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ABSTRACT

During 1972-73 a hypertension screening program conducted in the black community of Holmes County, Mississippi, evaluated 4,272 individuals. Definite hypertension was found in 43.5 per cent of the males and 39.5 per cent of the females aged 18-79. Although both mean systolic and mean diastolic blood pressures rose with age the correlation to age was higher in the systolic readings. Analysis of environmental and social factors indicate that the specific geographic region of residence was associated with elevated blood pressures as well as social status within the household, occupational category, and place of birth.

INTRODUCTION

Hypertension has repeatedly been described by many observers (1) as the major public health problem of blacks, yet this widely accepted view is based on surveys of relatively small numbers of individuals. The data to be presented in this paper are derived from a large scale assessment of the distribution of blood pressures in a poor, rural black community in Mississippi, where an opportunity existed to observe a larger number of individuals than has been studied in previous reports. The unique circumstances of this community organized to determine its own health needs provided the ideal setting for these investigations. The Milton Olive III Memorial Corporation, a non-profit organization made up of representatives of the black community, had received a grant from the National Center for Health Services Research and Development, Department of Health, Education and Welfare. This grant permitted the Corporation to undertake a biosocial assessment of its health problems, to relate these to the demographic and cultural characteristics of the community, and to develop new programs for dealing with major health needs. Since 1969, assisted by consultants from a number of institutions, studies have been conducted under the control of community representatives and largely staffed by community people trained by the consultants in the skills necessary to conduct the research. This arrangement has assured nearly total community cooperation in the baseline assessments of population census and housing survey, and has made feasible random sampling for specific studies. Pilot programs have received virtually complete cooperation from the residents.

In 1971 a nutritional survey (2) was conducted in a stratified random sample of 500 households. Determination of blood pressures in 692 persons aged 18-79 showed the magnitude of the prevalence of hypertension and its importance as a major health problem. Definite hypertension, defined as a blood pressure of 160 mm Hg systolic and/or 95 mm Hg diastolic, rose steadily with age from 14.3 per cent in men

aged 25-34 to 52.2 per cent in those aged 65-74; in women, from 20 per cent to 50.9 per cent, respectively. The overall prevalence was 33.3 per cent in men and 39.8 per cent in women in contrast to 27.6 per cent for both sexes in the National Health Survey of 1960-1962 (3).

These preliminary findings were the impetus to initiate a demonstration project in the community control of hypertension making maximum use of the meager resources in professional personnel, a limited supply of free drugs which were available, and the community workers who had been trained to carry out field surveys. In this report, the prevalence of hypertension in 4,272 black individuals will be reported and related to the demographic and biosocial characteristics of the population and other environmental factors. These data were derived from the door-to-door screening of the community. The results of referral to a community health center for diagnostic evaluation and treatment have been presented elsewhere (4).

MATERIALS AND METHODS

Holmes County, located in the center of the state, is the third poorest county in Mississippi and one of the poorest in the United States. The U. S. Census of 1970 estimated the population at 15,743 blacks and 7,345 whites. There are no large cities in the County, the larger towns having between 1,000 and 1,500 blacks. It is, in a very real sense, a microcosm of the black belt of the U. S. Figure I is a map of the area showing the major geographic divisions of the 769 square miles of the County; the Delta occupying the western third and the Hills, the eastern two-thirds. The soil in the Delta is alluvial, characterized by a high organic content, low soil permeability, and a low electrolyte content. The Hills consist of two distinct soil types. One is loess, a deposited soil, which extends 8-10 miles east of the bluff separating the Hills from the Delta. Loess is the lowest of the three soils in electrolytes and organic matter. The other Hill

soil, a red-yellow podzolic, characterized by a prominent sub-surface layer of clay, has the highest electrolyte content. One consequence of these characteristics of the physical environment has been a higher prevalence of parasitoses and hepatitis in the Delta area, since a substantial amount of food, grown in small garden plots, is exposed to this organic milieu. An analysis of the mineral content of the three soil types is shown in Table 1. The most striking difference is the higher sodium content in the upland clay area. This finding may be reflected in the sodium content of the water supply, much of which is derived from shallow wells. Unfortunately, no comparable data on the electrolyte content of the water are currently available for the three geographic subdivisions of the County.

