cell count within all age-sex-race groups. Mean pulse rates were not consistently associated with alcohol, coffee, or tea drinking or adding salt at the table. Pulse rate was not consistently associated with intakes of nutrients determined by 24-hour diet recall.

Multivariate analyses. Table 3 shows results of multiple linear regression, taking sampling weights and sample design into account. The number of blacks in the sample was too small to permit race-specific analyses for blacks. Results for whites were similar to those shown in table 3. Diastolic blood pressure, body temperature, winter season, and hour of the day showed consistent, significant, independent associations with pulse rate. Blacks had significantly lower pulse rates than whites among 25–44-year-old men and among women after control of other variables. In these groups, the adjusted racial difference was only 2-3 beats per minute. The ratio of subscapular to triceps skinfold thickness showed significant negative independent associations with pulse rate among 65–74-year-old men and a positive association among women.

Coefficients for diastolic blood pressure were unchanged after addition of a score of combined recreational and nonrecreational activity to the model. When total white blood cell count was added in the model to the variables shown in table 3, its coefficients were positive and significant for both men (beta 0.53, $P=0.0002$) and for women (beta 0.87, $P=0.0000$) ages 25–74. When hemoglobin concentration was added to the variables shown in table 3, its coefficients were positive and significant in men (beta 0.96, $P=0.0000$) and women

Table 1. Mean (SEM) resting pulse rate (beats per minute) in persons ages 25–74 years: United States, 1971–74

Age (years)	Men				Women			
	White		Black		White		Black	
	Mean	SEM	Mean	SEM	Mean	SEM	Mean	SEM
25–34	77.9	0.7	74.7	1.5	81.6	0.4	79.6	0.8
35–44	78.4	0.6	77.2	1.8	81.8	0.5	81.2	0.8
45–54	79.8	0.6	77.9	2.3	80.1	0.7	81.1	1.3
55–64	77.4	0.8	80.5	2.8	81.2	0.6	78.7	1.6
65–74	78.5	0.5	77.5	0.9	80.6	0.5	78.8	1.3

NOTE: SEM = standard error of the mean.

(beta 0.88, $P=0.0000$) ages 25-74, remaining unchanged when physical activity was also controlled. Results were similar to those shown in table 3 when persons were excluded who reported regular or occasional use of heart or blood pressure medication or who had outlying values of pulse rate and diastolic blood pressure.

The independent effect of the examinees' sex on pulse rate was examined by entering sex as an independent variable in a multiple regression, taking sampling weights and design into account. The predictor variables listed in table 3 were entered as control variables. In each age group, women had significantly higher pulse rates than men. Adjusted sex differences were as follows: 25–44 years, 5.1 beats per minute, $P=0.000$; 45–64 years, 2.8 beats per minute, $P=0.0002$; 65-74 years, 1.5 beats per minute, $P=0.014$.

Detailed examination variables. Table 4 shows mean supine resting heart rate from the ECG by age, sex, and race. Within the detailed examination sample, the mean difference between resting pulse rate when sitting and resting heart rate when supine was 9.25 beats per minute (SD 9.41) with a minimum of −45 and a maximum of 60. The correlation of supine heart rate and sitting pulse rate ranged from 0.51 to 0.73 among the various age-sex-race groups. As with pulse rate, supine heart rate did not differ systematically among age groups. White women had higher mean heart rates than white men at each age, but the pattern was less consistent among blacks. Unlike sitting pulse rate, supine heart rate did not tend to be higher for white men than black men at any age. Among women, the trend towards higher heart rates for whites than for blacks was similar to that for pulse rate.

Current smokers had higher heart rates than never smokers in over half of the subgroups (table 5). In weighted regression analyses, current smoking was significantly associated with slightly higher resting heart rates independent of age, race, season, hour of the day, body mass index, skinfold ratio, body temperature, and serum uric acid. Regression coefficients indicated that the mean heart rate was about 2.9 beats per minute higher in men ($P=0.000$) and 1.4 beats per minute higher in women ($P=0.003$) among current smokers than among ex- or never smokers. Among current smokers, heart rate was positively correlated with the number of cigarettes smoked per day at ages 25–44 and 45–64. At ages 65–74, correlations were negative except in black women.

