2012 -2014

Mississippi Delta Cardiovascular Health Examination Survey Report

A Report to Mississippi Delta Community

MISSISSIPPI STATE DEPARTMENT OF HEALTH

December 2018

Mississippi Delta
Cardiovascular Health Examination Survey Report

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Executive Summary

In recent decades cardiovascular disease (CVD) mortality rates have declined among Mississippi adults but remain the leading cause of death. Its frequency in most populations and association with mortality, premature deaths, loss of independence, impaired quality of life, social and economic cost, and health disparities make CVD a major public health priority for most communities especially those with continual high burden. Common CVD risk factors include high blood pressure, abnormal lipid profile, diabetes mellitus, obesity, unhealthy diet, physical inactivity, harmful alcohol use, and smoking. In Mississippi, certain population groups and geographic regions such as blacks and the Mississippi Delta region respectfully, are disproportionately affected by the burden of CVD. Assessing, monitoring and evaluating CVD burden at a regional level particularly in rural underserved regions is limited. The Mississippi State Department of Health (MSDH) in collaboration with the Center for Disease Control and Prevention (CDC) developed and initiated the Cardiovascular Health Examination Survey (CHES) in the Mississippi Delta; a distinct rural, low-income, underserved 18-county region in Northwest Mississippi. The CHES is a population-based, cross-sectional study of a representative sample of adults (≥ 18 years) living in the Mississippi Delta. The primary objectives of Delta CHES were to (1) determine the prevalence and distribution of CVD and CVD risk factors using self-reported and directly measured health metrics and (2) to assess environmental perceptions and existing policies that support or deter healthy choices.

Data from CHES showed among adults 18 years and older in the Mississippi Delta region, CVD (myocardial infarction, angina, coronary heart failure, or stroke) prevalence was 13.1%. Hypertension (high blood pressure) prevalence was 42.8% and one in five (20.7%) had prehypertension; 21.8% had type 2 diabetes and more than a quarter (29.1%) had prediabetes; and 29.8% had high cholesterol blood level. Four of ten (46.7%) CHES participants were classified as obese (BMI ≥ 30kg/m^2) and more than a quarter (26.8%) overweight. Current cigarette smoking prevalence was 23.9%, and more than half (57.1%) reported exercising more than 150 minutes per week, with most (78.6%) reported having health insurance coverage.

Improving cardiovascular health in the Mississippi Delta should include sustained effective evidence-based, community-wide cardiovascular health promotion and CVD prevention interventions. Ongoing collaborative efforts between the CDC and MSDH through the Mississippi Delta Health Collaborative (MDHC) initiative are currently implementing policy, systems and environmental change strategies aimed at preventing and reducing CVD risk by targeting the "ABCS" (appropriate use of aspirin for those eligible, blood pressure control, cholesterol management and smoke cessation) in the Mississippi Delta region (www.healthyms.com/MDHC).

Acknowledgements

Special appreciation is extended to the participants of the Mississippi Delta Cardiovascular Health Examination Survey for the devotion of their time, effort, and commitment to the study.
The implementation of this project could not have happened without their belief in the future.

MS Delta CHES Investigator Team

Victor Sutton, PhD
Principal Investigator
Cassandra Dove, MPH
Director, Chronic Disease Bureau and Mississippi Delta Health Collaborative
Tameka Walls, PhD, MS
CHES Program Manager
Vincent L. Mendy, DrPH, MPH
Epidemiologist
Masoumeh Karimi, PhD, MPH
Epidemiologist
Lei Zhang, PhD, MBA
Director, Office of Health Data and Research
Alfio Rausa, MD
District Medical Officer, Public Health District 1 and 3
Fleetwood Loustalot, PhD
Division for Heart Disease and Stroke Prevention, Center for Disease Control and Prevention

Report Writing Team:

Jung Hye Sung, MPH, ScD,
Department of Epidemiology and Biostatistics, School of Public Health, Jackson State University
Jae Eun Lee, MPH, DrPH,
RCMI Translational Research Network Data Coordinating Center, Jackson State University

Funding Agency:
This work was supported by the Center for Disease Control and Prevention (Grant award no. 1U50DP00308)

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Introduction

Mississippians suffer from many health concerns, most notably cardiovascular disease (CVD), for which Mississippi leads the nation in the number of deaths per population. Data from 2002 show that CVD death rates from heart disease, stroke, and heart failure in black men and women in Mississippi were 12- and 22 percent higher, respectively, than the rest of the United States [1]. Despite heightened concerns and focused endeavors to address this disparity, the pattern has persisted.

Cardiovascular disease (CVD) exacts a disproportionate toll in geographical locations that have high rates of CVD and related risk factors. For example, residents of the 18-county Mississippi Delta region (MS Delta) experience age-adjusted rates of death due to major CVDs that are considerably higher than the Mississippi and national rates. Furthermore, marked racial health disparities exist [2]. Such disparities are linked to several complex factors, such as income and education, genes and physiology, access to care, and communication barriers [3, 4]. The MS Delta, where a high percent of black population exists alongside a low percent of people with a bachelor's degree, consistently ranks among the most disadvantaged areas in the nation; approximately one-quarter of its population lives below the federal poverty level [5].

Although the state has made efforts to bridge the gap and ensure access to quality health care for vulnerable populations, Local data are needed to better target these efforts. Local-level surveillance data is necessary to develop a replicable and flexible prevention and control model and to track the status of implementing such programs. For this purpose, the state has resorted to using the datasets of the National Health and Nutrition Examination Survey (NHANES) or the Behavioral Risk Factor Surveillance System (BRFSS). However, although NHANES provides national information on measured risk factors and diseases, the equivalent regional or local level surveillance of CVD is not currently available, and the coordination of CVD surveillance is lacking [6]. Therefore, these findings may not be applicable to individual states, and they do not influence local policy makers as much as local data do. Despite the availability of local data (i.e., county-level data), BRFSS also has limitations because of its design (i.e., telephone-based interview survey) and the fact that it collects BRFSS self-reported information. Self-reports do not present a complete picture of many chronic diseases because the respondents cannot provide information on undiagnosed diseases and levels of control; moreover, recall may be incomplete [7].

To develop a model for CVD surveillance at the regional level and to examine the CVD risk factors in an area with significant health needs, the Mississippi State Department of Health (MSDH), with support from the Centers for Disease Control and Prevention (CDC), developed and initiated the Cardiovascular Health Examination Survey (CHES) in the Mississippi Delta region. The primary objectives of the Delta CHES were (1) to determine the prevalence and distribution of CVD and CVD risk factors using self-reported and directly measured health metrics and (2) to assess environmental perceptions and existing policies that support or deter healthy choices. The secondary objectives were (1) to develop a replicable, regional-level data collection model for use in future studies and (2) to create a blood repository for use in future ancillary studies. The information gathered was intended to guide the state in the development, implementation, and evaluation of cardiovascular health promotion and risk factor control strategies [5].

The data collection of the Delta CHES began on 24 September 2012 and was completed on 30 October 2014. This report contains a comprehensive overview of the baseline examination of the prevalence of CVD and related major risk factors by analyzing the data collected from 799 noninstitutionalized adults in the Mississippi Delta region. The results of this report will be used to communicate with participants and community members and to translate the findings into improved healthcare systems and prevention programs that will ultimately reverse the rising incidence of CVD among residents in the Mississippi Delta region.

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[6] Institute of Medicine, A Nationwide Framework For Surveillance of Cardiovascular and Chronic Lund Diseases, The National Academies Press, Washington, DC, USA, 2011.
[7] Zohoori N, Pulley L, Jones C, Senner J, Shoob H, Merritt RK. Conducting a statewide health examination survey: the Arkansas Cardiovascular Health Examination Survey (ARCHES). Prev Chronic Dis. 2011 May;8(3):A67. Epub 2011 Apr 15.

1. The Demographics of the MS Delta CHES Participants

How the Participants were Recruited
Statistical Methods
Composition of Participants
Marital Status
Education Level
Employment Status
Annual Household Income level

How the Participants were Recruited

In 2012, 799 participants were recruited from 18 counties in the Mississippi Delta region, located in the Northwestern part of Mississippi: Bolivar, Carroll, Coahoma, Desoto, Holmes, Humphreys, Issaquena, Leflore, Panola, Quitman, Sharkey, Sunflower, Tallahatchie, Tate, Tunica, Warren, Washington, and Yazoo. The participants in the MS Delta CHES were recruited from two sources: random selection from the communities in the region and volunteers from the communities in the region. The randomly selected participants accounted for 61 percent (n=485) and the volunteers accounted for 39 percent (n=314).

Figure 1. The 18-county Mississippi Delta region

Statistical Methods

The weighting method of post-stratification was conducted to avoid a lack of representativeness. The data were weighted for study participants who were identified as being from the initial random sample of the 6,000 households selected from the 18-county area included in the Delta CHES. If the respondent was in the randomized selection group and had an address in one of the 18 sampled counties, then he or she was eligible to be included in the weighted frequencies. Of the 485 respondents in the randomized selection group, 38 respondents were excluded from the weighted frequencies and 447 respondents were included in the Delta CHES report.

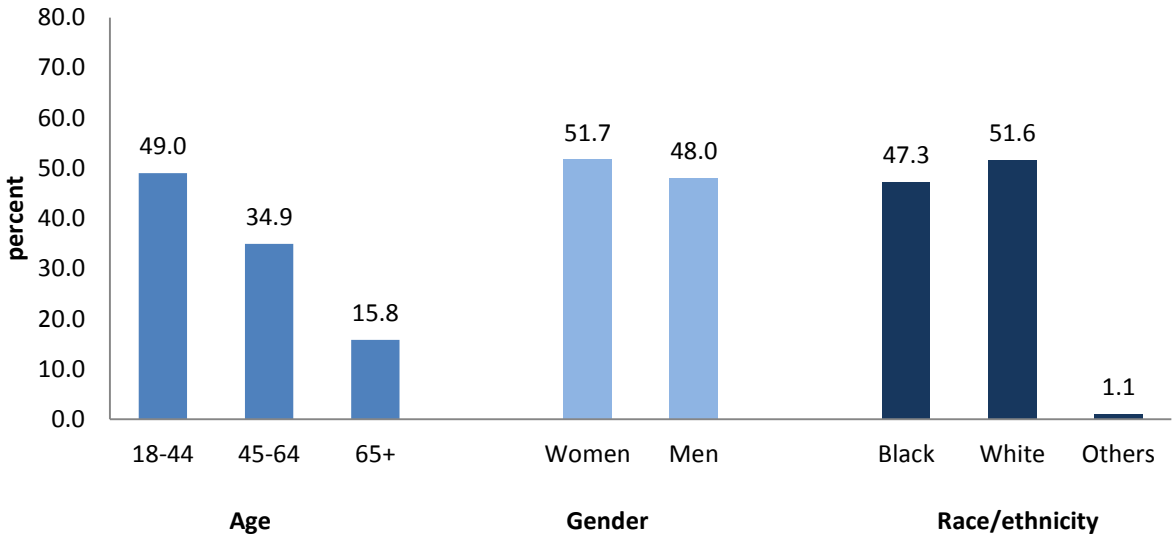
Composition of Participants

Forty-nine percent of the participants were between the ages of 18 and 44 years when they enrolled in the study; the average age was 46 years. Forty-eight percent of the participants were men, and 51.7 percent out of 447 were women. Forty-seven percent of the participants were blacks, and 51.6 percent were whites.

Table 1. Percentage of enrollment by age group, gender, and race/ethnicity

		%
Age (years)	18-44	**49.0**
	45-64	**34.9**
	65+	**15.8**
Gender		
	Women	**51.7**
	Men	**48.0**
Race/Ethnicity		
	Black	**47.3**
	White	**51.6**
	Others	**1.1**

Figure 2. Percentage of enrollment by age group, gender, and race/ethnicity



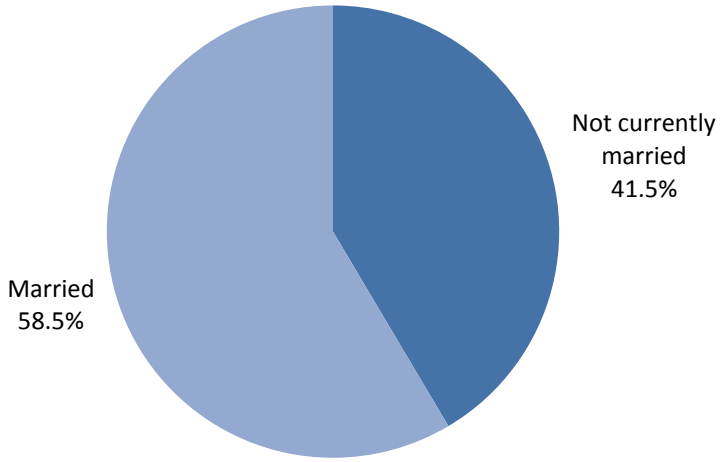
Marital Status

Based on the participants' reported marital status, they were grouped into married and not currently married. The group of not currently married included those who were never married, separated, divorced, or widowed. Overall, 58.5 percent of the participants were currently married.

Table 2. Percentage of marital status

Marital Status	%
Not currently Married	41.5
Married	58.5

Figure 3. Marital status



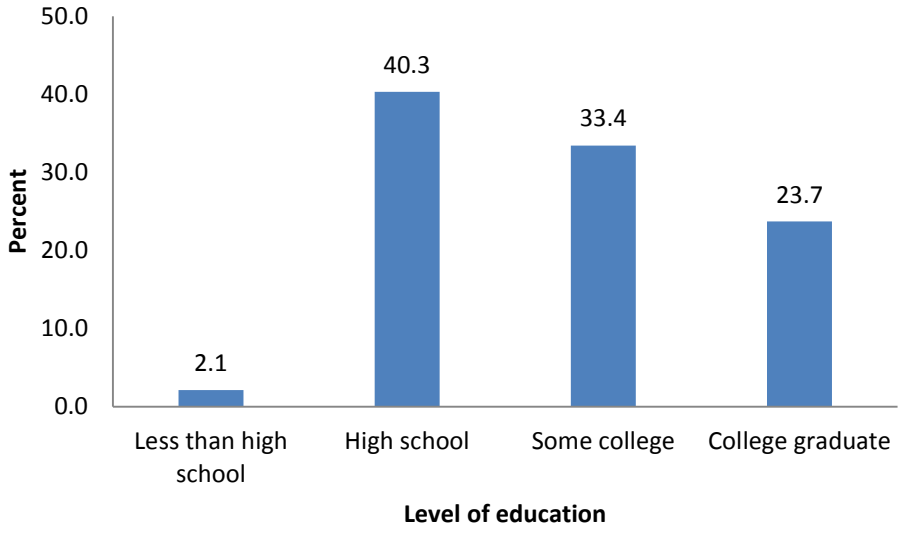
Education Level

The education level of the participants was self-reported as less than high school, high school graduate, some college graduate, and college graduate or higher. Forty-three percent of the participants had high school graduate education, and 33.4 percent and 23.7 percent had at least some college graduate education and college graduate or higher education, respectively.

Table 3. Percentage of level of education

Education	%
Less than high school	**2.1**
High school	**40.3**
Some college	**33.4**
College graduate	**23.7**

Figure 4. Percentage of level of education



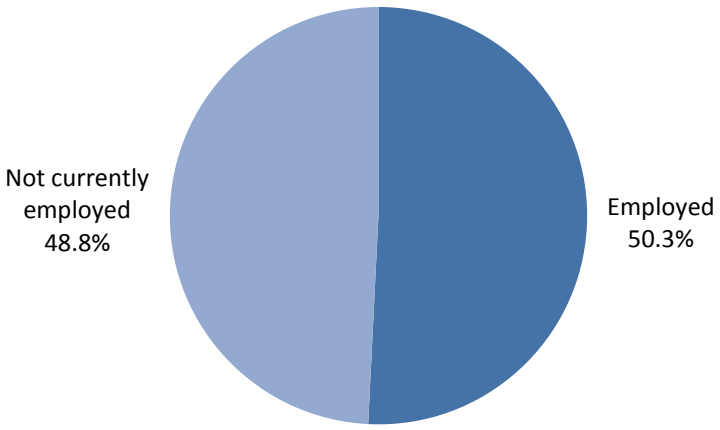
Employment status

Current employment status was self-reported by the participants; the status was categorized as employed and not currently employed. The group of not currently employed included those who were unable to work, retired, or unemployed, including students and homemakers. A half of the participants were employed (50.3 percent).

Table 4. Percentage of employment status

Employment Status	%
Employed	**50.3**
Not currently employed	**48.8**

Figure 5. Percentage of employment status



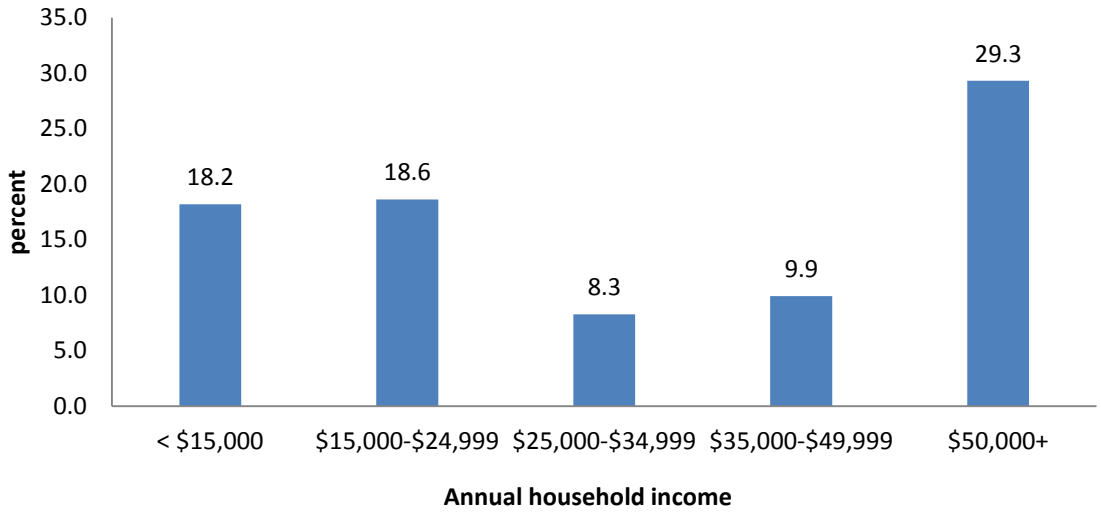
Annual household Income level

The participants' annual household income was self-reported according to five categories: less than $15,000, $15,000 - $24,999, $25,000 - $34,999, $35,000 - $49,999, and $50,000 or higher. Eighteen percent of the participants were the category of less than $15,000, and 29.3 percent reported $50,000 or higher as their household income.

Table 5. Percentage of annual household income

Annual household income	%
< $15,000	**18.2**
$15,000-$24,999	**18.6**
$25,000-$34,999	**8.3**
$35,000-$49,999	**9.9**
$50,000+	**29.3**

Figure 6. Percentage of annual household income Household income



2. *Prevalence of Chronic Vascular Disease*

Heart Attack/Myocardial Infarction
Coronary Heart disease
Stroke
Congestive Heart Failure
Cardiovascular Disease

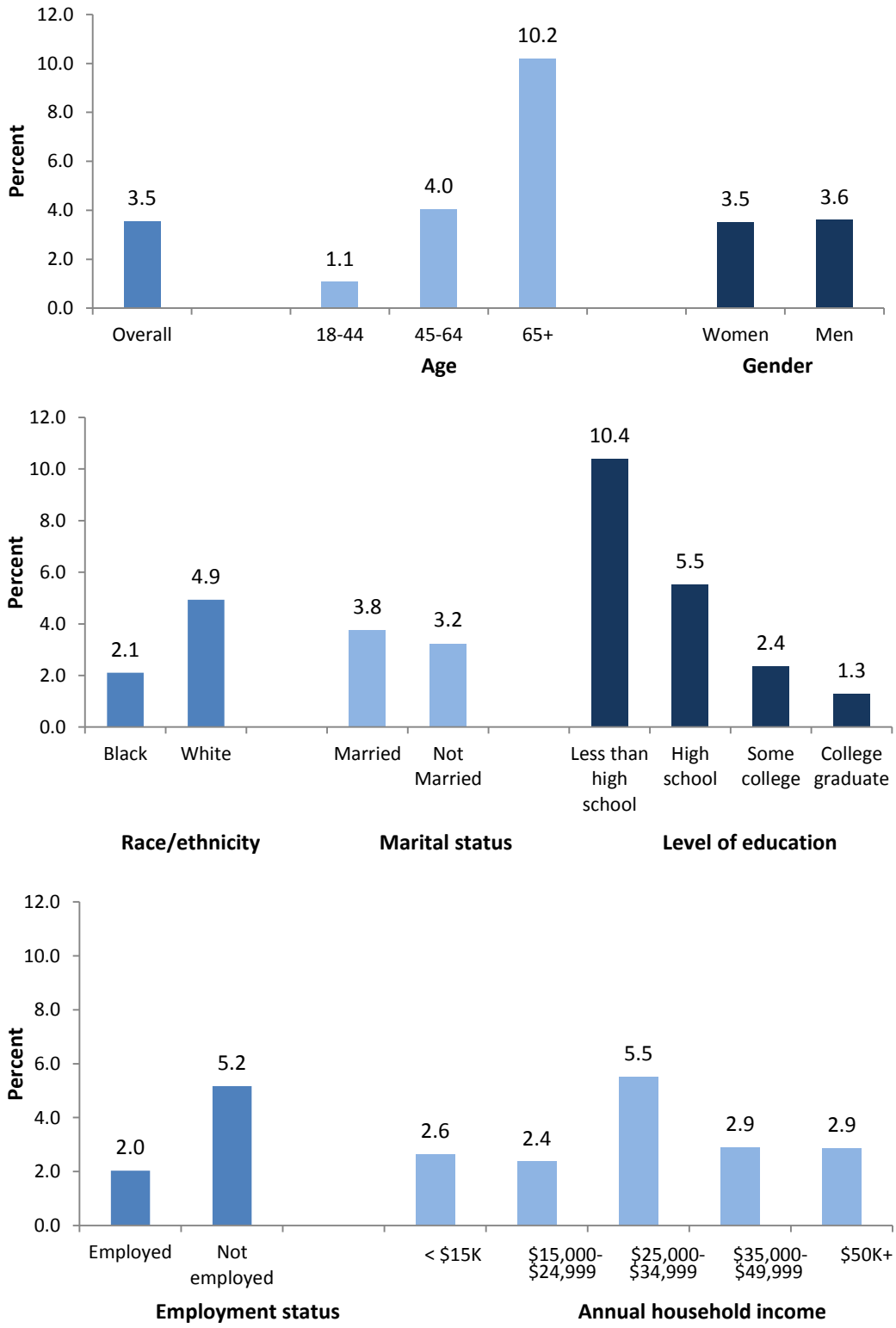
Heart Attack/Myocardial Infarction

Heart attack, which is also referred to as myocardial infarction, occurs when part of the heart muscle does not receive enough blood flow. Coronary artery disease is the main cause of heart attack. According to Table 6, among the Delta CHES participants, 3.5 percent reported ever having experienced a heart attack. Participants aged 65 and over reported higher prevalence of heart attack compared to those aged 18-44.

Table 6. Prevalence of heart attack by sociodemographic characteristics

Heart attack	%	95% CI	
		Lower	Upper
Overall	**3.5**	(1.8 ,	5.3)
Age (years)			
18-44	**1.1**	(0.0 ,	3.1)
45-64	**4.0**	(1.1 ,	7.0)
65+	**10.2**	(4.6 ,	15.8)
Gender			
Women	**3.5**	(1.3 ,	5.7)
Men	**3.6**	(0.9 ,	6.3)
Race/ethnicity			
Black	**2.1**	(0.4 ,	3.8)
White	**4.9**	(1.9 ,	7.9)
Marital status			
Married	**3.8**	(1.3 ,	6.2)
Not currently married	**3.2**	(1.0 ,	5.5)
Education			
Less than high school	**10.4**	(0.0 ,	22.6)
High school	**5.5**	(1.8 ,	9.2)
Some college	**2.4**	(0.4 ,	4.4)
College graduate	**1.3**	(0.0 ,	3.2)
Employment status			
Employed	**2.0**	(0.0 ,	4.4)
Not currently employed	**5.2**	(2.6 ,	7.8)
Annual household income			
< $15,000	**2.6**	(0.0 ,	6.0)
$15,000-$24,999	**2.4**	(0.0 ,	5.4)
$25,000-$34,999	**5.5**	(0.0 ,	12.0)
$35,000-$49,999	**2.9**	(0.0 ,	8.5)
$50,000+	**2.9**	(0.0 ,	6.5)

Figure 7. Prevalence of heart attack by sociodemographic characteristics



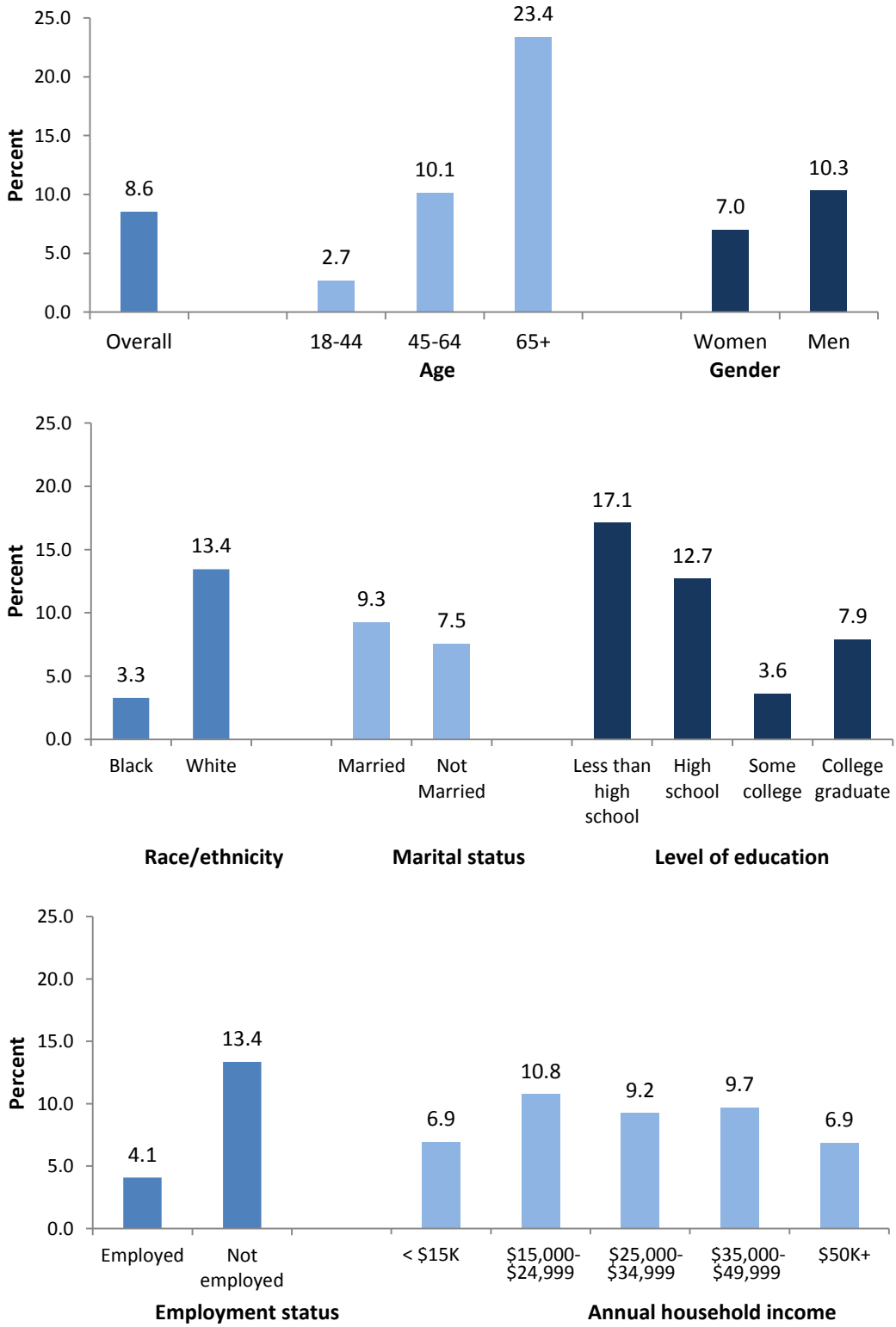
Coronary Heart disease

Coronary heart disease (CHD) is the narrowing of the blood vessels that supply blood and oxygen to the heart, which is caused by the buildup of plaque in the arteries. CHD is also referred to as coronary artery disease. Participants were considered to have CHD if they have had a heart attack, angina, or self-reported CHD. Table 7 showed that 8.6 percent of the Delta CHES participants had CHD. Participants aged 65 and over (compared to those aged 18-44), whites, those with high school education level (compared to participants with some college degrees) and those not currently employed reported higher prevalence of CHD.