Holmes County is very poor; United States Census data give a 1969 mean per capita income of $632 for blacks and $2,277 for whites. Our data show that over half of the black households had no one employed. Generally, in the urban areas people are older, unemployment is higher, and more households are headed by a female. In the rural areas a quarter of the land is owned by black farmers, about 300 of whom are substantial and about 500 of whom are part-time farmers. In addition, almost all rural families own or rent a subsistence plot, on which much of the vegetable, poultry, and pork supply of the county people depends. Our data show housing in the County to be generally poor. Window and door screening is often absent or in disrepair. Farm animals are frequently penned in close proximity to houses and wells. According to our housing survey piped water is available to 53 per cent of the 3,947 black homes in the County, in some black communities as many as 90 per cent of the houses are dependent on shallow wells. Indoor toilet facilities are found in only 44 per cent of black households. Outdoor privies, often close to and above grade from the well, are present in over half the black households.

Our own population census conducted in the winter of 1969-70 enumerated 16,591 persons in 3,741 households. The true population, corrected by standard demographic techniques, is estimated at 18,000.

Of these persons, about 3,000 are in-migrants from nearby counties, while some 30,000 black Holmes Countians have migrated out, especially to Chicago, Detroit, Jackson, and Los Angeles. In the cohorts aged 25-44, 80 per cent of the men and 65 per cent of the women have migrated. Return migration is typical for the older age groups.

The effects of migration upon hypertension prevalence are uncertain in the absence of control studies among the out-migrants. Nevertheless, it should be noted (Table 5) that relatively higher levels of hypertension are evident in Holmes County at early, pre-migration ages.

Beginning in April, 1972, and for a period of seventeen months, until August, 1973, the population was evaluated for the prevalence of hypertension by a field staff of community workers. These individuals had been trained in the techniques of measuring blood pressure using a mercury manometer and the first and fifth phase Korotkoff sounds as denoting systolic and diastolic blood pressures respectively. Training included use of a double stethoscope so that accuracy could be monitored by the instructors and use of special training film (5). Blood pressure measurements in the sitting position were made on 4,272 individuals five years of age and over. Blood pressures and demographic data were obtained in the home by the community staff workers who systematically went out to houses assigned on a daily basis from work maps prepared in the population census and housing survey of all black homes in the County. About 83 per cent of the households were contacted at least once. In only 7 per cent of the households were field workers not permitted to measure blood pressures. Despite all of the efforts made, the population sampled by the hypertension survey proved to be significantly different in composition by sex and age from the uncorrected results of the Health Research Project census (Table 2). A small part of this difference, notably the larger proportions of women aged 65 and over reflects better coverage in the hypertension survey. In general, however, there is no reason to believe that the nature or magnitude of the biases thus introduced affect the hypertension prevalence data significantly.

RESULTS

The mean blood pressures stratified by age and sex is shown in Table 3 for females and in Table 4 for males. For both sexes, there is a steady rise with age in both systolic and diastolic blood pressures. The correlation of 0.42 between systolic blood pressure and age was better, perhaps because the measurement of systolic blood pressure is more reliable. Systolic blood pressure rose an average of 0.89 mm Hg per year of age.* The correlation between diastolic blood pressure and age was 0.18. A tendency to low values, especially in the younger age groups, gave rise to a greater variance. The mean systolic blood pressure in males was 130.9, in females, 131.2. The difference in diastolic blood pressure was significant (F value 4.34, P value 0.05).

The data are noteworthy in particular because of the large number of measurements in younger individuals aged 5-19. In this age group there are little published data and, hence, no clear definition of normal limits have been possible to date.

Hypertension in this study was defined as borderline when the systolic blood pressure values were 140-159 mm Hg and/or the diastolic values were 90-94 mm Hg. Definite hypertension was defined as greater or equal to 160 mm Hg systolic and/or greater or equal to 95 mm Hg diastolic. Using these criteria, the prevalence of hypertension in this population sample is shown in Table 5, stratified by age and sex, and compared with data reported for blacks in the National Health Survey of 1960-62. A strikingly high prevalence of definite hypertension in both men and women was confirmed in this large sample. Compared to the National Health Survey Data, the prevalence is noticeably higher in Holmes County throughout all age strata except those 65 or older. For

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*The regression of systolic blood pressure with age was: age x 0.89 + 96.73; for diastolic blood pressure the regression was: age x 0.51 + 56.07.

the younger ages from 10-24, a surprisingly high percentage had systolic blood pressure values of 140-159 and/or diastolic values of 90-94, perhaps already indicative of definite hypertension.

