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Do Persons with High Medical and Behavioral Risks Have Limited Access to Health Care?

by

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ABSTRACT

Objectives: The objective of this study is to quantify the extent of limited health care access among three risk groups: (1) people with chronic illnesses, (2) those with high-risk behaviors or with high-risk conditions and (3) those who fail to comply with recommended preventive health care practices.

Methods: We used 1997-2000 survey data from the North Carolina Behavioral Risk Factor Surveillance System (BRFSS) for this study. Limited health care access consisted of non-continuous health insurance coverage in the past year, not seeing a doctor due to cost, and no medical checkup in the past year. Persons with chronic disease conditions, health risks, and non-compliant preventive health care behaviors were compared to those without these risks or conditions. Odd ratios adjusted for age, sex, race, household income, and education were calculated for each risk group using the SUDAAN software.

Results: Household income, education, and age were strong predictors of limited access to health care. Persons with chronic health conditions were more likely to report cost as a barrier to health care than those without chronic health conditions. In general, persons with high-risk behaviors or conditions were significantly more likely to report limited access to health care than those without high-risk behaviors or conditions. For example, after controlling for demographic characteristics, chronic drinkers were significantly more likely than non-drinkers (Adj. OR=1.73) and smokers were more likely than non-smokers (Adj. OR=1.55) to lack continuous health insurance. Non-compliance for preventive services was associated with significantly higher rates of non-continuous health insurance, limitation of care due to cost, and lack of routine medical care, both before and after controlling for socio-demographics.

Conclusions: This study shows that persons with high medical and behavioral risks are generally more likely than persons of lower risk to have problems with access to health care. This relationship persists after controlling for sex, race, age, education, and income. Persons with these risks have lower access to health care despite a higher level of health care needs. The strong association between risk factors such as smoking and drinking and limited access to health care suggests that persons with these risks face other obstacles to health care, such as lower self-motivation to maintain optimal health.

Introduction

Access to health care is critical for maintaining a healthy life. It is particularly vital for people with chronic illnesses whose medical needs most often exceed those of the general population. Access to health care among the chronically ill promotes the use of new therapies, lessens the burden of the disease, and enhances risk awareness and management of the disease.[1,2,3] Similarly, access to health care among those at high risk for developing chronic diseases can lower the risk or prevent the disease from occurring. For example, smokers with health insurance are known to quit smoking more often and more successfully than smokers without health insurance.[4] Advances in pharmacological treatment of obesity offer new promise in reducing the risk of diabetes onset among obese persons. [5] The health care cost directly attributable to health risks has been estimated to be a major portion of the total national health care expenditure.[6,7,8] Access to health care for persons with or at-risk for chronic disease is both cost effective and beneficial to the health and quality of life of those affected.

Access to health care is also particularly needed among persons who fail to participate in the use of preventive health care services, such as routine cancer screenings. The benefits of complying with preventive health care practices are well recognized.[9] For example, regular mammography screening for women over age 50 reduces mortality attributable to breast cancer by about 20 percent.[10] However, despite the known benefits, many adults do not make use of preventive health care and, as a result, are more likely to begin health care with disease diagnosis at an advanced stage, and to experience avoidable hospitalizations.

The objective of this study is to quantify the extent of limited health care access among three risk groups: (1) people with chronic illnesses, (2) those with high-risk behaviors or with high-risk conditions, and (3) those who fail to comply with recommended preventive health care practices. To serve as a reference for these study groups, we contrasted the extent of health care access among those without chronic diseases or those without the risk behaviors or conditions. Recognizing that socioeconomic and demographic characteristics impact heavily the use of and access to health care, these factors are controlled for in our assessment of limited access to health care.

Methods

Survey data from the North Carolina Behavioral Risk Factor Surveillance System (BRFSS) were used for this study. The BRFSS is a random-digit-dialed telephone survey of non-institutionalized adults, ages 18 and older. During the four-year study period (1997-2000), 11,496 North Carolina adults were interviewed.