Table 7. Prevalence of coronary heart disease by sociodemographic characteristics

Coronary heart disease	%	95% CI	
		Lower	Upper
Overall	**8.6**	(5.8 ,	11.3)
Age (years)			
18-44	**2.7**	(0.0 ,	5.9)
45-64	**10.1**	(5.5 ,	14.8)
65+	**23.4**	(14.8 ,	31.9)
Gender			
Female	**7.0**	(3.8 ,	10.1)
Male	**10.3**	(5.6 ,	15.0)
Race/ethnicity			
Black	**3.3**	(1.2 ,	5.3)
White	**13.4**	(8.4 ,	18.5)
Marital Status			
Married	**9.3**	(5.4 ,	13.2)
Not currently married	**7.5**	(3.8 ,	11.3)
Education			
Less than high school	**17.1**	(1.9 ,	32.3)
High school	**12.7**	(7.4 ,	17.9)
Some college	**3.6**	(1.0 ,	6.2)
College graduate	**7.9**	(1.9 ,	13.8)
Employment status			
Employed	**4.1**	(1.0 ,	7.2)
Not currently employed	**13.4**	(8.8 ,	17.9)
Annual household income			
< $15,000	**6.9**	(1.6 ,	12.2)
$15,000-$24,999	**10.8**	(3.0 ,	18.6)
$25,000-$34,999	**9.2**	(1.2 ,	17.3)
$35,000-$49,999	**9.7**	(1.3 ,	18.1)
$50,000+	**6.9**	(1.3 ,	12.4)

Figure 8. Prevalence of coronary heart disease by sociodemographic characteristics



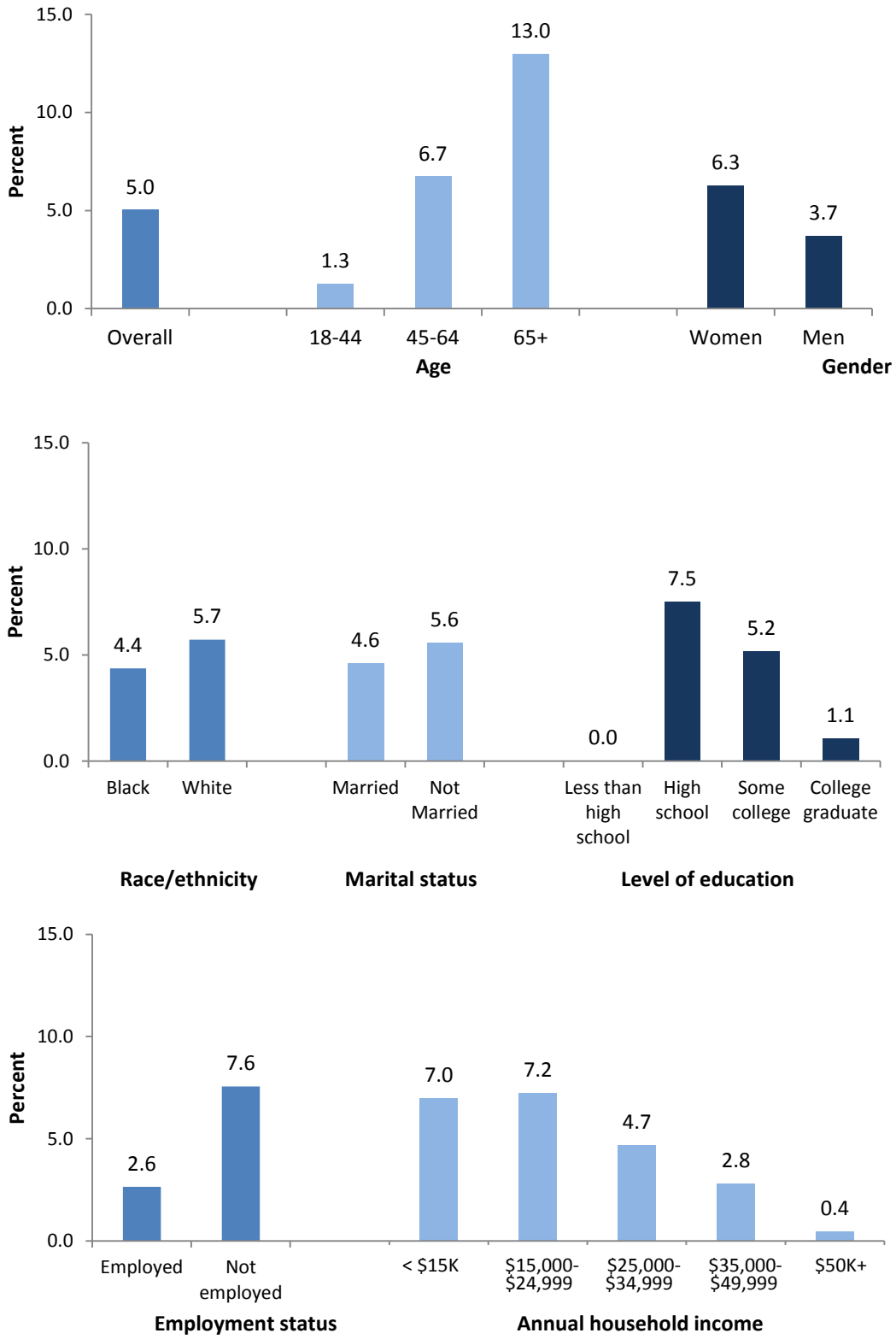
Stroke

Stroke occurs when the blood supply to the part of the brain is interrupted or severely reduced, depriving brain tissue of oxygen and nutrients. Brain cells begin to die within minutes of a stroke. The sudden loss of speech, weakness, or paralysis of one side of the body can be symptoms. According to Table 8, among the Delta CHES participants, 5 percent reported ever having experienced a stroke. Participants aged 65 and over (compared to those aged 18-44),those with high school graduate education level (compared to those with less than high school education and those with college graduate degree) and those with an annual household income of $15,000 and lower (compared to participants with annual household income of $50,000 and more) - reported higher prevalence of stoke.

Table 8. Prevalence of stroke by sociodemographic characteristics

Coronary heart disease	%	95% CI	
		Lower	Upper
Overall	**5.0**	(2.9 ,	7.1)
Age (years)			
18-44	**1.3**	(0.0 ,	3.7)
45-64	**6.7**	(2.9 ,	10.5)
65+	**13.0**	(6.6 ,	19.3)
Gender			
Female	**6.3**	(3.4 ,	9.1)
Male	**3.7**	(0.6 ,	6.8)
Race/ethnicity			
Black	**4.4**	(1.8 ,	7.0)
White	**5.7**	(2.4 ,	9.0)
Marital Status			
Married	**4.6**	(1.8 ,	7.5)
Not currently married	**5.6**	(2.5 ,	8.6)
Education			
Less than high school	**0.0**	(0.0 ,	0.0)
High school	**7.5**	(3.8 ,	11.2)
Some college	**5.2**	(0.9 ,	9.4)
College graduate	**1.1**	(0.0 ,	2.5)
Employment status			
Employed	**2.6**	(0.0 ,	5.4)
Not currently employed	**7.6**	(4.4 ,	10.8)
Annual household income			
< $15,000	**7.0**	(1.4 ,	12.6)
$15,000-$24,999	**7.2**	(0.1 ,	14.4)
$25,000-$34,999	**4.7**	(0.0 ,	9.6)
$35,000-$49,999	**2.8**	(0.0 ,	6.8)
$50,000+	**0.4**	(0.0 ,	1.3)

Figure 9. Prevalence of stroke by sociodemographic characteristics



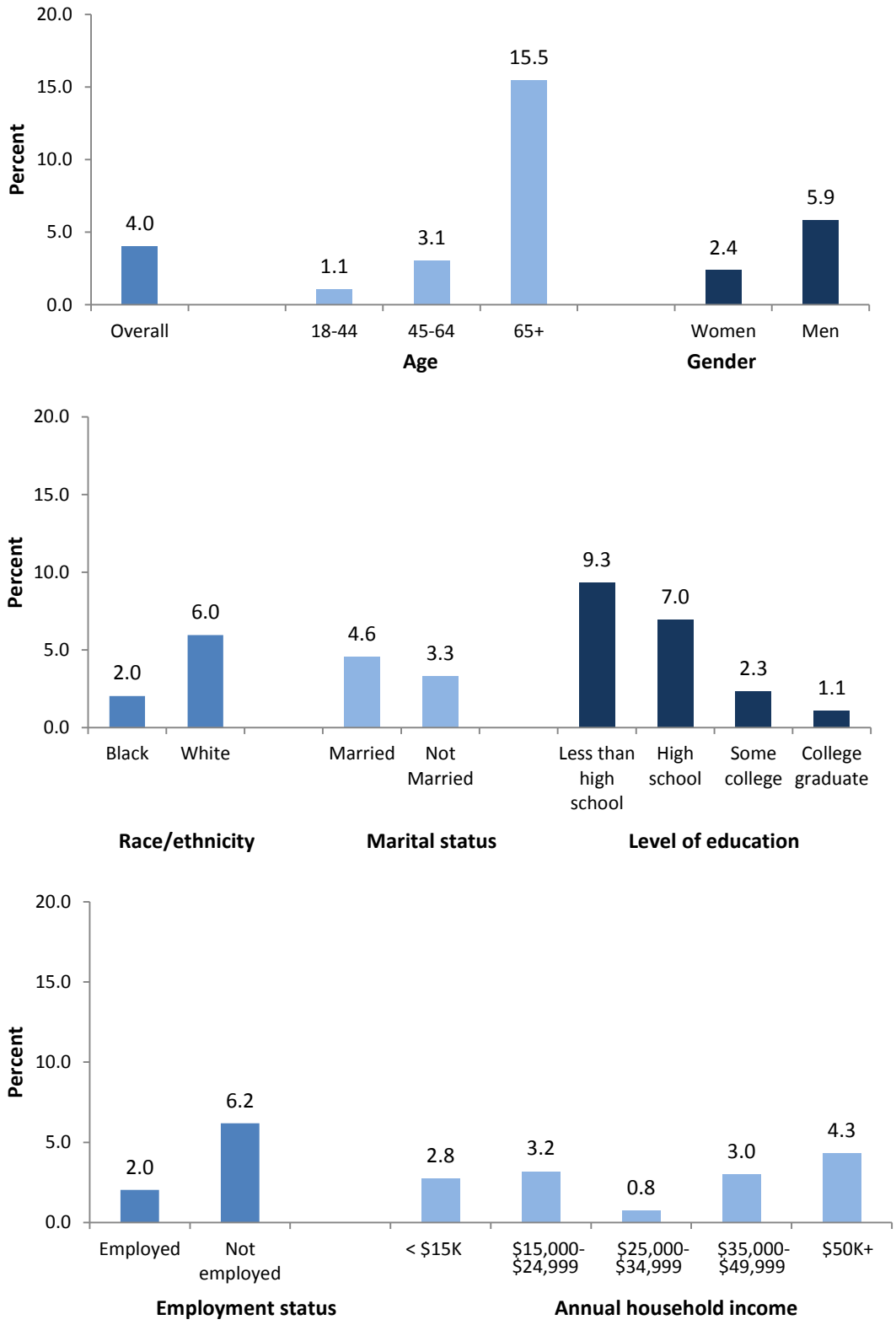
Congestive Heart Failure

Congestive heart failure (CHF) is a condition in which the heart's function as a pump is inadequate to deliver oxygen-rich blood to the body. The most common cause of CHF is longstanding high blood pressure, which results in a thickened (hypertrophied) heart. According to Table 9, 4 percent of the CHES participants reported ever having experienced CHF. Participants aged 65 and over (compared to those aged 45-64) and those with high school education level (compared to participants with college graduate degree) reported higher prevalence of CHF.

Table 9. Prevalence of congestive heart failure by sociodemographic characteristics

Congestive heart failure	%	95% CI	
		Lower	Upper
Overall	**4.0**	(2.1 ,	6.0)
Age (years)			
18-44	**1.1**	(0.0 ,	3.1)
45-64	**3.1**	(0.6 ,	5.5)
65+	**15.5**	(7.3 ,	23.7)
Gender			
Women	**2.4**	(0.7 ,	4.1)
Men	**5.9**	(2.2 ,	9.5)
Race/ethnicity			
Black	**2.0**	(0.4 ,	3.7)
White	**6.0**	(2.5 ,	9.5)
Marital status			
Married	**4.6**	(1.6 ,	7.5)
Not currently married	**3.3**	(1.1 ,	5.5)
Education			
Less than high school	**9.3**	(0.0 ,	20.2)
High school	**7.0**	(2.9 ,	11.0)
Some college	**2.3**	(0.0 ,	5.1)
College graduate	**1.1**	(0.0 ,	2.8)
Employment status			
Employed	**2.0**	(0.0 ,	4.4)
Not currently employed	**6.2**	(3.0 ,	9.4)
Annual household income			
< $15,000	**2.8**	(0.0 ,	5.6)
$15,000-$24,999	**3.2**	(0.0 ,	7.4)
$25,000-$34,999	**0.8**	(0.0 ,	2.3)
$35,000-$49,999	**3.0**	(0.0 ,	7.4)
$50,000+	**4.3**	(0.0 ,	8.9)

Figure 10. Prevalence of congestive heart failure by sociodemographic characteristics



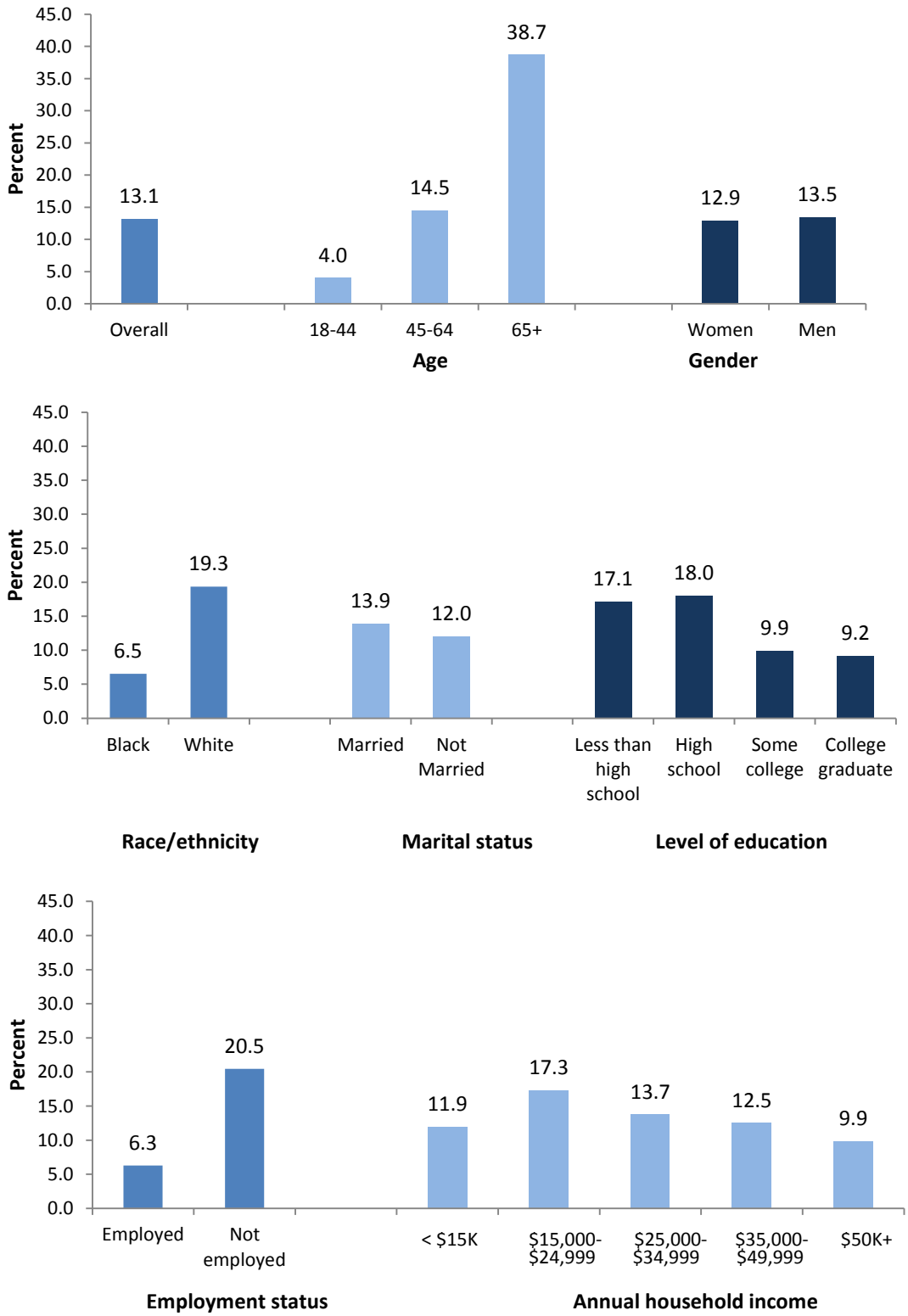
Cardiovascular Disease

Cardiovascular disease generally refers to conditions that involve narrowed or blocked blood vessels as well as all the diseases of the heart. The participants were considered to have CVD if they reported having had a myocardial infarction, angina, coronary heart failure, or stroke. According to Table 10, 13.1 percent of CHES participants had experienced CVD. Participants aged 65 and over (compared to all other ages), participants aged 45-64 (compared to those aged 18-44) whites and those not currently employed reported higher prevalence of CVD.

Table 10. Prevalence of cardiovascular disease by sociodemographic characteristics

Cardiovascular disease	%	95% CI	
		Lower	Upper
Overall	**13.1**	9.7	16.6
Age (years)			
18-44	**4.0**	0.0	8.0
45-64	**14.5**	9.3	19.7
65+	**38.7**	28.5	48.8
Gender			
Women	**12.9**	8.7	17.1
Men	**13.5**	7.9	19.0
Race/ethnicity			
Black	**6.5**	3.5	9.5
White	**19.3**	13.3	25.4
Marital status			
Married	**13.9**	9.1	18.7
Not currently married	**12.0**	7.4	16.7
Education			
Less than high school	**17.1**	1.9	32.3
High school	**18.0**	12.1	24.0
Some college	**9.9**	4.3	15.5
College graduate	**9.2**	3.1	15.4
Employment status			
Employed	**6.3**	2.4	10.1
Not currently employed	**20.5**	14.9	26.0
Annual household income			
< $15,000	**11.9**	4.9	19.0
$15,000-$24,999	**17.3**	7.0	27.5
$25,000-$34,999	**13.7**	4.1	23.4
$35,000-$49,999	**12.5**	3.2	21.8
$50,000+	**9.9**	3.5	16.2

Figure 11. Prevalence of cardiovascular disease by sociodemographic characteristics



3. Biologic Risk Factors for Cardiovascular Disease

Hypertension

Type 2 Diabetes

Chronic Kidney Disease

Body Mass Index

- **Overweight and Obesity**

Cholesterol

- **Total Cholesterol**
- **Low HDL Cholesterol**
- **High LDL Cholesterol**
- **Triglycerides**

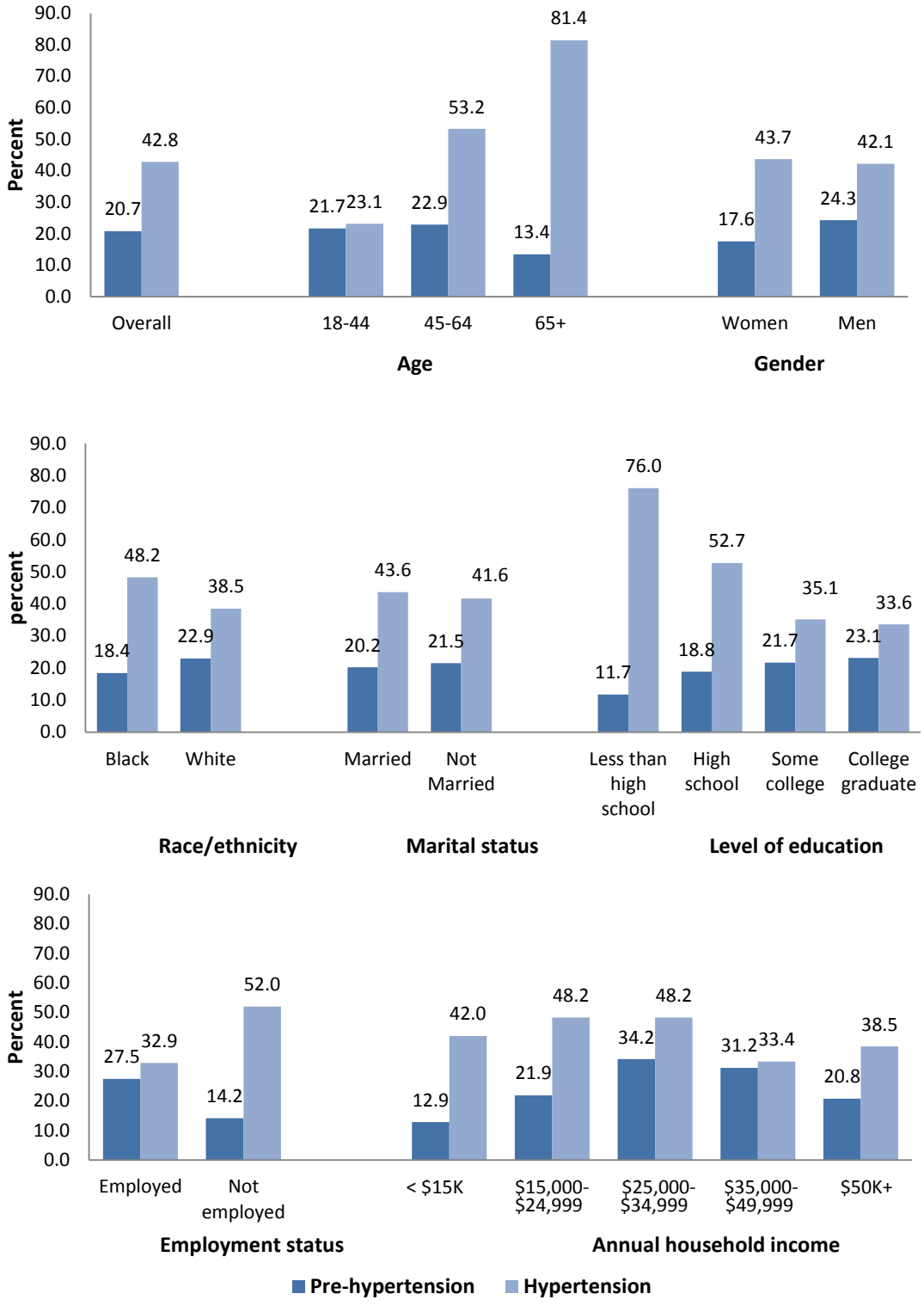
Hypertension

High blood pressure can damage the cells of the inner lining of the arteries and block blood flow to the heart, kidneys, brain, arms, and legs. The damage can cause angina, heart attack, heart failure, kidney failure, stroke, and peripheral artery disease. According to the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7), hypertension is defined as having a systolic blood pressure (SBP) of 140 mmHg or greater, diastolic blood pressure (DBP) of 90 mmHg or greater, or is taking antihypertensive medications (self-reported) to control high blood pressure. Prehypertension is defined as having a SBP of 120-139 mmHg or DBP of 80-89 mmHg. Resting blood pressure of the CHES participants was measured in the right arm in the seated position with an American Diagnostic Corporation (Hauppauge, New York) sphygmomanometer. According to Table 11, 20.7 percent of the CHES participants had prehypertension and 42.8 percent had hypertension. Participant aged 65 and over (compared to all other ages), participants aged 45-64 (compared to those aged 18-44), participants with less than high school education level (compared to those with some college and college graduate degree) and those not currently employed reported higher prevalence of hypertension.

Table 11. Prevalence of prehypertension and hypertension by sociodemographic characteristics

	Pre-Hypertension					Hypertension				
	%		95% CI			%		95% CI		
Overall	**20.7**	(	14.8	,	26.7)	**42.8**	(	36.5	,	49.1)
Age (years)										
18-44	**21.7**	(	10.8	,	32.6)	**23.1**	(	14.3	,	31.9)
45-64	**22.9**	(	16.0	,	29.7)	**53.2**	(	44.6	,	61.9)
65+	**13.4**	(	6.5	,	20.4)	**81.4**	(	73.8	,	89.1)
Gender										
Women	**17.6**	(	12.2	,	22.9)	**43.7**	(	35.9	,	51.4)
Men	**24.3**	(	13.6	,	35.0)	**42.1**	(	32.0	,	52.2)
Race/ethnicity										
Black	**18.4**	(	11.4	,	25.4)	**48.2**	(	38.9	,	57.6)
White	**22.9**	(	13.5	,	32.4)	**38.5**	(	30.0	,	46.9)
Marital status										
Married	**20.2**	(	13.4	,	27.0)	**43.6**	(	35.5	,	51.8)
Not currently married	**21.5**	(	10.9	,	32.1)	**41.6**	(	31.8	,	51.4)
Education										
Less than high school	**11.7**	(	0.0	,	28.8)	**76.0**	(	54.0	,	98.1)
High school	**18.8**	(	11.9	,	25.7)	**52.7**	(	43.5	,	62.0)
Some college	**21.7**	(	8.6	,	34.7)	**35.1**	(	23.7	,	46.6)
College graduate	**23.1**	(	11.0	,	35.3)	**33.6**	(	21.6	,	45.5)
Employment status										
Employed	**27.5**	(	17.1	,	37.8)	**32.9**	(	23.9	,	41.8)
Not currently employed	**14.2**	(	9.3	,	19.1)	**52.0**	(	43.7	,	60.2)
Annual household income										
< $15,000	**12.9**	(	4.8	,	20.9)	**42.0**	(	27.8	,	56.2)
$15,000-$24,999	**21.9**	(	1.5	,	42.3)	**48.2**	(	30.9	,	65.5)
$25,000-$34,999	**34.2**	(	13.8	,	54.5)	**48.2**	(	27.0	,	69.5)
$35,000-$49,999	**31.2**	(	13.7	,	48.8)	**33.4**	(	17.9	,	48.9)
$50,000+	**20.8**	(	11.0	,	30.5)	**38.5**	(	26.7	,	50.3)

Figure 12. Prevalence of prehypertension and hypertension by sociodemographic characteristics



Type 2 Diabetes

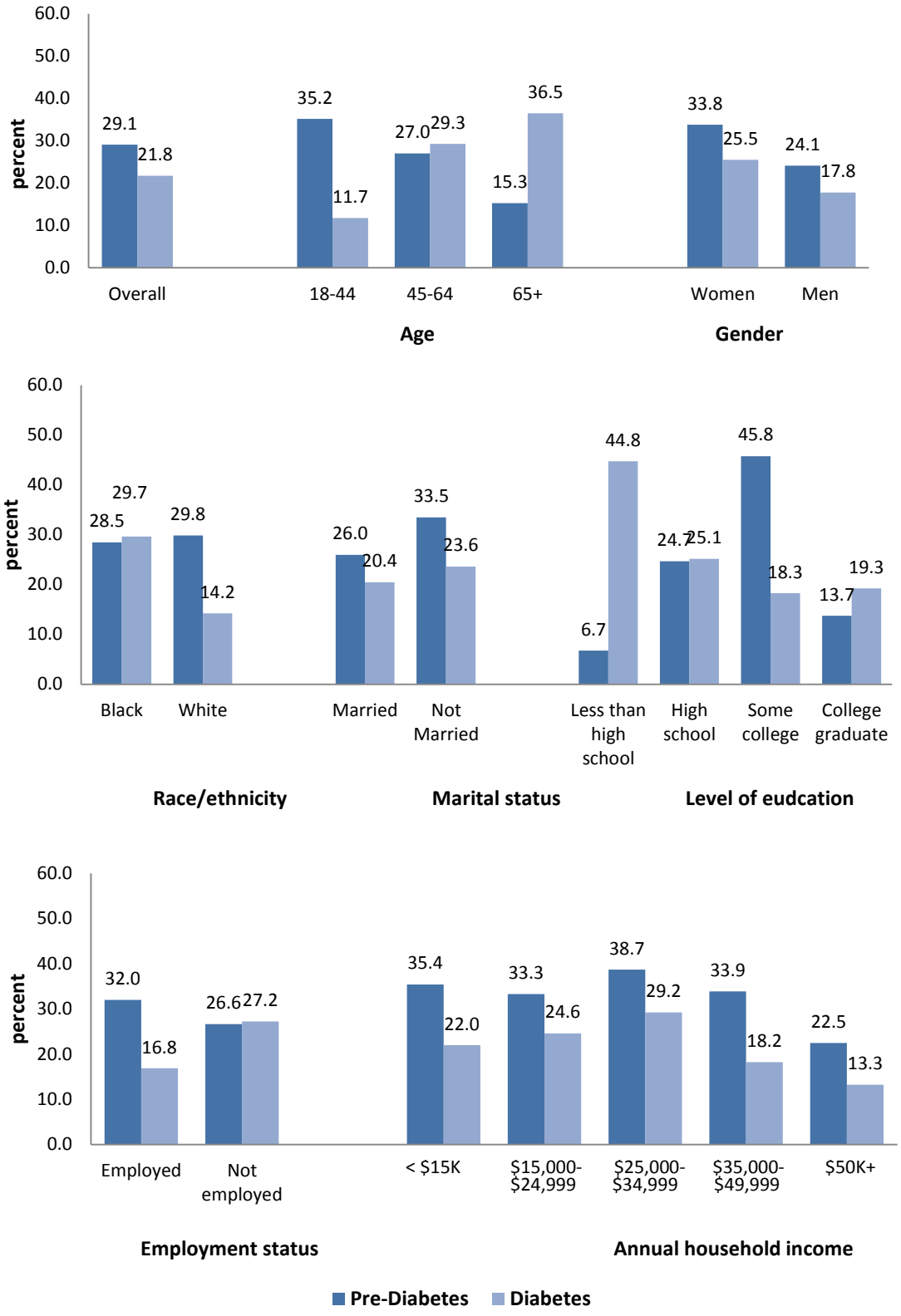
Diabetes is a prime risk factor for cardiovascular disease (CVD). It can cause vascular disorders including retinopathy and nephropathy, peripheral vascular disease (PVD), stroke, and coronary artery disease (CAD). Diabetes also affects the heart muscle, causing both systolic and diastolic heart failure. Diabetes is defined as fasting blood glucose of greater than or equal to 126 mg/dL, non-fasting blood glucose of greater than or equal to 200 mg/dL, or taking medications (self-reported) to control high blood sugar according to American Diabetes Association (ADA) classification of diabetes. Pre-diabetes is defined at fasting blood glucose in the 100-125 mg/dL range or non-fasting blood glucose in the 140-199 mg/dL range.

