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ASSOCIATION BETWEEN UTILIZATION OF PREVENTIVE SERVICES AND HEALTH INSURANCE STATUS: FINDINGS FROM THE 2008 BEHAVIORAL RISK FACTOR SURVEILLANCE SYSTEM

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Objectives: To describe the uninsured population in the United States, to determine factors of uninsurance and to test the association between insurance status and use of preventive care.

Methods: Using the 2008 Behavioral Risk Factor Surveillance System, we conducted univariate logistic regression and stratified, multivariate and multinomial analyses, adjusting for confounders.

Results: Respondents aged ≥65 years, regardless of their race/ethnicity, were much less likely to be uninsured than those aged 18 to 44 years. Lower annual income and unemployment were statistically significant factors of uninsurance for all racial/ethnic groups. Marital status was associated with lack of insurance, but only among non-Hispanic Whites, non-Hispanic Blacks and those in the other racial/ethnic category. Those with health insurance were almost 4 to 8 times more likely to report having one of more individuals they thought of as their personal doctor or healthcare provider. Compared to the uninsured, the insured had greater odds of having a physical within the past year, across all racial/ethnic groups. The same finding was true for having a dental check-up within the past year, but only among non-Hispanic Whites, non-Hispanic Blacks, and Hispanics.

Conclusions: The access of preventive care such as routine physical and dental exams differs by health insurance status and among racial/ethnic groups. As the number of uninsured grows, the US healthcare system needs to determine sustainable ways to increase health insurance coverage and improve access to preventive care for this population. (*Ethn Dis.* 2010;20:142–147)

Key Words: Health Insurance, Preventive Care, Disparities

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INTRODUCTION

Data from the US Census Bureau show that the percentage of people without health insurance jumped from 12.9% in 1987 to 15.4% in 2008.[1] In 2008, 46.3 million Americans were without health insurance.[1] This number does not include individuals who experienced a lapse in health insurance coverage. Employer-based coverage, the dominant mode of health insurance coverage in the United States, has been slowly weakening.[2–3] The percentage of people covered by employer-based health insurance decreased from 62.1% in 1987 to 58.5% in 2008.[1]

Blacks and Hispanics are disproportionately affected by lack of insurance. The number of uninsured did not statistically change from 2005 to 2006 for non-Hispanic Whites (21.2 million), and decreased among Asians from 2.1 million in 2005 to 2.0 million in 2006.[4] However, among Blacks, the number of uninsured rose from 7 million in 2005 to 7.6 million while among Hispanics, the number rose from 13.9 million in 2005 to 15.2 million in 2006.

Not having health insurance has a wide range of interconnected impacts on individuals, ranging from accessing health care, utilizing care, and health outcomes. Lack of health insurance and unstable coverage or lapses in health insurance have both been shown to negatively impact access to care.[5–7] Receiving preventive services such as blood pressure and cholesterol checks, physicals, flu shots, dental checkups, Pap tests, breast exams, and prostrate exams, has been shown to be statistically associated with having health insurance and a usual source of care either through an

> *In 2008, 46.3 million Americans were without health insurance.[1]*

individual provider or a healthcare facility.[8] The uninsured are more likely than insured adults to have worse health outcomes for treatable acute and chronic conditions.[9] They may be three times more likely than privately insured to experience adverse health outcomes and four times as likely to require both avoidable hospitalizations and emergency hospital care.[10] Compared to the insured, the uninsured may be less likely to have received medical care, even for serious (eg, loss of consciousness or fainting) and morbid symptoms (eg, cough with yellow sputum accompanied by fever).[11]

Access to health care, including increasing the proportion of individuals with health insurance and a specific source of ongoing care, are important national public health objectives set by *Healthy People 2010*.[12] This study uses data from a 2008 national survey to: describe the uninsured population in the United States; to determine factors for lack of insurance; and, to determine the extent to which the utilization of preventive care is determined by health insurance status.