The high prevalence of hypertension in the County, and the wealth of demographic and biosocial data previously obtained from the population census and housing surveys encouraged the testing of a number of hypotheses regarding possible relationships between environmental or social factors and hypertension. A Delta-Hill contrast is expectable, given the Delta's alluvial soils; evidently more significant pathogen reservoirs (streptococcus, Ascaris, etc.); later population entry, multiple origins, and greater social heterogeneity (plantations, larger black farms, urban poor), and weaker extended families. It can be seen that the highest diastolic blood pressures are found in the rural Delta area. These differences are highly significant.

Their interpretation is, however, elusive. It will be recalled that the electrolyte content of the soil is lowest in the Delta, particularly in respect to sodium. Moreover, the physical condition of dwellings in regard to adequate screening, indoor plumbing, or the proximity of animals, proved to have no effects on mean blood pressures. On the other hand, as seen in Table 7, significantly higher diastolic blood pressures are found in those homes in which the water supply is derived from shallow wells. The F value of 29 gave this a high degree of significance ($P < .01$). No significant difference between the Hill and Delta regarding the source of the water supply could be demonstrated.

The analysis of social factors yielded important results, both negative and positive. Our basic measures of relative poverty: the quality of housing, household crowding, and employment vs. unemployment (Table 8) all failed to show any association with blood pressure. The years of schooling did not show any association with the prevalence of hypertension in either sex, now did the number of persons per household.

Three correlates with hypertension were identified. As Table 9 shows, those individuals listed as the head of a household, whether male or female, had significantly higher blood pressures ($P < .01$). Place of

birth was also significantly related to the prevalence of hypertension. Whereas 21 per cent of the native-born residents of the County had definite hypertension, 29.9 per cent of those born elsewhere in the South (almost all, in nearby counties) were hypertensives. Finally, both farm and non-farm laborers had higher blood pressures than did workers in other occupations.

DISCUSSION

The manifestation of high blood pressure is considered to be the result of environmental influences acting over time on the genetically predisposed individual (6). The black community in Holmes County, Mississippi, provided an ideal location for studying these environmental factors because hypertension is very prevalent in this relatively homogeneous population.

The environment is marked by all-pervasive poverty and social deprivation. The population reached its peak in 1910 and has fallen progressively since. The first World War and the Great Depression were the impetus for accelerated migration of blacks to the north. Land owned or rented by blacks has declined from two-thirds of the County total in 1910 to a quarter today (7).

Agricultural displacements due to mechanization have forced former sharecroppers and plantation hands into urban slums. Loss of income derived from farm labor has reduced an increasing number to subsistence gardening and reliance on food stamps. By 1970 only one-third of the black population aged 16 and over was employed and in half the households there was no employed individual at all (8,9).

The extensive out-migration of young men and women has resulted in an extreme imbalance in the sex ratio in the critical ages of 20-49, with fewer than 3 men to 4 women. As a correlate, only two-thirds of all black families have both husband and wife present.

Socio-economic conditions in the County were rated by the U. S. Bureau of the Census (9) as very poor for blacks and poor for whites. Marked educational differences between the two races exist. Forty-three percent of black men and 22 per cent of black women had fewer than 5 years of schooling contrasted to 9 per cent and 4 per cent respectively for whites. Full-time employment is exceptional for blacks, 78 per cent of whom were at poverty-level incomes. Corresponding differences in housing between blacks and whites reflected the over three-fold higher per capita income of whites. Death rates for blacks were 50 per cent above those expected for whites in the southeastern states. For whites, the excess mortality was only 7 per cent.