According to Table 12, 29.1 percent of the CHES participants had prediabetes and 21.8 percent had diabetes. Participants aged 18-44 (compared to those aged 65 and over) and participants with some college education (compared to those with college graduate degree) reported higher prevalence of pre-diabetes. Participant aged 45 and over (compared to those aged 18-44) and blacks reported higher prevalence of diabetes.

Table 12. Prevalence of prediabetes and diabetes by sociodemographic characteristics

	Pre-Diabetes			Diabetes		
	%	95% CI		%	95% CI	
Overall	**29.1**	(22.4 , 35.7)		**21.8**	(17.3 , 26.3)	
Age (years)						
18-44	**35.2**	(23.4 , 47.0)		**11.7**	(5.7 , 17.8)	
45-64	**27.0**	(19.1 , 34.9)		**29.3**	(22.0 , 36.6)	
65+	**15.3**	(8.9 , 21.7)		**36.5**	(26.7 , 46.3)	
Gender						
Women	**33.8**	(25.5 , 42.2)		**25.5**	(19.2 , 31.9)	
Men	**24.1**	(13.6 , 34.7)		**17.8**	(11.7 , 24.0)	
Race/ethnicity						
Black	**28.5**	(18.9 , 38.0)		**29.7**	(22.0 , 37.3)	
White	**29.8**	(20.3 , 39.4)		**14.2**	(9.5 , 19.0)	
Marital status						
Married	**26.0**	(18.7 , 33.3)		**20.4**	(14.8 , 26.1)	
Not currently married	**33.5**	(21.6 , 45.3)		**23.6**	(16.2 , 31.0)	
Education						
Less than high school	**6.7**	(0.0 , 19.4)		**44.8**	(21.1 , 68.5)	
High school	**24.7**	(16.6 , 32.7)		**25.1**	(18.2 , 32.0)	
Some college	**45.8**	(32.2 , 59.4)		**18.3**	(10.6 , 25.9)	
College graduate	**13.7**	(4.8 , 22.6)		**19.3**	(9.8 , 28.7)	
Employment status						
Employed	**32.0**	(21.5 , 42.5)		**16.8**	(10.7 , 23.0)	
Not currently employed	**26.6**	(18.4 , 34.9)		**27.2**	(20.8 , 33.7)	
Annual household income						
< $15,000	**35.4**	(18.7 , 52.2)		**22.0**	(12.0 , 31.9)	
$15,000-$24,999	**33.3**	(13.3 , 53.3)		**24.6**	(13.3 , 35.9)	
$25,000-$34,999	**38.7**	(16.1 , 61.3)		**29.2**	(12.3 , 46.1)	
$35,000-$49,999	**33.9**	(17.5 , 50.3)		**18.2**	(5.6 , 30.9)	
$50,000+	**22.5**	(13.6 , 31.3)		**13.3**	(6.6 , 19.9)	

Figure 13. Prevalence of type 2 diabetes by sociodemographic characteristics



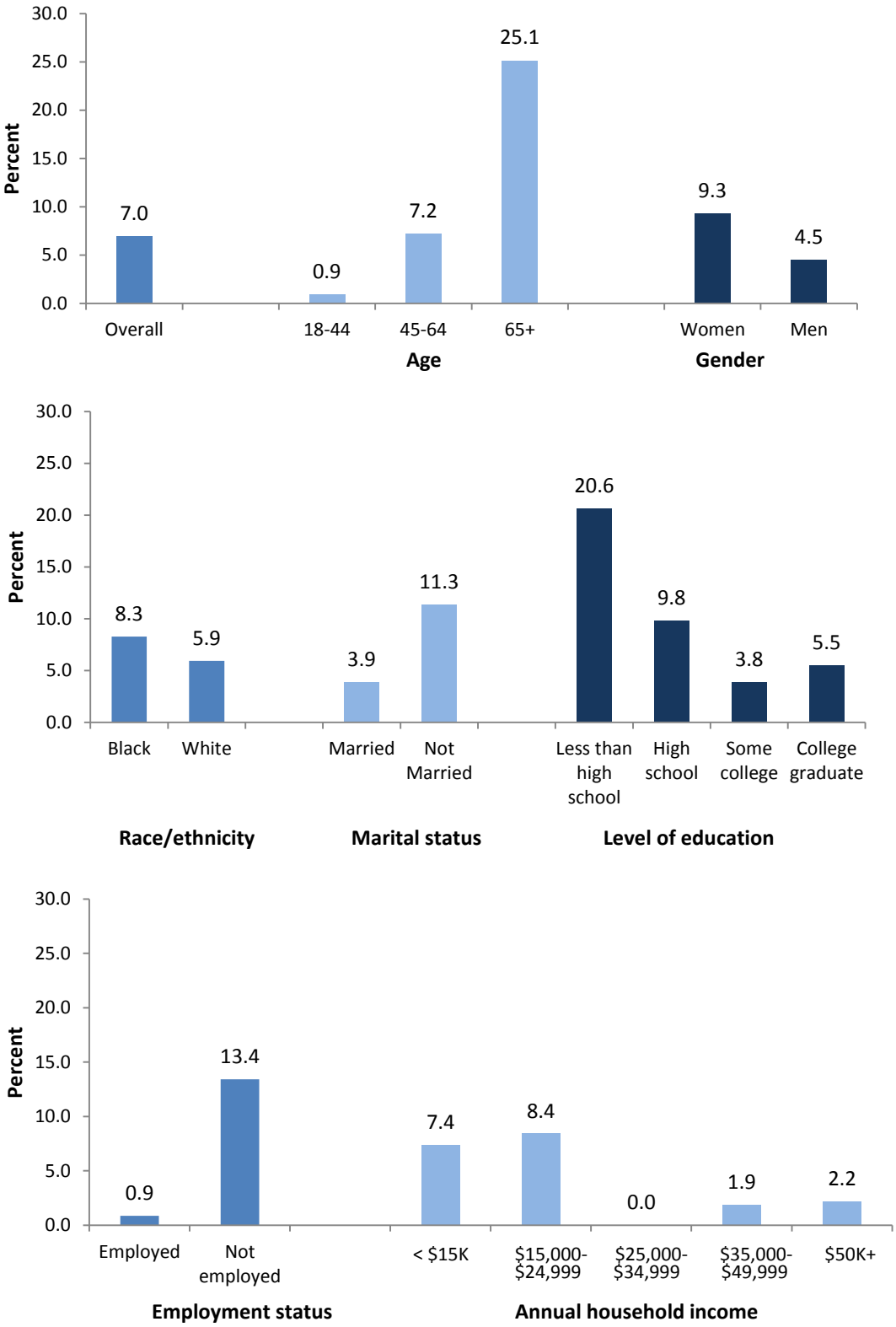
Chronic Kidney Disease

Cardiovascular disease is common in people with chronic kidney disease (CKD). If a kidney is damaged, the level of erythropoietin, which is a hormone manufactured by the kidney to produce red blood cells, can decrease. Consequently, fewer red blood cells with less oxygen go to the body's tissues and organs, which may cause a heart attack. CKD is defined as low GFR (less than 60 ml/min/1.73 m2) or self-report of being told by a doctor or other health professionals that they had kidney disease.
According to Table 13, 7 percent of CHES participants had CKD. Participants aged 65 and over (compared to all other ages), participants 45-64 years old (compared to those aged 18-44) and those not currently employed reported higher prevalence of CKD.

Table 13. Prevalence of chronic kidney disease by sociodemographic characteristics

Chronic kidney disease	%	95% CI	
		Lower	Upper
Overall	**7.0**	4.3	9.6
Age (years)			
18-44	**0.9**	0.0	2.8
45-64	**7.2**	3.1	11.4
65+	**25.1**	14.6	35.7
Gender			
Women	**9.3**	5.0	13.7
Men	**4.5**	1.7	7.3
Race/ethnicity			
Black	**8.3**	3.9	12.7
White	**5.9**	2.8	9.1
Marital status			
Married	**3.9**	1.2	6.6
Not currently married	**11.3**	6.1	16.5
Education			
Less than high school	**20.6**	3.3	37.9
High school	**9.8**	5.2	14.4
Some college	**3.8**	0.6	7.1
College graduate	**5.5**	0.0	11.5
Employment status			
Employed	**0.9**	0.0	1.9
Not currently employed	**13.4**	8.3	18.5
Annual household income			
< $15,000	**7.4**	1.5	13.2
$15,000-$24,999	**8.4**	1.9	14.9
$25,000-$34,999	**0.0**	0.0	0.0
$35,000-$49,999	**1.9**	0.0	5.6
$50,000+	**2.2**	0.0	4.9

Figure 14. Prevalence of chronic kidney disease by sociodemographic characteristics



Body Mass Index

Body mass index (BMI) is a measure of body fat based on height and weight. A high BMI can be an indicator of high body fatness. BMI categories are underweight, less than 18.5; normal weight, 18.5–24.9; overweight, 25–29.9; obesity: 30 or greater.
Weight and height of the CHES participants were measured on hard surface floor using a digital scale (Healthometer) and a metal tape measure, respectively.

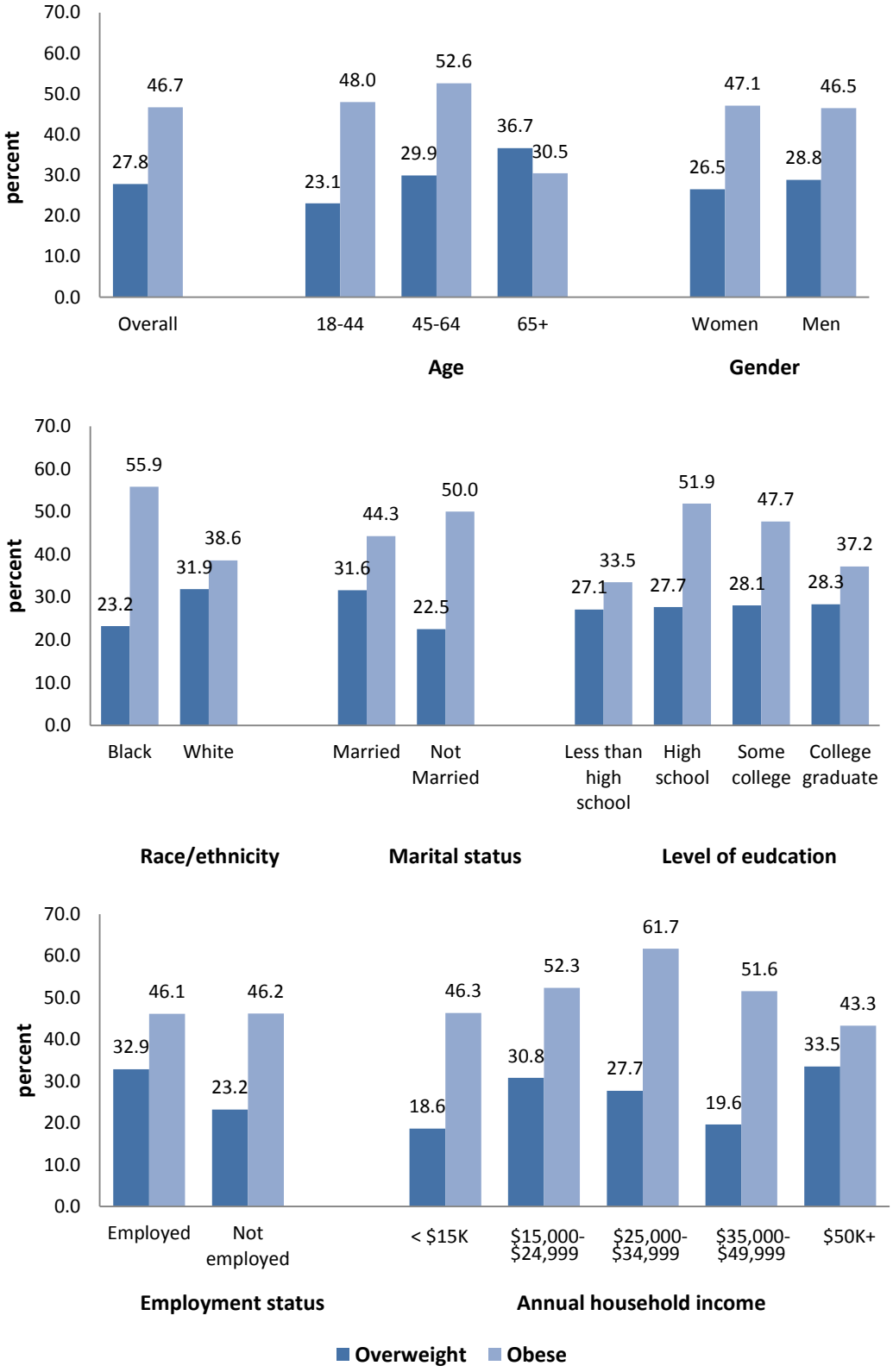
Overweight and Obesity

Table 14 showed that Delta CHES participants reported that the prevalence of obesity was 46.7 percent and the prevalence of overweight was 27.8 percent. Participants 45-64 years old (compared to those aged 65 and over) reported higher prevalence of obesity.

Table 14. Prevalence of overweight and obese by sociodemographic characteristics

	Overweight					Obese				
	%	95% CI				%	95% CI			
Overall	**27.8**	(	22.1	,	33.6)	**46.7**	(	40.0	,	53.3)
Age (years)										
18-44	**23.1**	(	13.4	,	32.7)	**48.0**	(	36.3	,	59.6)
45-64	**29.9**	(	22.0	,	37.9)	**52.6**	(	44.0	,	61.2)
65+	**36.7**	(	26.4	,	46.9)	**30.5**	(	21.0	,	39.9)
Gender										
Women	**26.5**	(	19.3	,	33.7)	**47.1**	(	39.1	,	55.1)
Men	**28.8**	(	19.6	,	38.0)	**46.5**	(	35.6	,	57.3)
Race/ethnicity										
Black	**23.2**	(	15.1	,	31.3)	**55.9**	(	46.3	,	65.5)
White	**31.9**	(	23.5	,	40.3)	**38.6**	(	29.0	,	48.3)
Marital status										
Married	**31.6**	(	23.8	,	39.4)	**44.3**	(	35.9	,	52.7)
Not currently married	**22.5**	(	14.1	,	30.9)	**50.0**	(	39.3	,	60.8)
Education										
Less than high school	**27.1**	(	6.3	,	48.0)	**33.5**	(	11.3	,	55.7)
High school	**27.7**	(	19.3	,	36.1)	**51.9**	(	42.8	,	61.1)
Some college	**28.1**	(	17.7	,	38.4)	**47.7**	(	34.4	,	61.0)
College graduate	**28.3**	(	15.2	,	41.5)	**37.2**	(	24.6	,	49.8)
Employment status										
Employed	**32.9**	(	23.2	,	42.6)	**46.1**	(	35.6	,	56.6)
Not currently employed	**23.2**	(	17.1	,	29.2)	**46.2**	(	38.2	,	54.2)
Annual household income										
< $15,000	**18.6**	(	8.8	,	28.5)	**46.3**	(	31.3	,	61.3)
$15,000-$24,999	**30.8**	(	15.5	,	46.1)	**52.3**	(	34.9	,	69.8)
$25,000-$34,999	**27.7**	(	11.1	,	44.3)	**61.7**	(	42.9	,	80.5)
$35,000-$49,999	**19.6**	(	3.6	,	35.7)	**51.6**	(	33.4	,	69.8)
$50,000+	**33.5**	(	21.7	,	45.4)	**43.3**	(	30.9	,	55.7)

Figure 15. Prevalence of overweight, and obese by sociodemographic characteristics



Cholesterol

Cholesterol itself is not bad. In fact, cholesterol is one of the many substances created and used by our bodies to keep us healthy. Cholesterol comes from the body, especially from the liver, and foods from animal sources, such as meat, poultry, and full-fat dairy products. Excess cholesterol can form plaque between layers of artery walls, which can cause blood clots. The clot causes a stroke or a heart attack if it blocks an artery that feeds the brain or the heart. There are two types of cholesterol: low-density lipoprotein (LDL) and high-density lipoprotein (HDL). LDL cholesterol is considered the bad cholesterol. It can slowly build up in the inner walls of the arteries; atherosclerosis, a heart attack, or a stroke can result. HDL is considered the good cholesterol; it helps remove LDL cholesterol from the arteries.

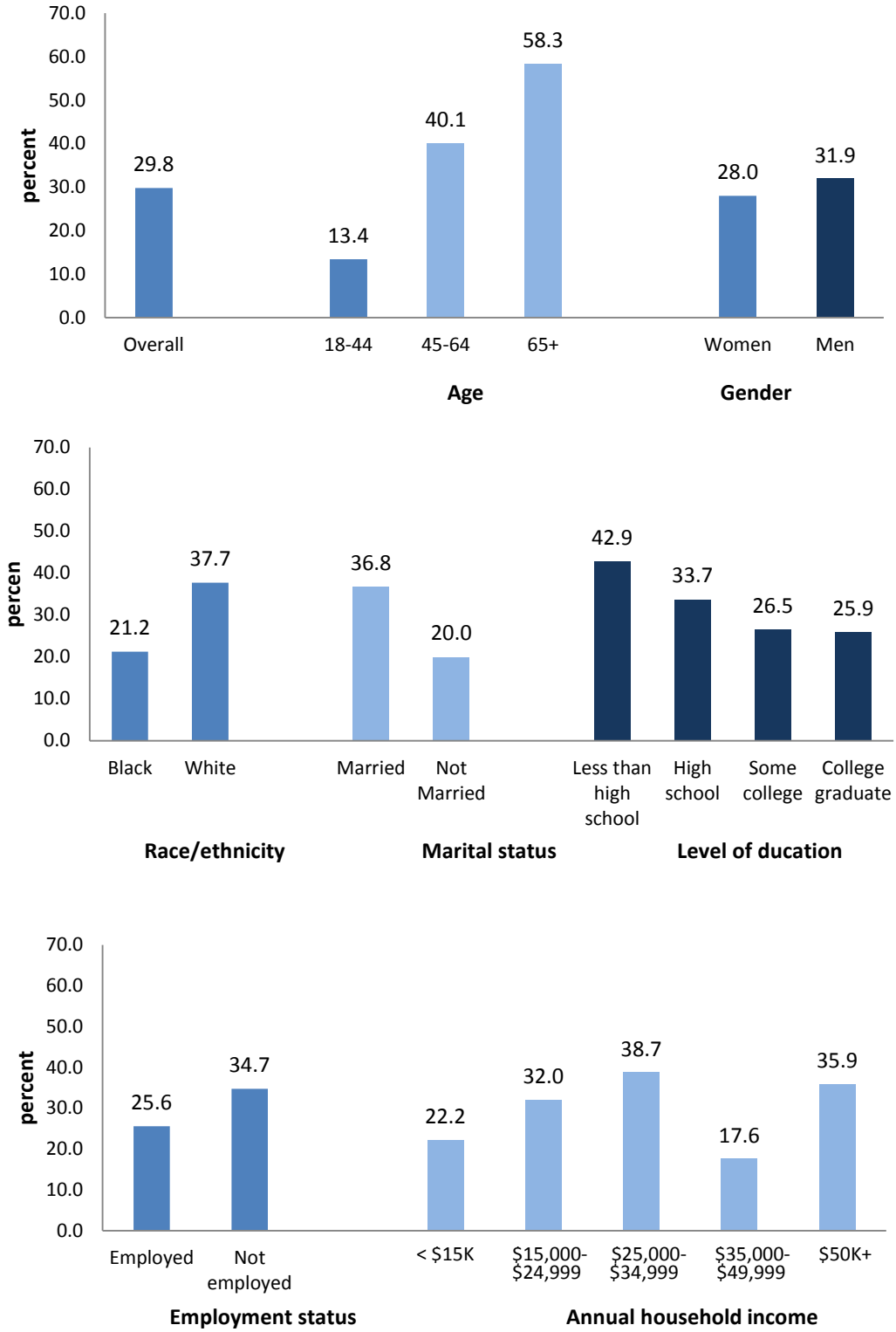
High Total Cholesterol

According to National Cholesterol Education Program-Adult Treatment Panel III (NCEP-APT III), total cholesterol levels less than 200 mg/dL are desirable, 200-239 mg/dL are borderline high, and 240 mg/dL and above are high. High total cholesterol is defined in a person who has total cholesterol level of 240 mg/d or greater, or/and use of cholesterol lowering medication.
According to Table 15, 29.8 percent of the Delta CHES participants had high total cholesterol. Participants aged 45 and over (compared to participants aged 18-44) whites and married participants reported higher prevalence of high total cholesterol.

Table 15. Prevalence of high total cholesterol by sociodemographic characteristics

High total cholesterol	%	95% CI	
		Lower	Upper
Overall	**29.8**	(24.4 ,	35.2)
Age (years)			
18-44	**13.4**	(6.3 ,	20.5)
45-64	**40.1**	(31.8 ,	48.4)
65+	**58.3**	(47.9 ,	68.7)
Gender			
Women	**28.0**	(21.5 ,	34.5)
Men	**31.9**	(23.1 ,	40.8)
Race/ethnicity			
Black	**21.2**	(15.0 ,	27.5)
White	**37.7**	(29.2 ,	46.3)
Marital status			
Married	**36.8**	(29.1 ,	44.5)
Not currently married	**20.0**	(13.7 ,	26.3)
Education			
Less than high school	**42.9**	(19.4 ,	66.4)
High school	**33.7**	(25.6 ,	41.9)
Some college	**26.5**	(17.1 ,	36.0)
College graduate	**25.9**	(14.9 ,	37.0)
Employment status			
Employed	**25.6**	(17.5 ,	33.7)
Not currently employed	**34.7**	(27.7 ,	41.7)
Annual household income			
< $15,000	**22.2**	(12.3 ,	32.2)
$15,000-$24,999	**32.0**	(18.4 ,	45.6)
$25,000-$34,999	**38.7**	(19.0 ,	58.3)
$35,000-$49,999	**17.6**	(5.8 ,	29.3)
$50,000+	**35.9**	(24.4 ,	47.4)

Figure 16. Prevalence of high total cholesterol by sociodemographic characteristics



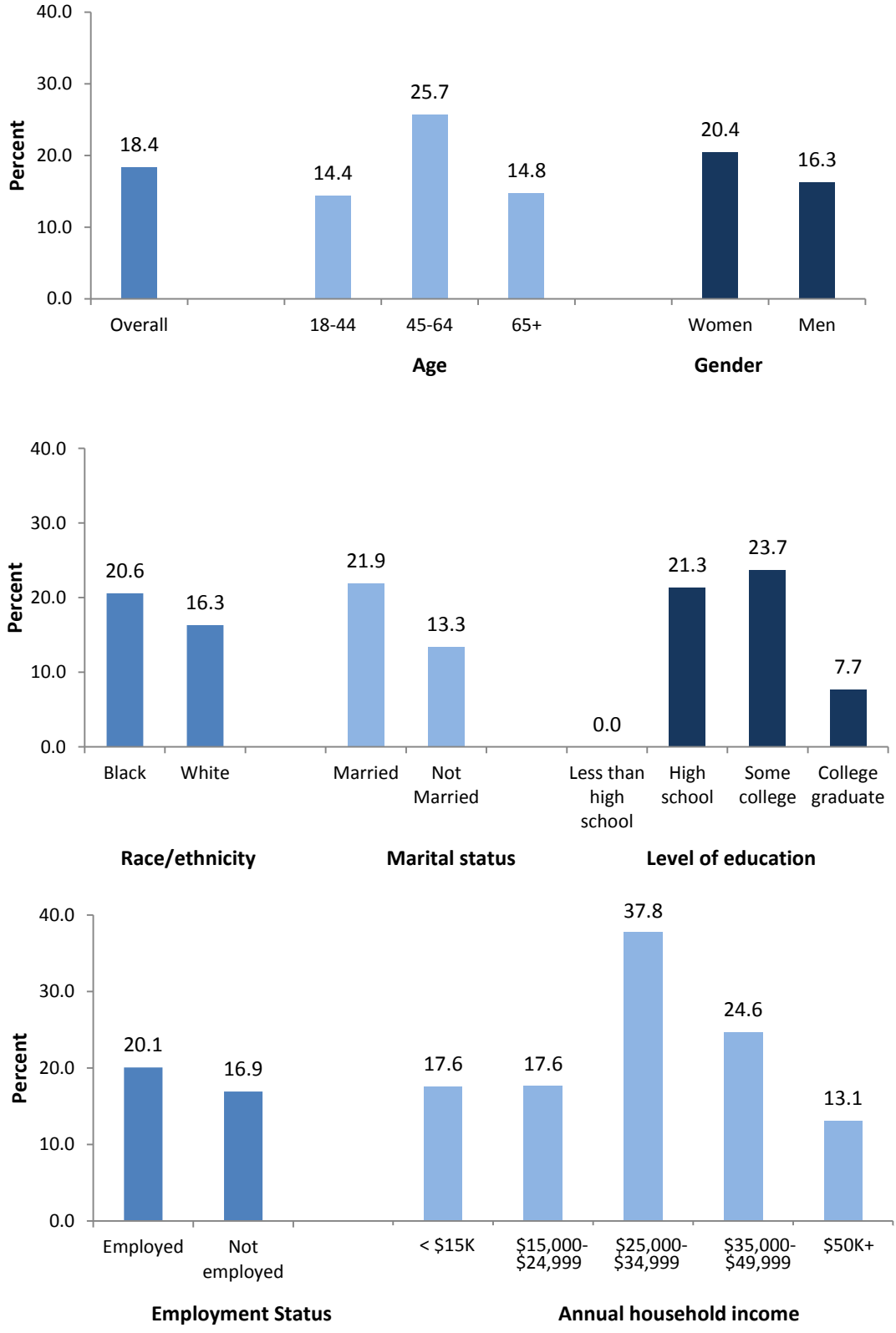
High LDL Cholesterol

High levels of LDL cholesterol increase the chance of getting heart diseases. According to NCEP-APT III, LDL cholesterol levels less than 130 mg/dL are normal and 130 mg/dL and above are high. According to Table 16, 18.4 percent of Delta CHES participants had high LDL cholesterol. Participants with less than high school graduate education level reported the lowest prevalence of high LDL cholesterol comparing to those with higher education level while within the group, participants with some college degree reported higher prevalence of high LDL cholesterol than those with college graduate degree.