METHODS

The Centers for Disease Control and Prevention (CDC), conducts a monthly telephone survey, the Behavioral Risk Factor Surveillance System (BRFSS), which measures information

on health risk behaviors, preventive practices, and health care access of the non-institutionalized US population.[13] Approximately 350,000 adults are surveyed every year from all 50 states and US territories. The CDC produced report, 2008 BRFSS Overview, provides details on the survey methodology, including questionnaire development, data collection, quality assurance and weighting. Data was analyzed from BRFSS for 2008 from all 50 states or 4 US territories and weighted using BRFSS provided variables to adjust for complex sampling design.[13]

Health insurance status was determined by the following question, "Do you have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare?"[14] The use of preventive care was determined with the questions, "About how long has it been since you last visited a doctor for a routine checkup? (A routine checkup is a general physical exam, not an exam for a specific injury, illness, or condition)," "How long has it been since you last visited a dentist or a dental clinic for any reason? (Include visits to dental specialists, such as orthodontists)." Responses were categorized into: within the past year; two to five years ago; more than five years ago; and, never. Access to care was determined by the following question, "Do you have one person you think of as your personal doctor or healthcare provider? (If no, "Is there more than one or is there no person who you think of as your personal doctor or healthcare provider?"). Responses were dichotomized, with yes indicating one or more and no indicating none.

Race/ethnicity was determined by using BRFSS computed race/ethnicity groupings, which included non-Hispanic White, non-Hispanic Black, and Hispanic. Additionally, non-Hispanic Asians, Native Hawaiian or other Pacific Islanders, American Indian or Alaska Natives, other races only and multiracial indi-

viduals were grouped into the other category due to small sample sizes in each individual category. Continuous variables, age and income, were categorized to provide meaningful groups for comparison. Employment status was categorized with those reporting being employed for wages as employed. Those reporting either that they were out of work for less than a year, or out of work for more than a year were categorized as unemployed. Students, retired individuals and homemakers were grouped into one category. Those who reported they were unable to work were excluded from the analysis. Blank values, refusals and individuals reporting don't know were coded as missing.

Analysis was conducted in SAS (SAS Institute, Cary, NC). Descriptive statistics were generated for demographic and explanatory variables such as age, sex and education. Association between being uninsured and each explanatory variable was examined by crude odds ratios (OR's) and 95% Wald confidence intervals (CI's). Multivariate logistic regression was performed to determine factors of being uninsured. Multivariate logistic regression models were adjusted for confounding variables, and stratified by race/ethnicity. A final model was built to determine the extent to which the use of preventive services was determined by health insurance status. The proportional odds assumption was tested for ordinal dependent variables in the final model.[15] The proportional odds assumption was rejected (*P*-value <.01 for all models tested), and a multinomial generalized logit model was fitted. Bivariate logistic regression was conducted for the binary dependent variable, number of personal doctors.

RESULTS

Of the 413,542 individuals in the 2008 BRFSS sample, approximately 16.83% of males and 13.65% of females were uninsured (see Table 1). The

percentage of uninsured was almost three times higher among Hispanics than non-Hispanic Whites, (32.99% vs 10.49%, respectively) and almost two times higher for Non-Hispanic Blacks than non-Hispanic Whites (19.64% vs 10.49%, respectively). Lack of insurance was highest among the unemployed (43.78%), single (26.06%), 18–44 age group (21.57%), those who had a high school education or less (9.51%), and those earning less than $20,000 annually (32.75%). Forty-four percent of those who did not have a personal doctor or health care provider were uninsured.

Table 2 shows unadjusted univariate OR's for factors of being uninsured. All univariate OR's were statistically significant. Females were more likely to be insured than males and all age groups were more likely to be insured compared to the reference age group of 18 to 44. Compared to non-Hispanic Whites, Hispanics were four times and Blacks twice as likely to be uninsured. Those with some college education or a college degree and higher were more likely to be insured than those with a high school education or less. Those earning less than $20,000 annually were about 10 times more likely to be uninsured than those earning more than $50,000.

Race/ethnic interactions were statistically significant in the multivariate model. The final model (Table 3) was stratified by race/ethnicity and adjusted for the following confounders: age, sex, education, income, marital status, employment, number of personal doctors, number of physical check-ups, and number of dental visits. Respondents aged ≥65 years, regardless of their race/ethnicity, were much more likely to be insured than those aged 18 to 44. For non-Hispanic Whites, Hispanics and those in the other racial/ethnic category, the greater the level of educational attainment, the lower the odds of being uninsured. However, the odds of being uninsured among non-Hispanic Blacks remained the same regardless of educational attainment. Lower annual income

