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

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ABSTRACT

Background: Given the complexity of the health insurance market in the United States and the confusion that often stems from these complexities, patient perception about the value of health insurance in managing chronic disease is important to understand.

Objective: To examine differences between public and private health insurance in perceptions of financial burden with managing asthma, outcomes, and factors that explain these perceptions.

Methods: Secondary analysis was performed using baseline data from a randomized clinical trial that were collected through telephone interviews with 219 African American women seeking services for asthma and reporting perceptions of financial burden with asthma management. Path analysis with multigroup models and multiple variable regression analyses were used to examine associations.

Results: For public ($P < .001$) and private ($P < .01$) coverage, being married and more educated were indirectly associated with greater perceptions of financial burden through different explanatory pathways. When adjusted for multiple morbidities, asthma control, income, and out-of-pocket expenses, those with private insurance used fewer inpatient ($P < .05$) and emergency department ($P < .001$) services compared with those with public insurance. When also adjusted for health insurance, greater financial burden was associated with more urgent office visits ($P < .001$) and lower quality of life ($P < .001$).

Conclusion: African American women who perceive asthma as a financial burden regardless of health insurance report more urgent health care visits and lower quality of life. Burden may be present despite having and being able to generate economic resources and health insurance. Further policy efforts are indicated and special attention should focus on type of coverage.

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Introduction

Health insurance serves the purpose of providing financial protection from unanticipated illness episodes and is 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 United States. In the private market, large-group subscriber

coverage may cover approximately 86% of the cost of services, but this type of insurance is enjoyed by only 19% (48.6 million) of insured Americans.² Recent trends have shown that the comprehensiveness of large-group employer-sponsored insurance coverage is decreasing 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. Owing 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 usage by health insurance are evident. In pediatric asthma, children with Medicaid coverage use more emergency department (ED) and inpatient services for asthma compared with children with private insurance.⁴ Other work in adults has shown that Medicaid coverage after 2 years of coverage has not resulted in decreases in urgent care use.⁵ Whether these relations are also evident in adults with asthma is unclear.

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High-risk groups, such as African American women with asthma, provide a valuable population for understanding relations among 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 with other subgroups.⁶ They may be vulnerable to perceiving financial burden with asthma management owing to racial and gender disparities in economic opportunities.⁷

Given the complexity of the health insurance market in the United States, 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 among type of coverage, perceptions of financial burden, and asthma-related health outcomes.

Methods

Data Source

This study was a secondary data analysis. Data were comprised of items from the baseline assessment in a randomized controlled trial 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 through community advertisements. Study eligibility criteria for these women were: (1) self-identify as African American, (2) at least 18 years old, (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. During the 3-year recruitment period, 1,315 women were identified through the University of Michigan Health System and were mailed recruitment materials, including a description of the study, 2 copies of the consent form, and a decline postcard. Of those, 843 women were successfully reached by telephone, and 444 women (53%) consented to participate. Women who declined participation ($n = 301$) did so primarily owing 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 by 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 by telephone was attributable to nonworking 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 present analysis is comprised of 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.

Measurements

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 a participant's appraisal of her financial situation as it related to her health. The single-item measurement assessed on a 5-point Likert-scale was: "Do you consider cost to be a problem in managing your asthma?" "Problem" was defined as not paying the bills because a participant was unable to or paying them despite financial hardship. Self-report subjective methods were adequate for how financial burden was conceptualized in this study. Similar measurements in a general population of adults have been used in previous work in which participants were asked whether 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 physician or clinic for urgent asthma treatment," "gone to the ED for asthma treatment," or "had to stay overnight at least 1 night in the hospital because of 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 of signal health care events such as ED visits and hospitalizations 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 measurement in this study for total out-of-pocket expenses.¹¹ Participants were asked to name each medication they used for their asthma, how many times they refilled each medicine, and how much the out-of-pocket payment was for each refill. Each out-of-pocket payment was multiplied by the number of refills, summed, and rounded to obtain total expenses during the past year.

Health insurance

Respondents were asked what kinds of health coverage they had and to select all that applied (private health insurance, Medicare, Medi-Gap, Medicaid, military health care, Indian Health Service, state-sponsored plan, other government program, single-service plan [eg, vision]). Verification of health insurance through the review of medical records was conducted with the Cohen κ statistic, indicating high level of agreement ($\kappa = 0.69$). Participants with dual coverage in the sample were those with Medicare and supplementary coverage. These participants were categorized into the public insurance group because their primary health insurance plan was a government-sponsored plan.

