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Emerging Educational Gradients in Health: A Comparison of Self-Reported Morbidities and Objective Biomarker Measures.

Using data from the fourth wave of the National Longitudinal Survey of Adolescent Health (Add Health), we pursue two research aims: 1) to document emerging educational gradients in health in a sample of young adults and 2) to examine educational gradients in underreporting of morbidities. While hypertension risk is elevated among older populations, hypertension and cardiovascular disease risk is increasing among younger populations and few studies have examined educational gradients in risk among young adults. We find that educational gradients are more pronounced when using *objective* measures of hypertension compared to *self-reported* hypertension. Comparison of the two gradients reveals a strong educational gradient in underreporting of hypertension. These results are an important contribution both methodologically and theoretically to the literature, and further exploration of objective versus self-reported morbidities will improve our understanding of perceived health, access to care, and physical health among the U.S. population.

Emergent Educational Gradients in Health: A Comparison of Self-Reports and Objective Measures.

For several decades researchers have documented socioeconomic (SES) gradients in health (Aaron Antonovsky 1967; Adler and Newman 2002; Link and Phelan 1995; Hummer and Lariscy 2011). In particular, multiple studies have shown that cardiovascular disease, hypertension, and cardiovascular disease risk factors are strongly associated with educational gradients (Winkleby et al. 1992; Mirowsky and Catherine E. Ross 1998; McWilliams et al. 2009; Sánchez-Vaznaugh et al. 2009; Clarke et al. 2009; Denney et al. 2010). While hypertension risk is elevated among older populations, hypertension and cardiovascular disease risk is increasing among younger populations (Muntner et al. 2004), however, few studies have examined hypertension among young adult populations.

Complicating the issue of examining education disparities in hypertension is the fact that much research relies on self-reported hypertension and only few studies have compared self-reported hypertension to objective measures systolic and diastolic blood pressure. Understanding the disparity between self-reported morbidities and objective biomarkers of morbidities by educational achievement has several important implications for social epidemiologists. First, the accuracy of self-reported morbidities has long been debated and suffers from several methodological problems (Goldman et al. 2003; Ferraro and Farmer 1999; Giles et al. 1995; McAdams, Van Dam, and Hu 2007). Second, given that health service access and utilization is associated with educational attainment (Adler and Katherine Newman 2002; Andrulis 1998), education may be associated not only with hypertension itself, but also knowledge of one's hypertensive status. Using data from the fourth wave of the National Longitudinal Survey of Adolescent Health (Add Health), we examine the extent to which educational gradients emerge among a population between the ages 24 and 32. In this study we have two research aims: 1) to

document emerging educational gradients in hypertension among a sample of young adults and 2) to examine educational gradients in underreporting of morbidities.

Education and Cardiovascular Disease

Despite some work that has suggested that hypertension control is improving, rates of hypertension have continued to climb over the last several decades (Hajjar and Kotchen 2003; Cutler et al. 2008). Moreover, several suggest that educational disparities in health are growing over time, a trend that extends to hypertension (McWilliams et al. 2009). The links between education and hypertension are complex; education not only improves access to health care, but is also related to several risk factors for hypertension including smoking, exercise, and BMI (Catherine E. Ross and Mirowsky 2000).

Documenting educational gradients in underreporting of hypertension is an important task as respondents with lower levels of education are less likely to have access to care or to make regular doctor visits (Adler and Newman 2002; Andrulis 1998; Sudano and Baker 2006). Indeed, respondents who have not recently seen a medical practitioner may not be aware that they have high blood pressure. For example, Using data from NHANES in 2005 and 2006, Ostchega and colleagues showed that 7% of US adult population was hypertensive but had not been previously informed of their status by a health care professional, and only 78% of hypertensive adults were aware of their hypertensive status (Ostchega et al. 2008). Another study that examined the validity of self-reported hypertension found much lower levels of accuracy in hypertension: Bowlin et al. found that self-reported hypertension was underreported by 43% among respondents who were contacted by phone (Bowlin et al. 1993).