Table 16. Prevalence of high LDL cholesterol by sociodemographic characteristics

High LDL cholesterol	%	95% CL	
		Lower	Upper
Overall	**18.4**	(13.7 ,	23.0)
Age (years)			
18-44	**14.4**	(7.3 ,	21.4)
45-64	**25.7**	(17.8 ,	33.7)
65+	**14.8**	(7.7 ,	21.8)
Gender			
Women	**20.4**	(14.4 ,	26.4)
Men	**16.3**	(9.0 ,	23.5)
Race/ethnicity			
Black	**20.6**	(13.2 ,	28.0)
White	**16.3**	(10.4 ,	22.2)
Marital status			
Married	**21.9**	(15.1 ,	28.8)
Not currently married	**13.3**	(7.9 ,	18.8)
Education			
Less than high school	**0.0**	(0.0 ,	0.0)
High school	**21.3**	(14.0 ,	28.7)
Some college	**23.7**	(13.8 ,	33.6)
College graduate	**7.7**	(2.0 ,	13.4)
Employment status			
Employed	**20.1**	(12.4 ,	27.8)
Not currently employed	**16.9**	(11.5 ,	22.3)
Annual household income			
< $15,000	**17.6**	(6.8 ,	28.4)
$15,000-$24,999	**17.6**	(7.4 ,	27.9)
$25,000-$34,999	**37.8**	(15.2 ,	60.3)
$35,000-$49,999	**24.6**	(9.5 ,	39.8)
$50,000+	**13.1**	(6.2 ,	19.9)

Figure 17. Prevalence of high LDL cholesterol by sociodemographic characteristics



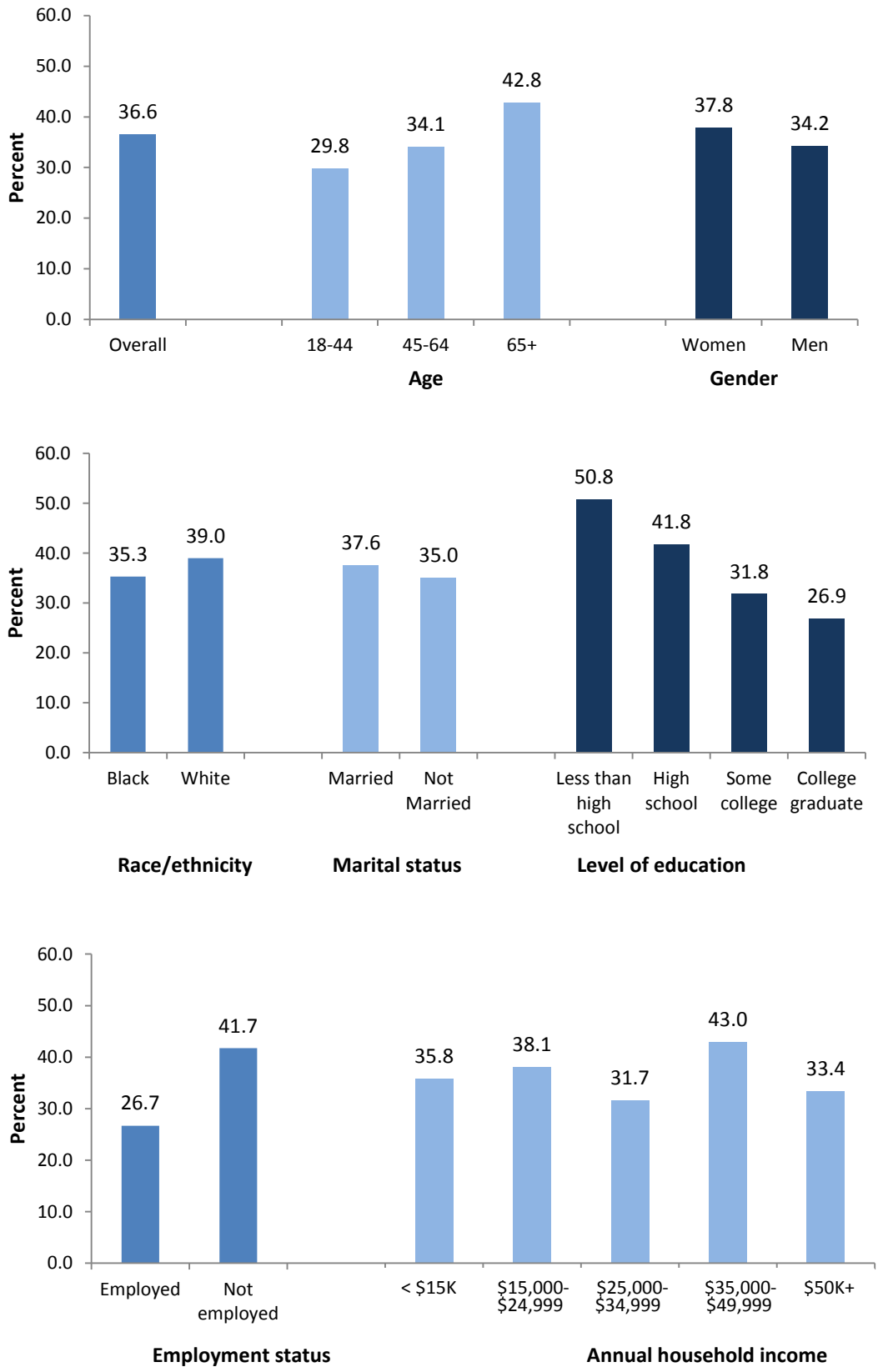
Low HDL Cholesterol

High levels of HDL cholesterol protect against heart disease. According to NCEP-APT III, HDL cholesterol levels less than 40 mg/dL in men and less than 50 mg/dL in women are considered low. According to Table 17, 36.6 percent of Delta CHES participants had low HDL cholesterol. No differences were found on low HDL cholesterol by subgroups.

Table 17. Prevalence of low HDL cholesterol by sociodemographic characteristics

Low HDL cholesterol	%	95% CI	
		Lower	Upper
Overall	**36.6**	(29.7 ,	43.5)
Age (years)			
18-44	**29.8**	(10.6 ,	48.9)
45-64	**34.1**	(25.3 ,	42.9)
65+	**42.8**	(30.9 ,	54.6)
Gender			
Women	**37.8**	(29.2 ,	46.4)
Men	**34.2**	(22.7 ,	45.7)
Race/ethnicity			
Black	**35.3**	(26.2 ,	44.4)
White	**39.0**	(28.6 ,	49.4)
Marital status			
Married	**37.6**	(27.9 ,	47.3)
Not currently married	**35.0**	(25.9 ,	44.1)
Education			
Less than high school	**50.8**	(23.7 ,	77.8)
High school	**41.8**	(30.3 ,	53.2)
Some college	**31.8**	(21.1 ,	42.4)
College graduate	**26.9**	(15.0 ,	38.8)
Employment status			
Employed	**26.7**	(18.3 ,	35.1)
Not currently employed	**41.7**	(32.5 ,	51.0)
Annual household income			
< $15,000	**35.8**	(21.8 ,	49.9)
$15,000-$24,999	**38.1**	(38.1 ,	53.2)
$25,000-$34,999	**31.7**	(12.2 ,	51.1)
$35,000-$49,999	**43.0**	(22.7 ,	63.3)
$50,000+	**33.4**	(19.8 ,	47.0)

Figure 18. Prevalence of low HDL cholesterol by sociodemographic characteristics



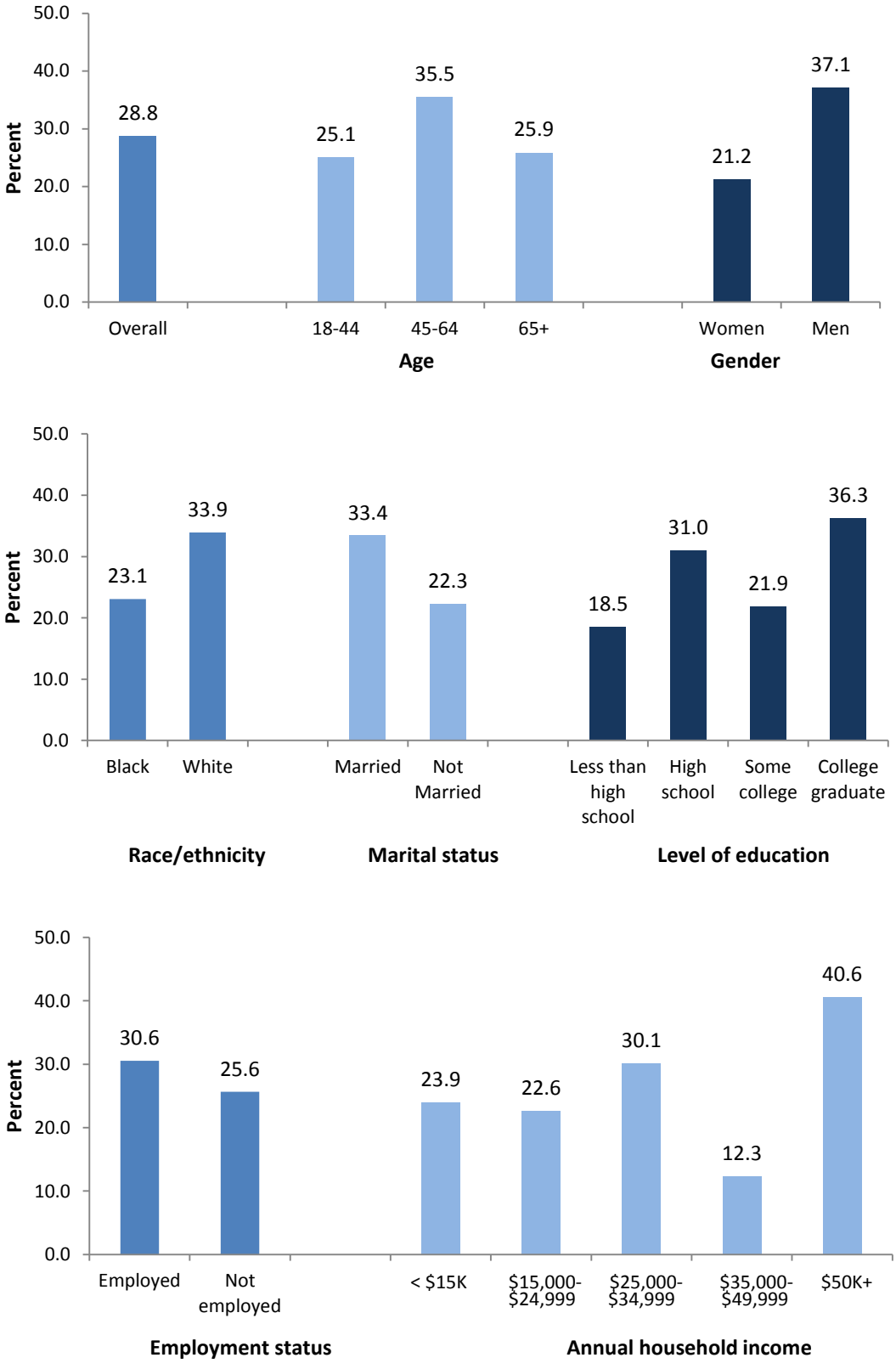
Triglycerides

Triglycerides are the end-product of digesting and breaking down fats in meals. Some triglycerides are made in the body from other energy sources, such as carbohydrates. According to NCEP-APT III, triglyceride levels of 150 mg/dL and above are considered high. According to Table 18, 28.8 percent of Delta CHES participants had high triglycerides. Participants with an annual household income of $50,000 and more compared to those with annual income of $35,000- $49,999, reported higher prevalence of high triglycerides.

Table 18. Prevalence of high triglyceride by sociodemographic characteristics

High triglyceride	%	95% CI	
		Lower	Upper
Overall	**28.8**	22.9	34.7
Age (years)			
18-44	**25.1**	15.1	35.1
45-64	**35.5**	27.1	43.9
65+	**25.9**	17.5	34.3
Gender			
Women	**21.2**	15.0	27.4
Men	**37.1**	27.0	47.3
Race/ethnicity			
Black	**23.1**	15.0	31.1
White	**33.9**	25.2	42.7
Marital status			
Married	**33.4**	25.2	41.7
Not currently married	**22.3**	14.6	29.9
Education			
Less than high school	**18.5**	0.0	38.2
High school	**31.0**	22.7	39.3
Some college	**21.9**	12.4	31.4
College graduate	**36.3**	22.0	50.6
Employment status			
Employed	**30.6**	21.2	40.0
Not currently employed	**25.6**	18.9	32.4
Annual household income			
< $15,000	**23.9**	12.7	35.1
$15,000-$24,999	**22.6**	11.3	34.0
$25,000-$34,999	**30.1**	10.8	49.4
$35,000-$49,999	**12.3**	2.2	22.4
$50,000+	**40.6**	27.8	53.4

Figure 19. Prevalence of high triglyceride by sociodemographic characteristics



4. Awareness, Treatment, and Control of Risk Factors

Awareness of High Blood Pressure
Treatment for High Blood Pressure
Control of High Blood Pressure

Awareness of High Blood Sugar
Treatment for High Blood Sugar
Control of High Blood Sugar

Awareness of High Total Cholesterol
Treatment for High Total Cholesterol
Control of High Total Cholesterol

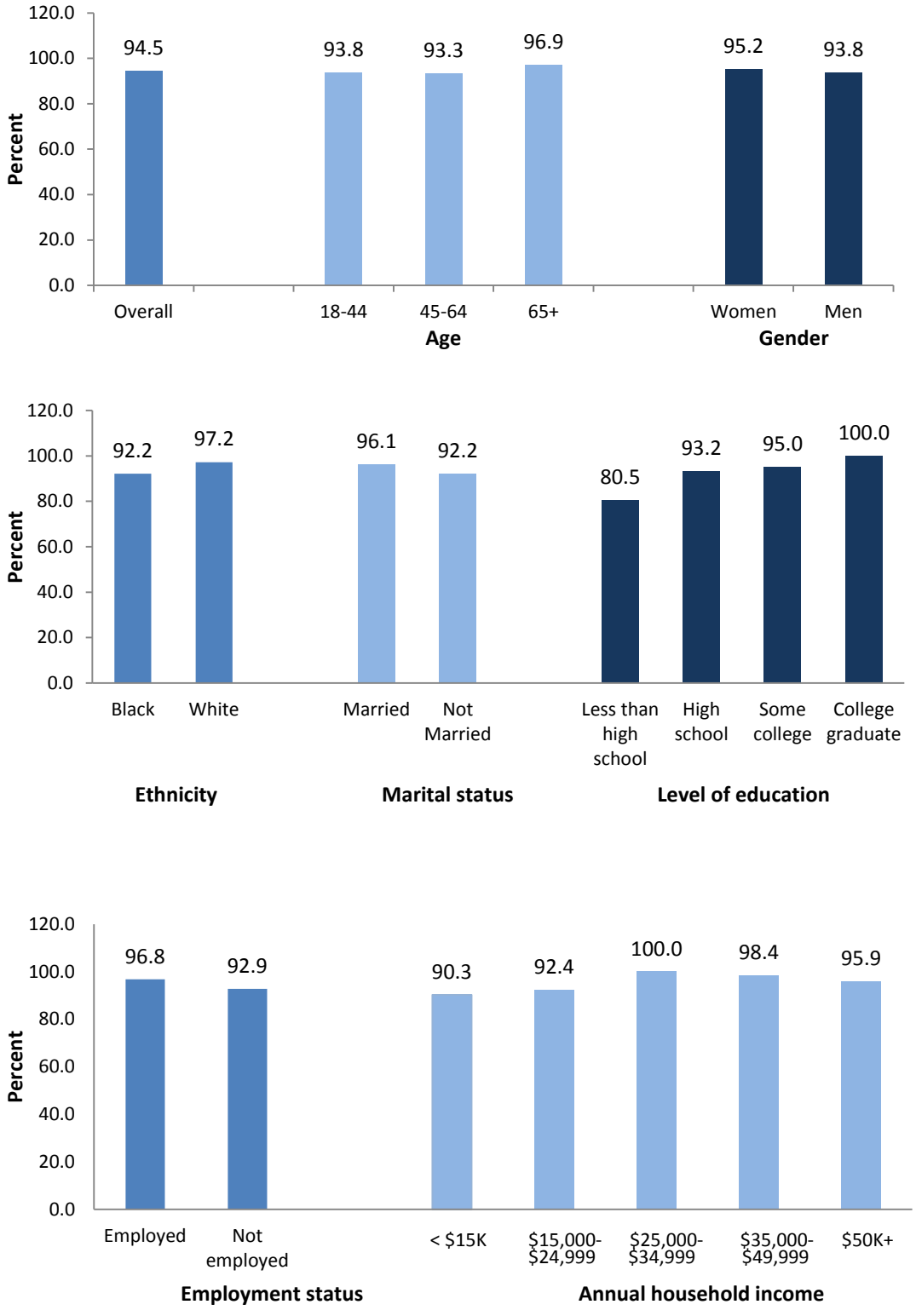
Awareness of High Blood Pressure

Among the participants with measured high blood pressure defined by JNC 7 classification of blood pressure, if participants reported that their doctor or other health professional had told them that they had high blood pressure, then they were considered aware of their high blood pressure. According to Table 19, 94.5% of participants with hypertension were aware of their high blood pressure. Most of the Delta CHES participants with hypertension across all categories were well aware of their high blood pressure.

Table 19. Prevalence of awareness of high blood pressure by sociodemographic characteristics

Awareness of high blood pressure	%	95% CI Lower	95% CI Upper
Overall	**94.5**	91.0	98.1
Age (years)			
18-44	**93.8**	85.0	100.0
45-64	**93.3**	87.5	99.0
65+	**96.9**	93.8	100.0
Gender			
Women	**95.2**	91.4	98.9
Men	**93.8**	87.5	100.0
Race/ethnicity			
Black	**92.2**	86.1	98.3
White	**97.2**	94.2	100.0
Marital status			
Married	**96.1**	91.6	100.0
Not currently married	**92.2**	86.5	97.8
Education			
Less than high school	**80.5**	58.0	100.0
High school	**93.2**	87.8	98.6
Some college	**95.0**	87.3	100.0
College graduate	**100.0**	100.0	100.0
Employment status			
Employed	**96.8**	91.3	100.0
Not currently employed	**92.9**	88.1	97.6
Annual household income			
< $15,000	**90.3**	79.9	100.0
$15,000-$24,999	**92.4**	85.0	99.8
$25,000-$34,999	**100.0**	100.0	100.0
$35,000-$49,999	**98.4**	95.1	100.0
$50,000+	**95.9**	87.9	100.0

Figure 20. Prevalence of awareness of high blood pressure by sociodemographic characteristics



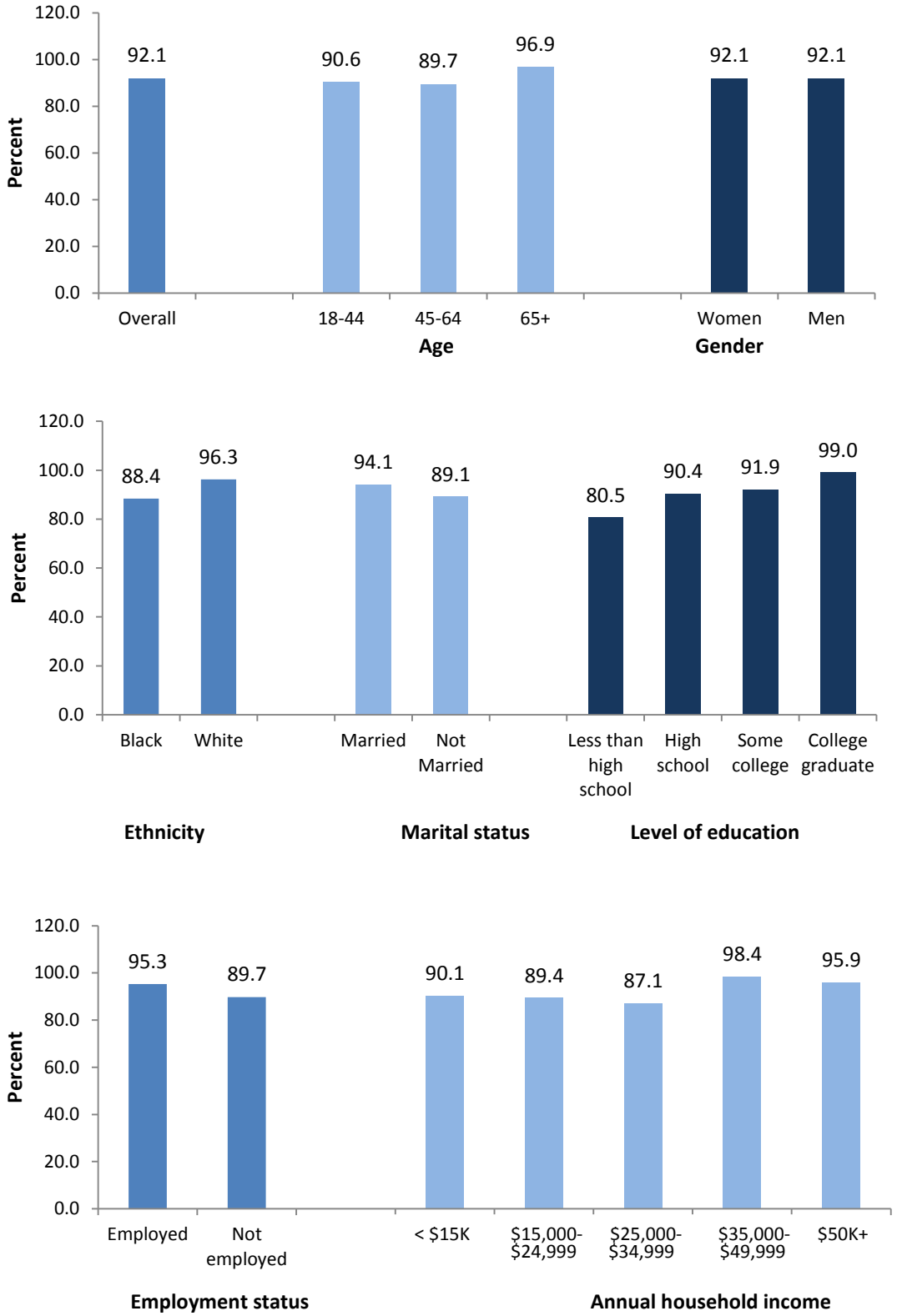
Treatment for High Blood Pressure

If participants with measured high blood pressure were taking prescribed medicine, then they were considered as being treated for high blood pressure. According to Table 20, 92.1% of the hypertensive participants were being treated for high blood pressure. Most of the Delta CHES participants with hypertension across all categories were being treated for their high blood pressure.

Table 20. Prevalence of treatment of high blood pressure by sociodemographic characteristics

Treatment for high blood pressure	%	95% CI Lower	95% CI Upper
Overall	**92.1**	88.0	96.2
Age (years)			
18-44	**90.6**	80.5	100.0
45-64	**89.7**	82.9	96.5
65+	**96.9**	93.8	100.0
Gender			
Women	**92.1**	87.1	97.0
Men	**92.1**	85.4	98.9
Race/ethnicity			
Black	**88.4**	81.2	95.5
White	**96.3**	93.1	99.5
Marital status			
Married	**94.1**	89.0	99.2
Not currently married	**89.1**	82.3	96.0
Education			
Less than high school	**80.5**	58.0	100.0
High school	**90.4**	84.1	96.6
Some college	**91.9**	82.9	100.0
College graduate	**99.0**	97.1	100.0
Employment status			
Employed	**95.3**	89.0	100.0
Not currently employed	**89.7**	84.2	95.3
Annual household income			
< $15,000	**90.1**	79.6	100.0
$15,000-$24,999	**89.4**	80.1	98.6
$25,000-$34,999	**87.1**	72.2	100.0
$35,000-$49,999	**98.4**	95.1	100.0
$50,000+	**95.9**	87.9	100.0

Figure 21. Prevalence of treatment of high blood pressure by sociodemographic characteristics



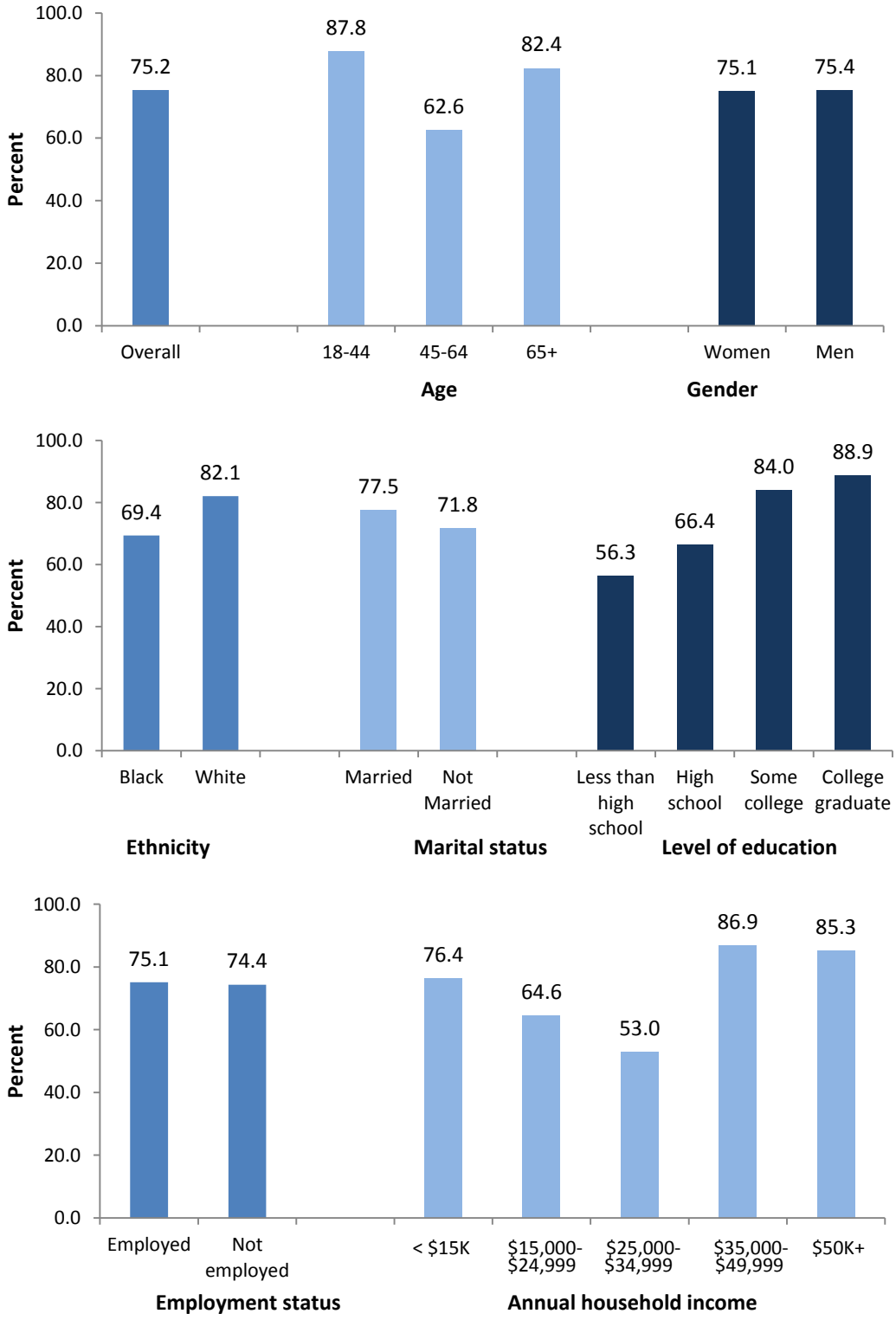
Control of High Blood Pressure

The participants with measured high blood pressure who were treated for hypertension and had blood pressure levels lower than 140/90 mmHg, were considered controlled for high blood pressure. According to Table 21, 75.2% of hypertensive participants were considered controlled for high blood pressure. Participants aged 45-64 compared to all other ages, reported the lowest prevalence of high blood pressure.