These stressful conditions were the setting, then, for the social background of hypertension among black people of Holmes County, Mississippi. The results of this investigation show that even under conditions of great poverty and presumed socio-psychological stress, the associations with hypertension appear to be complex. The strongest indication is that specific social roles define the sub-populations particularly at risk. Holmes County black society place critical responsibilities upon the heads of households, who are the decision-makers and managers of extended families, as well as their own immediate kin (8). Conversely, children, the elderly, and other dependents can call upon support from a network of relatives; the fosterage of children by grandparents is a common way of reducing strains in large families.

At another level, black-white relationships are the tensest. It is not surprising that laborers, who are almost all in high dependency to whites, and whose status among blacks is low, should be most hypertensive.

Finally, local in-migrants have largely come to Holmes County from even more deprived areas; for example, to take advantage of Head Start. This is in accordance with migration theory on selection by "minus factors" (10).

The fact that higher mean diastolic blood pressures were found in the Delta where the soil content is lowest in sodium is discordant with the extensive evidence linking salt with hypertension (11). It was assumed that soil sodium would be reflected in the sodium content of water derived from shallow wells and vegetables grown in gardens. Unfortunately, data on the sodium content of the food and water and electrolyte excretion studies are not available at this time. Although diastolic blood pressures were higher among those who obtained water from a well, no consistent relationship could be shown for those living in the Delta vs. the Hills in this regard.

CONCLUSIONS

Blood pressures were measured in a community-wide door-to-door screening of 4,272 black residents of Holmes County, Mississippi. Mean systolic and diastolic blood pressures rose with age, the former in a more correlated fashion. In males, age-adjusted diastolic blood pressure was significantly lower.

Hypertension was very prevalent. Definite hypertension was found in 43.5 per cent of the males and 39.5 per cent of the females aged 18-79; these values are 50 per cent higher than those reported for blacks in the National Health Survey of 1960-62.

Among the environmental factors associated with elevation of diastolic blood pressure was residence in the Delta region of the County, even though the soil in this area has the lowest sodium content. On the other hand, higher blood pressures were found in those depending on shallow wells as a water source. Social factors associated with higher diastolic blood pressures in this poverty-stricken, socially deprived area were head of household status, work as a laborer, and in-migration from elsewhere in the South. If poverty is the common factor underlying the strikingly high prevalence of hypertension, these preliminary studies should be invaluable in further investigation of the precise mechanisms by which it asserts its action.

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TABLE 1

SOIL ANALYSES IN HOLMES COUNTY, MISSISSIPPI
(EXPRESSED AS % BY WEIGHT)

	Upland (Clay)	Bluff (Loess)	Delta (Alluvial)
FE_2O_3	4.42	4.64	6.44
MgO	.92	.88	1.37
CaO	.61	.38	.67
Na_2O	1.31	.95	.58
K_2O	1.82	1.87	1.73

TABLE 2

AGE AND SEX DISTRIBUTION IN THE HYPERTENSION SAMPLE
COMPARED TO THE TOTAL CENSUS, HOLMES COUNTY, MISSISSIPPI

	FEMALES				MALES			
	Hypertension Survey		HRP Census		Hypertension Survey		HRP Census	
Age	No.	%	No.	%	No.	%	No.	%
5-9	229	9.0	1,150	15.7	210	12.6	1,140	17.9
10-14	325	12.8	1,156	15.8	246	14.8	1,130	17.8
15-19	321	12.6	1,029	14.0	215	13.0	1,000	15.7
20-24	115	4.5	441	6.0	67	4.0	376	5.9
25-34	201	7.9	591	8.1	84	5.1	388	6.1
35-44	257	10.1	625	8.5	113	6.8	424	6.7
45-54	291	11.5	661	9.0	148	8.9	497	7.8
55-64	338	13.3	691	9.4	208	12.5	551	8.7
≥ 65	462	18.2	982	13.4	367	8.7	850	13.4
TOTAL	2,539	60.0% of total	7,326	53.5 of total	1,658	40.0% of total	6,356	46.5% of total