Table 1 defines each of the chronic disease conditions, health risks, and non-complaint preventive health care behaviors examined in this study and shows the survey years that the data were available. The chronic disease conditions were derived from doctor-diagnosed questions such as, “Have you ever been told by a doctor that you have diabetes?” The risk behaviors/risk conditions were derived from the core questions, which appear annually or every other year, and are asked by all states participating in the BRFSS Survey. The preventive health behavior measures were derived from the core, optional module, and state-added questions.

Limited health care access was defined by three indicators. The first indicator included those who reportedly had no health insurance or had lapses in coverage in the past 12 months (referred to hereafter as “non-continuous health insurance”). The analyses of this indicator were restricted to 18 to 64 year olds due to universal insurance coverage by Medicare for Americans ages 65 and older. The second indicator, limitation of medical care due to cost, included those with or without health insurance who responded positively to the survey question, “Was there a time in the last 12 months when you needed to see a doctor but could not because of cost?” The third indicator included those who reportedly did not have a routine medical checkup in the past year regardless of health insurance coverage.

All analyses were performed with the SUDAAN software, designed for the analysis of complex sample designs, such as the BRFSS survey. The study results were tabulated by the three indicators of limited health care access for each risk category and their low risk comparison groups, i.e., those without the chronic disease, those without the risk behavior or risk condition, and those in compliance with the preventive health services. Multiple logistic regression was used to generate adjusted odds ratios for each risk category to measure the association between having the chronic disease or risk

Table 1. High Risk Groups Studied for Access to Health Care and Years of Data Available

Study Groups	Years Data Available
Chronic Disease Conditions	
Arthritis	1998, 2000
Asthma	2000
Diabetes	1997-2000
Heart Disease; includes heart attack, angina, or stroke	1999
High Cholesterol	1997,1999
Hypertension (high blood pressure)	1997,1999
Risk Behaviors / Risk Conditions	
Chronic Drinker; average 60 or more drinks per month	1997,1999
Current Smoker; current daily or occasional smoking	1997-2000
Medium or High HIV Risk; self-reported medium or high HIV risk	1997-2000
Obese; computed body mass index greater than or equal to 30.0	1997-2000
Physically Inactive; no reported leisure-time physical activity	1998,2000
Non-Compliant Preventive Health Behaviors (did **not** meet following guidelines)	
Blood Pressure Check; age 18+ in past 2 years	1997,1999
Cholesterol Check; age 18+ in past 5 years	1997,1999
Flu shot; age 40+ had shot in past 12 months	1997,1999,2000
Mammogram; age 40+ in past 2 years	1997-2000
Pap Smear Exam; age 18+ in past 3 years	1997-2000
Pneumonia Vaccination; age 40+ ever had vaccine	1997,1999,2000
Sigmiodoscopy/Colonoscopy Exam; age 50+ ever had exam	1997,1999
Recent Dental Visit (for any reason); age 18+ past year	1999

factor and the likelihood of having limited access to health care, while controlling for age, race, sex, education, and household income.

Results

Socio-Demographic Characteristics

For the study period (1997-2000), an estimated one in five adult North Carolinians reported having no health insurance or interrupted coverage within the past year (Table 2). About one in eight adults reported not being able to obtain needed medical services because of cost, and about one in four adults reported not having a routine checkup in the past year.

With respect to gender, the percentage of those not having continuous health insurance in the past year was about the same for both sexes: 21.1 and 20.8 percent for males and females respectively. In contrast, males (9.6%) were significantly less likely than females (14.6%) to report that cost prohibited access to medical care, while females (18.1%) were significantly less likely than males (34.2%) to report not having a routine checkup in the past year.

After adjusting for household income, age, sex and education, there was no significant difference by race in reporting not having continuous health insurance. The same was true for cost; minorities were no more likely than whites (Adj. OR=0.95) to be limited by the cost of obtaining medical care. However, when considering the use of routine medical care, whites were significantly *more likely* than minorities (Adj. OR=1.46) to report not having a recent routine checkup.

After adjusting for income and other demographics, adults under the age of 40 were more likely than 40 to 64 year olds to report no insurance or lapses in coverage in the recent past (Adj. OR=2.22). When compared

Table 2. Demographic Characteristics and Adjusted Odd Ratios by Indicators of Limited Health Care Access: North Carolina BRFSS, 1997-2000.