Research that has examined sociodemographic gradients in the validity of self-reported hypertension versus objective measures has shown that validity varies by several characteristics. For example, a study that examined the validity of self-reported hypertension in the 'stroke belt' found that hypertension sensitivity was much lower among younger populations, and that a graded relationship emerged between education and hypertension sensitivity particularly among white men (Giles et al. 1995). Another study showed that blacks are more likely to report hypertension than whites, suggesting that public health prevention efforts targeting high risk groups (bad neighborhoods) may be effective at screening, but not necessarily preventing or treating hypertension (Morenoff et al. 2007).

Pathways of Bias

There is debate regarding the extent to which health insurance is the primary pathway through which SES generates in health disparities. Some work supports the 'health commodity hypothesis,' which posits that SES increases access to health insurance, and therefore increases access and usage of health systems and explains socioeconomic differences in health disparities. A recent study showed that lack of health insurance has a strong cumulative effect on the health of respondents (Quesnel-Vallée 2004); that is, it may not be that those without health insurance are less likely to receive preventative treatment for conditions, which may result in worse health as age increases (Hadley 2003). Among young adults (ages 19-24), uninsured persons were more likely to have no contact with a physician, no usual source of care, delay or miss a medical appointment, and not fill a prescription because of cost (Callahan and Cooper 2005). Lack of health insurance was associated with decreased likelihood of using cardiovascular disease preventative treatments (Ross, Bradley, and Busch 2006; Lurie et al. 1986).

Alternatively, the 'ineffectual commodity hypothesis' argues that health insurance is not the primary pathway linking SES to health outcomes, but rather health inequalities are perpetuated outside the health care system (Ross and Mirowsky 2000). Further, several studies have shown that having insurance is not a guarantee of better health, nor does it guarantee that that there will not be differences in the type or quality of treatment by SES or insurance coverage status (Lutfey and Freese 2005; Bernheim et al. 2008).

Access and utilization of health care, therefore, may not be strongly related to prevalence of hypertension, but may be critical for having accurate knowledge of one's hypertensive status. Documenting educational gradients in accuracy is an important task as respondents with lower levels of education are less likely to have access to care or to make regular doctor visits (Adler and Newman 2002; Andrulis 1998; Sudano and Baker 2006). Thus, their knowledge of morbidity status may be downwardly biased. That is, respondents may report never having been diagnosed by a medical practitioner with a specific condition that may be reflected in the collected biomarkers.

In addition to access and utilization of health care, illness level or perceived health may influence the likelihood that someone would use services and therefore be more informed of their health status. Persons who perceive themselves as healthy may be less likely to seek out medical care or have a regular physician, regardless of what their actual health status is (Andersen and John F. Newman 2005). Indeed, smoking (Gnecchi et al. 2005), exercise (Kraus et al. 2002; Slentz et al. 2004), and BMI (Haapanen-Niemi et al. 2000; Kannel, D'Agostino, and Cobb 1996) are well-documented cardiovascular risk factors that have had massive public health campaigns associated with them. Thus, persons who are overweight, regular smokers, or do not exercise may be more likely to perceive themselves as being at risk for developing cardiovascular disease

and therefore more likely to be aware of their hypertensive status. For example, Giles et al. found higher levels of accuracy in hypertensive status among persons who were overweight or obese (1995).

DATA AND METHODS

Data

This study uses data from Wave IV of the National Longitudinal Study of Adolescent Health (Add Health). The initial Add Health sample was drawn from 80 high schools and 52 middle schools, with unequal probability of selection, throughout the United States (Bearman, Jones, and Udry). Wave IV of the Add Health survey, collected between 2007 and 2008, located 92.5% of the original sample, and interviewed 80.3% of the eligible respondents whose ages range from 24 to 34. The sample is restricted to respondents who have information on systolic and diastolic blood pressure and education and results in a total sample size of 14,493 respondents.

Measures

Our independent variable, education, captures the highest level of reported educational achievement: less than a high school degree; a GED; a high school diploma, some college or vocational training; and college graduate or more years of education (referent).

Hypertension

Interviewers collected three measurements systolic and diastolic blood pressures at the time of interview from participants. Systolic and diastolic scores are constructed as the mean scores from the second and third measurements and were used to construct a dummy variable that measure

whether the respondent is normotensive (< 139 SBP and < 90 DBP) (referent) or hypertensive (≥140 SBP or ≥ 90).