Asthma control

Asthma control was measured using the 5-item validated Asthma Control Test.¹² The National Asthma Education and Prevention Program asthma guidelines were used to classify asthma control into 3 categories—poorly controlled, not well controlled, or well controlled—and assess the frequency of daytime and nighttime asthma symptoms.¹³

Clinical and demographic data also were collected.

Analysis

The Student *t* test for continuous variables and contingency tables with χ^2 test and the Fisher exact test 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 participants 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 relations 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 the path is adjusted for all factors included in the model.¹⁴ All equations were estimated simultaneously with Mplus 6.12 software (Muthén and Muthén, Los Angeles, California). *P* values less than or equal to .05 were considered statistically significant for these analyses.

Multiple variable regression models computed in SAS 9.3 (SAS Institute, Cary, North Carolina) were used to examine relations 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), urgent care use (Poisson regression), and asthma-related quality of life (linear regression).

Results

Sample

Table 1 lists economic, demographic, and clinical characteristics of participants who perceived financial burden ($n = 219$) stratified by health insurance (private vs public coverage). More participants in the private insurance group were married ($P < .01$), had greater educational attainment ($P < .001$), higher income ($P < .001$), part-time or full-time employment ($P < .001$), and greater out-of-pocket expenses ($P < .05$) compared with the public insurance group. Compared with the private insurance group, more participants in the public insurance group were the head of their household ($P < .01$) and unemployed ($P < .001$).

More participants with public coverage had more daytime ($P < .05$) and nighttime ($P < .01$) symptom days, worse asthma control ($P < .001$), more medications ($P < .01$), and multiple morbidities ($P < .01$) compared with those with private coverage. The public insurance group was more likely to see only a primary care provider and had more asthma-related ED visits ($P < .01$), hospitalizations ($P < .05$), urgent office visits ($P < .01$), and lower asthma-related quality of life ($P < .001$) compared with the private insurance group.

Path Model Results

The fit of the final path model was adequate according to goodness-of-fit criteria ($\chi^2 = 65.80$, $df = 56$, $P = .17$; comparative fit index = 0.93, root mean square error of approximation = 0.035, 90% confidence interval 0.00–0.06; weighted root mean square residual = 1.09). Strong evidence was found for differences between public and private health insurance in the relations among demographic factors, household income, out-of-pocket expenses, and perceptions of financial burden when adjusted for clinical factors ($\Delta\chi^2_5 = 39.89$, $P < .001$).

For the public insurance group, being married and having greater educational attainment were positively associated with perceptions of financial burden through a higher income and thus more out-of-pocket expenses when adjusted for clinical factors (Fig 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 the public ($P < .001$) and private ($P < .05$) insurance groups, more out-of-pocket expenses were associated with greater perceptions of financial burden. For those with public insurance, more income was associated with more out-of-pocket expenses ($P < .001$), whereas this relation 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, participants with private insurance had fewer asthma-related ED visits ($P < .001$) and fewer hospitalizations ($P < .05$) compared with those with public insurance (Table 2). When also adjusted for extent of health insurance coverage, participants who perceived financial burden had more urgent office visits for asthma ($P < .001$) and reported lower asthma-related quality of life ($P < .001$; Table 3).

Discussion

This is the first study of which the authors are aware of to examine differences in perceptions of financial burden by health insurance coverage and the relation 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 who perceived asthma as a financial burden regardless of health insurance had poor asthma control, more urgent health care visits, lower household income, and reported a lower quality of life.

Differences in who is at risk for perceptions of financial burden were evident in those who had private vs public coverage and stemmed primarily 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 participants 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 them and their 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 the present findings are consistent with those of 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 more barriers to access but also may 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 the risk for inpatient and ED services, and the publicly insured with asthma are at particularly high risk.