	No Continuous Health Insurance				Could not See a Doctor Due to Cost				Did not Have a Checkup in Last Year			
	N	%	95% C.I.	Adj. OR	N	%	95% C.I.	Adj. OR	N	%	95% C.I.	Adj. OR
Total	1,804	20.9	19.8-22.0		1,472	12.2	11.5-12.9		2,688	25.8	24.8-26.8	
Sex												
Male	701	21.1	19.4-22.9	1.04	446	9.6	8.6-10.6	0.62*	1,476	34.2	32.5-35.9	2.36*
Female	1,103	20.8	19.5-22.1	1.00	1,026	14.6	13.6-15.6	1.00	1,212	18.1	17.0-19.2	1.00
Race												
White	1,266	19.5	18.3-20.7	1.14	977	11.0	10.2-11.8	0.95	2,188	26.9	25.8-28.0	1.46*
Minority	534	25.6	23.1-28.3	1.00	492	16.4	14.8-18.2	1.00	492	22.1	19.9-24.6	1.00
Age Groups												
18-39	1,095	27.1	25.3-28.9	2.22*	658	14.0	12.8-15.3	3.64*	1,251	31.0	29.2-32.8	2.88*
40-64	703	14.5	13.3-15.7	1.00	641	12.8	11.7-14.0	3.42*	1,126	25.7	24.2-27.2	2.33*
65 +	–	–	–	–	166	6.4	5.4- 7.6	1.00	291	13.2	11.7-15.0	1.00
Education												
H.S. or Less	1,102	28.0	26.2-29.8	1.49*	937	15.8	14.7-17.0	1.33*	1,369	26.7	25.2-28.2	1.16*
Some College +	694	14.6	13.4-15.9	1.00	527	8.5	7.7- 9.4	1.00	1,304	24.9	23.5-26.3	1.00
Household Income												
Less than $25,000	924	38.8	36.4-41.3	6.49*	811	22.3	20.6-24.0	6.95*	857	26.4	24.6-28.3	1.33*
$25,000-49,999	489	17.0	15.4-18.6	2.13*	345	9.6	8.5-10.8	2.41*	880	26.8	25.1-28.6	1.10
$50,000+	146	7.7	6.3- 9.3	1.00	89	3.9	3.1- 5.0	1.00	576	25.9	23.8-28.2	1.00

N = Number of respondents, % = Weighted Percentage, 95% C.I. = Confidence Interval.
* Indicates that Adj. OR (Adjusted Odd Ratio) is significant at least at the 0.05 probability level;
Adj. ORs are adjusted for all other variables in the table (sex, race, age group, education, income).

to persons age 65 and older, both groups of younger adults (18-39 yrs. and 40-64 yrs.) were much more likely to report not being able to see a doctor because of cost, and to report not having a recent medical checkup.

Household income had the strongest independent effect on limited access to health care. Most notably, respondents from very low-income households (< $25,000) were much more likely to report non-continuous health coverage (Adj. OR=6.49), being limited by the cost of medical care (Adj. OR=6.95), and not having a recent medical checkup (Adj. OR=1.33), as compared to those from higher income households ($50,000+).

Chronic Disease Conditions

Table 3 shows the association of chronic disease conditions, risk behaviors/risk conditions, and non-compliant preventive health behaviors with limited health care access. For all chronic disease conditions, the percentage with non-continuous health insurance coverage in the past year was not substantially different from the non-disease groups. After adjusting for socio-demographic characteristics, there was no noticeable association between having one of the six chronic conditions and the report of non-continuous health insurance.

The percentage reporting that cost had prevented access to medical care was significantly higher for persons with arthritis, asthma, diabetes, and high cholesterol, as compared to those without these conditions. After controlling for sex, race, age, income and education, persons with arthritis (Adj. OR=1.92), asthma (Adj. OR=1.90) and high cholesterol (Adj. OR=1.55) were more likely to be limited by the cost of care than their respective comparison groups.

