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Patient perceptions of asthma-related financial burden: public vs. private health insurance in the United States

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Introduction

Health insurance serves the purpose of providing financial protection from unanticipated illness episodes and is also a mechanism for financing or pre-paying a variety of health benefits that are neither unexpected nor rare.¹ Numerous reports by the Institute of Medicine have shown that lack of insurance, underinsurance, and gaps in coverage have significant adverse health consequences.¹

Major differences in health insurance coverage are evident in the U.S. In the private market, large-subscriber group coverage may cover about 86% of the cost of services, but this type of insurance is only enjoyed by 19% (48.6 million) of insured Americans.² Recent trends demonstrate that the comprehensiveness of large group employer-sponsored insurance coverage is declining and individuals with chronic disease in this population can be underinsured.³ Public insurance consists of Medicare and Medicaid coverage, and other safety net programs. Due to rising costs to states of sustaining Medicaid programs, the Deficit Reduction Act of 2005 allowed states to charge nominal co-pays and premiums to Medicaid recipients.

Differences in health care utilization by health insurance are evident. In pediatric asthma, children with Medicaid coverage use more emergency department (ED) and inpatient services for asthma compared to children with private insurance.⁴ Other work among adults has shown that Medicaid coverage after 2 years of coverage has not resulted in reductions in

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urgent care utilization.⁵ Whether these relationships are also evident among adults with asthma is unclear.

High risk groups, such as African American women with asthma, provide a valuable population for understanding relationships between types of health insurance coverage, perceptions of financial burden, and asthma health outcomes. Asthma is a prevalent chronic condition marked by poor health outcomes and high associated costs. African American women are disproportionately affected by asthma, face the greatest challenges with self-management, have disproportionately high urgent care use for the condition, and experience worse outcomes compared to other subgroups.⁶ They may be vulnerable to perceiving financial burden with asthma management due to racial and gender disparities in economic opportunities.⁷

Given the complexity of the health insurance market in the U.S., the value of health insurance in managing chronic disease is important to understand. Identifying pathways that explain how patient characteristics lead to perceptions of health-related financial burden and how these perceptions relate to health outcomes may better equip providers to anticipate which patients are at greatest risk for adverse results and require particular attention regarding ways to minimize the costs to manage their condition.

The purpose of this study was to describe 1) who is at risk for perceiving financial burden among those who have public or private health insurance, and 2) associations between type of coverage, perceptions of financial burden and asthma-related health outcomes.

Methods

Data Source

This study was a secondary data analysis. Data comprise items from the baseline assessment in a randomized controlled trial (RCT) evaluating a self-management program for women with asthma. All study procedures were approved by the Institutional Review Board of the university (HUM00033784).

Sample

Participants with persistent asthma were recruited from clinics within the university health system, through Blue Cross Blue Shield, and community advertisements. Study eligibility criteria for women were: 1) self-identity as African American, 2) age 18 years or older, 3) listed on the university health system Asthma Patient Registry, or within the asthma registry of Blue Cross Blue Shield, or cared for by a provider contracted with Blue Cross, 4) access to a telephone, and 5) not pregnant. Over the 3-year recruitment period a total of 1,315 women were identified through UMHS and were mailed recruitment materials, including a description of the study, two copies of the consent form, and a decline postcard. Of those, 843 women were successfully reached via telephone, and a total of 444 (53%) women consented to participate. Women who declined participation ($n = 301$) did so primarily due to lack of interest ($n = 63$), perception of no asthma diagnosis ($n = 52$), and feeling too busy ($n = 43$). Women who declined with no reason ($n = 136$) did so either via telephone or by mailing in a decline postcard. Ineligible women ($n = 98$) were largely women who had

intermittent or no asthma symptoms in the past 12 months ($n = 58$), or an exclusionary respiratory disease ($n = 21$). Failure to contact women via telephone was attributable to non-working or changed telephone numbers ($n = 146$), or multiple unsuccessful call attempts and unreturned voice messages ($n = 250$). Ultimately, 422 of those who consented to participate provided baseline data. The analysis presented here comprises 219 participants who reported perceptions of health-related financial burden in the baseline interview. Participants provided written informed consent to provide data and have their medical records reviewed.

Measures

All data were collected through hour-long telephone calls conducted by trained interviewers.