TABLE 3

MEAN BLOOD PRESSURE OF BLACK FEMALES
HOLMES COUNTY, MISSISSIPPI

Age	No.	Systolic (mm Hg)		Diastolic (mm Hg)	
		Mean	Std. Dev.	Mean	Std. Dev.
5-9	227	94.3	17.4	52.3	16.2
10-14	325	107.0	14.1	60.8	15.8
15-19	321	111.2	14.8	65.0	15.6
20-24	115	112.6	16.9	68.0	17.8
25-29	102	125.9	22.3	80.1	17.7
30-34	99	129.6	22.5	89.7	24.7
35-39	104	129.1	24.3	84.2	20.2
40-44	153	142.4	26.6	86.1	17.8
45-49	147	142.4	28.2	89.4	18.4
50-54	142	147.0	24.5	91.6	20.7
55-59	160	149.9	25.5	88.3	19.8
60-64	177	156.3	28.9	89.4	18.8
65-69	163	156.4	28.0	88.0	17.5
70-74	141	160.8	27.7	92.1	22.7
75-79	86	156.7	25.6	86.2	23.0
80-84	41	159.7	28.8	88.5	28.2
85-89	13	164.8	30.1	81.7	14.0
90-94	10	165.3	26.6	78.4	26.4
$\geq$ 95	8	165.3	28.6	95.8	28.8

TABLE 4

MEAN BLOOD PRESSURE OF BLACK MALES
HOLMES COUNTY, MISSISSIPPI

Age	No.	Systolic (mm Hg)		Diastolic (mm Hg)	
		Mean	Std. Dev.	Mean	Std. Dev.
5-9	208	93.6	13.7	49.9	16.7
10-14	246	106.6	15.0	57.3	18.9
15-19	215	117.5	16.6	60.0	19.6
20-24	67	123.6	16.3	69.9	18.3
25-29	41	128.8	18.7	72.2	22.0
30-34	43	143.8	29.4	87.5	24.2
35-39	41	135.6	20.9	86.7	14.9
40-44	72	137.3	19.7	84.9	16.3
45-49	70	142.1	26.3	87.5	19.5
50-54	78	144.5	27.5	86.2	18.2
55-59	98	147.3	28.7	87.4	20.5
60-64	110	155.5	30.8	89.6	21.9
65-69	143	156.7	26.4	86.4	20.7
70-74	101	159.3	26.9	84.4	22.7
75-79	56	157.5	24.7	85.6	20.5
80-84	35	154.2	25.3	80.1	16.0
85-89	22	165.5	23.0	91.7	28.8
90-94	8	156.5	23.0	86.8	24.0
$\geq$ 95	2	138.0	-	91.0	-

TABLE 5

HYPERTENSION IN BLACKS IN HOLMES COUNTY, MISSISSIPPI
-- EXPRESSED AS PER CENT COMPARED WITH
BLACKS IN THE NATIONAL HEALTH SURVEY, 1960-62

MALES

Age	Borderline*	Definite**	Blacks National Health Survey**
10-17	4.9	1.5	-
18-24	13.9	6.6	1.9
25-34	17.9	34.5	12.5
35-44	25.7	32.7	26.5
45-54	18.2	43.2	30.8
55-64	21.6	50.5	44.6
65-74	23.0	57.8	66.0
75+	25.2	56.1	59.8
All 18-79	21.1	43.5	27.6

FEMALES

Age	Borderline*	Definite**	Blacks National Health Survey**
10-17	5.1	1.5	-
18-24	7.9	3.5	3.4
25-34	15.9	23.9	8.5
35-44	19.8	31.5	25.6
45-54	25.4	42.6	41.9
55-64	24.6	52.1	41.0
65-74	25.0	57.6	71.0
75+	27.2	57.0	69.4
All 18-79	21.2	39.5	27.6
Both Sexes 18-79	21.2	40.0	27.6

*Blood pressure 140-159/90-94
**Blood pressure $\geq$ 160-95
Males = 1669, 1042 aged 18-79
Females = 2566, 1776 aged 18-79

TABLE 6

THE EFFECT OF LIVING IN THE DELTA OR HILL, URBAN OR RURAL, ON MEAN BLOOD PRESSURE, HOLMES COUNTY, MISSISSIPPI

			Systolic*	Diastolic*
Female	Hill	Urban	146.5	87.8
		Rural	141.6	84.0
	Delta	Urban	146.1	84.5
		Rural	145.0	90.0
Male	Hill	Urban	148.2	83.6
		Rural	146.3	81.7
	Delta	Urban	155.2	87.1
		Rural	143.6	89.1