The present findings also showed that regardless of insurance coverage, economic resources, and asthma control, those who perceived financial burden had more urgent office visits for asthma and reported lower asthma-related quality of life. One's health

Table 1Economic and demographic characteristics of participants who perceive financial burden: differences by health insurance^a

	Private insurance (n = 103)	Public insurance (n = 98) ^b	t or χ^2
Economic and demographic characteristics			
Age (y), mean (SD)	43.61 (12.08)	44.36 (16.18)	t = -0.37, NS
Married, % (n)	42 (43)	16 (16)	$\chi^2_1 = 15.64^g$
Currently head of household, % (n)	62 (63)	79 (77)	$\chi^2_1 = 7.39^f$
≥3 individuals in household, % (n)	37 (38)	34 (34)	$\chi^2_3 = 2.83$, NS
Educational attainment, % (n)			$\chi^2_2 = 16.15^g$
High school/GED or less	8 (8)	24 (23)	
Some college, associate's degree, or vocational school	48 (49)	55 (54)	
At least college	44 (45)	21 (21)	
Employment status, % (n)			$\chi^2_2 = 42.44^g$
Part-time	25 (26)	28 (27)	
Full-time	58 (59)	17 (17)	
No employment	17 (17)	55 (54)	
Household income, % (n)			$\chi^2_2 = 55.27^g$
<\$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 (US\$)			
Mean (SD)	271.98 (424.06)	160.49 (286.59)	t = 2.19 ^e
Range	0–2,840	0–2,000	
Clinical characteristics			
Specialty of care, % (n)			^c $\chi^2_1 = 1.17$, NS
Primary care and specialist	41 (42)	39 (38)	
Primary care only	48 (50)	53 (52)	
Specialist only	8 (8)	4 (4)	
No physician	3 (3)	4 (4)	
Frequency of daytime symptoms, % (n)			$\chi^2_2 = 5.97^e$
<2 d/wk	66 (68)	49 (48)	
≥3 d/wk	25 (26)	38 (37)	
Throughout day	9 (9)	13 (13)	
Frequency of nighttime symptoms, % (n)			$\chi^2_2 = 9.49^f$
≤2 times/mo	66 (67)	47 (46)	
1–3 times/wk	17 (17)	35 (34)	
>4 times/wk	18 (18)	18 (18)	
Asthma control, % (n)			$\chi^2_2 = 11.46^f$
Well controlled	34 (35)	17 (17)	
Not well controlled	33 (34)	28 (27)	
Very poorly controlled	33 (34)	55 (54)	
Asthma medications, % (n)			$\chi^2_1 = 1.14^d$, 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 ^f
Total number of other chronic conditions, mean (SD)	3.31 (2.38)	4.38 (2.80)	t = -2.94 ^f
Currently has asthma action plan, % (n)	68 (69)	68 (65)	$\chi^2_1 = 0.01$, NS
Owns a Peak flowmeter, % (n)	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 ^g
Urgent office visits for asthma, mean (SD)	1.39 (1.63)	2.49 (3.11)	t = -3.07 ^f
Emergency department visits for asthma, mean (SD)	0.66 (1.22)	1.53 (2.18)	t = -3.44 ^g
Hospitalizations for asthma, mean (SD)	0.24 (0.75)	0.49 (0.90)	t = -2.13 ^e

Abbreviation: NS, not significant.

^aThe χ^2 tests were performed on clinical variables of interest to identify differences between groups.^bMedicaid, Medicare, Medicare and supplemental coverage, or other government insurance.^cBecause of the low cell count, the χ^2 test is based on associations between primary care and specialist and primary care only.^dBecause of the low cell count, the χ^2 test is based on associations between controller and rescue and rescue only.^eP < .05.^fP < .01.^gP < .001.

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 also may 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 also may 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 the economic circumstances of the participants in this study. Because this was secondary data analysis, data were limited to what were available in the data source. Future studies might 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