Perceptions of health-related financial burden—Perception of financial burden was conceptualized in this study as financial burden that tapped into an individual's own appraisal of their financial situation as it relates to their health. The single-item measure assessed on a 5-point Likert-scale included: "Do you consider cost to be a problem in managing your asthma?" 'Problem' was defined as either not paying the bills because they could not be afforded or paying them despite financial hardship. Self-report, subjective methods are adequate for how financial burden is conceptualized in this study. Similar measures with a general population of adults have been used in previous work where individuals were asked if they considered their out-of-pocket expenses a problem in managing their health.⁸

Urgent care use—Respondents were asked how many times during the past year they had: 'an unscheduled visit to the doctor or clinic for urgent asthma treatment?', 'gone to the ED for asthma treatment?', 'to stay overnight at least one night in the hospital, because of your asthma?'. Few medical records were available to assess a true validation for the sample of interest in this particular study. However, other work has shown that recall with signal health care events such as emergency department visits and hospitalizations are shown to correlate highly with medical records given that these are rare events.⁹

Quality of life—Asthma-related quality of life was measured using the 15-item, validated, Mini Asthma Quality of Life Questionnaire.¹⁰

Out-of-pocket expenses for prescribed medications—The most prevalent out-of-pocket expense for disease management, cost of medicines, was used as the measure in this study for total out-of-pocket expenses.¹¹ Participants were asked to name each medication they take for their asthma, how many times they refilled each medicine, and how much they pay out-of-pocket for each refill. Each out-of-pocket payment was multiplied by the number of refills, summed, and rounded to obtain total expenses over the past year.

Health insurance—Respondents were asked what kinds of health coverage they had and to select all that apply (private health insurance, Medicare, Medi-Gap, Medicaid, military health care, Indian Health Service, state-sponsored plan, other government program, single service plan (e.g. vision)). Verification of health insurance through review of medical record was conducted with Cohen's Kappa, indicating high level of agreement ($K = 0.69$).

Individuals with dual coverage in the sample were those with Medicare and supplementary coverage. These individuals were categorized into the public insurance group given that their primary health insurance plan was a government sponsored plan.

Asthma Control—Asthma control was measured using the 5-item, validated, Asthma Control Test (ACT).¹² The National Asthma Education and Prevention Program (NAEPP) asthma guidelines were used to classify asthma control into three categories: poorly controlled, not well controlled, or well controlled, and assess frequency of daytime and nighttime asthma symptoms.¹³

Clinical and demographic data were also collected.

Analysis

Student's t-test for continuous variables and contingency tables with chi-square and Fisher's exact tests for categorical variables were used to examine differences in economic, demographic, and clinical factors among those who reported perceptions of financial burden (n=180) by health insurance coverage (public vs. private). Given the small number of individuals in the sample with no insurance, they were excluded from the analysis.

Multigroup, path analytic models were used to investigate whether health insurance (private vs. public coverage) had a moderating effect on indirect relationships between demographic and clinical characteristics, and perceptions of financial burden (dependent variable), when adjusted for clinical factors. Path models are a useful method for assessing explanatory mechanisms with observed variables, and path is adjusted for all factors included in the model.¹⁴ All equations were estimated simultaneously with Mplus 6.12 software. P-values of 0.05 or less were considered statistical significant for these analyses.

Multiple variable regression models computed in SAS 9.3 were used to examine relationships between type of health insurance coverage (private vs. public) (independent variable) and perceptions of financial burden (independent variable) on asthma outcomes (dependent variables) of interest: asthma-related ED visits (Poisson regression), hospitalizations (negative binomial regression), and urgent care use (Poisson regression), and asthma-related quality of life (linear regression).

Results

Sample

Table 1 describes economic, demographic, and clinical characteristics of individuals who perceived financial burden (n=219) stratified by health insurance (private vs. public coverage). More individuals in the private insurance group were married ($p<0.01$), had greater educational attainment ($p<0.001$), higher income ($p<0.001$), part-time or full-time employment ($p<0.001$), and greater out-of-pocket expenses ($p<0.05$) compared to the public insurance group. Compared to the private insurance group, more individuals in the public insurance group were head of their household ($p<0.01$) and unemployed ($p<0.001$).