Self-reported hypertension is derived from a survey item that asks respondents to identify if a "doctor, nurse, or other health care provider ever told you have or had hypertension." An additional measure is created to capture underreporting of hypertension: respondents who report having never been told by a health professional that they are hypertensive, but whose blood pressure is categorized as hypertensive are coded as 'underreporting' hypertension (1; else 0).

Mediating Pathways

Anthropometric measures of height and weight were taken at the time of interview and are used to calculate BMI for respondents and captures whether respondents are normal weight (BMI<25), overweight (BMI≥25 and BMI<30), obese class I (BMI≥30 and BMI<35), obese class II (BMI≥35 and BMI<40), or obese class III (BMI≥ 40) (referent).

The tobacco use variable measures whether respondents are current regular smokers, which is at least one cigarette a day for 30 days, former regular smokers, or never regular smokers (referent).

Physical activity is a series of dummy variables derived from a summed scale of the number of hours a respondent spends engaging in a variety of physical activities in the past seven days. Respondents who report zero hours of physical activity in the last 7 days are coded as 'low' level of activity of physical activity; respondents who report 1 to 6 hours of physical activity in the past 7 days are coded as 'medium' level of activity; and respondents who report 7 or more hours of physical activity in the past 7 days are coded as 'high' levels of activity (referent).

Insurance coverage is derived from question that asks respondents to identify if they have insurance, and if so, what type of coverage. Respondents are categorized as having no insurance (referent), private insurance coverage, or public insurance.

Self-rated health is derived from a question that asks respondents: "in general, how is your health?" Responses are categorized as either fair/poor (referent), good, or very good/excellent.

Health care utilization is derived from a measure that asks respondents "how long ago did you last have a routine check-up?" Respondents are categorized as having a check-up in the past 6 months (referent); the past 7 to 12 months; longer than 1 year ago but less than 2 years ago; 2 years ago of longer; or never/don't know.

Demographic Covariates

I also control for race/ethnicity, age, and marital status. Race/ethnicity is measured as a series of dummy variables that measures whether respondents identify as non-Hispanic white (referent); non-Hispanic black; Hispanic; non-Hispanic Asian; or other. Age is coded as a continuous variable that ranges from 24 to 34 years of age. Respondents who report ever having been married are coded as 1 and those who have never been married are coded as 0 (referent).

Analyses

We first present descriptive statistics for all covariates used on the models for the total population as well as by educational status. We then examine educational gradients for the objective measure of hypertension and self-reported diagnosis of hypertension using multivariate logistic regressions. We then present sensitivity and specificity test statistics for hypertension by

educational status. Finally, we then examine education gradients in underreporting of hypertension and examine using logistic regression and examine the mediating impact of several covariates. All of the analyses control for Add Health's complex survey design using the "svy" commands in Stata 11.0.

RESULTS

Descriptive Statistics

Table 1 presents descriptive statistics. Just over 8% of the population reports not having completed high school, 17% have a high school diploma. The largest proportion of respondents report some post high-school vocational training or "some" college (42.7%) and 31.5% have a college degree or more years of education.

Educational gradients emerge in risk factors for hypertension. Roughly 40% of respondents with less than a high school degree, a high school degree, or some college are obese compared to only 26% of college graduates. Further, only 8% of college graduates are current smokers compared to 45% of respondents with less than a high school degree and 32% of high school graduates. Interestingly, persons with less than high school degrees have the highest prevalence of high levels of activity (75%). There is a strong graded relationship between education and insurance coverage: 48% of respondents with less than 5 years of education; 31% of respondents with high school degrees; and 21% of respondents with some college have no insurance compared to only 9% of those with college degrees. Those without college degrees have higher prevalence of poor/fair self-rated health. The educational gradient in health care utilization is less pronounced than the other risk factors.

Almost 20% of the total sample is hypertensive, however, only 11% report ever having been told by a health care professional that they are hypertensive, and 14% of the total sample is hypertensive, but has never been told they are hypertensive by a health care professional. The descriptive statistics are also suggestive of a graded relationship in hypertension by education: roughly 23% of respondents with a high school degree or fewer years of education, compared to 16% of those with a college degree or more years of education. Further, over 17% of respondents with a high school degree of fewer years of education underreport their hypertensive status compared to 12% of college graduates. We now turn to multivariate analyses to further examine educational gradients in both objective and self-reported hypertension and the mediating impact of risk factors.