Because smoking data were not available in the general examination survey, confounding by smoking was examined for selected associations in the detailed examination survey. In nonsmokers, correlations of heart rate with total white blood cell count were generally higher than those shown for the general sample in table 2. In smokers, correlations were similar to those shown in table 2. In regression analysis, the total white blood cell count remained significantly positively associated with heart rate after controlling for smoking and the variables in table 3. Of the various types of white blood cells, only total segmented neutrophils showed correlations with heart rate equivalent to those of the total white blood cell count. The association of blood pressure with heart rate remained significant after controlling for smoking and multiple other variables.

Weighted regression analysis confirmed a significant positive association of serum uric acid with heart rate in men ($P=0.004$) but not women ($P=0.08$) after controlling age, race, season, hour, body mass index, skinfold ratio, diastolic blood pressure, body temperature, and smoking.

Discussion

In persons 25-74 years, in the NHANES survey, women had slightly higher resting pulse rates than

Table 2. Correlations of resting pulse rate with selected variables:

Variable	Men, 25–44 years, Black (N = 1,237)	Men, 25–44 years, White (N = 202)	Men, 45–54 years, Black (N = 1,128)	Men, 45–54 years, White (N = 214)	Men, 65–74 years, Black (N = 1,336)	Men, 65–74 years, White (N = 294)
Age (months)	0.05	0.07	−0.12	0.06	0.03	0.02
Family income	−0.02	0.18	−0.06	−0.15	−0.08	0.00
Poverty index	0.02	0.15	−0.04	−0.06	−0.09	0.06
Education	0.00	0.18	−0.00	−0.14	−0.06	−0.02
Hour of day	0.18	0.06	0.14	0.01	0.09	0.10
Nonrecreational exercise	0.10	0.15	0.14	0.19	0.16	0.20
Recreational exercise	0.08	0.03	0.08	0.10	0.08	0.15
Body temperature	0.11	0.25	0.14	0.21	0.09	0.08
Triceps skinfold	0.04	0.16	0.07	−0.02	0.09	0.09
Subscapular skinfold	0.10	0.21	−0.06	0.01	0.02	0.08
Skinfold ratio	0.04	0.09	−0.01	0.07	−0.08	−0.00
Sum of skinfolds	0.08	0.20	0.07	−0.00	0.06	0.10
Weight	0.07	0.18	0.05	−0.01	−0.07	0.03
Height	−0.05	−0.06	0.04	0.05	−0.09	0.00
Body mass index	0.11	0.22	0.04	−0.03	−0.03	0.03
Systolic blood pressure	0.22	0.18	0.17	0.06	0.06	0.10
Diastolic blood pressure	0.17	0.18	0.18	0.15	0.17	0.16
Serum cholesterol	0.11	0.26	−0.02	0.16	0.06	0.06
Hemoglobin	0.10	−0.01	0.12	0.17	0.05	0.17
Serum iron	−0.04	−0.01	0.01	−0.04	−0.04	0.15
Total iron binding capacity	0.12	0.21	0.09	0.08	0.04	0.15
Transferrin saturation	−0.07	−0.11	−0.02	−0.08	−0.05	0.09
Serum magnesium	−0.02	−0.07	−0.02	−0.03	−0.00	0.02
White blood cell count	0.07	0.19	0.15	0.18	0.23	0.09
Red blood cell count	0.06	0.06	0.07	0.09	0.10	0.18

Table 3. Multiple linear regression with resting pulse rate

Variable	25–44 years Beta	F	P	45–64 years Beta	F	P
Men						
Age (months)	0.00	0.25	0.62	−0.01	3.51	0.06
Black race	−2.94	6.40	0.01	0.41	0.05	0.82
Winter season	2.63	9.62	0.00	1.59	2.91	0.09
Hour of day	0.45	30.52	0.00	0.35	12.40	0.00
Body mass index	0.14	1.66	0.20	−0.08	0.51	0.48
Skinfold ratio	0.50	0.01	0.94	−0.17	0.06	0.80
Diastolic blood pressure	0.15	16.93	0.00	0.17	21.90	0.00
Body temperature	2.08	6.11	0.01	2.77	16.25	0.00
Women						
Age (months)	−0.01	5.38	0.02	0.00	0.00	0.97
Black race	−2.81	15.17	0.00	−2.42	5.13	0.02
Winter season	1.62	9.85	0.00	1.84	3.38	0.07
Hour of day	0.33	29.36	0.00	0.24	4.66	0.03
Body mass index	0.00	0.00	0.95	−0.22	6.26	0.01
Skinfold ratio	1.78	4.14	0.04	2.13	2.32	0.13
Diastolic blood pressure	0.22	74.02	0.00	0.23	58.54	0.00
Body temperature	2.89	16.27	0.00	2.52	16.80	0.00