Table 21. Prevalence of control of high blood pressure by sociodemographic characteristics

Control of high blood pressure	%	95% CI	
		Lower	Upper
Overall	**75.2**	68.2	82.2
Age (years)			
18-44	**87.8**	76.3	99.2
45-64	**62.6**	50.9	74.3
65+	**82.4**	74.4	90.4
Gender			
Women	**75.1**	67.0	83.2
Men	**75.4**	63.7	87.1
Race/ethnicity			
Black	**69.4**	58.4	80.3
White	**82.1**	74.3	89.8
Marital status			
Married	**77.5**	67.9	87.2
Not currently married	**71.8**	61.8	81.7
Education			
Less than high school	**56.3**	29.5	83.2
High school	**66.4**	55.6	77.2
Some college	**84.0**	72.3	95.7
College graduate	**88.9**	78.6	99.2
Employment status			
Employed	**75.1**	61.7	88.5
Not currently employed	**74.4**	66.6	82.1
Annual household income			
< $15,000	**76.4**	62.4	90.5
$15,000-$24,999	**64.6**	49.5	79.6
$25,000-$34,999	**53.0**	21.3	84.6
$35,000-$49,999	**86.9**	71.4	100.0
$50,000+	**85.3**	73.1	97.5

Figure 22. Prevalence of control of high blood pressure by sociodemographic characteristics



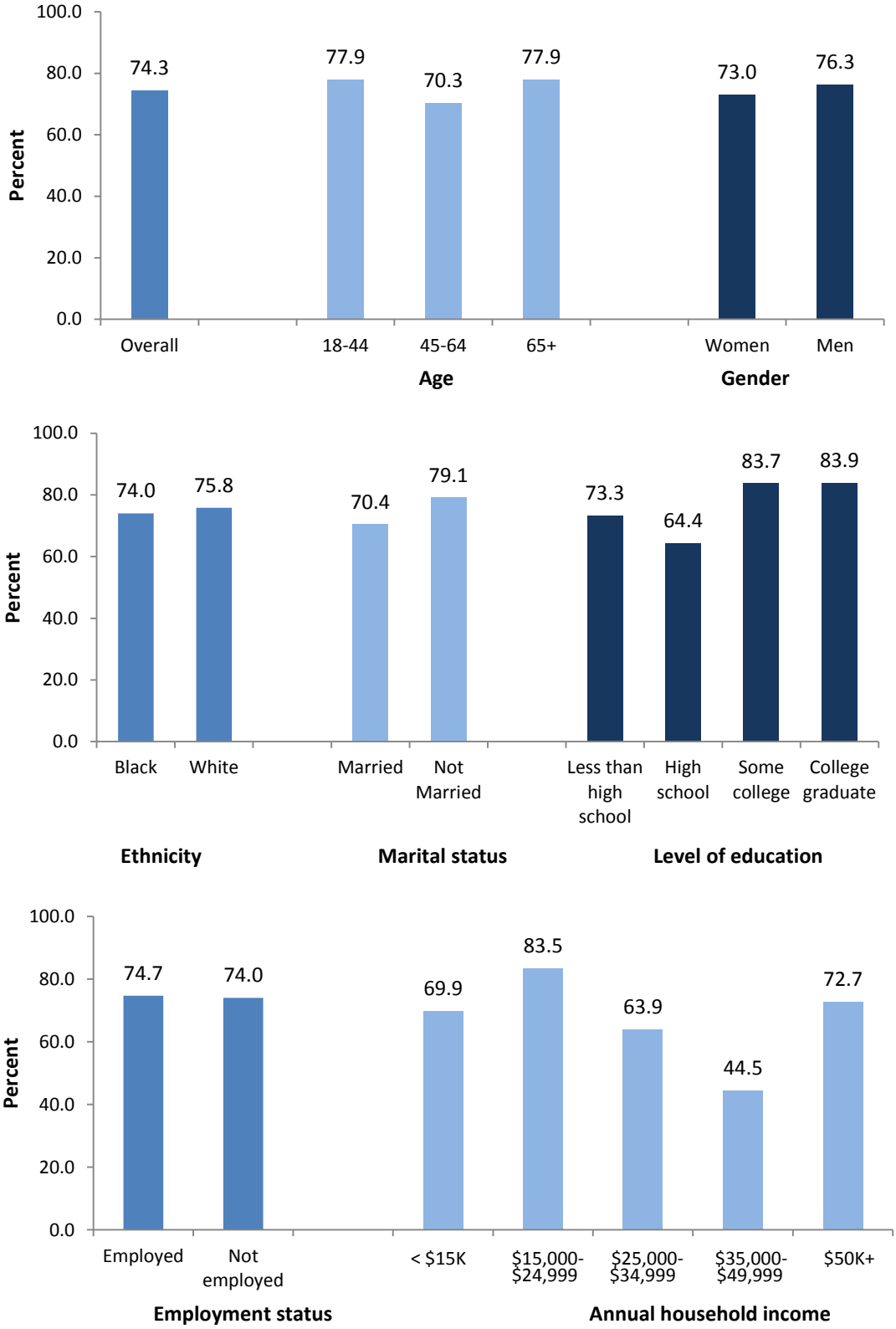
Awareness of High Blood Sugar

Among participants with type 2 diabetes defined by ADA classification of diabetes, if the participants reported that a doctor or other health professional had told them that they had high blood sugar, then they were considered aware of their high blood sugar. According to Table 22, 74.3percent of diabetic participants with type 2 diabetes were aware of their high blood sugar.

Table 22. Prevalence of awareness of high blood sugar by sociodemographic characteristics

Awareness of high blood sugar	%	95% CI	
		Lower	Upper
Overall	**74.3**	(65.5 ,	83.1)
Age (years)			
18-44	**77.9**	(58.5 ,	97.3)
45-64	**70.3**	(57.2 ,	83.3)
65+	**77.9**	(65.6 ,	90.2)
Gender			
Women	**73.0**	(61.6 ,	84.3)
Men	**76.3**	(62.6 ,	90.1)
Race/ethnicity			
Black	**74.0**	(62.5 ,	85.5)
White	**75.8**	(62.5 ,	89.2)
Marital status			
Married	**70.4**	(57.7 ,	83.1)
Not currently married	**79.1**	(67.7 ,	90.4)
Education			
Less than high school	**73.3**	(39.6 ,	100.0)
High school	**64.4**	(50.3 ,	78.5)
Some college	**83.7**	(71.2 ,	96.2)
College graduate	**83.9**	(68.2 ,	99.7)
Employment status			
Employed	**74.7**	(59.1 ,	90.3)
Not currently employed	**74.0**	(63.7 ,	84.4)
Annual household income			
< $15,000	**69.9**	(49.6 ,	90.3)
$15,000-$24,999	**83.5**	(69.1 ,	97.9)
$25,000-$34,999	**63.9**	(35.8 ,	92.0)
$35,000-$49,999	**44.5**	(8.7 ,	80.3)
$50,000+	**72.7**	(51.3 ,	94.0)

Figure 23. Prevalence of awareness of high blood sugar by sociodemographic characteristics



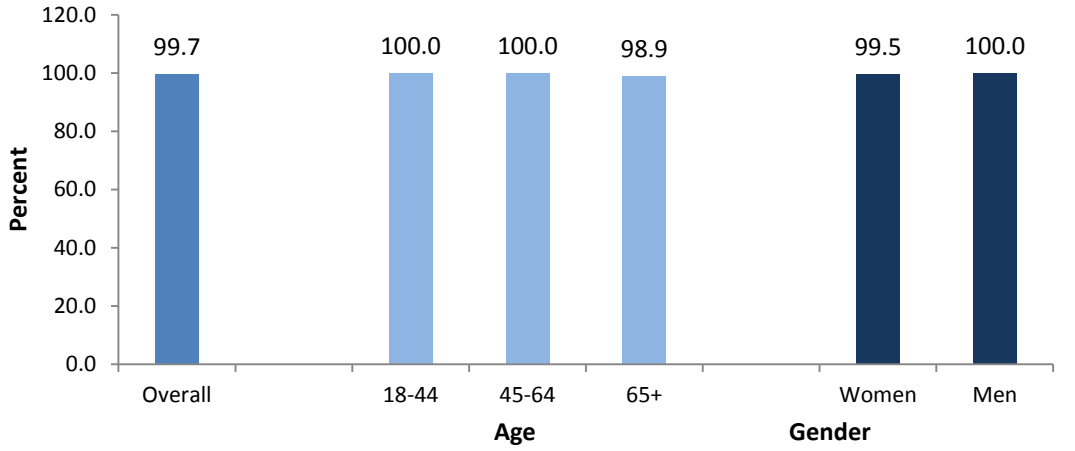
Treatment for High Blood Sugar

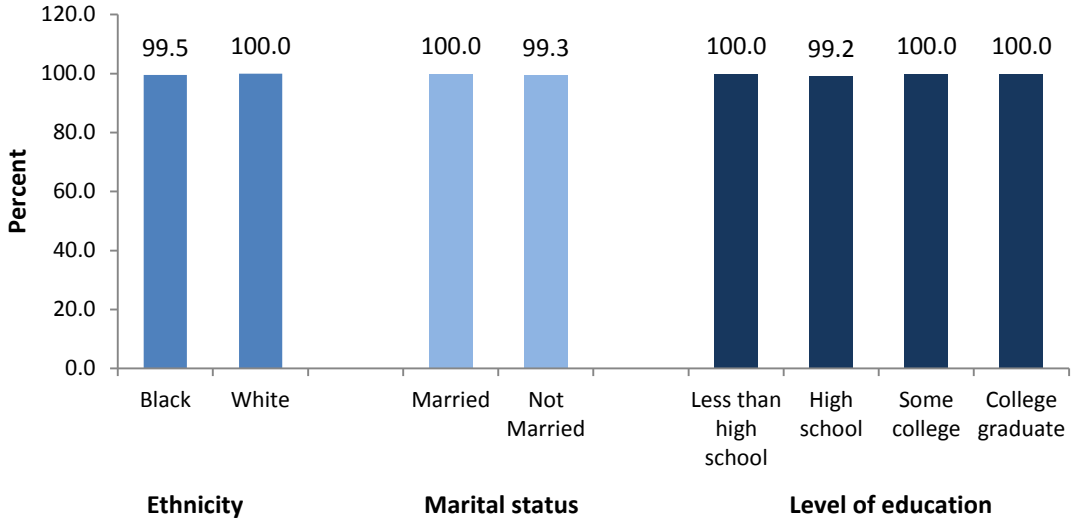
If the diabetic participants were taking prescribed medicine, then they were considered being treated for high blood sugar. According to Table 23,99.7 percent of diabetic participants were treated for high blood sugar. Most of the Delta CHES participants with diabetes across all categories were well treated for high blood sugar.

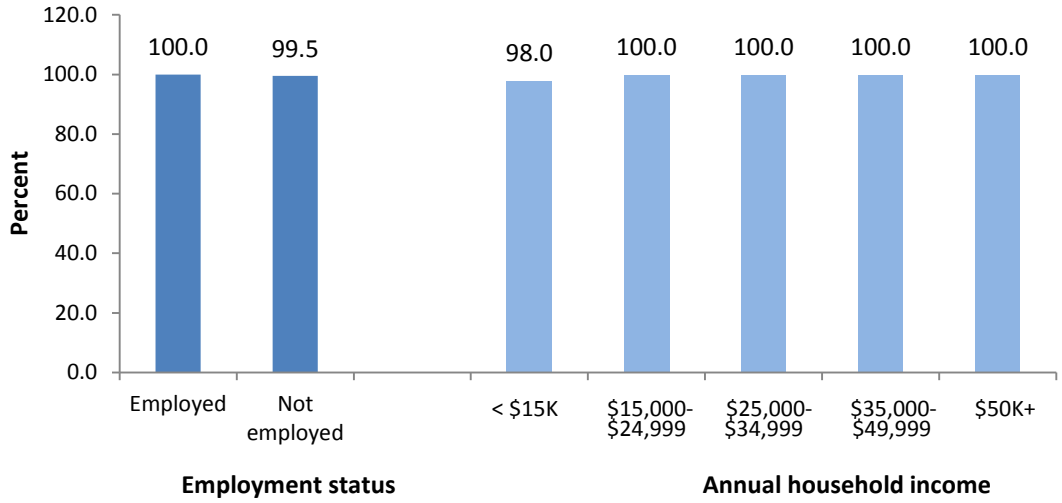
Figure 23. Prevalence of treatment for high blood sugar by sociodemographic characteristics

Treatment for high blood sugar	%	95% CI Lower	95% CI Upper
Overall	**99.7**	99.0	100.0
Age (years)			
18-44	**100.0**	100.0	100.0
45-64	**100.0**	100.0	100.0
65+	**98.9**	96.7	100.0
Gender			
Women	**99.5**	98.3	100.0
Men	**100.0**	100.0	100.0
Race/ethnicity			
Black	**99.5**	98.5	100.0
White	**100.0**	100.0	100.0
Marital status			
Married	**100.0**	100.0	100.0
Not currently married	**99.3**	97.9	100.0
Education			
Less than high school	**100.0**	100.0	100.0
High school	**99.2**	97.5	100.0
Some college	**100.0**	100.0	100.0
College graduate	**100.0**	100.0	100.0
Employment status			
Employed	**100.0**	100.0	100.0
Not currently employed	**99.5**	98.4	100.0
Annual household income			
< $15,000	**98.0**	93.8	100.0
$15,000-$24,999	**100.0**	100.0	100.0
$25,000-$34,999	**100.0**	100.0	100.0
$35,000-$49,999	**100.0**	100.0	100.0
$50,000+	**100.0**	100.0	100.0

Figure 24. Prevalence of treatment for high blood sugar by sociodemographic characteristics







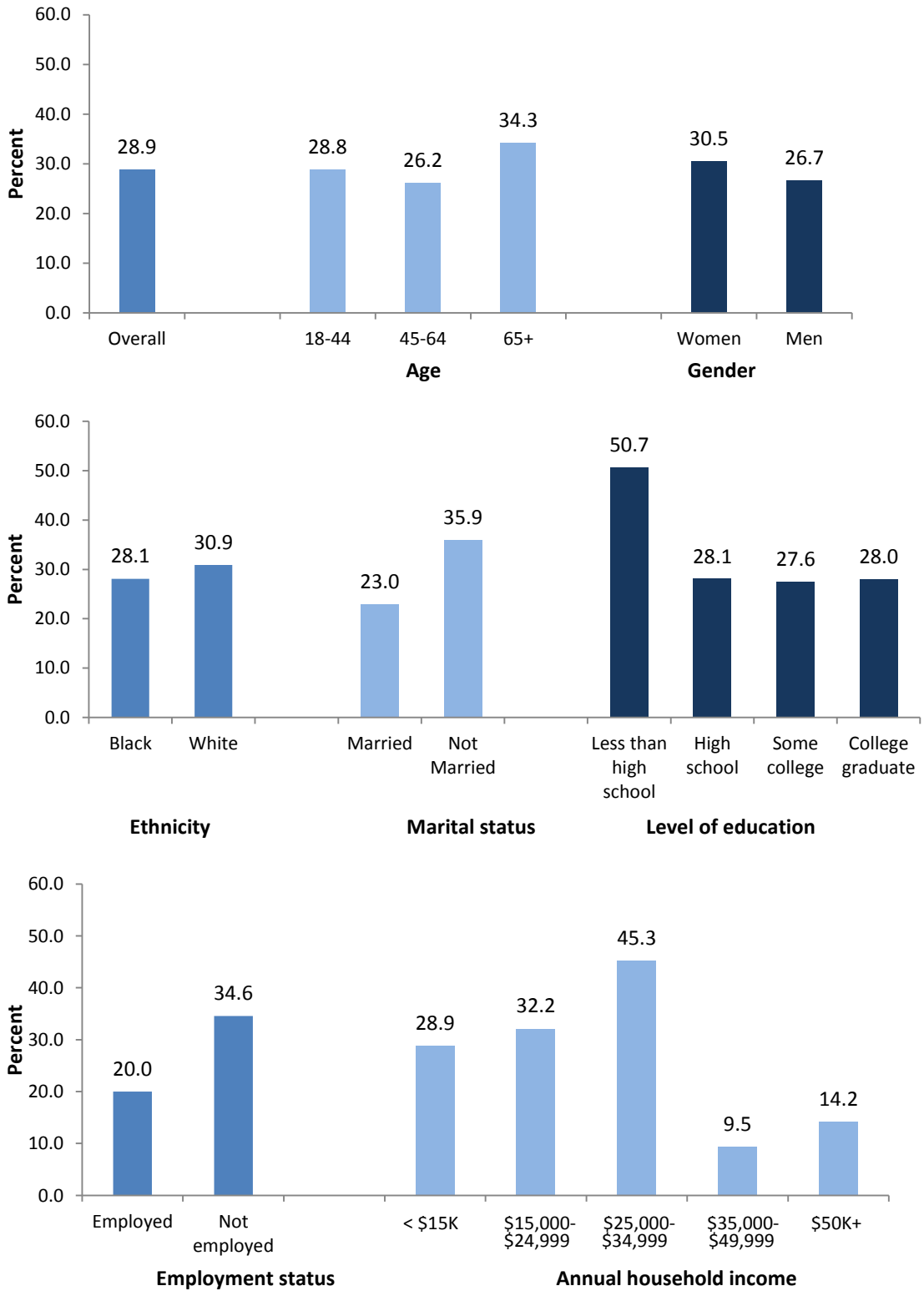
Control of High Blood Sugar

The diabetic participants who were treated for their high blood sugar and who had fasting blood sugar levels lower than 126 mg/dL or non-fasting blood sugar levels lower than 200 mg/dL were considered controlled for high blood sugar. According to Table 24, 28.9% of diabetic participants were considered controlled for high blood sugar.

Table 24. Prevalence of control of high blood sugar by sociodemographic characteristics

Control of high blood sugar	%	95% CI	
		Lower	Upper
Overall	**28.9**	18.7	39.2
Age (years)			
18-44	**28.8**	2.5	55.2
45-64	**26.2**	13.0	39.3
65+	**34.3**	19.6	49.0
Gender			
Women	**30.5**	16.9	44.2
Men	**26.7**	11.2	42.2
Race/ethnicity			
Black	**28.1**	14.4	41.8
White	**30.9**	15.5	46.3
Marital status			
Married	**23.0**	11.8	34.2
Not currently married	**35.9**	18.9	53.0
Education			
Less than high school	**50.7**	14.0	87.4
High school	**28.1**	15.1	41.0
Some college	**27.6**	7.4	47.7
College graduate	**28.0**	0.0	57.5
Employment status			
Employed	**20.0**	4.1	35.9
Not currently employed	**34.6**	21.7	47.5
Annual household income			
< $15,000	**28.9**	9.5	48.3
$15,000-$24,999	**32.2**	11.5	52.8
$25,000-$34,999	**45.3**	13.7	76.9
$35,000-$49,999	**9.5**	0.0	27.9
$50,000+	**14.2**	0.0	34.4

Figure 25. Prevalence of control of high blood sugar by sociodemographic characteristics



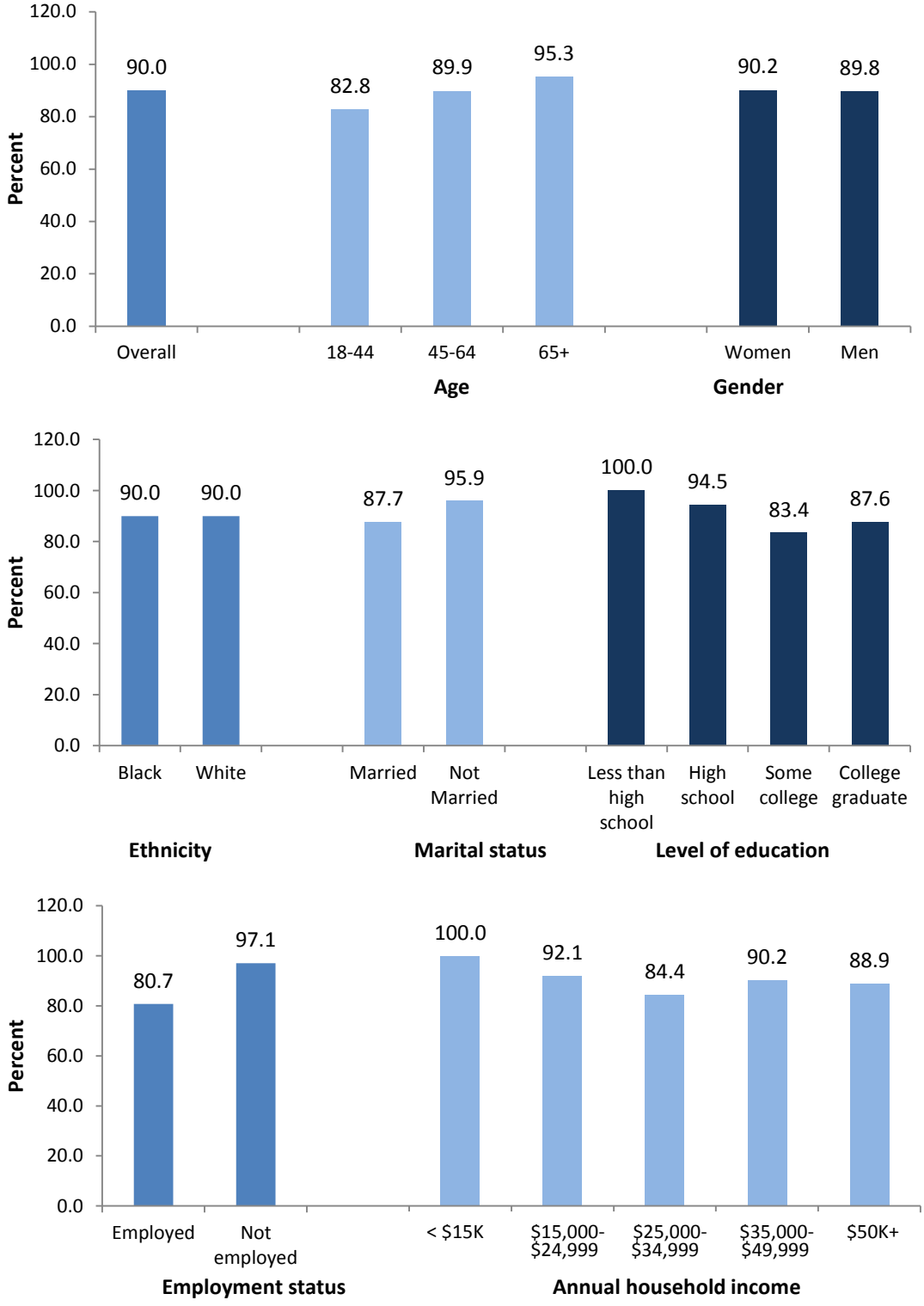
Awareness of High Total Cholesterol

If the participants with high total cholesterol (240 mg/dL or more) were told by a doctor or other health professional that they had high total cholesterol, then they were considered aware of their high total cholesterol. According to Table 25, 90 percent of participants with high total cholesterol were aware of their high total cholesterol. Majority of the Delta CHES participants with high total cholesterol across all categories were well treated for their high total cholesterol.

Figure 25. Prevalence of awareness of high total cholesterol by sociodemographic characteristics

Awareness of high total cholesterol	%	95% CI Lower	95% CI Upper
Overall	**90.0**	82.9	97.2
Age (years)			
18-44	**82.8**	60.9	100.0
45-64	**89.9**	79.4	100.0
65+	**95.3**	90.4	100.0
Gender			
Women	**90.2**	81.3	99.2
Men	**89.8**	78.7	100.0
Race/ethnicity			
Black	**90.0**	77.9	100.0
White	**90.0**	81.0	99.0
Marital status			
Married	**87.7**	78.1	97.3
Not currently married	**95.9**	91.2	100.0
Education			
Less than high school	**100.0**	100.0	100.0
High school	**94.5**	87.1	100.0
Some college	**83.4**	68.8	98.1
College graduate	**87.6**	66.6	100.0
Employment status			
Employed	**80.7**	65.6	95.9
Not currently employed	**97.1**	94.2	99.9
Annual household income			
< $15,000	**100.0**	100.0	100.0
$15,000-$24,999	**92.1**	84.2	100.0
$25,000-$34,999	**84.4**	57.1	100.0
$35,000-$49,999	**90.2**	75.7	100.0
$50,000+	**88.9**	75.1	100.0

Figure 26. Prevalence of awareness of high total cholesterol by sociodemographic characteristics



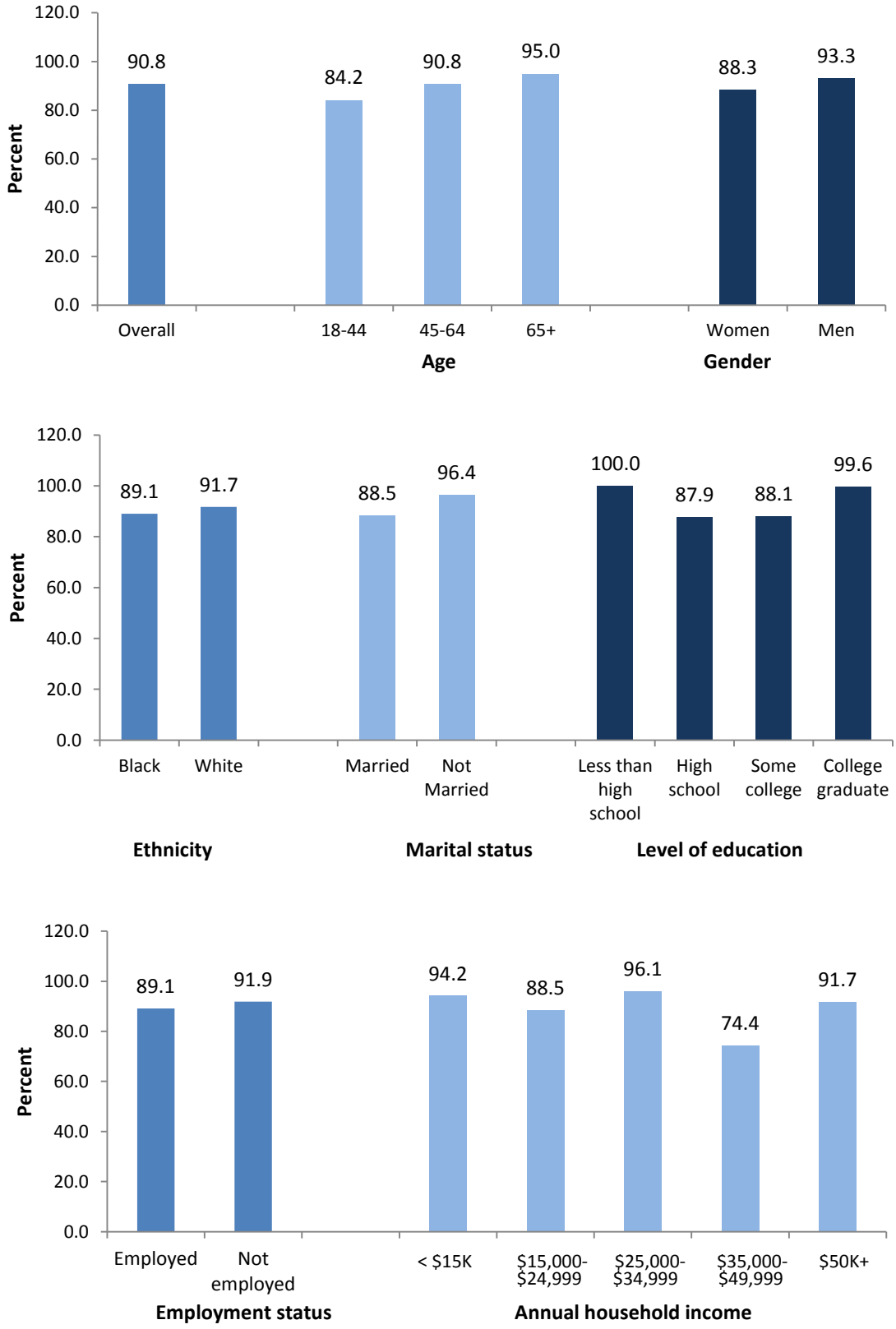
Treatment for High Total Cholesterol

If participants with high total cholesterol were taking prescribed cholesterol-lowering medications, then they were considered as being treated for high total cholesterol. According to Table 26, 90.8 percent of participants with high total cholesterol were considered as being treated for high total cholesterol. Majority of the Delta CHES participants with high total cholesterol across all categories were considered as being treated for high total cholesterol.