Educational Gradients in Hypertension and Self-Reported Hypertension

Table 2 presents odds ratios for the relationship between educational achievement, self-reported hypertension, and objective measures of hypertension. Model 1 controls for sociodemographic characteristics; Model 2 controls for BMI; Model 3 controls for two behavioral risk factors: smoking and physical activity; Model 4 controls for insurance coverage; and Model 5 controls for all covariates.

In Model 1 persons with less than a high school degree are 42% ($p<.01$) as likely, persons with high school degrees are 28% ($p<.05$) as likely, and persons with some college are 16% ($p<.10$) as likely to be hypertensive compared to college graduates. Controlling for BMI in Model 2 fully mediates the relationship between self-reported hypertension and education for respondents with high school degrees or some college; respondents with less than a high school

degree, however, are still 28% ($p<.10$) as likely to be hypertensive compared to college graduates.

Model 3 controls for smoking and physical activity. Respondents with low levels of activity are more likely to be hypertensive (OR=1.17; $p<0.10$) than respondents with high levels of physical activity, however in this model both persons with less than a high school degree and those with high school degrees are still significantly more likely to be hypertensive than college graduates. Similarly, controlling for insurance status in Model 4 has little impact on the relationship between education and hypertension. Controlling for all factors in Model 5, the relationship between education and hypertension is fully mediated for all educational categories.

The results for self-reported hypertension largely reflect those of the objective measure of hypertension. In Model 1, respondents with less than a high school degree are 50% ($p<.05$) as likely to report being hypertensive, those with high school degrees are 29% ($p<.10$) as likely and those with some college are 37% ($p<.01$) as likely to report being hypertensive compared to college graduates. Controlling for BMI in Model 2 fully mediates the relationship between education and self reported hypertension. Controlling for exercise and smoking in Model 3 and insurance status in Model 4 do not have a large impact on the relationship between education and hypertension. In Model 4, however, insurance coverage is associated with self-reported hypertension. Those persons without insurance are less likely (OR=0.81, $p<.05$) to report being informed by a health care professional that they are hypertensive, while those with public insurance are more likely (OR=1.36, $p<.05$) to report being diagnosed as hypertensive than persons with private health insurance.

Controlling for all covariates in Model 5 fully explains the relationship between education and hypertension, however most of the explanatory power is due to differences in BMI by educational achievement.

Educational Gradients in Underreporting

Table 3 presents sensitivity and specificity measures for hypertension from the Add Health sample for the total population and by educational attainment. Sensitivity is the percentage of respondents with hypertension that reported not having been diagnosed as hypertensive and specificity is the percentage of normotensive respondents that reported not having been diagnosed as hypertensive. The sensitivity measure for the total population is 46%, which suggests a low level of hypertensive awareness among this population. The specificity measure suggests a better concordance between normotensive blood pressure and awareness of normal hypertensive status. The results show a slight improvement in sensitivity as educational attainment increases: the sensitivity estimate for those with less than a high school degree is 44.5% compared to 47% for college graduates. Specificity also improves as educational attainment increases.

Table 4 presents odds ratios derived logistic regressions examining the link between education and underreporting of hypertension. We use multivariate model building techniques to examine the mediating impact of several factors on our dependent variable. Model 1 shows a graded relationship between education and underreporting of hypertension. Compared to college graduates, respondents with less than a high school degree are 40% ($p<.05$) as likely to underreport hypertension and those with a high school degree are 31% ($p<.05$) as likely to underreport being hypertensive. Model 2 controls for insurance coverage. Respondents with no

insurance are more likely to underreport their hypertensive status (OR=1.17, p<.10) compared to those with private insurance and controlling for insurance reduces the relationship between education and underreporting hypertension, but those with a high school degree of fewer years are still more likely to underreport being hypertensive.