The percentage reporting no routine medical checkup in the past year was generally much lower in the chronic disease groups than in the non-disease groups. For persons with diabetes, the percentage of those with no routine medical checkup (8.6%) was much lower than that observed among persons without diabetes (26.9%); a similar pattern was evident among persons with heart disease. After controlling for socio-demographic factors, the odds of not having a routine checkup were significantly lower among persons with chronic diseases, except for those with asthma.

Risk Behaviors/Risk Conditions

Chronic drinkers and current smokers were significantly more likely than persons without these risks to have interrupted or no health insurance. After controlling for socio-demographic factors, chronic drinkers were significantly more likely than non-drinkers (Adj. OR=1.73) and smokers were more likely than non-smokers (Adj. OR=1.55) to lack continuous health insurance. Furthermore, chronic drinkers and smokers also had the highest odds of not being able to see a doctor because of cost and of not having a recent medical checkup. Nearly 45 percent of drinkers and about one-third of smokers reported no recent routine medical care.

The rates of non-continuous health insurance, limitation of care due to cost, and lack of routine care were slightly higher among persons with a perceived high or moderate chance of getting HIV, compared to those who perceived their risk as low or none. However, when controlling for income and other factors, only the odds ratio for “could not see a doctor due to cost” was statistically significant for persons with a perceived high/moderate HIV risk.

Obese and physically inactive persons had substantially higher rates of non-continuous insurance and of limited health care access due to cost, as compared to persons without these risk conditions. When controlling for demographic factors, obesity remained strongly associated with lack of continuous insurance and limited access due to cost, while physical inactivity remained associated only with limited access due to cost.

Non-Compliant Preventive Health Behaviors

For most preventive services, non-compliance was associated with significantly higher rates of non-continuous health insurance, limitation of care due to cost, and lack of routine medical care. Large, statistically significant adjusted odd ratios further indicate that non-compliant persons had higher risks of having limited access to health care regardless of their socio-economic status, compared to the compliant persons.

Non-compliant groups nearly always had larger rates and odds of having no continuous health insurance than the compliant groups. The only exception was persons not

Table 3. The Association of Chronic Disease Conditions, Risk Behaviors/Risk Conditions and Non-Compliant Preventive Behaviors with Three Limited Health Care Access Indicators in North Carolina, 1997-2000.

	No Continuous Health Insurance			Could not See a Doctor Due to Cost			Did not Have a Checkup in Last Year		
	Study Group (%)	Comparison Group (%)	Adj. OR	Study Group (%)	Comparison Group (%)	Adj. OR	Study Group (%)	Comparison Group (%)	Adj. OR
Chronic Disease Conditions									
Arthritis	19.0	21.0	0.99	16.4*	10.9	1.92*	16.9*	29.2	0.68*
Asthma	21.7	19.8	1.05	21.3*	11.0	1.90*	20.9	26.2	0.87
Diabetes	19.5	21.0	0.80	16.3*	11.9	1.26	8.6*	26.9	0.27*
Heart Disease	19.4	19.8	1.19	13.7	10.8	1.39	7.3*	24.7	0.28*
High Cholesterol	14.9	16.0	1.09	12.0*	9.1	1.55*	14.7*	21.8	0.61*
Hypertension	21.5	20.7	1.09	13.7	11.8	1.11	14.8*	28.6	0.46*
Risk Behaviors/ Risk Conditions									
Chronic Drinking	32.1*	20.4	1.73*	21.6*	12.0	2.46*	44.5*	24.7	1.62*
Current Smoker	29.7*	17.4	1.55*	18.9*	10.0	1.71*	33.5*	23.2	1.33*
Medium or High HIV Risk	22.8	20.6	1.04	16.4	13.2	1.36*	29.8	28.1	1.12
Obese	24.6*	19.8	1.21*	17.9*	10.5	1.46*	23.3*	26.4	0.87
Physically Inactive	26.5*	19.9	1.18	16.1*	10.4	1.43*	26.7	27.5	1.15
Non-Compliant Preventive Health Behaviors									
Blood Pressure Check	50.2*	19.3	3.05*	23.8*	11.6	1.70*	95.5*	21.6	53.0*
Cholesterol Check	33.3*	15.4	1.76*	19.0*	9.8	1.55*	46.8*	18.1	3.82*
Flu Shot	29.0*	16.3	2.36*	14.6	11.9	1.20	31.8*	24.7	1.61*
Mammogram	25.3*	7.8	3.37*	17.4*	9.2	1.69*	36.1*	5.6	9.56*
Pap Smear	33.3*	18.3	2.02*	20.0*	12.8	1.57*	50.0*	7.6	14.52*
Pneumonia Vaccination	27.2	26.0	1.12	14.6	10.1	1.73*	30.5	26.8	1.53*
Sigmiodoscopy/ Colonoscopy	14.2*	5.9	2.17*	10.0*	6.6	1.07	21.8*	9.1	3.14*
Dental Visit	36.1*	12.2	3.17*	19.1*	6.9	1.94*	31.5*	18.7	1.97*