Table 1. Prevalence of health insurance rates among US adults by sociodemographic characteristics: BRFSS, 2008 (N=413,542)*

Variable	No Health Insurance	
	n‡	(%)†
Sex		
Male	17,607	(16.83)
Female	25,639	(13.65)
Age group, years		
18–44	20,019	(21.57)
45–64	20,707	(12.53)
65+	2,189	(1.98)
Race/ethnicity		
Non-Hispanic White	26,697	(10.49)
Non-Hispanic Black	5,456	(19.64)
Hispanic	7,321	(32.99)
Other	3,233	(16.02)
Education levels		
High school or less	25,429	(9.51)
Some college	11,033	(3.65)
College graduate and higher	6,611	(2.00)
Income		
$0 to $19,999	14,498	(32.75)
$20,000 to $49,999	17,615	(20.23)
$50,000 +	5,509	(4.78)
Marital status		
Married/cohabiting	20,429	(11.94)
Single	9,592	(26.06)
Divorced/separated/widowed	13,009	(15.43)
Employed		
Yes	24,569	(14.57)
No	6,418	(43.78)
Student/retired/homemaker	9,053	(10.66)
Number of personal doctors		
None	19,397	(44.28)
One or more	23,702	(8.16)
Last physical exam		
Within past year	19,074	(9.34)
Within 2 to 5 years	13,406	(23.45)
More than 5 years ago	8,739	(36.47)
Never	1,230	(41.44)
Last dental exam		
Within past year	18,574	(9.42)
Within 2 to 5 years	14,138	(25.26)
More than 5 years ago	9,290	(29.82)
Never	807	(50.84)

BRFSS: Behavioral Risk Factors Surveillance System.

* N=413,542 (unweighted). There may be some differences in sample size within categories due to missing values, blanks or refusals.

† Percentages are weighted.

‡ n's are unweighted.

(<$20,000) was a statistically significant factor for lack of insurance across all racial/ethnic groups. Hispanics in this income range were almost 6 times more likely to be uninsured than Hispanics earning $50,000 or more annually.

Marital status was associated with lack of insurance, but only among non-Hispanic Whites, non-Hispanic Blacks and those in the other racial/ethnic category (Table 3). Non-Hispanic Whites who were either single or divorced/separated/widowed were almost twice as likely as their married counterparts to be uninsured. Single, non-Hispanic Blacks had slightly greater odds of uninsured than non-Hispanic Blacks who were married. Those in the other racial/ethnic category who were either divorced, separated or widowed also had slightly increased odds of being uninsured than individuals who married. Those who were unemployed were more likely to be uninsured; this finding was consistent across all racial/ethnic groups.

The associations between accessing preventive care and health insurance status provided mixed results (Table 4). Those with health insurance were almost 4 to 8 times more likely to report having one of more individuals they thought of as their personal doctor or health care provider. These increased odds were statistically significant for all racial/ethnic groups.

Compared to the uninsured, the insured had greater odds of having a physical within the past year, compared to never having a physical, across all racial/ethnic groups. The same finding was true for having a dental check-up within the past year, but only among non-Hispanic Whites, non-Hispanic Blacks, and Hispanics. Generally, as the length of time until the last physical or dental exam increased (compared to those who had never used these preventive services), the odds of accessing the preventive services decreased. This finding, however, was not always statistically significant across racial/ethnic groups. For example, those with health insurance had increased odds of having a physical within the past 2 to 5 years, compared to never having a physical, but only among Hispanics. Compared to those without health insurance, the insured had increased odds of having a dental exam within the past 2 to 5 years,

Table 2. Odds ratio and 95% CI of being uninsured: BRFSS 2008 (N=413,542)*

	Variable	Univariate Odds Ratio (95% Wald Confidence Interval)
Sex	male	reference group
	female	.78† (.75–.82)
Age group, years	18–44	reference group
	45–64	.52† (.50–.54)
	65+	.07† (.07–.08)
Race/ethnicity	non-Hispanic White	reference group
	non-Hispanic Black	2.09† (1.95–2.23)
	Hispanic	4.20† (3.96–4.46)
	other	1.63† (1.49–1.79)
Education levels	high school or less	reference group
	some college	.52† (.49–.55)
	college graduate and higher	.21† (.19–.22)
Income	$0 to $19,999	9.71† (9.04–10.43)
	$20,000 to $49,999	5.06† (4.72–5.41)
	$50,000 +	reference group
Marital status	married/cohabiting	reference group
	single	2.60† (2.46–2.75)
	divorced/separated/widowed	1.35† (1.28–1.42)
Employed	yes	reference group
	no	4.57† (4.25–4.91)
	student/retired/homemaker	.70† (.66–.74)

BRFSS: Behavioral Risk Factors Surveillance System.
* N=413,542 (unweighted). There may be some differences in samples size within categories due to missing values, blanks or refusals.
† P<.001.