More individuals with public coverage had greater daytime ($p<0.05$) and nighttime ($p<0.01$) symptom days, worse asthma control ($p<0.001$), more medications ($p<0.01$) and multiple morbidities ($p<0.01$) compared to individuals with private coverage. The public insurance group was more likely to see only a primary care provider, and experienced greater asthma-related ED visits ($p<0.01$), hospitalizations ($p<0.05$), urgent office visits ($p<0.01$), and lower asthma-related quality of life ($p<0.001$), compared to the private insurance group.

Path model results

The fit of the final path model was adequate according to the goodness-of-fit criteria ($X^2=65.80$, $df=56$, $p=0.17$; CFI= 0.93, RMSEA= 0.035, 90% CI: 0.00 to 0.06; WRMR=1.09). Strong evidence was found for differences between public and private health insurance in terms of the relationships between demographic factors, household income, out-of-pocket expenses, and perceptions of financial burden, when adjusted for clinical factors ($X^2(5) = 39.89$, $p<0.001$).

For the public insurance group, being married and having greater educational attainment were positively associated with perceptions of financial burden through more income, out-of-pocket expenses, when adjusted for clinical factors (Figure 1). For the private insurance group, being married, having greater educational attainment, and having full time employment were positively associated with perceptions of financial burden through more income when adjusted for clinical factors. For both the public ($p<0.001$) and private insurance groups ($p<0.05$), greater out-of-pocket expenses was associated with greater perceptions of financial burden. For those with public insurance, more income was associated with more out-of-pocket expenses ($p<0.001$), whereas this relationship was not observed for the private insurance group.

Asthma Outcomes

When adjusted for multiple morbidities, asthma control, household income, out-of-pocket expenses, and perceptions of financial burden, individuals with private insurance had fewer asthma-related ED visits ($p<0.001$) and fewer hospitalizations ($p<0.05$) compared to individuals with public insurance (Table 2). When additionally adjusted for extent of health insurance coverage, individuals who perceived financial burden had more urgent office visits for asthma ($p<0.001$) and reported lower asthma-related quality of life ($p<0.001$) (Table 3).

Discussion

This is the first study we are aware of to examine differences in perceptions of financial burden by health insurance coverage and the relationship of these perceptions to asthma outcomes, especially in a high-risk adult population with asthma. Findings showed demographic and clinical differences in perceptions of financial burden by health insurance, and these perceptions were associated with adverse asthma health outcomes. Those that perceive asthma as a financial burden regardless of health insurance have poor asthma control, more urgent healthcare visits, lower household income, and report lower quality of life.

Differences in who is at risk for perceptions of financial burden were evident between those who have private versus public coverage, and primarily stemmed from household income. Provisions and cost-sharing requirements for public insurance programs such as Medicaid are predominately dependent on income for the working age population and individuals with Medicare requiring supplemental coverage. Marriage and greater educational attainment may increase income, and therefore decrease protection from out-of-pocket expenses. No policy protection for out-of-pocket health care costs existed for individuals with private insurance at the time of the study. For individuals with chronic conditions who may accrue substantial routine health care costs, private health insurance may not shield individuals and families from out-of-pocket health care expenses that may comprise a substantial percentage of their incomes. This may continue with the recent passage of the Affordable Care Act given that subsidies for out-of-pocket expenses are contingent on income requirements for the privately insured.

Differences in adverse asthma outcomes by health insurance and perception of financial burden were evident, and our findings are consistent with other work.⁴ The publicly insured in this sample used more urgent care than the privately insured. The availability of quality care for the publicly insured may explain these differences. Individuals with public coverage, particularly Medicaid and other safety net programs, not only face reduced access barriers, but may also experience disruptions in continuity of care from episodic coverage commonly prevalent with public insurance.¹⁵ Lack of appropriate and comprehensive asthma treatment and education in ambulatory settings increase risk for inpatient and ED services, and the publicly insured with asthma are at particularly high risk.

Our findings also showed that regardless of insurance coverage, economic resources, and asthma control, those who perceive financial burden had greater urgent office visits for asthma and reported lower asthma-related quality of life. One's health insurance may not provide adequate financial protection from the tailored asthma treatment plan prescribed to manage the condition. Although not directly measured in this study, perceptions of financial burden may also include factors beyond services that are typically covered by insurance such as travel costs to reach health care facilities, lost work time, or lifestyle changes. Individuals may also not have opportunities to adequately address these concerns with health care providers, or navigate low-cost options on their own.