Model 3 controls for time since last regular medical check-up. Compared to respondents who have been to the doctor in the last 6 months, persons who haven't been to the doctor for 1-2 years (OR=1.23, p<.10) or 2 years or more (OR=1.42, p<.001) are significantly more likely to underreport being hypertensive. Thus, both not having insurance coverage and not seeing a doctor increase the likelihood of not being aware of one's hypertensive status, but neither of these pathways explains the relationship between education and underreporting as respondents with less than a high school degree and high school graduates are still significantly more likely to underreport being hypertensive in both Model 2 and Model 3.

Self-rated health is related to underreporting hypertension and partially mediates the link between education and underreporting. Compared to those who rate their health as poor or fair, persons who say they are in good health are more likely to underreport their hypertension (OR=1.38, p<.05). Thus, persons who believe they are in good health may be less likely to feel the need to go to the doctor and therefore may not be aware of their hypertensive status. Further, the relationship between education and underreporting is reduced by 20% for both those with less than a high school degree and high school graduates.

Model 5 shows that BMI is also associated with underreporting hypertension. For example, compared to those with normal body weights, persons who are overweight are obese are much more likely to underreport hypertension, and controlling for BMI explains 22% of the

relationship between education and mortality for those with less than high school degrees and 39% of the relationship for high school graduates.

Model 6 controls for health behaviors and shows that current smokers are more likely to underreport their hypertensive status, and controlling for health behaviors reduces the relationship between education and mortality slightly, however the link between less than high school and high school graduates and underreporting is still marginally significant.

Model 7 controls for all risk factors and fully explains the link between education and underreporting. Health insurance status is no longer significant, however, persons who have not had a regular check-up for two years or more are 40% as likely to underreport their hypertensive status. Interestingly, those who report their health status as good, or very good/excellent are also more likely to underreport hypertension. Persons who are overweight or obese are also more likely to underreport being hypertensive, as are current smokers.

DISCUSSION

Our results add to the literature in several important ways. First, we examine education gradients in hypertension among U.S. young adults. We find a graded relationship between education and both objective and self-reported measure of hypertension. The gradient is slightly stronger among self-reported hypertension rather than objective measures of hypertension. This finding is in line with the fact that those with higher levels of education are more likely to have access to care, and therefore more likely to have been diagnosed by a health care professional as being hypertensive. In fact, health insurance coverage is not related to objective measures of hypertension, but those without insurance are less likely to report having been diagnosed as hypertensive. Thus, it may be that health insurance coverage does not influence the likelihood of

being hypertensive, but does increase the likelihood of diagnosis and therefore may increase the likelihood of receiving treatment.

We also investigate factors related to underreporting of hypertensive status. We find a graded relationship between education and underreporting and reveal several important factors related to discordance between hypertensive status and self-reported hypertension. In line with other research, we find that persons who have not visited a doctor recently are more likely to underreport their hypertensive status (Giles et al. 1995). Insurance coverage, however, is not related to underreporting in the final model of Table 4. Thus, it appears that having a recent check-up, regardless of one's health insurance status is important for improving concordance between self-reported diagnosis and objective measures of hypertension. Insurance may work indirectly therefore as other studies have shown that insurance increases the likelihood that one will have had a recent check-up (Callahan and Cooper 2005).

Another important covariate for explaining the educational gradient in underreporting of hypertension is BMI. Our results show that persons who are overweight or obese are more likely to underreport their hypertensive status. This is primarily due to the fact that being overweight or obese is strongly associated with education and increases the likelihood that one will be hypertensive, in general, therefore increasing the chances of having inaccurate information about one's hypertensive status. This finding contrast the Giles et al. study that found persons who were obese were more likely to have accurate knowledge of their hypertensive status (1995).

Self-reported health, however, works differently for explaining underreporting of hypertension. That is, perceiving oneself as being in good health, increases the likelihood of not being aware of one's hypertensive status. Indeed, as stated before rates of hypertension continue to increase in the United States, and while evidence suggests that over time, hypertension

awareness has gone up, continued efforts could be made to increase hypertensive awareness among groups who do not perceive themselves as being at risk.

The findings presented in this paper demonstrate that even among a young population, educational gradients in morbidities are present. For our analysis of hypertension, we find a stronger educational gradient when we examine the objective measures of blood pressure compared to self-reports. Moreover, we find a strong educational gradient in the underreporting of hypertension. These results are an important contribution both methodologically and theoretically to the literature, and further exploration of objective versus self-reported morbidities will improve both our understanding of perceived health, access to care, and physical health among the U.S. population.