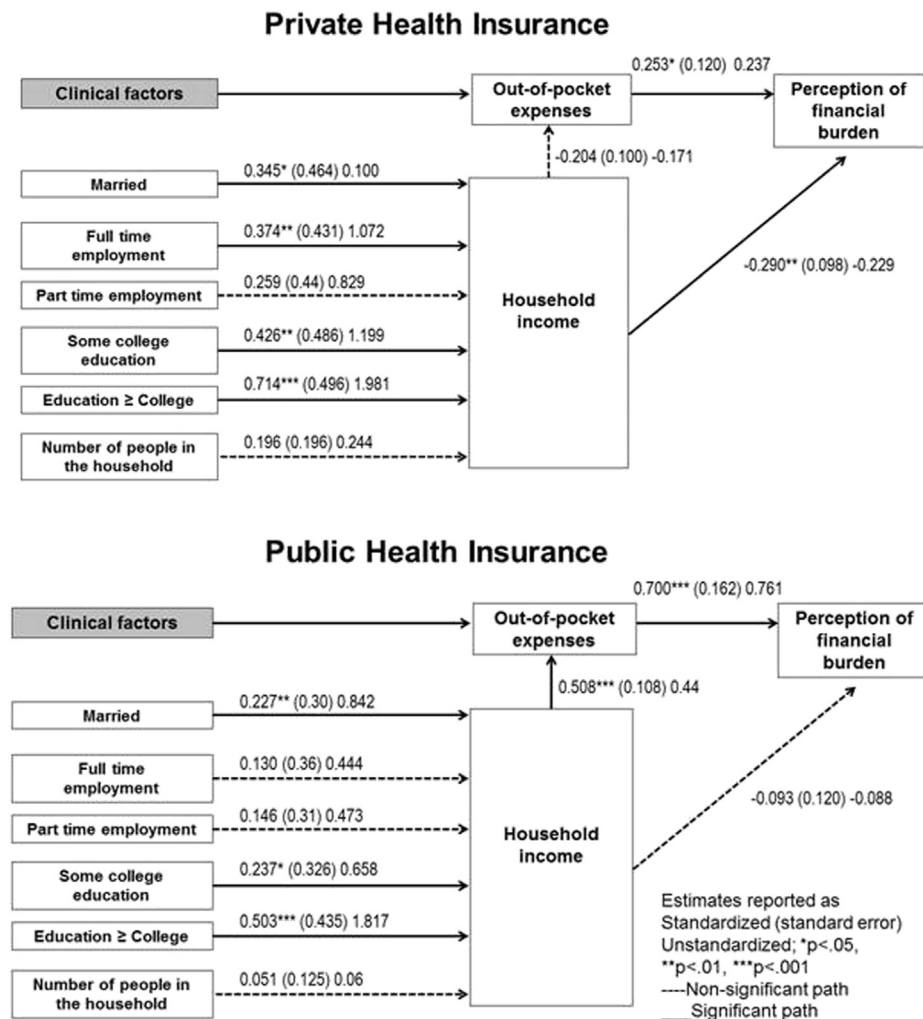


Figure 1. Moderated effects of health insurance on relationships between patient factors and perceptions of financial burden.

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 by 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. The study sample was comprised of 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 are certainly generalizable to high-risk populations.

These findings have some implications for policy and clinical practice. The Affordable Care Act will provide millions of uninsured

Table 2

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

Variable	Private insurance estimate (95% CI)	Public insurance
Emergency department visits ^b	−0.57 ^c (−0.90 to −0.25)	reference
Hospitalizations ^c	−0.91 ^d (−1.73 to −0.09)	reference
Urgent office visits ^b	−0.13 (−0.37 to 0.09)	reference
Asthma-related quality of life	−0.11 (−0.37 to 0.13)	reference

Abbreviation: CI, confidence interval.

^aAll models were adjusted for number of chronic conditions, asthma control, household income, and total out-of-pocket expenses; estimates for control variables are not displayed.

^bModel estimated with a Poisson distribution.

^cModel estimated with a negative binomial distribution.

^d $P < .05$.

^e $P < .001$.

Table 3

Adjusted effects of perceptions of financial burden on health outcomes, obtained from multivariate regression^a

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

Abbreviation: CI, confidence interval.

^aAll models were adjusted for number of chronic conditions, asthma control, household income, total out-of-pocket expenses, and health insurance; estimates for control variables are not displayed.

^bPoisson regression model.

^cNegative binomial regression model.

^d $P < .001$.

Americans with greater availability of 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 persist for individuals with 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 behaviors,¹⁶ and other work has shown associations between poor health outcomes and perceptions of financial burden.¹⁶ Because health care providers make therapeutic recommendations, the present findings suggest opportunities for communication between care teams and patients regarding ways to lower 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 decrease the cost-sharing associated with a treatment plan is needed for patients with private insurance because 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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