Table 3. Adjusted odds of being uninsured by race/ethnicity: BRFSS, 2008 (N=413,542)*

Variable	Non-Hispanic White AOR (95%CI)	Non-Hispanic Black AOR (95%CI)	Hispanic AOR (95%CI)	Other AOR (95%CI)
Sex				
Male	reference group	reference group	reference group	reference group
Female	1.01 (.94–1.09)	.96 (.81–1.15)	1.15 (.98–1.35)	1.05 (.84–1.32)
Age group, years				
18–44	reference group	reference group	reference group	reference group
45–64	.85† (.80–.91)	1.07 (.90–1.27)	.96 (.83–1.12)	.91 (.72–1.15)
65+	.07† (.06–.08)	.15† (.10–.23)	.10† (.07–.15)	.12† (.06–.23)
Education Levels				
High school or less	reference group	reference group	reference group	reference group
Some college	.78† (.72–.84)	.68† (.57–.81)	.65† (.54–.79)	.68§ (.52–.88)
College graduate +	.43† (.40–.47)	.68§ (.54–.86)	.57† (.45–.74)	.59‡ (.43–.79)
Income				
$0 to $19,999	5.38† (4.77–6.06)	4.36† (3.27–5.82)	5.70† (4.35–7.47)	4.92† (3.39–7.14)
$20,000 to $49,999	3.14† (2.90–3.41)	2.34† (1.81–3.02)	4.30† (3.34–5.53)	3.19† (2.34–4.36)
$50,000 +	reference group	reference group	reference group	reference group
Marital status				
Married/cohabiting	reference group	reference group	reference group	reference group
Single	1.64† (1.48–1.81)	1.29§ (1.05–1.58)	.93 (.76–1.15)	1.34 (1.00–1.81)
Divorced/separated/widow	1.53† (1.41–1.65)	1.19 (.98–1.46)	1.08 (.89–1.31)	1.42§ (1.07–1.90)
Employed				
Yes	reference group	reference group	reference group	reference group
No	2.71† (2.40–3.07)	2.34† (1.84–2.97)	1.83† (1.39–2.41)	1.56‡ (1.14–2.14)
Student/retired/homemaker	1.05 (.96–1.15)	.89 (.72–1.11)	1.04 (.86–1.26)	.81 (.58–1.13)

BRFSS: Behavioral Risk Factors Surveillance System; AOR: Odds ratio adjusted for all variables included in this table.
* N=413,542 (unweighted). There may be some differences in samples size within categories due to missing values, blanks or refusals. † P<.001; ‡ P<.01; § P < .05.

Table 4. Adjusted odds of the utilization of preventive care among the insured by race/ethnicity: BRFSS, 2008 (N=413,542)*

Variable	Non-Hispanic White AOR (95%CI)	Non-Hispanic Black AOR (95%CI)	Hispanic AOR (95%CI)	Other AOR (95%CI)
Number of personal doctors				
None	reference group	reference group	reference group	reference group
One or more	4.83† (4.50–5.19)	7.84† (6.59–9.32)	5.40† (4.66–6.27)	4.35† (3.48–5.44)
Last physical exam				
Within past year	3.21† (2.55–4.03)	9.11‡ (2.30–35.99)	4.74† (3.18–7.07)	1.97§ (1.10–3.52)
Within past 2–5 years	1.24 (.99–1.57)	3.06 (.77–12.18)	1.82‡ (1.20–2.74)	.63 (.35–1.13)
More than 5 years ago	.61§ (.48–.77)	1.42 (.34–5.93)	1.04 (.67–1.61)	.41‡ (.22–.75)
Never	reference group	reference group	reference group	reference group
Last dental exam				
Within past year	4.55† (2.84–7.31)	3.92‡ (1.69–9.11)	4.28† (3.06–5.97)	1.64 (.82–3.27)
Within past 2–5 years	1.82§ (1.13–2.93)	1.68 (.72–3.90)	2.14 (1.52–3.01)	.87 (.43–1.74)
More than 5 years ago	1.40 (.87–2.25)	1.19 (.50–2.83)	1.26 (.87–1.83)	.46§ (.23–.95)
Never	reference group	reference group	reference group	reference group