*Indicates that study group rate is significantly different than comparison group rate at least at the 0.05 probability level, or adjusted odd ratios are significant at least at the 0.05 probability level.

Adj. ORs (Adjusted Odd Ratios) are adjusted for sex (male and female) if needed, race (white and minority), age group (18-39, 40-64 and/or 65+), education level (H.S. or less and Some College or more), and income level (Less than $25,000, $25,000- 49,999 and $50,000+).

meeting the recommended guidelines for pneumonia vaccination. The lack of continuous health insurance exceeded 30 percent among those not in compliance with cholesterol, blood pressure, or Pap smear screenings and among those without recent dental care.

The largest disparity in limitation of health care due to cost was found among those with no recent dental visit. This group was much more likely to report not being able to see a doctor because of cost than those with a recent dental visit (Adj. OR=1.94). Similarly, those who were non-compliant with blood pressure checks, cholesterol checks, mammograms, Pap tests, and pneumonia vaccinations were significantly more likely than persons in compliance to experience cost as a barrier to health care.

Very high rates of not having a checkup in the past year were evident for almost all non-compliant groups. About 95 percent of those with no blood pressure check in 2 years, 50 percent of women with no Pap test in 3 years, and nearly 47 percent of those with no cholesterol check in 5 years reported that they did not have a recent medical checkup. When adjusted for demographic differences, the odds ratio for not having a checkup was 9.56 for non-compliance with mammograms, 14.52 for non-compliance with Pap tests, and 53.0 for non-compliance with blood pressure checks.

Discussion

In this study, the strongest demographic predictors of limited health care access were household income and age. Almost 40 percent of survey respondents with total household incomes under $25,000 and nearly 30 percent adults under age 40 had no health insurance or had interrupted coverage in the past year. Younger adults may opt not to have health insurance or a routine checkup due to relatively good health, as compared to older adults. Adults under age 40 were three times less likely than older adults to report having fair or poor health. However, people in low-income groups simply may not be able to afford the cost of health insurance.

Level of education was an independent predictor of limited health care access. In addition to having more stable income, people with college or higher education levels may value having continuous health insurance more than people with lower education levels. The observed disparity in access to health care between whites and minorities appears to be due primarily to differences in household income, education, and age. After controlling for these factors, the odds ratios for race were not significant for non-continuous health insurance and limitation of care due to cost. However, whites were significantly more likely than minorities to report that they did not have a checkup in the last year (Adj. OR= 1.46).

Chronic Disease Conditions

In North Carolina, people with chronic health conditions had about the same likelihood of experiencing interrupted or no health insurance in the past year as people without chronic health conditions. However, this could be viewed as a disparity between the groups with and without these conditions. People with chronic conditions have an increased need for medical care. Also people with asthma, diabetes, and arthritis have significantly lower household incomes. This suggests that people with chronic illnesses may be making a bigger sacrifice to have continuous health insurance coverage. Furthermore, the cost of a doctor visit was a significant barrier to health care among persons with arthritis, asthma, and high cholesterol.