Table 26. Prevalence of treatment for high total cholesterol

Treatment for high total cholesterol	%	95% CI Lower	95% CI Upper
Overall	**90.8**	84.6	97.0
Age (years)			
18-44	**84.2**	63.5	100.0
45-64	**90.8**	81.9	99.7
65+	**95.0**	89.5	100.0
Gender			
Women	**88.3**	79.7	96.8
Men	**93.3**	84.2	100.0
Race/ethnicity			
Black	**89.1**	76.5	100.0
White	**91.7**	84.8	98.6
Marital status			
Married	**88.5**	80.0	97.0
Not currently married	**96.4**	91.7	100.0
Education			
Less than high school	**100.0**	100.0	100.0
High school	**87.9**	77.5	98.2
Some college	**88.1**	75.4	100.0
College graduate	**99.6**	98.8	100.0
Employment status			
Employed	**89.1**	77.7	100.0
Not currently employed	**91.9**	84.8	99.0
Annual household income			
< $15,000	**94.2**	85.4	100.0
$15,000-$24,999	**88.5**	72.3	100.0
$25,000-$34,999	**96.1**	88.2	100.0
$35,000-$49,999	**74.4**	33.9	100.0
$50,000+	**91.7**	81.4	100.0

Figure 27. Prevalence of treatment for high total cholesterol by sociodemographic characteristics



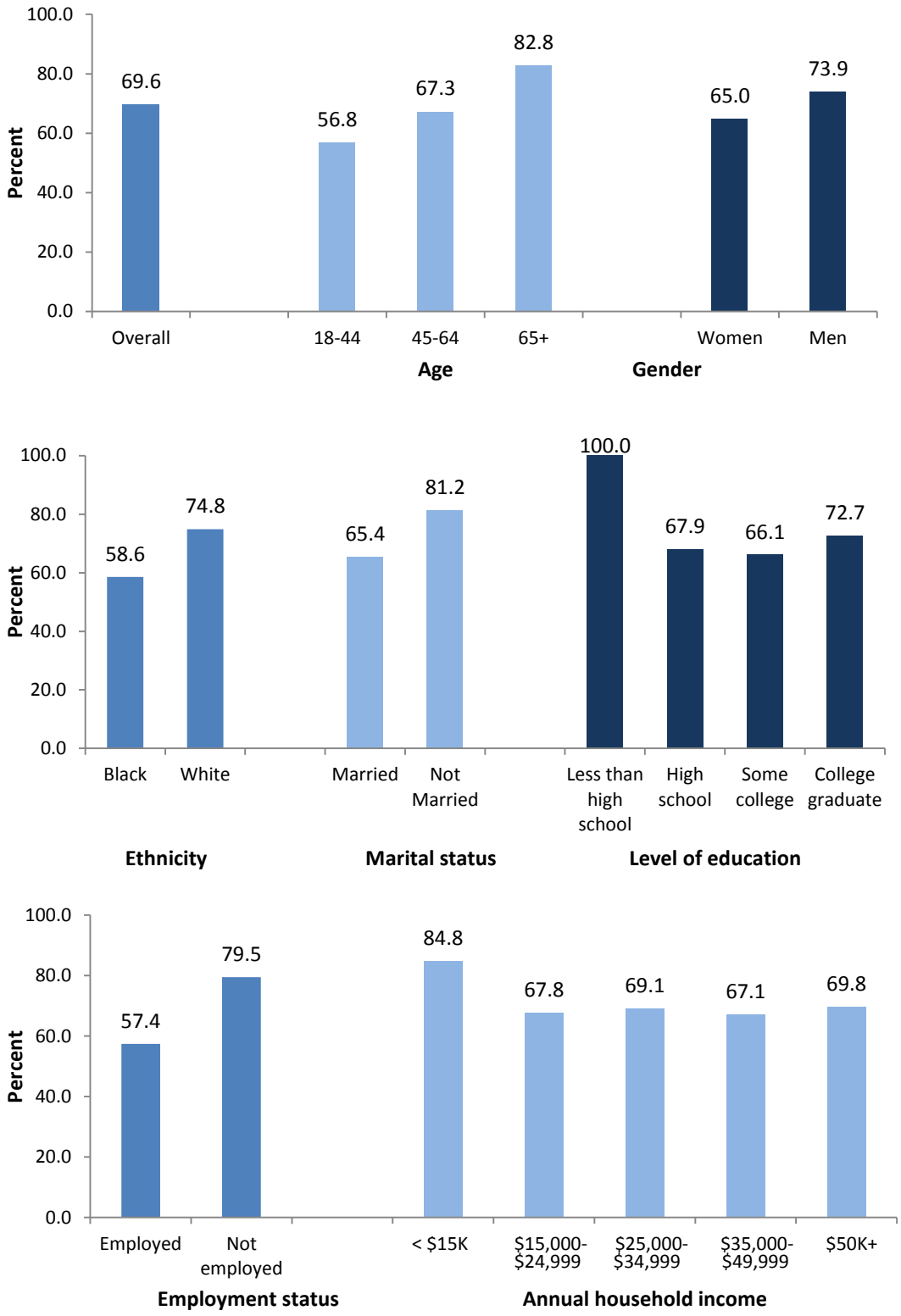
Control of High Total Cholesterol

Participants who were being treated for their high total cholesterol and who had blood total cholesterol lower than 240 mg/dL were considered as being under control for high total cholesterol. According to Table 27, 69.7 percent of participants with high total cholesterol were considered as being under control for it. Participants with less than high school graduate education level reported the highest prevalence of high total cholesterol that was considered as being under control.

Figure 27. Prevalence of control of high total cholesterol by sociodemographic characteristics

Control of high total cholesterol	%	95% CI Lower	95% CI Upper
Overall	**69.6**	59.7	79.6
Age (years)			
18-44	**56.8**	27.2	86.4
45-64	**67.3**	53.4	81.2
65+	**82.8**	73.0	92.7
Gender			
Women	**65.0**	51.8	78.2
Men	**73.9**	58.9	88.9
Race/ethnicity			
Black	**58.6**	41.1	76.1
White	**74.8**	63.1	86.6
Marital status			
Married	**65.4**	52.8	77.9
Not currently married	**81.2**	67.9	94.4
Education			
Less than high school	**100.0**	100.0	100.0
High school	**67.9**	53.3	82.5
Some college	**66.1**	48.5	83.7
College graduate	**72.7**	47.4	98.0
Employment status			
Employed	**57.4**	39.6	75.1
Not currently employed	**79.5**	69.8	89.2
Annual household income			
< $15,000	**84.8**	70.7	98.9
$15,000-$24,999	**67.8**	47.3	88.2
$25,000-$34,999	**69.1**	37.7	100.0
$35,000-$49,999	**67.1**	30.7	100.0
$50,000+	**69.8**	51.2	88.4

Figure 28. Prevalence of control of high total cholesterol by sociodemographic characteristics



5. Behavioral Risk Factors for Cardiovascular Disease

- Smoking Status
- Alcohol Consumption
- Nutrition
  - Calories
  - Carbohydrates
  - Protein
  - Fat
  - Dietary Cholesterol
  - Saturated Fatty Acid
  - Sodium Intake
- Physical Activity

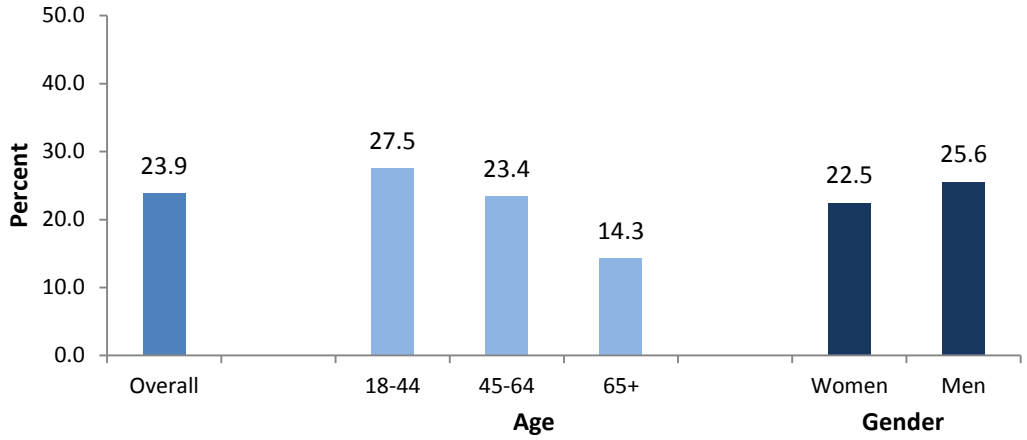
Smoking Status

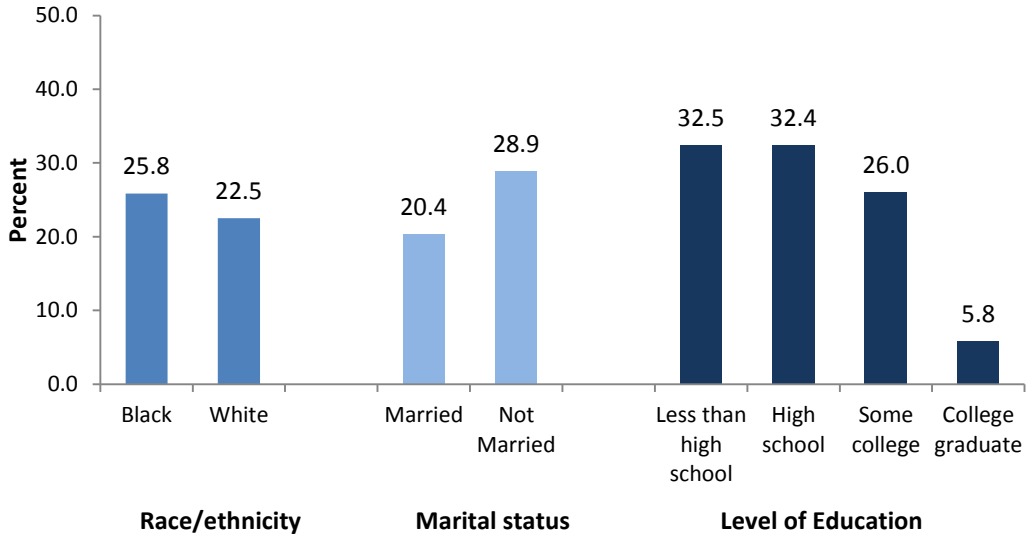
Cigarette smoking increases blood pressure, increases the tendency for the blood to clot, and decreases HDL cholesterol. Smoking raises the risk of heart disease by itself, but when it acts with other factors, it greatly increases the risk. According to Table 28, approximately 24 percent of MS Delta CHES participants smoked cigarettes at the time of survey. Participants with college graduate education level reported lower prevalence of smoking compared to those with high school graduate education level and some college degrees.

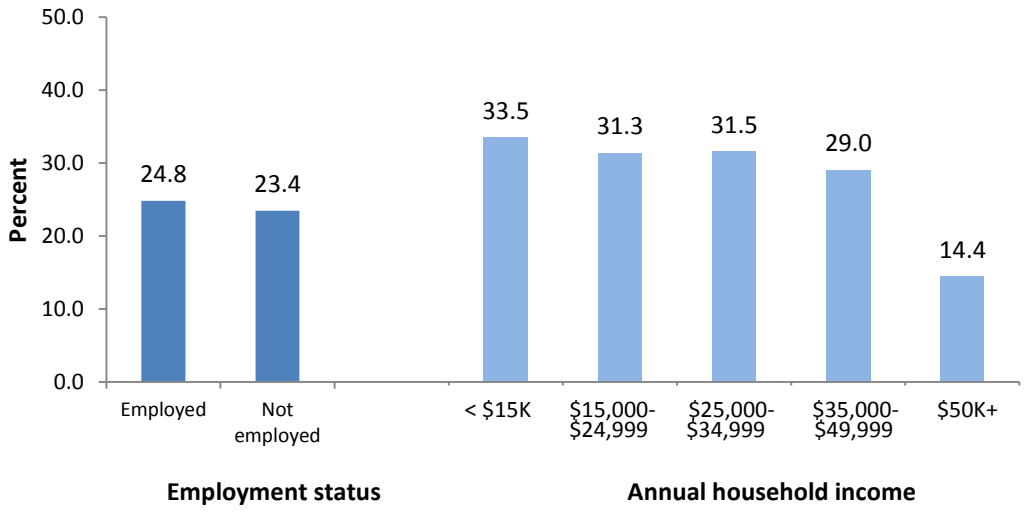
Table 28. Prevalence of smoking status by sociodemographic characteristics

Smoking	%	95% CI	
		Lower	Upper
Overall	**23.9**	18.4	29.4
Age (years)			
18-44	**27.5**	17.7	37.4
45-64	**23.4**	16.3	30.5
65+	**14.3**	6.7	21.9
Gender			
Women	**22.5**	15.6	29.4
Men	**25.6**	16.8	34.4
Race/ethnicity			
Black	**25.8**	17.9	33.8
White	**22.5**	14.7	30.3
Marital status			
Married	**20.4**	13.5	27.2
Not currently married	**28.9**	19.7	38.1
Education			
Less than high school	**32.5**	8.2	56.7
High school	**32.4**	23.3	41.5
Some college	**26.0**	15.3	36.7
College graduate	**5.8**	1.0	10.6
Employment status			
Employed	**24.8**	15.9	33.7
Not currently employed	**23.4**	16.8	30.1
Annual household income			
< $15,000	**33.5**	20.2	46.7
$15,000-$24,999	**31.3**	15.5	47.1
$25,000-$34,999	**31.5**	10.0	53.1
$35,000-$49,999	**29.0**	12.3	45.7
$50,000+	**14.4**	4.9	23.9

Figure 29. Prevalence of smoking status by sociodemographic characteristics







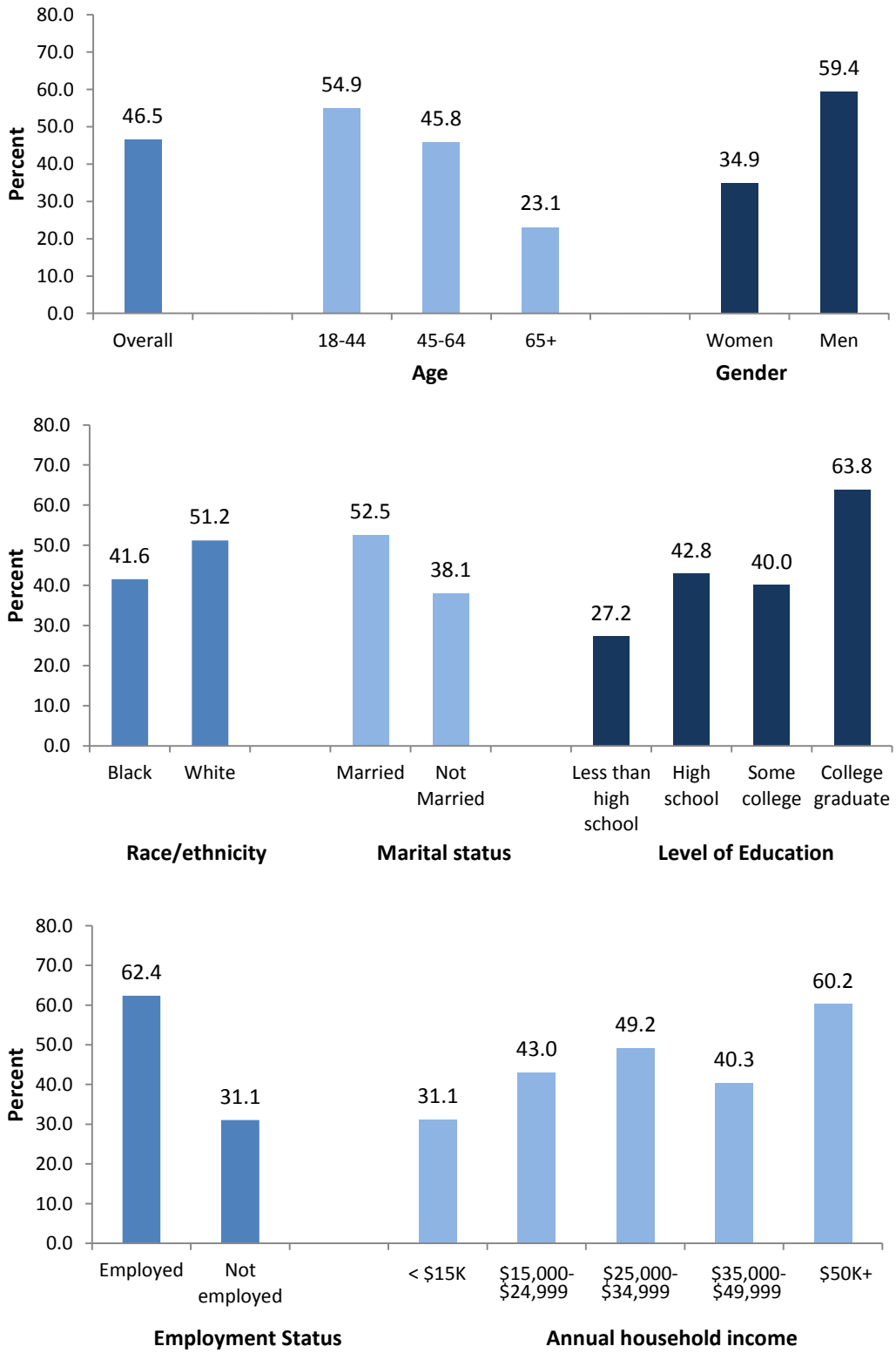
Alcohol Consumption

Excessive alcohol consumption can raise the levels of triglycerides and lead to hypertension, stroke, or heart failure. Some research has shown that wine, especially red wine, has potential benefits to reduce heart disease risk. However, the American Heart Association does not recommend drinking wine or any other form of alcohol to gain these potential benefits. According to Table 29, 46.5 percent of participants had consumed any alcohol during the past 30 days. Participants aged 18-44, men and those who were employed reported higher prevalence of alcohol consumption.

Table 29. Prevalence of alcohol consumption by sociodemographic characteristics

Alcohol consumption	%	95% CI	
		Lower	Upper
Overall	**46.5**	(39.8 ,	53.3)
Age (years)			
18-44	**54.9**	(43.5 ,	66.3)
45-64	**45.8**	(37.1 ,	54.5)
65+	**23.1**	(14.9 ,	31.4)
Gender			
Women	**34.9**	(27.1 ,	42.7)
Men	**59.4**	(49.4 ,	69.4)
Race/ethnicity			
Black	**41.6**	(32.1 ,	51.0)
White	**51.2**	(41.7 ,	60.7)
Marital status			
Married	**52.5**	(44.2 ,	60.9)
Not currently married	**38.1**	(26.9 ,	49.2)
Education			
Less than high school	**27.2**	(3.9 ,	50.6)
High school	**42.8**	(33.3 ,	52.3)
Some college	**40.0**	(26.7 ,	53.4)
College graduate	**63.8**	(51.4 ,	76.1)
Employment status			
Employed	**62.4**	(53.0 ,	71.7)
Not currently employed	**31.1**	(23.6 ,	38.5)
Annual household income			
< $15,000	**31.1**	(18.0 ,	44.3)
$15,000-$24,999	**43.0**	(24.0 ,	61.9)
$25,000-$34,999	**49.2**	(27.9 ,	70.4)
$35,000-$49,999	**40.3**	(22.0 ,	58.6)
$50,000+	**60.2**	(48.4 ,	72.1)

Figure 30. Prevalence of alcohol consumption by sociodemographic characteristics



Nutrition

To assess important CVD risk factors related to nutrition, the Delta CHES used a food frequency questionnaire (FFQ) developed by the Nutrition Assessment Shared Resource of Fred Hutchinson Cancer Research Center (Seattle, WA). The Delta CHES participants reported the frequency of consumption and portion size of approximately 120 line items over the past three months. Each line item was defined by a series of foods or beverages.

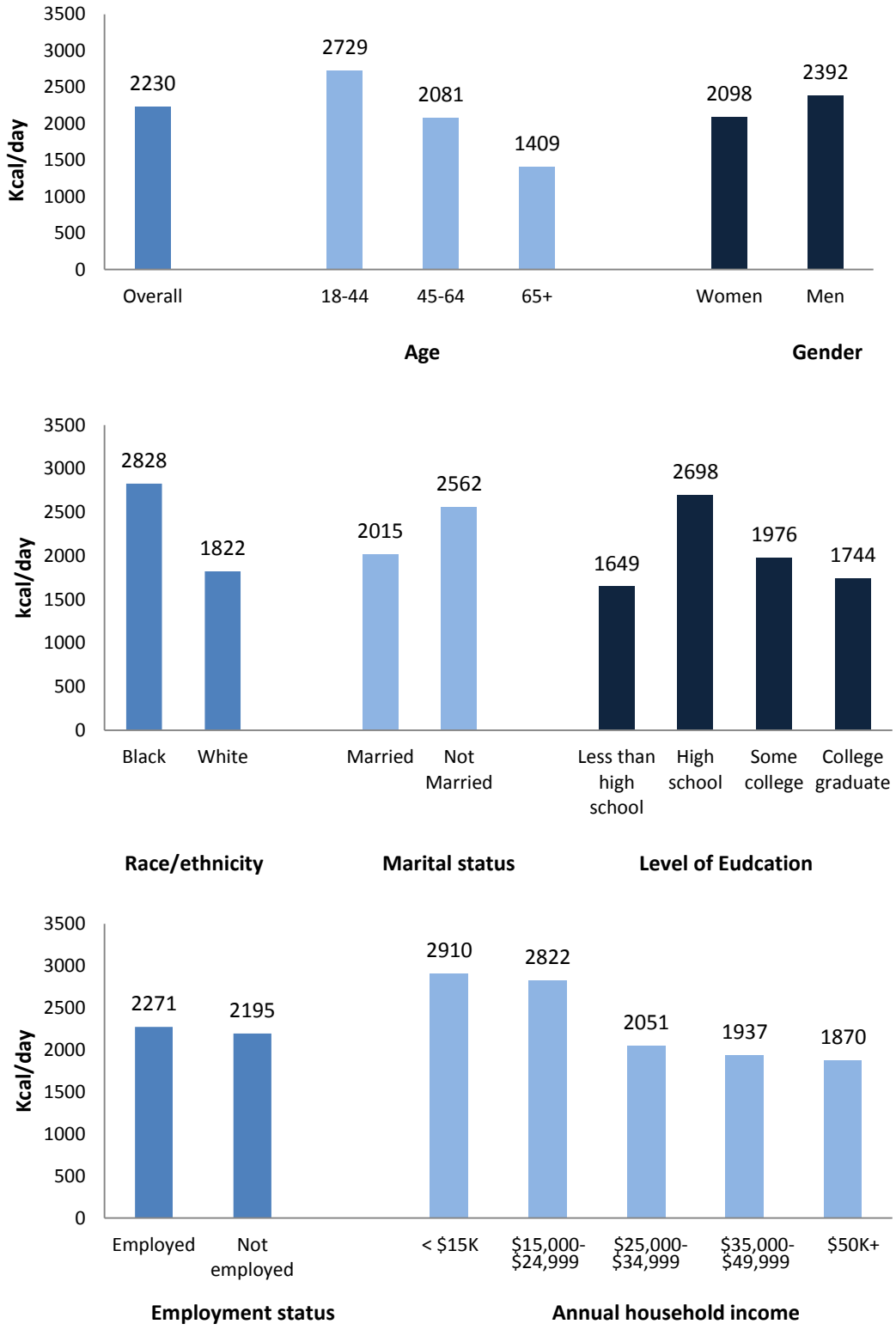
Calories

Calories (kcal) are the units of energy (heat) in the foods and beverages that a person consumes during a day. According to the Dietary Guidelines for Americans 2015-2020, women generally need 1,600 to 2,000 kcal per day to maintain a healthy body weight, while men usually need 2,000 to 3,000 kcal each day. According to Table 30, the average calories consumed during a day in Delta CHES participants was 2,230 kcal. The men were more likely to meet targets for the dietary calorie intake than the women did. Participants aged 18-44 compared to all other ages, and blacks tended to consume more calories.

Table 30. Mean dietary calorie intake by sociodemographic characteristics

Calories	Mean	95% CL	
		Lower	Upper
Overall	**2230.4**	(1915.2 ,	2545.5)
Age (years)			
18-44	**2728.8**	(2122.2 ,	3335.4)
45-64	**2081.2**	(1678.8 ,	2483.6)
65+	**1409.4**	(1264.1 ,	1554.7)
Gender			
Women	**2097.9**	(1798.5 ,	2397.3)
Men	**2392.4**	(1800.4 ,	2984.3)
Race/ethnicity			
Black	**2827.7**	(2119.0 ,	3536.3)
White	**1822.4**	(1608.5 ,	2036.4)
Marital status			
Married	**2015.3**	(1721.9 ,	2308.6)
Not currently married	**2561.5**	(1933.2 ,	3189.8)
Education			
Less than high school	**1648.6**	(1166.2 ,	2130.9)
High school	**2697.6**	(2051.5 ,	3343.6)
Some college	**1976.2**	(1624.0 ,	2328.5)
College graduate	**1744.0**	(1417.3 ,	2070.7)
Employment status			
Employed	**2271.4**	(1897.5 ,	2645.4)
Not currently employed	**2194.6**	(1705.3 ,	2683.8)
Annual household income			
< $15,000	**2909.9**	(1739.8 ,	4080.1)
$15,000-$24,999	**2822.3**	(1986.9 ,	3657.8)
$25,000-$34,999	**2051.3**	(1484.5 ,	2618.0)
$35,000-$49,999	**1936.7**	(1183.1 ,	2690.3)
$50,000+	**1870.4**	(1639.3 ,	2101.5)

Figure 31. Mean dietary calorie intake by sociodemographic characteristics



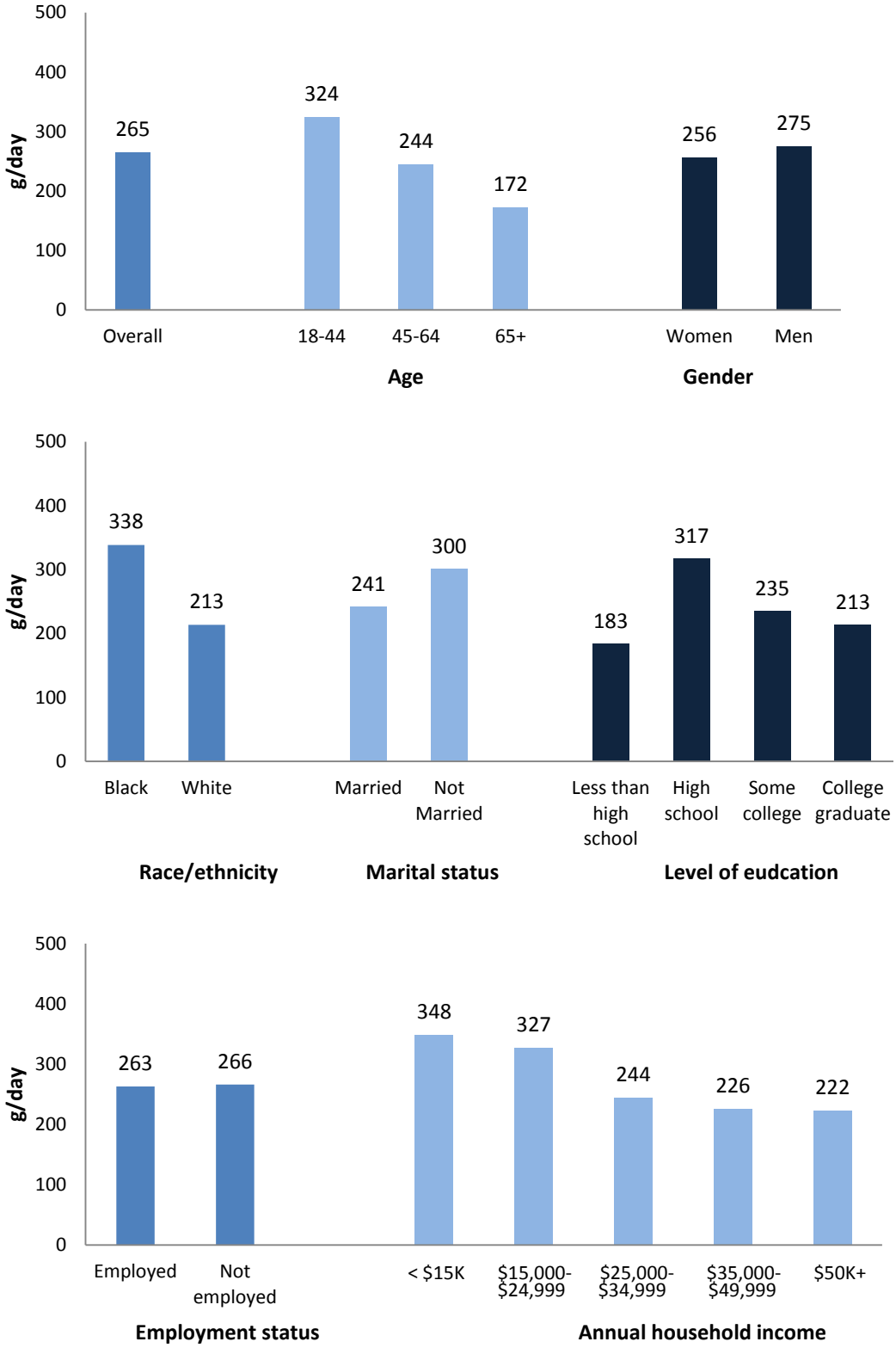
Carbohydrates

According to the Dietary Guidelines for Americans, 2015-2020, adults should consume 45 to 65 percent of their calorie intake as carbohydrates, at least 130 grams per day. According to Table 31, the mean of carbohydrate intake among the participants was 264.6 grams. Participants aged 18-44 year olds and blacks reported a higher mean of carbohydrate intake.