NOTE: All tests for overall model were significant at P less than 0.001.

men. Age had no consistent effects. Pulse rate was slightly higher in whites than in blacks among women and in 25–44-year-old men. Blood pressure was significantly positively associated with pulse rate independent of multiple confounders. Analysis of a large number of dietary, biochemical, and hematological variables led to hypotheses requiring testing in other populations: total white blood cell count, hemoglobin, and serum uric acid show consistent, independent associations with resting pulse or heart rate.

Figures 4 and 5 show mean resting pulse rate in

United States, 1971–74

Women					
25–44 years		45–64 years		65–74 years	
Black (N = 2,750)	White (N = 648)	Black (N = 1,248)	White (N = 238)	Black (N = 1,484)	White (N = 314)
−0.01	0.03	0.04	−0.07	−0.04	0.04
−0.01	0.06	−0.06	−0.08	−0.09	0.02
−0.02	0.05	−0.05	−0.08	−0.12	−0.00
−0.06	0.02	0.01	−0.06	−0.12	−0.09
0.13	0.07	0.08	0.23	0.06	0.14
0.04	0.08	0.07	0.21	0.11	0.23
0.04	−0.08	0.03	−0.05	0.05	0.09
0.14	0.10	0.11	0.20	0.06	0.18
0.08	0.09	−0.05	0.02	0.06	−0.17
0.12	0.08	0.02	0.04	0.09	−0.11
0.10	−0.02	0.07	−0.01	0.06	0.09
0.11	0.09	−0.01	0.03	0.08	−0.14
0.10	0.17	−0.01	0.08	0.01	−0.10
0.01	0.07	−0.03	0.15	−0.14	−0.03
0.10	0.16	0.00	0.03	0.07	−0.09
0.23	0.16	0.19	0.17	0.11	0.03
0.23	0.17	0.23	0.18	0.18	0.15
0.08	0.12	0.05	−0.15	−0.01	0.01
0.10	0.06	0.10	0.02	0.07	0.04
−0.04	0.01	0.01	−0.03	−0.03	0.13
0.02	0.11	0.10	−0.07	−0.03	0.05
−0.04	−0.04	−0.02	0.02	−0.05	−0.15
−0.02	−0.02	−0.04	−0.16	−0.04	−0.04
0.16	0.10	0.18	0.04	0.09	0.27
0.09	0.05	0.07	−0.09	0.11	0.02

as dependent variable

65–74 years			25–74 years		
Beta	F	P	Beta	F	P
0.01	0.34	0.56	0.00	0.89	0.35
−1.72	2.96	0.09	−1.37	2.13	0.14
1.19	1.37	0.24	2.01	10.00	0.00
0.31	5.96	0.01	0.40	54.18	0.00
−0.26	4.53	0.03	−0.00	0.00	−0.98
−1.84	9.19	0.00	−0.29	0.48	0.49
0.20	42.16	0.00	0.18	82.02	0.00
1.80	4.36	0.04	2.42	21.36	0.00
0.01	1.41	0.24	−0.01	18.28	0.00
−3.08	5.59	0.02	−2.74	20.49	0.00
2.52	8.04	0.00	1.83	8.86	0.00
0.31	5.14	0.02	0.30	32.05	0.00
−0.03	0.05	0.82	−0.97	4.84	0.03
2.61	4.11	0.04	2.12	8.98	0.00
0.18	52.61	0.00	0.22	137.29	0.00
1.17	2.69	0.10	2.48	40.32	0.00

persons ages 1–74 years, summarizing growth, development, and aging trends. Changes in heart rate associated with aging and their mechanisms have been examined in various studies (*19–27*). NHANES findings were generally consistent with the findings described for adult subjects free of cardiovascular disease; resting pulse rate did not decline with age. Consistent with findings reported for the National Health Examination Survey of 1960–62 were associations of resting pulse rate or heart rate with female sex, blood pressure, winter season, time of day, and the lack of association with age, other demographic variables, and body size (*27*).