*Mean blood pressures in mm Hg, age adjusted

Effect	Degrees Freedom	F Ratio		
		Multivariate	Systolic	Diastolic
Urban-Rural	2	.7465	1.3227	.0015
Hill-Delta	2	11.2951**	7.6734**	21.2075**
Sex	2	4.1292*	.0567	6.6679**
Urban-Rural x Hill-Delta	2	7.6150**	2.4555	15.2102**
Urban-Rural x Sex	2	0.0035	0.0049	0.0060
Hill-Delta x Sex	2	1.9443	1.1291	1.3529
Urban-Rural x Hill-Delta x Sex	2	1.8413	0.6573*	0.7242

*$p < .05$
**$p < .01$

TABLE 7

EFFECT OF SOURCE OF WATER SUPPLY ON MEAN BLOOD PRESSURE
HOLMES COUNTY, MISSISSIPPI

		Systolic*	Diastolic*
Well Water	Female	140.9	86.9
	Male	146.4	86.3
Piped Water	Female	144.0	82.8
	Male	144.6	77.9

*Mean blood pressure in mm Hg, age adjusted.

Effect	Degrees Freedom	F Ratio		
		Multivariate	Systolic	Diastolic
Sex	2	4.3422*	0.3443	6.1537**
Well	2	16.3093**	0.0286	28.9886**
Sex x Well	2	2.3506	3.2948	3.1092

*$p < .05$
**$p < .01$

TABLE 8

EFFECT OF EMPLOYMENT ON BLOOD PRESSURES IN BLACK ADULTS AGE 18 AND OVER, HOLMES COUNTY, MISSISSIPPI (ANALYSIS OF COVARIANCE; AGE AS A COVARIATE)

			Systolic*	Diastolic*
Unemployed	Female	Hill	143.5	84.7
		Delta	144.4	87.7
	Male	Hill	145.3	87.2
		Delta	149.3	89.5
Employed	Female	Hill	140.5	85.0
		Delta	145.6	88.1
	Male	Hill	147.4	82.4
		Delta	144.3	87.9

*Mean blood pressure in mm Hg, age adjusted.

Effect	Degrees Freedom	F Ratio		
		Multivariate	Systolic	Diastolic
Employment	2	0.6	1.14	0.33
Sex	2	3.73	0.007	6.66**
Employment & Sex	2	0.37	0.74	0.03
Hill-Delta	2	10.88*	7.29**	20.42**
Employment x Hill-Delta	2	0.39	0.78	0.11
Sex x Hill-Delta	2	1.95	0.15	2.77
Employment x Sex x Hill-Delta	2	0.816	1.59	0.07

*$p < .05$
**$p < .01$

TABLE 9

EFFECT OF STATUS AS HEAD OF HOUSEHOLD AND MEAN BLOOD PRESSURE IN BLACKS AGE 18 AND OVER, HOLMES COUNTY, MISSISSIPPI (ANALYSIS OF COVARIANCE; AGE AS A COVARIATE)

			Systolic*	Diastolic*
Not Head	Female	Hill	140.0	83.9
		Delta	142.8	85.3
	Male	Hill	128.9	67.7
		Delta	127.9	80.3
Head	Female	Hill	149.8	87.4
		Delta	150.5	93.1
	Male	Hill	149.7	84.5
		Delta	150.3	90.3

*Mean blood pressure in mm Hg, age adjusted.

Effect	Degrees Freedom	F Ratio		
			Univariate	
		Multivariate	Systolic	Diastolic
Hill-Delta	2	10.81**	8.52**	19.61**
Head of Household	2	5.66**	1.05	11.28**
Sex	2	3.003*	0.2	4.9**
Hill-Delta x Head of Household	2	0.31	0.13	0.27
Hill-Delta x Sex	2	2.67	0.66	2.99
Head of Household x Sex	2	2.40	0.0049	4.10**
Hill-Delta x Head of Household x x Sex	2	2.45	0.003	4.37**