Table 31. Mean dietary carbohydrates intake by sociodemographic characteristics

Carbohydrates	Mean	95% CI	
		Lower	Upper
Overall	**264.6**	(225.7 ,	303.4)
Age (years)			
18-44	**323.8**	(250.7 ,	397.0)
45-64	**244.5**	(190.7 ,	298.2)
65+	**172.5**	(153.4 ,	191.6)
Gender			
Women	**256.0**	(220.2 ,	291.8)
Men	**275.1**	(200.8 ,	349.3)
Race/ethnicity			
Black	**338.4**	(250.3 ,	426.5)
White	**213.3**	(188.4 ,	238.2)
Marital status			
Married	**241.3**	(202.2 ,	280.3)
Not currently married	**300.5**	(225.0 ,	375.9)
Education			
Less than high school	**183.4**	(123.8 ,	243.0)
High school	**316.7**	(234.9 ,	398.5)
Some college	**234.7**	(198.7 ,	270.6)
College graduate	**212.9**	(166.2 ,	259.7)
Employment status			
Employed	**263.0**	(219.8 ,	306.2)
Not currently employed	**266.0**	(203.7 ,	328.2)
Annual household income			
< $15,000	**348.0**	(205.7 ,	490.3)
$15,000-$24,999	**327.3**	(218.6 ,	436.1)
$25,000-$34,999	**243.8**	(172.2 ,	315.4)
$35,000-$49,999	**225.6**	(154.3 ,	296.8)
$50,000+	**222.1**	(188.1 ,	256.1)

Figure 32. Mean dietary carbohydrates intake by sociodemographic characteristics



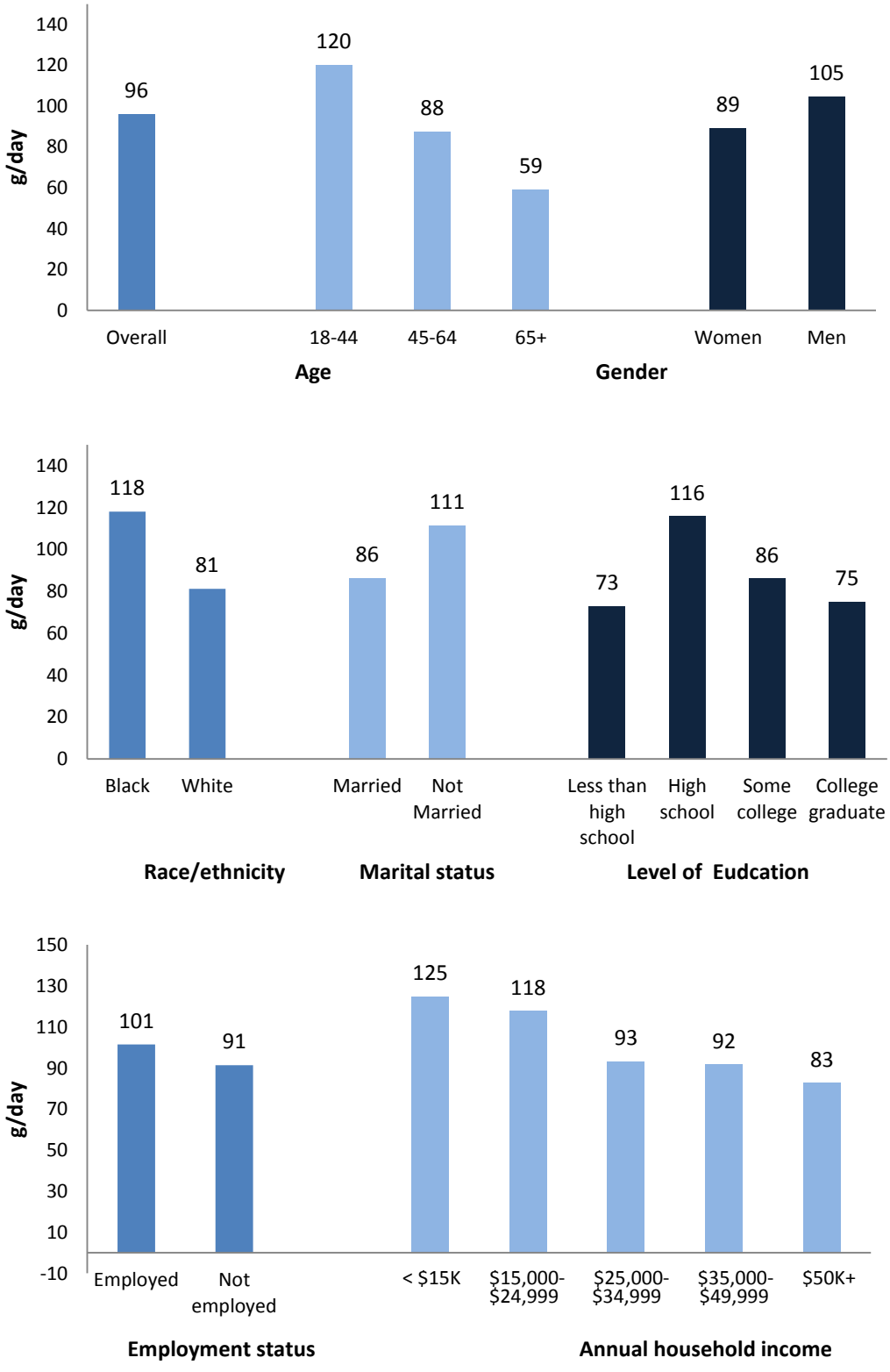
Protein

Protein is needed for the growth, maintenance, and energy of the human body. The recommended protein intake is 46 grams for women and 56 gram for men (Dietary Guidelines for Americans, 2015-2020). According to Table 32, the average of protein intake among the participants was much higher (96.1 grams) than the recommended amount (46-56 grams). Participants aged 18-44 year olds compared to those aged 65 and over, reported higher mean of protein intake.

Table 32. Mean dietary protein intake by sociodemographic characteristics

Protein	Mean	95% CI	
		Lower	Upper
Overall	**96.1**	81.8	110.3
Age (years)			
18-44	**120.2**	91.8	148.5
45-64	**87.6**	72.3	102.9
65+	**59.3**	52.2	66.4
Gender			
Women	**89.0**	76.1	102.0
Men	**104.7**	77.8	131.6
Race/ethnicity			
Black	**118.1**	86.6	149.5
White	**81.2**	70.0	92.4
Marital status			
Married	**86.2**	74.2	98.2
Not currently married	**111.3**	81.9	140.6
Education			
Less than high school	**72.9**	51.5	94.2
High school	**115.8**	87.2	144.4
Some college	**86.0**	67.8	104.2
College graduate	**74.9**	61.7	88.0
Employment status			
Employed	**101.5**	84.3	118.6
Not currently employed	**91.4**	69.7	113.0
Annual household income			
< $15,000	**124.6**	68.1	181.1
$15,000-$24,999	**117.6**	84.9	150.2
$25,000-$34,999	**93.1**	64.0	122.3
$35,000-$49,999	**91.5**	50.8	132.2
$50,000+	**82.5**	71.6	93.5

Figure 33. Percentage of protein intake by sociodemographic characteristics



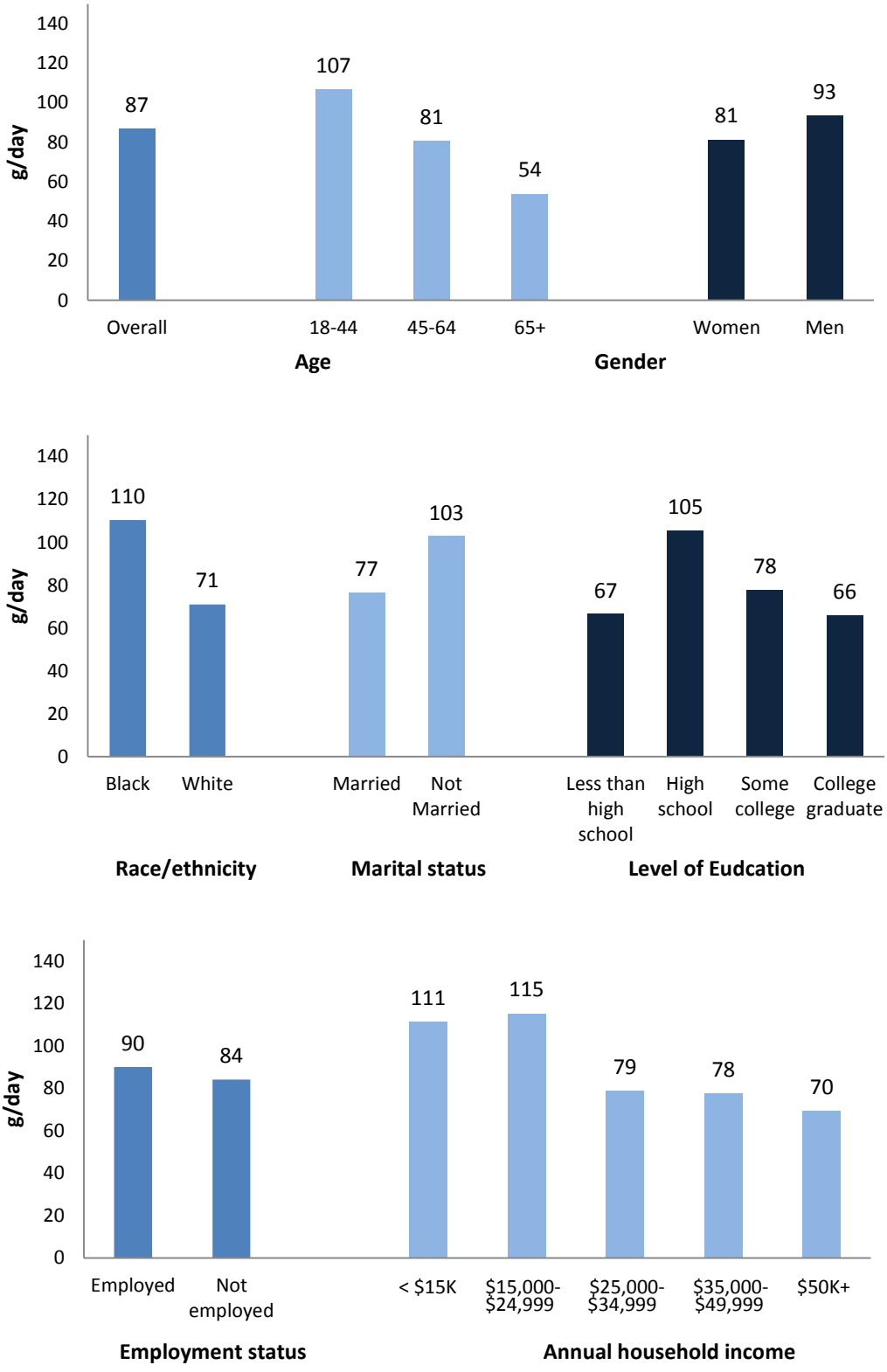
Fat

Dietary Guidelines for Americans, 2015-2020 recommends that adults should consume 20 to 35 percent of their total calories from fat to meet the body's daily nutritional requirements. It would be 53 -65 grams for intake of range of 1600 -2000 calories per day for women and 65-80 grams for intake of range of 2000-3000 calories per day for men. According to Table 33, the mean fat intake reported by the CHES participants was 86.9 grams. Participants aged 18-44 compared to those aged 65 and over, blacks, those with high school graduate education level compared to participants with college graduate degree, and those with an annual household income of $15,000-$24,999 compared to participants with an annual household income of $50,000, reported higher mean of fat intake.

Table 33. Mean dietary fat intake by sociodemographic characteristics

Fat	Mean	95% CL	
		Lower	Upper
Overall	**86.9**	(74.7 ,	99.1)
Age (years)			
18-44	**107.0**	(82.8 ,	131.3)
45-64	**80.7**	(67.0 ,	94.3)
65+	**54.0**	(47.3 ,	60.8)
Gender			
Women	**81.5**	(68.9 ,	94.1)
Men	**93.5**	(71.4 ,	115.5)
Race/ethnicity			
Black	**110.4**	(83.7 ,	137.0)
White	**71.0**	(61.8 ,	80.2)
Marital status			
Married	**76.5**	(66.3 ,	86.7)
Not currently married	**102.8**	(78.0 ,	127.6)
Education			
Less than high school	**66.5**	(47.4 ,	85.7)
High school	**105.4**	(81.7 ,	129.2)
Some college	**77.8**	(61.4 ,	94.1)
College graduate	**66.1**	(54.6 ,	77.5)
Employment status			
Employed	**90.0**	(73.3 ,	106.7)
Not currently employed	**84.1**	(66.8 ,	101.4)
Annual household income			
< $15,000	**111.4**	(67.8 ,	155.0)
$15,000-$24,999	**115.4**	(84.2 ,	146.6)
$25,000-$34,999	**78.9**	(57.2 ,	100.5)
$35,000-$49,999	**77.8**	(41.6 ,	113.9)
$50,000+	**69.6**	(62.0 ,	77.2)

Figure 34. Mean dietary fat intake by sociodemographic characteristics



Saturated Fatty Acids

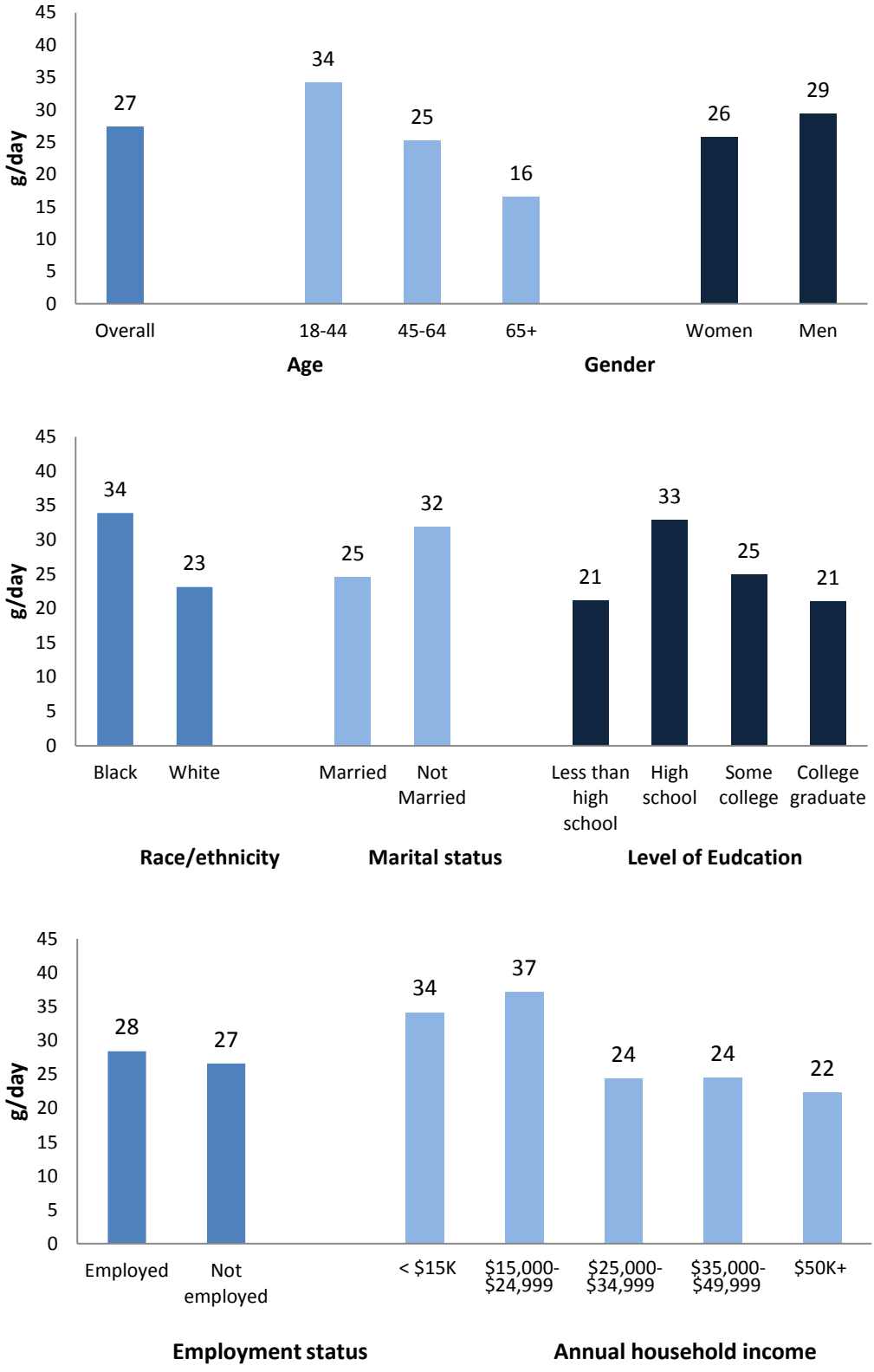
Saturated fatty acids can raise LDL cholesterol. Foods that are high in saturated fat include fatty meats, lard, and full-fat dairy products, such as butter and cream, coconuts, coconut oil, palm oil, and palm kernel oil. Saturated fatty acid intake should be less than 10 percent of calories in order to minimize the risk for chronic disease. The American Heart Association (AHA) recommends reducing saturated fat to no more than 5 to 6 percent of total calories in order to lower the level of LDL cholesterol, which is about 11 to 13 grams of saturated fat in an adult diet of 2,000 calories per day.

According to Table 34, the mean of saturated fatty acids intake reported by the participants was 27.4 grams. Participants aged 18-64 compared to those aged 65 and over, participants with high school graduate education level compared to those with college graduate degree, and participants with an annual household income of $15,000-$24,999 compared to those with an annual household income of $50,000 and more, reported higher mean prevalence of saturated fatty acids intake.

Table 34. Mean dietary saturated fatty acids intake by sociodemographic characteristics

Saturate fatty acids	Mean	95% CI	
		Lower	Upper
Overall	**27.4**	23.4	31.4
Age (years)			
18-44	**34.3**	26.6	41.9
45-64	**25.3**	20.4	30.1
65+	**16.5**	14.4	18.6
Gender			
Women	**25.8**	21.7	29.9
Men	**29.4**	22.2	36.7
Race/ethnicity			
Black	**33.9**	25.2	42.6
White	**23.1**	19.8	26.4
Marital status			
Married	**24.6**	21.0	28.1
Not currently married	**31.9**	23.9	39.9
Education			
Less than high school	**21.2**	14.7	27.7
High school	**32.9**	24.9	40.9
Some college	**24.9**	19.8	30.0
College graduate	**21.0**	17.4	24.6
Employment status			
Employed	**28.4**	23.1	33.8
Not currently employed	**26.6**	20.8	32.4
Annual household income			
< $15,000	**34.1**	20.1	48.1
$15,000-$24,999	**37.1**	26.7	47.5
$25,000-$34,999	**24.3**	17.5	31.2
$35,000-$49,999	**24.4**	13.2	35.6
$50,000+	**22.3**	19.8	24.8

Figure 35. Mean dietary saturated fatty acids intake by sociodemographic characteristics



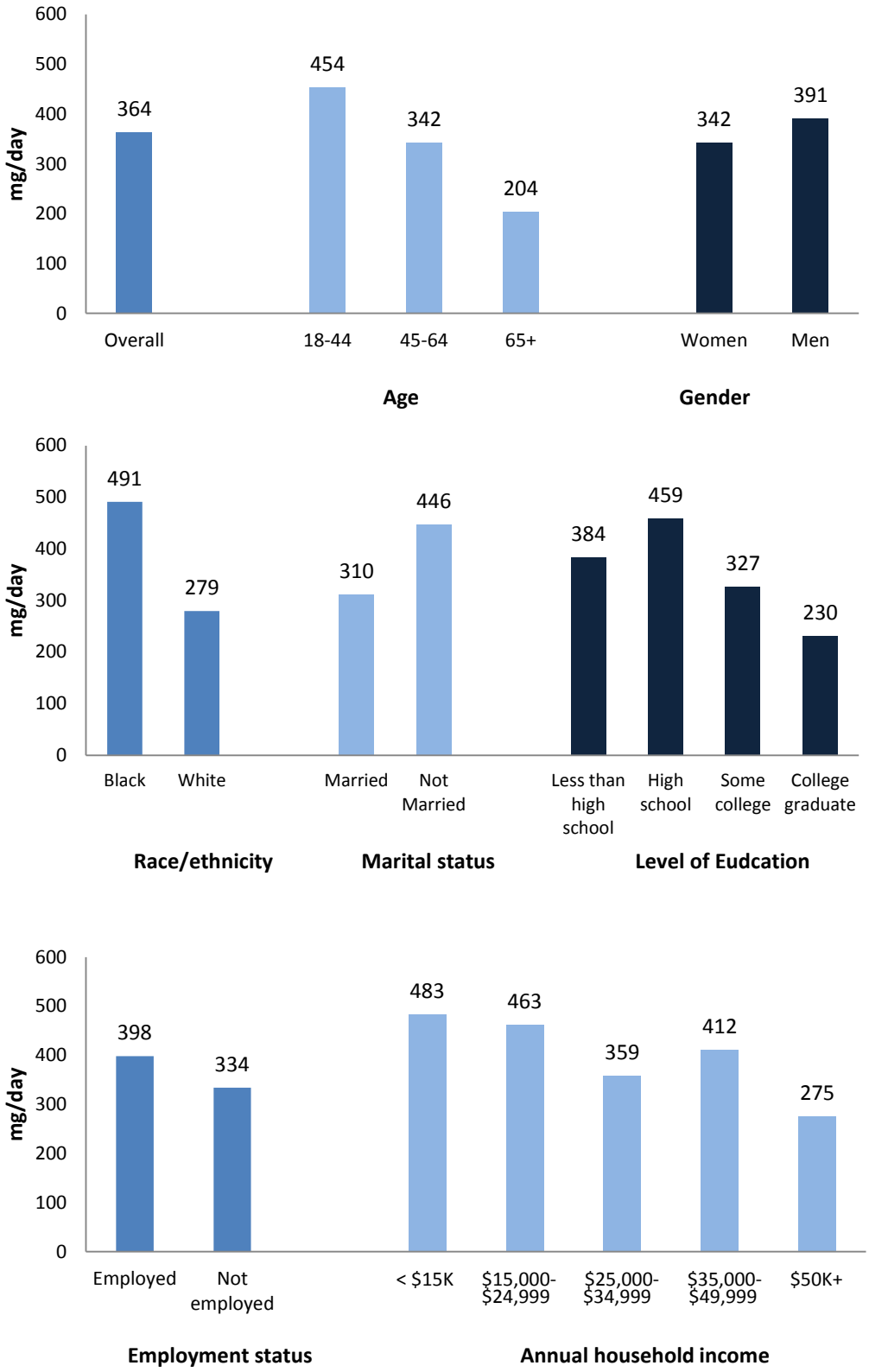
Dietary Cholesterol

Dietary cholesterol refers to the cholesterol derived from foods consumed. The Dietary Guidelines for Americans recommended that cholesterol intake be limited to no more than 300 mg per day. According to Table 34, the mean dietary cholesterol intake reported by the participants was 364 mg. Participants with high school graduate education level compared to those with college graduate degree, reported higher mean of dietary cholesterol intake.

Table 35. Mean dietary cholesterol intake by sociodemographic characteristics

Dietary cholesterol	Mean	95% CL	
		Lower	Upper
Overall	**364.0**	(301.6 ,	426.4)
Age (years)			
18-44	**454.2**	(325.2 ,	583.2)
45-64	**342.2**	(275.6 ,	408.7)
65+	**203.6**	(164.3 ,	242.8)
Gender			
Women	**341.8**	(274.4 ,	409.2)
Men	**391.1**	(280.0 ,	502.3)
Race/ethnicity			
Black	**490.9**	(351.9 ,	629.9)
White	**279.3**	(239.2 ,	319.3)
Marital status			
Married	**310.5**	(251.5 ,	369.4)
Not currently married	**446.4**	(323.7 ,	569.0)
Education			
Less than high school	**383.6**	(115.1 ,	652.0)
High school	**459.0**	(339.1 ,	578.8)
Some college	**326.6**	(242.3 ,	410.8)
College graduate	**230.3**	(186.8 ,	273.9)
Employment status			
Employed	**398.3**	(304.3 ,	492.2)
Not currently employed	**334.1**	(252.3 ,	415.8)
Annual household income			
< $15,000	**482.8**	(267.8 ,	697.9)
$15,000-$24,999	**462.6**	(318.2 ,	607.0)
$25,000-$34,999	**358.8**	(184.4 ,	533.2)
$35,000-$49,999	**411.6**	(108.2 ,	714.9)
$50,000+	**275.2**	(227.7 ,	322.7)

Figure 36. Mean dietary cholesterol intake by sociodemographic characteristics



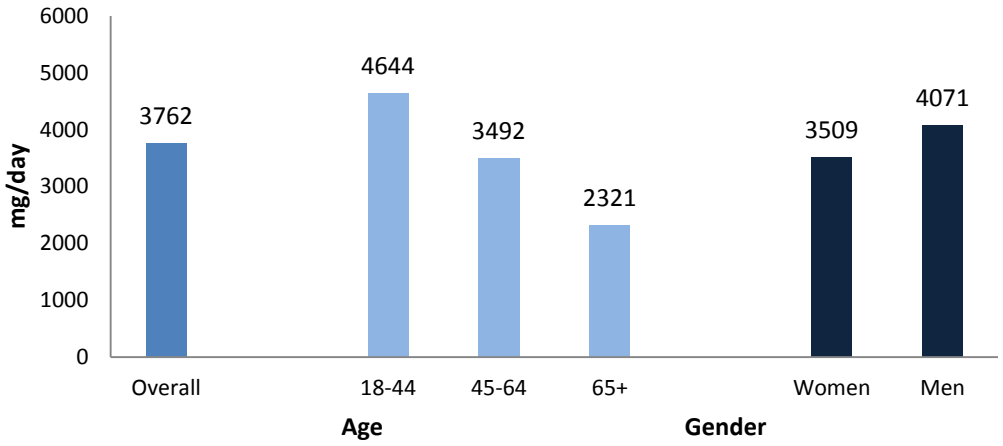
Sodium Intake

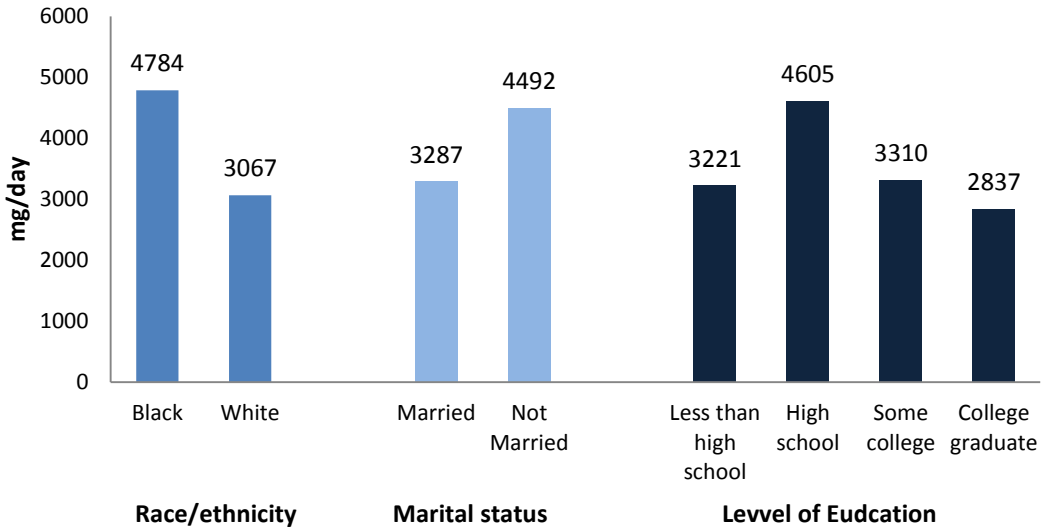
In excess, sodium is associated with several adverse health effects, particularly hypertension. Dietary Guidelines for Americans recommend that Americans consume less than 2,300 mg of sodium per day as part of a healthy eating pattern. According to Table 36, the mean sodium intake reported by the participants was 3761.6 mg. Participants aged 18-64 compared to those aged 65 and over, blacks, those in high school compared to participants with college graduate degree and those with an annual household income of $15,000-$24,999 compared to participants with an annual household income of $50,000, reported higher mean of sodium intake.