Several limitations in this study were evident. Data were self-reported, therefore some responses may not reflect actual economic circumstances of participants in this study. Since this was secondary data analysis, data were limited to what was available in the data source. Future studies may consider incorporating multiple survey items to measure perceptions of financial burden. Some private insurance plans, particularly group coverage, can be more comprehensive than government sponsored insurance or be perceived as such, however data on the comprehensiveness of coverage or formularies were not available in the data sources. The ability to note subtle distinctions in variables collapsed into categories via response distribution may have been lost. Variables with observations expressed as categorized data were checked with similar results evident when collapsed into categories a different way. The data were cross-sectional therefore the true direction of association between some variables may not be easily discerned. Finally, the study sample comprised African

American women receiving care in Southeast Michigan. As a result, findings may not be generalizable to all women or adults with asthma or those receiving care in other regions, but certainly generalizable to high risk populations.

These findings have a number of implications for policy and clinical practice. The Patient Affordable Care Act will provide millions of uninsured Americans with greater availability of both private and public insurance. Despite these reforms, the findings from this study suggest that perceptions of financial burden and the pathways through which these perceptions occur will still persist for individuals with both private and public health insurance. Given the increasingly difficult financial environment, growing chronic disease burden requiring health services use, and the fact that health care reform policy protections continue to be dependent on income thresholds, policy reforms continue to be indicated to mitigate out-of-pocket expenses that may accumulate as a result of managing chronic disease over the long-term.

The findings also have implications for clinical practice. Patient perceptions influence self-management behaviors¹⁶, and other work has shown associations between poor health outcomes and perceptions of financial burden.¹⁶ Since health care providers make therapeutic recommendations, the findings here suggest opportunities for communication between care teams and patient regarding ways to reduce the cost of regimens and access low cost options and assistance programs. Special attention is needed for patients with government-sponsored insurance to address the fact that they have greater disease burden and are particularly vulnerable to changes in eligibility for their coverage. Consideration of how to reduce cost-sharing associated with a treatment plan is needed for patients with private insurance given that even broad annual limits on out-of-pocket spending with new reforms have no bearing on income for the heterogeneous population covered under these plans.

Individuals with all types of health insurance coverage perceive financial burden with their asthma care, and these perceptions are associated with negative health outcomes. Demographic characteristics suggesting more financial security were not necessarily aligned with lower perceptions of financial burden. Burden may be present despite having economic resources and health insurance. Tailored communication that considers unique risk factors and outcomes by health insurance coverage is indicated.

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Figure 1.

Table 1

Economic and demographic characteristics of participants who perceive financial burden: differences by health insurance.

Economic and demographic characteristics	Private insurance (n=103)	^a Public insurance (n=98)	t or χ^2
Age (Mean, (SD))	43.61 (12.08)	44.36 (16.18)	T=-0.37 NS
Marital status (% Married)	42% (43)	16% (16)	$\chi^2(1)=15.64^{***}$
Head of household (% yes)	62% (63)	79% (77)	$\chi^2(1)=7.39^{**}$
3 or more individuals in the household	37% (38)	34% (34)	$\chi^2(3)=2.83$ NS
Educational attainment			$\chi^2(2)=16.15^{***}$
High school /GED or less	8% (8)	24% (23)	
Some college, associate's degree, or vocational school	48% (49)	55% (54)	
College or above	44% (45)	21% (21)	
Employment status			$\chi^2(2)=42.44^{***}$
Part-time	25% (26)	28% (27)	
Full-time	58% (59)	17% (17)	
No employment	17% (17)	55% (54)	
Household income			$\chi^2(2)=55.27^{***}$
<\$20,000	18% (14)	69% (63)	
\$20,001 – \$40,000	44% (35)	28% (25)	
\$40,001 – \$60,000	19% (15)	3% (3)	
>\$60,001	19% (15)	0% (0)	
Out-of-pocket expenses for prescribed medicines (Mean, (SD))	\$271.98 (424.06)	\$160.49 (286.59)	T=2.19*
(Range)	\$0 – \$2,840	\$0 – \$2,000	
Clinical Characteristics			
Specialty of care			
Primary care and specialist	41% (42)	39% (38)	^b $\chi^2(1)=1.17$ NS
Primary care only	48% (50)	53% (52)	
Specialist only	8% (8)	4% (4)	
No doctor	3% (3)	4% (4)	
Frequency of daytime symptoms			$\chi^2(2)=5.97^*$
<2 days per week	66% (68)	49% (48)	
3 days per week	25% (26)	38% (37)	
Throughout the day	9% (9)	13% (13)	
Frequency of nighttime symptoms			$\chi^2(2)=9.49^{**}$
2 times per month	66% (67)	47% (46)	
1–3 times per week	17% (17)	35% (34)	
More than 4 times per week	18% (18)	18% (18)	
Asthma control			$\chi^2(2)=11.46^{**}$