BRFSS: Behavioral Risk Factors Surveillance System; AOR: Odds ratio adjusted for all variables included in this table.
* N=413,542 (unweighted). There may be some differences in samples size within categories due to missing values, blanks or refusals. † P<.001; ‡ P<.01; § P<.05.

compared to never having a dental exam, but only among non-Hispanic Whites.

DISCUSSION

Our study used national data to examine sociodemographic characteristics of the uninsured. We found that the uninsured were a diverse group of individuals who were predominantly non-Hispanic Black or Hispanic, most likely to be younger males, had a high school or less education, were unemployed, and single. This finding was consistent with other studies.[2,16]

We found that the uninsured were a diverse group of individuals who were predominantly non-Hispanic Black or Hispanic, most likely to be younger males, had a high school or less education, were unemployed, and single.

We also found that preventive care was accessed differently by those with health insurance than those without. These differences, though slightly attenuated in the multivariate model after adjusting for sociodemographic variables, remained statistically significant. Studies have shown that while health insurance alone does not guarantee access to primary care,[17] health insurance does affect access and utilization of preventive care.[18–20]

The uninsured do receive some care through safety net providers. These providers include public hospital systems, federal, state and local community health centers or clinics.[21] However, the current safety net provider system in the United States is neither a coordinated system, nor a nationally monitored system.[22] There are no checks and balances in place to insure the availability and location of safety net providers in areas of high numbers of uninsured. Studies have shown that the location and proximity of safety net providers,[23] especially among the uninsured living in rural areas,[24] has a statistically significantly impact on subsequent health care utilization. Emergency departments in hospitals are an example of a safety net utilized by the uninsured. However, overcrowding of

emergency departments is an emerging concern.[25–27]

As the number of uninsured grows, and quality and adequacy of safety net programs remains in question, the United States will likely have to determine sustainable solutions for this population to increase health insurance coverage. Universal health care is a hot topic in the current national debate on health care reform,[28] with advocates and opponents on both sides of the issue. Addressing some of these issues will be an important and landmark step toward meeting national public health objectives of health care access outlined in Healthy People 2010.[12]

There are several limitations to this study. BRFSS is a cross-sectional survey in which different individuals are sampled every year. Therefore, only associations between different variables were tested. A longitudinal study design in which the same individuals are followed over a period of time may be better suited for making correlations and testing causality.[29] BRFSS data is self-reported data. There is always concern for recall bias in this type of data, which may pull the findings into more favorable directions. Finally, the BRFSS question regarding health insurance assessed only current health insur-

ance status. It did not measure insurance coverage over the past 12 months, lapse in health insurance coverage, or individuals who are underinsured. This could lead to an underestimate in the number of uninsured in this study.

REFERENCES

1. DeNavas-Walt C, Proctor BD, Smith J. US Census Bureau, Current Population Reports, P60-236, Income, Poverty, and Health Insurance Coverage in the United States: 2008. Available at: http://www.census.gov/prod/2009pubs/p60-236.pdf. Last accessed on September 24, 2009.

2. Sources of health insurance and characteristics of the uninsured: analysis of the March 2007 Current Population Survey. *EBRI Issue Brief*. 2007;(310):1–33. Available at: http://www.ebri.org/pdf/briefspdf/EBRI_IB_10-20073.pdf. Last accessed on May 1, 2009.

3. Lewin M, Baxter JR. America's health care safety net: revisiting the 2000 IOM Report. *Health Aff*. 2007;26(5):1490–1494.

4. DeNavas-Walt C, Proctor BD, Smith J. US Census Bureau, Current Population Reports, P60-233, Income, Poverty, and Health Insurance Coverage in the United States: 2006. Available at: http://www.census.gov/prod/2007pubs/p60-233.pdf. Last accessed on May 1, 2009.

5. Kasper JD, Giovannini TA, Hoffman C. Gaining and losing health insurance: strengthening the evidence for effects on access to care and health outcomes. *Med Care Res Rev*. 2000;57:298–318; discussion 319–325.