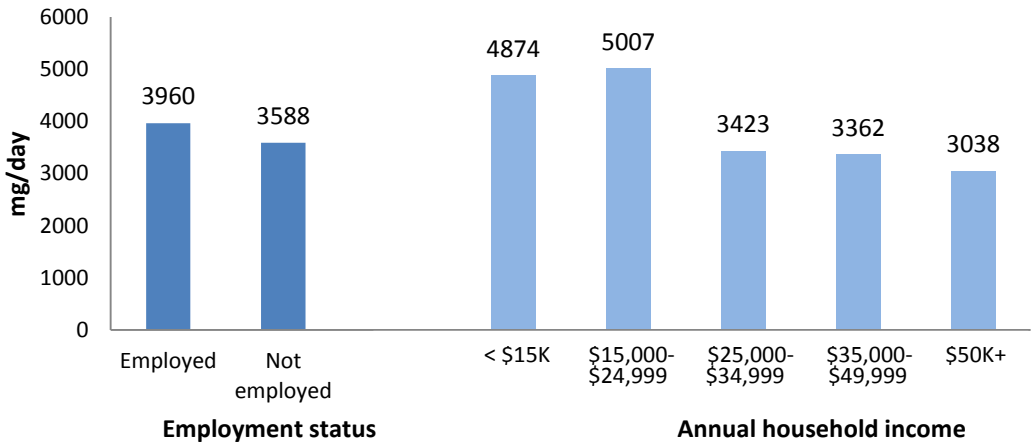
Table 36. Mean dietary sodium intake by sociodemographic characteristics

Sodium intake	Mean	95% CL	
		Lower	Upper
Overall	**3761.6**	(3209.4 ,	4313.9)
Age (years)			
18-44	**4644.0**	(3585.8 ,	5702.2)
45-64	**3491.9**	(2837.3 ,	4146.5)
65+	**2321.4**	(2052.4 ,	2590.3)
Gender			
Women	**3508.6**	(2980.3 ,	4036.8)
Men	**4071.2**	(3050.9 ,	5091.6)
Race/ethnicity			
Black	**4784.3**	(3645.6 ,	5922.9)
White	**3066.9**	(2524.9 ,	3609.0)
Marital status			
Married	**3287.3**	(2800.4 ,	3774.2)
Not currently married	**4491.9**	(3415.3 ,	5568.6)
Education			
Less than high school	**3221.2**	(2319.8 ,	4122.7)
High school	**4604.7**	(3570.5 ,	5638.8)
Some college	**3310.2**	(2434.9 ,	4185.5)
College graduate	**2837.0**	(2305.9 ,	3368.1)
Employment status			
Employed	**3960.2**	(3196.2 ,	4724.1)
Not currently employed	**3588.5**	(2817.4 ,	4359.6)
Annual household income			
< $15,000	**4874.0**	(3025.7 ,	6722.3)
$15,000-$24,999	**5007.3**	(3576.5 ,	6438.2)
$25,000-$34,999	**3422.7**	(2277.9 ,	4567.4)
$35,000-$49,999	**3362.0**	(1845.6 ,	4878.4)
$50,000+	**3038.3**	(2666.9 ,	3409.8)

Table 37. Mean dietary sodium intake by sociodemographic characteristics







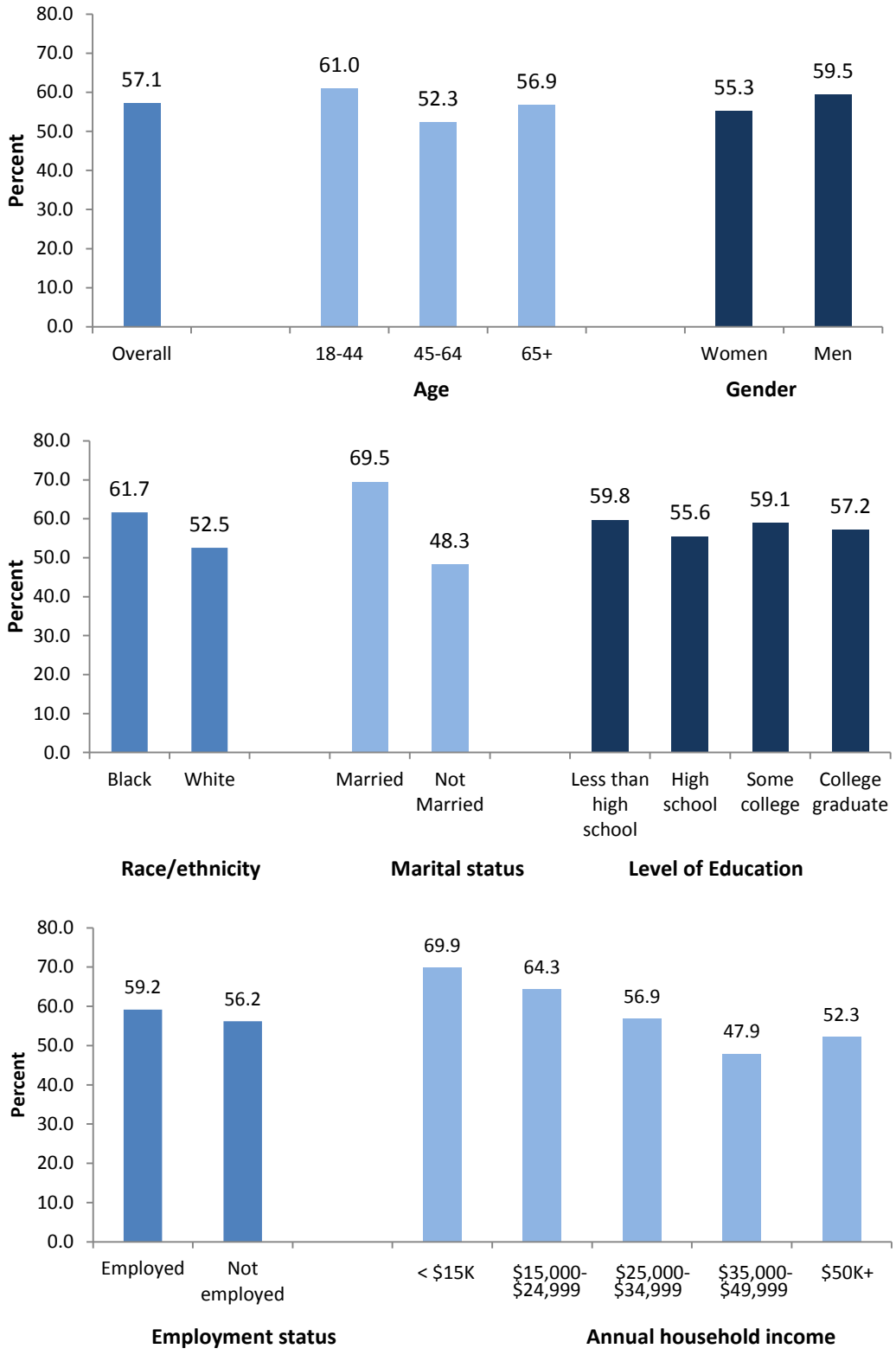
Physical Activity

To improve health, regardless of age, the 2008 Physical Activity Guidelines for Americans recommends at least 150 minutes per week of moderate-intensity physical activity, or 75 minutes per week of vigorous intensity aerobic physical activity, or an equivalent combination of moderate- and vigorous-intensity aerobic activity. According to Table 37, 57.1 percent of participants reached physical activity targets. Married participants reported higher prevalence of physical activity.

Table 37. Percentage of exercising >150 min physical activity by sociodemographic characteristics

>150 min physical activity	%	95% CL	
		Lower	Upper
Overall	**57.1**	(50.7 ,	63.6)
Age (years)			
18-44	**61.0**	(50.0 ,	72.0)
45-64	**52.3**	(43.7 ,	60.9)
65+	**56.9**	(46.7 ,	67.0)
Gender			
Women	**55.3**	(47.3 ,	63.2)
Men	**59.5**	(49.1 ,	69.9)
Race/ethnicity			
Black	**61.7**	(52.8 ,	70.6)
White	**52.5**	(43.1 ,	62.0)
Marital status			
Married	**69.5**	(61.2 ,	77.9)
Not currently married	**48.3**	(39.9 ,	56.8)
Education			
Less than high school	**59.8**	(36.1 ,	83.4)
High school	**55.6**	(46.5 ,	64.7)
Some college	**59.1**	(46.8 ,	71.3)
College graduate	**57.2**	(43.4 ,	71.1)
Employment status			
Employed	**59.2**	(51.4 ,	66.9)
Not currently employed	**56.2**	(46.0 ,	66.4)
Annual household income			
< $15,000	**69.9**	(57.9 ,	81.8)
$15,000-$24,999	**64.3**	(49.5 ,	79.2)
$25,000-$34,999	**56.9**	(35.0 ,	78.8)
$35,000-$49,999	**47.9**	(29.8 ,	66.0)
$50,000+	**52.3**	(39.6 ,	64.9)

Figure 38. Percentage of exercising >150 min physical activity by sociodemographic characteristics



6. Accessibility of Healthcare Facilities

Cardiovascular disease (CVD) requires the frequent use of healthcare services, comprehensive services, and personalized services. The accessibility of healthcare facilities is an important factor in the effective management and continuity of care of CVD.

Health Insurance Coverage

Financial Barrier to Health Care Access

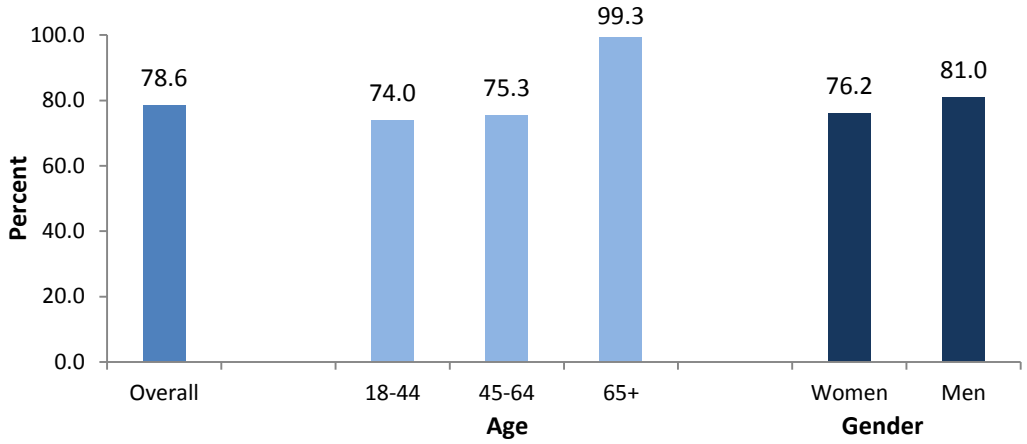
Health Insurance Coverage

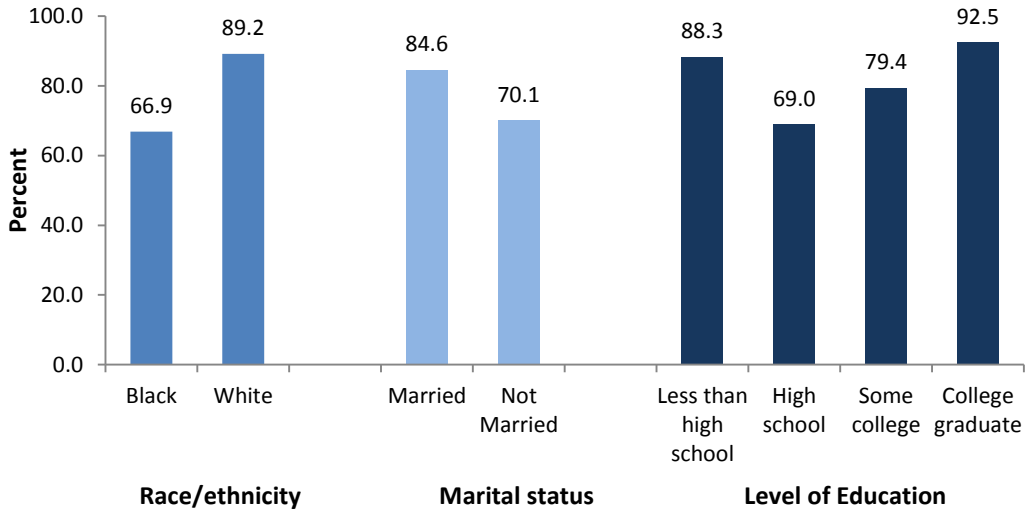
One of key barriers to health care access is not having health insurance coverage. Participants were considered to have health insurance if they reported the following: either their own or their partner's employment health insurance, their parents, someone else, Medicare, Medicaid, or other sources. According to Table 38, 78.6 percent of participants had health insurance. Participants aged 65 and over compared to all other ages, whites, those with college graduate and higher education level compared to those with high school graduate education level, and those with an annual household income of $35,000 and higher compared to those with an annual income less than $15,000, reported higher prevalence of having health insurance.

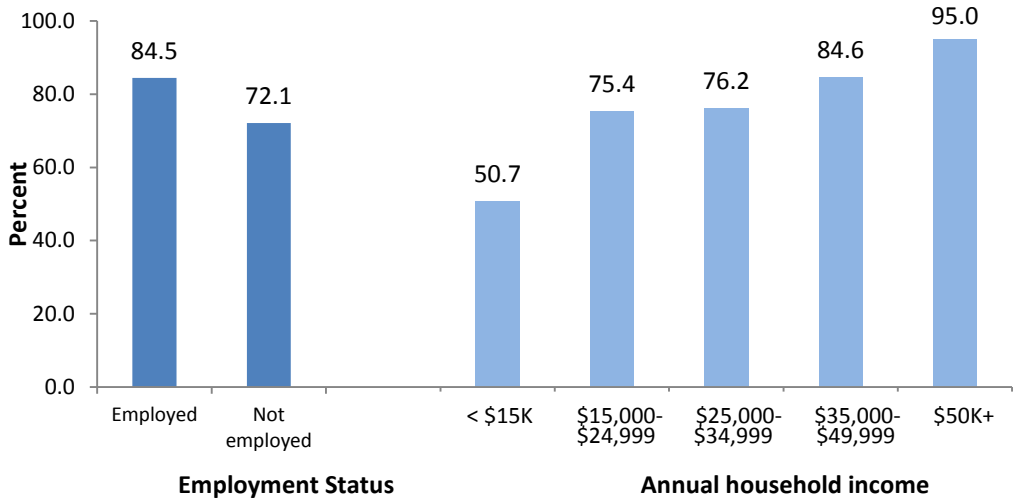
Table 38. Percentage of having health insurance coverage by sociodemographic characteristics

Health insurance	%	95% CI	
		Lower	Upper
Overall	**78.6**	(72.7 ,	84.5)
Age (years)			
18-44	**74.0**	(63.6 ,	84.4)
45-64	**75.3**	(67.5 ,	83.2)
65+	**99.3**	(98.1 ,	100.0)
Gender			
Women	**76.2**	(68.3 ,	84.1)
Men	**81.0**	(72.3 ,	89.7)
Race/ethnicity			
Black	**66.9**	(57.2 ,	76.5)
White	**89.2**	(83.3 ,	95.1)
Marital status			
Married	**84.6**	(77.9 ,	91.2)
Not currently married	**70.1**	(59.8 ,	80.4)
Education			
Less than high school	**88.3**	(71.3 ,	100.0)
High school	**69.0**	(59.7 ,	78.2)
Some college	**79.4**	(67.7 ,	91.1)
College graduate	**92.5**	(85.4 ,	99.7)
Employment status			
Employed	**84.5**	(76.8 ,	92.1)
Not currently employed	**72.1**	(63.5 ,	80.7)
Annual household income			
< $15,000	**50.7**	(35.2 ,	66.2)
$15,000-$24,999	**75.4**	(62.3 ,	88.4)
$25,000-$34,999	**76.2**	(54.9 ,	97.5)
$35,000-$49,999	**84.6**	(71.3 ,	97.8)
$50,000+	**95.0**	(87.3 ,	100.0)

Figure 39. Percentage of having health insurance coverage by sociodemographic characteristics







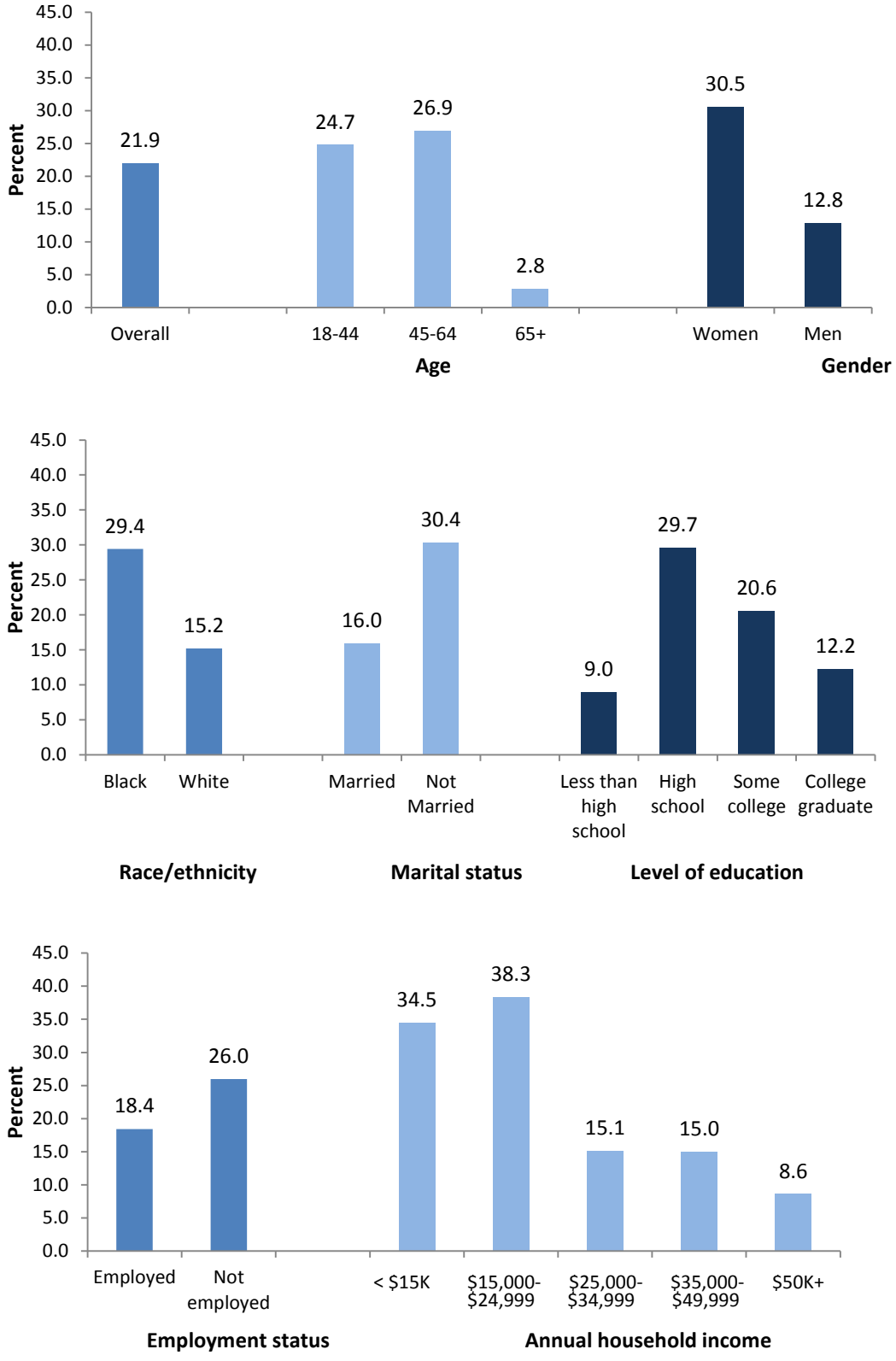
Financial Barrier to Health Care Access

If participants could not see a doctor in the past 12 months because of the cost, even if they needed to, they were considered to have a financial barrier to health care access. According to Table 39, approximately 22 percent of participants could not visit a doctor in the past 12 months because of the cost, even when they needed to. Participants aged 18-64 compared to those aged 65 and over, those with high school graduate education level compared to participants with college graduate degree, and those with an annual household income less than $25,000 compared to participants with an annual household income of $50,000 and more, reported higher prevalence of a financial barrier to health care access.

Table 39. Percentage of having financial barrier to health care access by sociodemographic characteristics

Financial barrier to health care access	%	95% CI	
		Lower	Upper
Overall	**21.9**	16.8	27.1
Age (years)			
18-44	**24.7**	15.6	33.8
45-64	**26.9**	19.6	34.2
65+	**2.8**	0.5	5.1
Gender			
Women	**30.5**	23.1	37.9
Men	**12.8**	6.2	19.4
Race/ethnicity			
Black	**29.4**	21.1	37.8
White	**15.2**	9.1	21.3
Marital status			
Married	**16.0**	10.1	21.8
Not currently married	**30.4**	21.1	39.6
Education			
Less than high school	**9.0**	0.0	25.5
High school	**29.7**	21.2	38.1
Some college	**20.6**	11.4	29.8
College graduate	**12.2**	3.7	20.8
Employment status			
Employed	**18.4**	11.0	25.9
Not currently employed	**26.0**	18.9	33.1
Annual household income			
< $15,000	**34.5**	21.3	47.7
$15,000-$24,999	**38.3**	22.0	54.6
$25,000-$34,999	**15.1**	1.3	29.0
$35,000-$49,999	**15.0**	2.0	28.0
$50,000+	**8.6**	1.4	15.8

Figure 40. Percentage of having financial barrier to health care access by sociodemographic characteristics



7. Summary

Mississippi's CVD mortality is the highest in the U.S. Over 40 percent of deaths in Mississippi are due to CVD and it is the leading cause of death in the state. The 18 counties in the Mississippi Delta region consistently rank among the most disadvantaged areas in the nation, with over 35 percent of its population in the 12 out of 18 counties living below the federal poverty level.

Despite the heightened efforts to bridge the disparity gap between MS Delta region and the rest of Mississippi and/or United State, the persistent higher prevalence of CVD among the residents in MS Delta region is of great concern.

This report provides the potential value of the health status and the risk factors for CVD in the disadvantaged areas. It can also provide the foundation for future studies to improve health of this population and to prevent the important health problems. Major findings from the descriptive, not associational, analyses of the MS Delta CHES data included:

First, the prevalence of chronic vascular disease was higher among whites than blacks. The prevalence rates of CVD were 19.3 percent and 6.5 percent, those of heart attack were 4.9 percent and 2.1 percent, those of CHD were 13.4 percent and 3.3 percent, those of stroke were 5.7 percent and 4.4 percent, and those of cardiovascular heart failure were 5.9 percent and 2.4 percent among whites than blacks, respectively. Whites in the MS Delta region were characterized to be physically inactive. One in two whites did not reach physical activity targets – at least 150 minutes per week of moderate intensity physical activity – while one in three in blacks did not. More intensive programs are needed for the whites.

Second, among the MS Delta CHES participants, 42.8 percent had hypertension, 21.8 percent had diabetes, 29.8 percent had elevated total cholesterol, 18.4 percent had elevated LDL cholesterol, 28.8 percent had elevated triglycerides, and 74.5 percent were overweight or obese. The much higher prevalence rates of biological risk factors in the MS Delta CHES than those in MS can affect higher prevalence rates of chronic diseases including CVD and increase the health disparities.

Third, awareness of their own risk factors and treatment for those are the most important step to prevent CVD. Those who were unaware of their own health risk were more likely to engage unhealthy behavior. Approximately 95 percent in MS Delta region were aware that they had high blood pressure, 74 percent

of diabetes participants were aware that they had high blood sugar, and 90 percent of participants with total cholesterol of 240 mg/dL or higher were aware of their high total cholesterol.

Fourth, the residents in MS Delta region engaged in unbalanced dietary intakes. To minimize the risk for chronic disease, it is important to meet the body's daily nutrition needs. However, the majority of participants was more likely to consume carbohydrates, fats, proteins, dietary cholesterols, and saturated fatty acids than recommended amounts from Dietary Guidelines for Americans, 2015-2020. According to researches, adults with hypertension are recommended to reduce sodium intake to less than 1,500 mg per day for lowering blood pressure. Although the MS Delta residents had a high prevalence rate for hypertension, they consumed an average of 3,762 mg of sodium per day. Therefore, more attention needs to be placed on promoting healthy dietary intake behavior.

Lastly, a barrier to healthcare access among the at-risk population was more likely among blacks than whites. Among blacks with CVD, 36.7 percent could not see a doctor in the past 12 months because of the cost even when they needed to, compared to 8.3 percent of whites with CVD. This pattern persisted for other risk factors such as hypertension and diabetes (30 percent of blacks and 14 percent of whites counterparts for hypertension; 33 percent of blacks and 13 percent of whites counterparts for diabetes).

This report provides many health issues in the MS Delta region; it can be used to develop CVD control strategies at the regional level and to conduct the health educational interventions to promote health in the MS Delta region.

Abbreviations

NIH: National Institute of Health
NCCDPHP: National Center for Chronic Disease Prevention and Health Promotion
CVD: Cardiovascular Disease
MS: Mississippi
MSDH: Mississippi State Department of Health
CHES: Cardiovascular Health Examination Survey
NHANES: National Health and Nutrition Examination Survey
BRFSS: Behavioral Risk Factor Surveillance System
CHD: Coronary heart disease
CHF: Congestive heart failure
SBP: Systolic Blood Pressure
DBP: Diastolic Blood Pressure
CKD: Chronic Kidney Disease
PVD: Peripheral Vascular Disease
CAD: Coronary Artery Disease
GFR: Glomerular filtration rate
BMI: Body mass index
LDL cholesterol: Low Density Lipoprotein cholesterol
HDL cholesterol: High Density Lipoprotein
NCEP-APT III: National Cholesterol Education Program-Adult Treatment Panel III
AHA: American Heart Association
U.S.: United States
JNC 7: Seventh Report of the Joint National Committee
ADA: American Diabetes Association
DGA: Dietary Guidelines for Americans

For More Information

Mississippi State Department of Health
570 East Woodrow Wilson Drive
Jackson, MS 39216

Postal Address
Post Office Box 1700
Jackson, MS 39215-1700

Hours
Central Office: weekdays 8am to 5pm

Central Office Phone
601-576-7400 (8am-5pm)
Toll-free: 1-866-458-4948 (1-866-HLTHY4U)