Economic and demographic characteristics	Private insurance (n=103)	^a Public insurance (n=98)	t or χ^2
Well controlled	34% (35)	17% (17)	
Not well controlled	33% (34)	28% (27)	
Very poorly controlled	33% (34)	55% (54)	
Asthma medications			^c $\chi^2(1)=1.14$ NS
Controller and rescue	75% (77)	62% (61)	
Controller only	3% (3)	3% (3)	
Rescue only	16% (16)	19% (19)	
Allergy only	1% (1)	1% (1)	
Allergy and rescue only	2% (2)	10% (10)	
Leukotriene modifier and rescue	2% (2)	1% (1)	
Leukotriene modifier only	1% (1)	0% (0)	
Other	1% (1)	3% (3)	
Total number of medications (Mean, (SD))	5.02 (2.51)	6.07 (3.21)	T=-2.57**
Total number of other chronic conditions (Mean, (SD))	3.31 (2.38)	4.38 (2.80)	T=-2.94**
Asthma action plan (% yes)	68% (69)	68% (65)	$\chi^2(1)=0.01$ NS
Own a Peak flow meter	68% (70)	65% (64)	$\chi^2(1)=0.15$ NS
Asthma-related quality of life (Mean, (SD))	4.83 (1.20)	4.12 (1.08)	T=4.32***
Urgent office visits due to asthma (Mean, (SD))	1.39 (1.63)	2.49 (3.11)	T=-3.07**
Emergency department visits due to asthma (Mean, (SD))	0.66 (1.22)	1.53 (2.18)	T=-3.44***
Hospitalizations due to asthma (Mean, (SD))	0.24 (0.75)	0.49 (0.90)	T=-2.13*

Chi-square tests were performed on clinical variables of interest to identify differences between the groups. NS= not significant. Level of significance reported as (p-value):

*
p<.05,

**
p<.01,

p<.001.

^aPublic Insurance= Medicaid, Medicare, Medicare and supplemental coverage, other government insurance.

^bDue to low cell count, chi-square test is based on the associations between primary care and specialist, and primary care only.

^cDue to low cell count, chi-square test is based on the associations controller and rescue, and rescue only

Table 2

Adjusted effects of extent of health insurance on health outcomes, obtained from multivariate regression.

Variable	^a Private Insurance estimate [95% CI]	Public Insurance
^a Emergency department visits	−0.57*** [−.90 to −0.25]	Reference
^b Hospitalizations	−0.91* [−1.73 to −0.09]	Reference
^a Urgent office visits	−0.13 [−0.37 to 0.09]	Reference
Asthma-related quality of life	−0.11 [−0.37 to 0.13]	Reference

NOTE: All models were adjusted for number of chronic conditions, asthma control, household income, total out-of-pocket expenses; estimates for control variables not displayed;

* p<0.05;

** p<0.01;

*** p<0.001. CI= confidence interval

^a Model estimated with a Poisson distribution

^b Model estimated with a negative binomial distribution

Table 3

Adjusted effects of perceptions of financial burden on health outcomes, respectively, obtained from multivariate regression.

Response variable	Estimate of adjusted effect of perceptions of financial burden [95% CI]	No perception of financial burden
^a Emergency department visits	0.22 [−0.02 to 0.47]	Reference
^b Hospitalizations	0.27 [−0.34 to 0.89]	Reference
^a Urgent office visits	0.40 *** [0.21 to 0.59]	Reference
Asthma-related quality of life	−0.46 *** [−0.66 to −0.25]	Reference

NOTE: All models were adjusted for number of chronic conditions, asthma control, household income, total out-of-pocket expenses, health insurance; estimates for control variables not displayed;

*
p<0.05;

**
p<0.01;

p<0.001. CI= confidence interval

^a Poisson regression model

^b Negative binomial regression model