Our study results revealed that persons with chronic diseases were much *less likely* than persons with these diseases to report not having an annual routine checkup. This seems reasonable, given the greater need for medical surveillance among the chronically ill population. However, these results may also reflect differences in interpretation of the term “routine checkup” between those who have and do not have chronic health problems. It may be that those with chronic health problems tend to equate a routine checkup with a scheduled disease-management visit, whereas the non-chronically ill may perceive the term more generally, as an overall health checkup.

Finally, the higher routine checkup rates of adults with chronic health conditions may be biased. The groups with chronic health conditions were chosen because they reported being told about their health conditions

by a doctor. People who visit a doctor regularly may be more likely to be diagnosed with a chronic health condition than those who do not.

Risk Behaviors/Risk Conditions

For persons engaged in high risk behaviors or those with high risk conditions, limited health care access was characterized chiefly by lack of continuous health insurance and limitation of care due to cost. This was true for all risk groups, except for persons who believed they had a high or moderate chance of getting HIV/AIDS and those who were physically inactive, whose adjusted odds of limited insurance coverage were not statistically significant. The adjusted odds of not having a routine medical checkup was elevated only for smokers and chronic drinkers.

After adjusting for socio-demographic factors such as low income, which are known to be associated with problems in accessing health care, the higher risk of not having continuous health insurance persisted among chronic drinkers, current smokers, and obese persons. The strong association between these risk factors and lack of continuous health insurance suggests that these risk groups face other obstacles to health care such as lower self-motivation to maintain optimal health, not perceiving health as a priority, or differential insurance rates that make coverage more expensive.

Not being able to access medical care because of cost was the highest among chronic drinkers, smokers, and obese persons. The high cost of health care among the latter two risk groups is probably associated with the presence of multiple disease or risk conditions. Obesity is known to be a risk factor for diabetes and hypertension; smoking is a widely known risk factor for many diseases, including heart and lung disease. A recent study found that both the increased use of health care and the cost of treating persons with obesity was primarily a function of obesity-associated conditions, such as diabetes and hypertension.[11] In our study, the prevalence of diabetes was 2.9 times as high among obese persons, compared to those who were not obese.

Non-Compliant Preventive Health Behaviors

For persons not in compliance with preventive health care service guidelines, limited access to health care was reflected in all three study indicators: non-continuous health insurance, limitation of health care due to cost, and no recent checkup.

For women's preventive health services, i.e. Pap Smear tests and mammography exams, those *not in* compliance were substantially at higher risk for non-continuous health insurance, limitation of health care due to cost, and no routine health checkup. Other studies show similar results. For example, the Women's Health Initiative Observational Study (n=55,278) found that insurance status and type, *and time since last provider visit,* were significantly associated with appropriate mammography and Pap Smear cancer screenings, independent of demographic and other health-related characteristics .[12]

For all recommended preventive services except pneumonia vaccinations, lack of continuous health insurance coverage was elevated among those not in compliance. Non-continuous insurance coverage was highest for those screening categories that included more younger persons: Pap tests, cholesterol checks, blood pressure checks, and dental visits. Young age is likely a factor contributing to poor insurance coverage, given that younger adults are less likely to have stable health insurance than older adults. For example, when considering blood pressure screenings, which accompany most medical visits, nearly 60 percent of non-compliant 18 to 39 year olds lacked continuous health insurance coverage.

The risk of not having a recent routine medical checkup was also significantly elevated among the non-compliant groups. As one would expect, almost all of those (95%) who did not have their blood pressure taken in the previous two years also had no routine medical care in the previous year. Among persons non-compliant on cholesterol screening, nearly half had no checkup in the last year. Given the association of health screening compliance and having a checkup in the last year, the results of this study emphasize the importance of having an annual medical checkup. In a study of community-based primary care practices, researchers found that appropriate screening for breast, cervical, colorectal, and prostate cancer was strongly associated with having a health maintenance visit.[13]

In summary, this study shows that persons with chronic disease conditions, risk behaviors/risk conditions, and non-compliant preventive health behaviors are generally

more likely than persons of lower risk to have problems with access to health care. This relationship persists after controlling for sex, race, age, education, and income. Persons with these risks have lower access to health care despite a higher level of health care needs. The BRFSS is useful for monitoring patterns and trends in access to health care among North Carolina's adult population.

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