The NHANES findings are consistent with many other reports of positive associations of resting pulse rate or heart rate with blood pressure in both cross-sectional and longitudinal studies (*1,2,27,28*). As in an Israeli study (*28*), the correlates of pulse rate differed from those reported for blood pressure in NHANES (*12*); body mass index and skinfold thickness had the most consistent relationship to blood pressure but were not consistently related to pulse rate. Associations reported in this study for other variables with pulse rate or heart rate are generally consistent with those reported in a number of published reports, although findings vary somewhat among studies (*29–41*).

Few data have been published on biochemical, hematological, or dietary correlates of pulse rate in populations. One study found no significant correlations with pulse rate for a wide range of such variables (*30*). White blood cell count has been positively associated with the risk of death from coronary heart disease and death from cancer independent of smoking (*37*). No studies that simultaneously examined heart rate and total white blood cell count as risk factors for coronary heart disease were found. Positive correlations of heart rate and white blood cell count were reported in an Israeli population (*38*).

Limitations of this study include the possible sources of bias inherent in cross-sectional studies (*14*). Key analyses were repeated with persons on heart or blood pressure medication excluded to minimize effects of cardiovascular disease and its treatment. Within the detailed sample population, differences between sitting pulse rate and supine ECG heart rate were probably due to a combination of examinee posture, measurement environment, personnel (physician versus technician), methods, and circadian variation (*34,41–43*).

Further research is needed to evaluate the significance of associations of pulse rate or heart rate with total white blood cell count, hemoglobin, and serum uric acid. Further longitudinal studies are needed of pulse rate as an independent risk factor for cardiovascular disease and cancer, especially among blacks and in women. The nature of associations of heart rate with coronary and cancer

Table 4. Mean (SEM) resting supine heart rate (beats per minute) in persons ages 25–74 years: United States, 1971–75

Age (years)	Men				Women			
	White		Black		White		Black	
	Mean	SEM	Mean	SEM	Mean	SEM	Mean	SEM
25–34	67.0	0.5	67.7	2.1	72.4	0.6	68.7	1.0
35–44	68.7	0.6	74.5	2.8	71.5	0.5	70.2	1.4
45–54	70.2	0.6	70.9	1.5	70.8	0.6	73.9	1.5
55–64	68.4	0.6	71.7	2.6	70.5	0.7	71.1	1.9
65–74	68.8	0.6	68.6	1.4	71.8	0.6	70.1	1.8

NOTE: SEM = standard error of the mean.

Table 5. Mean (SEM) resting heart rate (beats per minute) by cigarette smoking history, United States, 1971–75

Age (years) and smoking status	White men		Black men		White women		Black women	
	Mean	SEM	Mean	SEM	Mean	SEM	Mean	SEM
25–44								
Smokers	69.0	0.6	71.6	2.0	72.3	0.6	69.4	1.1
Ex-smokers	66.9	0.8	76.1	6.5	70.4	1.0	60.3	[1]3.4
Never smokers	66.4	0.7	64.9	1.7	72.3	0.6	71.2	1.5
45–64								
Smokers	70.9	0.6	72.8	1.9	72.7	0.7	74.9	2.0
Ex-smokers	69.0	0.8	65.7	2.3	68.2	1.3	(2)	(2)
Never smokers	67.1	0.9	73.0	2.2	69.9	0.6	71.7	1.7
65–74								
Smokers	67.8	1.4	71.1	2.2	70.5	1.4	68.8	[1]3.6
Ex-smokers	69.6	0.9	68.5	2.9	72.6	2.1	(2)	(2)
Never smokers	68.0	1.0	65.3	2.1	71.9	0.7	69.3	2.1
25–74								
Smokers	69.7	0.4	72.0	1.4	72.4	0.5	71.0	1.0
Ex-smokers	68.4	0.5	70.3	3.4	69.8	0.8	65.7	2.5
Never smokers	66.8	0.5	68.6	1.4	71.3	0.4	71.1	1.0

[1] N in sample 10–20; interpret with caution. [2] N less than 10.

NOTE: SEM = standard error of the mean.

mortality might be elucidated by further analyses of data from such studies and from clinical trials in which heart rate is altered by drugs such as beta blockers.

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