*$p < .05$

**$p < .01$

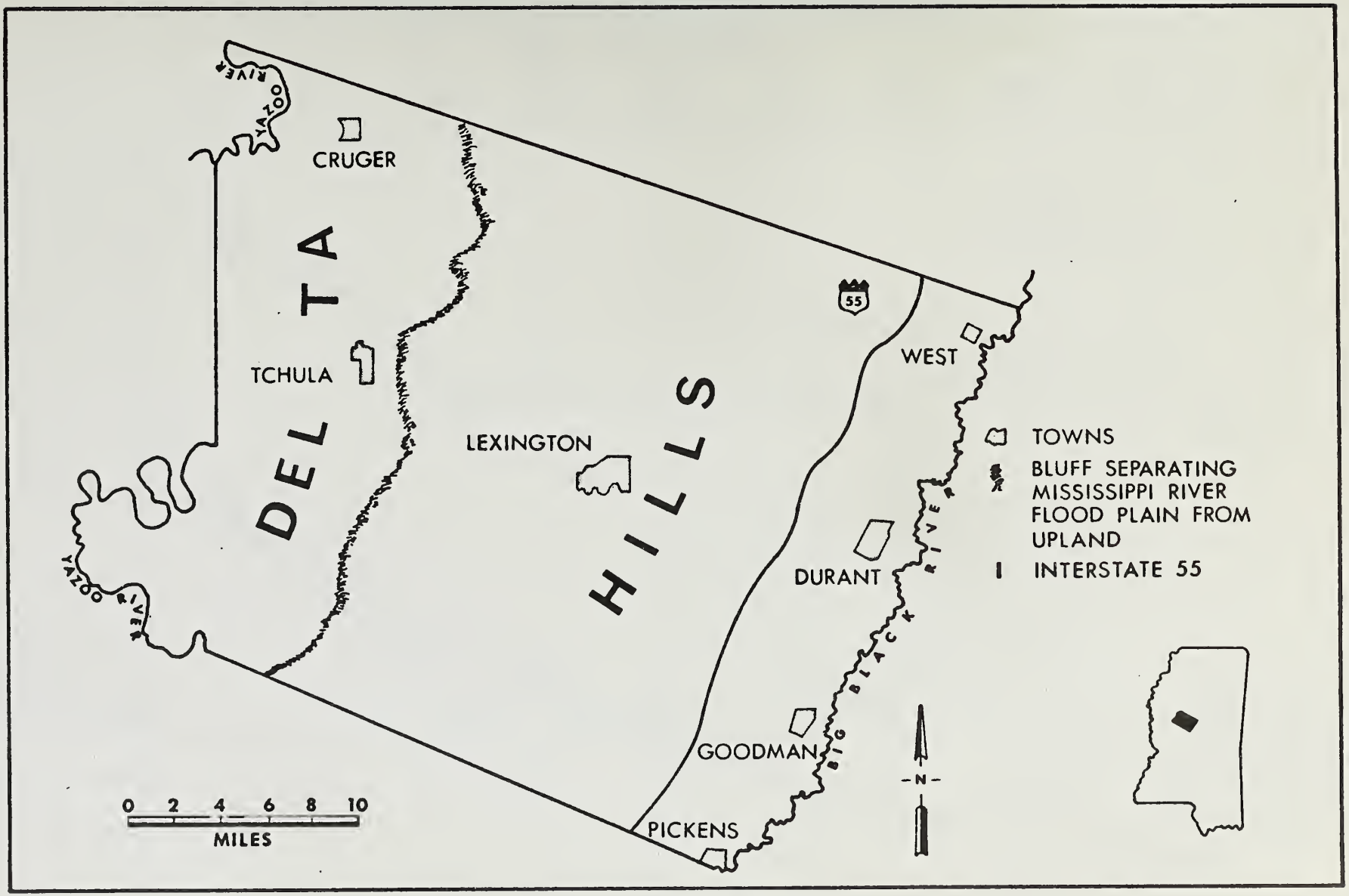

Figure 1. Holmes County, Mississippi

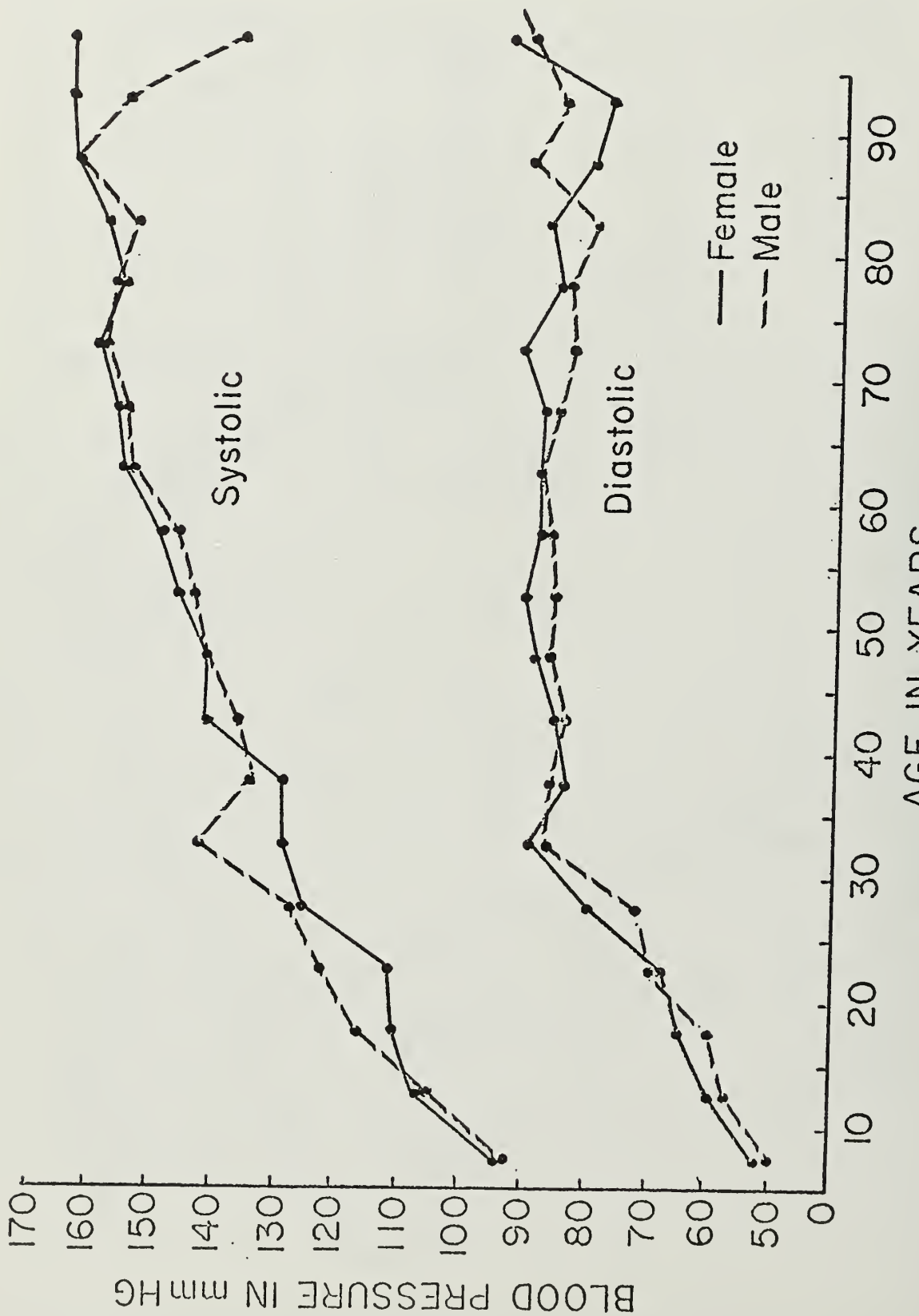

Figure 2. Mean Systolic and Diastolic Blood Pressure by Age and Sex (Holmes County, Mississippi)

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16. Abstracts

During 1972-73 a hypertension screening program conducted in the black community of Holmes County, Mississippi, evaluated 4,272 individuals. Definite hypertension was found in 43.5 per cent of the males and 39.5 per cent of the females aged 18-79. Although both mean systolic and mean diastolic blood pressures rose with age the correlation to age was higher in the systolic readings. Analysis of environmental and social factors indicate that the specific geographic region of residence was associated with elevated blood pressures as well as social status within the household, occupational category, and place of birth.

17. Key Words and Document Analysis. 17a. Descriptors

Hypertension
Blacks
Environment
Social factors

17b. Identifiers/Open-Ended Terms

17c. COSATI Field/Group

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