6. Schoen C, DesRoches C. Uninsured and unstably insured: the importance of continuous insurance coverage. *Health Serv Res*. 2000;35:187–206.

7. Freeman JD, Kadiyala S, Bell JF, Martin DP. The causal effect of health insurance on utilization and outcomes in adults: A systematic review of US studies. *Med Care*. 2008;46:1023–1032.

8. DeVoe JE, Fryer GE, Phillips R, Green L. Receipt of preventive care among adults: insurance status and usual source of care. *Am J Public Health*. 2003;93:786–791.

9. McWilliams JM. Health consequences of uninsurance among adults in the united states: recent evidence and implications. *Milbank Q*. 2009;87:443–494.

10. American College of Physicians-American Society of Internal Medicine. *No Health Insurance? It's Enough to Make You Sick*. Philadelphia, PA: American College of Physicians-American Society of Internal Medicine; 2000.

11. Baker DW, Shapiro MF, Schur CL. Health insurance and access to care for symptomatic conditions. *Arch Intern Med*. 2000;160(9):1269–1274.

12. U.S. Department of Health and Human Services. *Healthy People 2010: Understanding and Improving Health*, 2nd ed. Washington, DC: U.S. Government Printing Office; 2000.

13. Centers for Disease Control and Prevention. Behavioral Risk Factor Surveillance System Survey Data. Available at: http://www.cdc.gov/brfss/technical_infodata/surveydata/2008.htm#survey. Last accessed on May 1, 2009.

14. Centers for Disease Control and Prevention. Behavioral Risk Factor Surveillance System Survey Questionnaire. Available at: http://www.cdc.gov/brfss/technical_infodata/surveydata/2008.htm#survey. Last accessed on May 1, 2009.

15. Brant R. Assessing proportionality in the proportional odds model for ordinal logistic regression. *Biometrics*. 1990;46:1171–1178.

16. Fronstin P. Sources of health insurance and characteristics of the uninsured: Analysis of the March 2009 current population survey. *EBRI Issue Brief*. 2009;(334):1–35.

17. Pincus T, Esther R, DeWalt DA, Callahan LF. Social conditions and self-management are more powerful determinants of health than access to care. *Ann Intern Med*. 1998;129:406–411.

18. Andrulis DP. Access to care is the centerpiece in the elimination of socioeconomic disparities in health. *Ann Intern Med*. 1998;129:412–416.

19. DeVoe JE, Fryer GE, Phillips R, Green L. Receipt of preventive care among adults: insurance status and usual source of care. *Am J Public Health*. 2003;93:786–791.

20. Ross JS, Bradley EH, Busch SH. Use of health care services by lower-income and higher-income uninsured adults. *JAMA*. 2006;295:2027–2036.

21. Institute of Medicine. *America's Health Care Safety Net: Intact but Endangered*. Washington, DC: National Academy Press; 2000.

22. Lewin ME, Baxter RJ. America's health care safety net: revisiting the 2000 IOM report. *Health Aff (Millwood)*. 2007;26:1490–1494.

23. Hadley J, Cunningham P. Availability of safety net providers and access to care of uninsured persons. *Health Serv Res*. 2004;39(5):1527–1546.

24. Gresenz CR, Rogowski J, Escarce JJ. Health care markets, the safety net, and utilization of care among the uninsured. *Health Serv Res*. 2007;42:239–264.

25. American Academy of Pediatrics Committee on Pediatric Emergency Medicine. Overcrowding crisis in our nation's emergency departments: is our safety net unraveling? *Pediatrics*. 2004;114(3):878–888.

26. Siegel B. The emergency department: rethinking the safety net for the safety net. *Health Aff (Millwood)*. 2004;Suppl Web Exclusives:W4-146-8.

27. Trzeciak S, Rivers EP. Emergency department overcrowding in the United States: an emerging threat to patient safety and public health. *Emerg Med J*. 2003;20:402–405.

28. Gruber J. Covering the uninsured in the United States. *J Econ Lit*. 2008;43(3):571–606.

29. Kramer GH. The ecological fallacy revisited: Aggregate- versus individual-level findings on economics and elections, and sociotropic voting. *Am Polit Sci Rev*. 1983;77:92–111.