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Table 1. Descriptive Statistics

	Total Population	LT HS	HS Grad	Some College	College Graduate or More
	N=14,493	N=1,122	N=2,341	N=6,397	N=4,633
Education (%)					
Less than high school	8.50				
High school graduate	17.19				
Some college	42.71				
College graduate	31.52				
Female	50.82	42.87	41.14	52.25	56.32
Race/ethnicity (%)					
Non-Hispanic white	68.39	59.01	63.56	67.68	74.70
Non-Hispanic black	14.83	20.84	18.06	15.16	10.80
Hispanic	11.76	17.38	14.02	12.75	7.68
Asian	3.53	0.89	2.34	3.01	5.59
Other Race	1.49	1.88	2.02	1.40	1.23
Age (μ)	28.76	28.59	29.00	28.76	28.67
Married, ever (%)	49.67	44.82	48.59	52.84	47.40
Insurance coverage (%)					
No insurance	21.45	48.15	31.41	21.32	8.90
Public insurance	7.90	19.51	12.77	8.57	1.13
Private insurance	70.65	32.34	55.82	70.11	89.97
Last regular medical check-up (%)					
Lt 6 months	37.85	38.73	33.05	39.66	37.64
6 to 12 months ago	21.31	18.39	19.84	20.46	24.09
1 to 2 yrs	14.38	13.69	13.57	14.11	15.40
2 yrs or more	24.09	24.89	29.50	23.38	21.95
Unknown	2.37	4.30	4.04	2.39	0.92
Self-rated health (%)					
Fair/Poor	9.41	18.93	14.11	10.01	3.49
Good	32.95	42.59	39.58	36.00	22.69
Very Good/Excellent	57.64	38.48	46.31	53.99	73.82
BMI (%)					
Normal	33.78	31.82	27.54	30.67	42.07
Overweight	29.30	27.61	30.44	27.47	31.68
Obese 1	18.67	19.50	19.91	20.49	15.22
Obese 2	9.73	11.41	11.29	11.36	6.13
Obese 3	8.52	9.66	10.82	10.01	4.90
Smoking status (%)					
Nevers moker	52.74	31.15	45.67	47.31	69.67
Former	23.39	24.10	22.34	24.94	21.72
Current	23.87	44.75	31.99	27.75	8.61
Physical activity level (%)					
Low	14.58	19.97	17.98	15.56	9.99
Medium	45.22	4.69	46.80	45.87	43.72
High	40.20	75.34	35.22	38.57	46.29
Hypertensive (%)	18.90	23.67	22.41	18.64	16.09
Self-reported hypertension (%)	10.85	13.22	11.79	11.64	8.66
Underreported hypertension (%)	13.91	17.76	17.24	13.25	11.98

Notes: Source=Wave IV National Lognitudinal Study of Adolescent Health

† $p \leq .10$. * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$

Table 2. Odds ratios for educational differences in hypertension

	Objective Measures of Hypertension					Self-Reported Hypertensive Diagnosis				
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 1	Model 2	Model 3	Model 4	Model 5
Education (College Grad or more)										
Less than high school	1.42 **	1.28 +	1.32 *	1.37 *	1.13	1.5 *	1.28	1.5 *	1.52 *	1.27
High school graduate	1.28 *	1.10	1.22 +	1.26 *	1.02	1.29 +	1.06	1.28 +	1.29 +	1.04
Some college	1.16 +	0.99	1.12	1.15 +	0.93	1.37 **	1.11	1.37 **	1.37 **	1.1
Female	0.38 ***	0.36 ***	0.38 ***	0.38 ***	0.36 ***	0.71 ***	0.66 ***	0.69 ***	0.68 ***	0.63 ***
Race/ethnicity (non-Hispanic white)										
Non-Hispanic black	1.18 *	1.08	1.21 **	1.18 *	1.12	1.37 ***	1.2 +	1.32 **	1.35 **	1.19 +
Hispanic	0.99	0.91	1.02	0.99	0.96	0.92	0.86	0.9	0.92	0.87
Asian	1.08	1.20	1.1	1.08	1.23	0.94	1.07	0.94	0.94	1.08
Other Race	1.43	1.28	1.44	1.43	1.28	1.16	1.06	1.17	1.15	1.06
Age	1.08 ***	1.07 ***	1.08 ***	1.08 ***	1.07 ***	1.04 +	1.04	1.04 +	1.04 +	1.03
Married, ever	0.85 *	0.81 **	0.86 *	0.86 *	0.82 **	1.09	1.07	1.07	1.08	1.06
BMI (normal)										
Overweight		1.94 ***			1.94 ***		1.67 ***			1.67 ***
Obese 1		2.98 ***			3.02 ***		2.51 ***			2.49 ***
Obese 2		3.37 ***			3.42 ***		3.85 ***			3.83 ***
Obese 3		5.49 ***			5.63 ***		6.47 ***			6.45 ***
Smoking status (Never regular smoker)										
Former smoker			1.07		1.12			0.91		0.98
Current smoker			1.14		1.27 **			0.93		1.08
Physical Activity level (High)										
Low			1.17 +		1.08			1.33 *		1.2
Medium			1.11		1.03			1.13		1.03
Insurance coverage (Private insurance)										
No insurance				1.08	1.08				0.81 *	0.81 *
Public Insurance				1.01	0.97				1.36 *	1.24

Notes: Source=Wave IV National Lognitudinal Study of Adolescent Health

† $p \leq .10$. * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$

Table 3. Sensitivity and Specificity Estimates for Hypertension

	Sensitivity (95% CI)	Specificity (95% CI)
Total Population	46.05 (42.23, 49.86)	84.36 (83.35, 85.37)
Less than high school	44.51 (32.30, 56.72)	79.55 (75.78, 83.32)
High school graduate	44.36 (35.68, 53.19)	80.27 (77.19, 83.34)
Some college	46.45 (40.30, 52.59)	85.02 (83.58, 86.46)
College graduate	47.14 (40.86, 53.41)	86.84 (85.17, 88.50)

Notes: Source=Wave IV National Lognitudinal Study of Adolescent Health

Table 4. Odds Ratios for Education Differences in Underreports of Hypertension

	Underreporting Hypertension						
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Education (College Grad or more)							
Less than high school	1.41 *	1.34 *	1.41 *	1.33 +	1.32 +	1.3 +	1.19
High school graduate	1.31 *	1.28 *	1.29 *	1.25 +	1.19	1.25 +	1.1
Some college	1.09	1.08	1.09	1.05	0.99	1.05	0.93
Female	0.37 ***	0.37 ***	0.39 ***	0.36 ***	0.36 ***	0.36 ***	0.38 ***
Race/ethnicity (white)							
Non-Hispanic black	1.01	1.01	1.05	1	0.95	1.04	1.04
Hispanic	0.94	0.95	0.96	0.94	0.88	0.98	0.95
Asian	1.10	1.10	1.11	1.06	1.19	1.12	1.23
Other Race	1.34	1.34	1.36	1.35	1.22	1.34	1.25
Age	1.07 ***	1.07 ***	1.07 ***	1.07 **	1.05 **	1.07 ***	1.06 **
Married, ever	0.80 **	0.82 **	0.81 **	0.81 **	0.76 ***	0.81 +	0.78 ***
Insurance coverage (Private insurance)							
No insurance		1.17 +					1.12
Public Insurance		0.90					0.94
Last regular medical check-up (less than 6 months ago)							
6 to 12 months ago			1.18				1.18
1 to 2 yrs			1.23 +				1.17
2 yrs or more			1.42 ***				1.4 ***
Unknown/Never			1.27				1.27
Self-rated health (poor/fair)							
Good				1.38 *			1.5 **
Very Good/Excellent				1.04			1.4 *
BMI (normal)							
Overweight					1.85 ***		1.89 ***
Obese 1					2.6 ***		2.68 ***
Obese 2					2.76 ***		2.86 ***
Obese 3					3.1 ***		3.35 ***
Smoking status (Never regular smoker)							
Former smoker						1.16	1.15
Current smoker						1.12 +	1.23 *
Physical Activity level (High)							
Low						1.11	1.08
Medium						1.08	1.02

Notes: Source=Wave IV National Lognitudinal Study of Adolescent Health

† $p \leq .10$. * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$