

Surveillance of the cost of asthma in the 21st century

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Key words: Asthma, morbidity, burden, economic, cost

In this issue Sullivan et al¹ present the latest findings from the Medical Expenditures Survey (MEPS) on the economic burden of adult asthma in the United States. The MEPS is uniquely designed to provide such information. A nationally representative sample of households was monitored periodically over 2 years to track their medical expenditures, utilization, and productivity (eg, days missed from work or bed days). These data are supplemented by information gathered from the medical providers seen by the MEPS participants. The authors report that adults with asthma incur an additional \$1,907 increase per annum in medical costs and that the national medical expenditure attributed to asthma is \$18 billion. Is this too much or too little? The data presented in this report do not provide us with an answer. The data do provide a number of important insights into asthma care in the United States and also give us an opportunity to ask whether we are collecting the right data.

The pattern of expenditures provides insight into where we are spending the money. In the mid-1980s, hospitalizations were a major driving cost of asthma.² In the mid-1990s, the proportion spent on hospitalizations decreased, whereas the cost of medication became the predominant expenditure.³ The current analysis demonstrates that in the first decade of the 21st century, the mid-1990s pattern remains. What is different is the increasing presence of home health care expense and the decreasing proportion attributed to emergency department visits. This finding is good news because during the last several decades, lack of recognition and treatment were considered major contributors to the burden of asthma in this country. Much effort has been expended to increase the awareness and treatment of asthma, focusing especially on self-management.⁴ The pattern of expenditures provides evidence that these efforts are bearing fruit.

Now is the time to move beyond simply tracking the pattern of expenditures and ask whether this money is being well spent. Medication expenditures provide one such opportunity. The Expert Panel Report 3 asthma treatment guideline details a series of 6 steps beginning with the use of intermittent short-acting bronchodilators, progressing to low-dose inhaled corticosteroids (ICSs), and followed by increases in the dose of ICS and then

addition of long-acting bronchodilators.⁴ The cost of asthma medications varies but generally increases as one progresses along the various treatment steps. A retrospective review of commercially insured patients found that only 37.6% of asthmatic patients started on combination therapy met prespecified criteria for appropriate use of this medication.⁵ Many factors could be contributing to this, such as the marketing of pharmaceuticals to both physicians and patients^{6,7} or the nonadherence to guideline recommendations for the selection of initial medication.⁸ Other work has found treating mild persistent asthma with combination products as opposed to guideline-recommended ICSs does not improve outcomes but does increase cost.⁹ We need to refine our tracking data on medical expenditures to monitor that the level of medication prescribed matches the level of severity to avoid unnecessary costs.

Does increasing expenditures on medication necessarily translate into better care? Unfortunately, this report shows there is still much morbidity remaining. Adults with asthma were found to have more activity limitations than nonasthmatic subjects. Activity limitations among asthmatic subjects are usually due to lack of asthma control.¹⁰ The findings of this report are consistent with other work, showing that asthma is still not well controlled in the United States. For example, a recent provider-based study estimated that 58% of adult asthma is uncontrolled.¹¹ With spending on medication increasing, why is asthma control not better? To control asthma, a patient must not only have access to a medication but also know how and when to use it. In addition, environmental interventions must be implemented to reduce exposure to asthma triggers, such as cigarette smoke and environmental allergens, to increase our chance of controlling asthma.¹² Are we spending enough on asthma education and environmental remediation? Present monitoring systems cannot tell us the answer to this important question.

This report highlights an often overlooked facet of asthma that is potentially contributing to our difficulty in controlling asthma: the high prevalence of comorbidities in adults, which is almost double the rate of those without asthma. Other reports have also found high levels of comorbidity in adults with asthma and have demonstrated its negative effect on asthma control.^{13,14} These comorbidities include chronic conditions, such as arthritis, hypertension, and mental illness, in addition to other allergies, such as rhinitis. At present, this is an area that is ignored in most guidelines or asthma education. The treatment needs of these other conditions compete with our recommended asthma treatment for the attention of the patient. Future education efforts, especially in adults, must devise strategies on how to work with subjects with multiple morbidities so they can better manage their asthma and other morbidities simultaneously.

In contrast to other surveys in which asthmatic subjects are identified by self-report of either symptoms or diagnosis, in the MEPS a subject must report a medical expenditure related to asthma, such as a prescription or a visit to their doctor. This difference is of no importance when we look at the burden of

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Disclosure of potential conflict of interest: P. Gergen has declared that he has no conflict of interest.

Received for publication November 12, 2010; accepted for publication November 17, 2010.

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J Allergy Clin Immunol 2010;■■■:■■■-■■■.

0091-6749

doi:10.1016/j.jaci.2010.11.023

direct medical expenditures related to asthma; however, this difference makes the prevalence estimates of the MEPS of little value for tracking the prevalence of asthma. The difference does offer some new insights into asthma. As the authors point out in the MEPS, the prevalence of asthma is only approximately 57% of the prevalence reported in the National Health Interview Survey from which the MEPS sample is drawn (7.3% vs 4.2%). The 43% of the National Health Interview Survey prevalence estimate who did not report any medical expenditure raise some interesting questions. These subjects know they have asthma but are not receiving treatment: Is their disease truly that mild, or are they using complementary medical therapies for their asthma?¹⁵ Are they remaining untreated?

A careful reading of these analyses shows us that we need to make changes in the way we monitor the economic burden of asthma. Instead of tracking medication expenditures, we need to better track whether the correct medications are being prescribed, sufficient effort is being applied to teach people how to use their medications correctly, and appropriate environmental interventions are being applied. In addition, these analyses give us insight that we need to expand our asthma education effort to train adult patients in managing their asthma in light of their coexisting conditions. With increasing competition for health care dollars, we need to ensure that the money allocated to asthma is spent in the best possible manner.

REFERENCES

1. Sullivan PW, Ghushchyan VH, Slejko JF, Belozeroff V, Globe DR, Lin S-L. The burden of adult asthma in the United States: evidence from the Medical Expenditure Panel Survey. *J Allergy Clin Immunol* 2010;■■■:■■■.
2. Weiss KB, Gergen PJ, Hodgson TA. An economic evaluation of asthma in the United States. *N Engl J Med* 1992;326:862-6.
3. Weiss KB, Sullivan SD, Lyttle CS. Trends in the cost of illness for asthma in the United States, 1985-1994. *J Allergy Clin Immunol* 2000;106:493-9.
4. Expert Panel Report 3 (EPR-3): guidelines for the diagnosis and management of asthma—summary report 2007. *J Allergy Clin Immunol* 2007;120(suppl): S94-S138.
5. Ye X, Gutierrez B, Zarotsky V, Nelson M, Blanchette CM. Appropriate use of inhaled corticosteroid and long-acting beta(2)-adrenergic agonist combination therapy among asthma patients in a US commercially insured population. *Curr Med Res Opin* 2009;25:2251-8.
6. Adair RF, Holmgren LR. Do drug samples influence resident prescribing behavior? A randomized trial. *Am J Med* 2005;118:881-4.
7. Gellad ZF, Lyles KW. Direct-to-consumer advertising of pharmaceuticals. *Am J Med* 2007;120:475-80.
8. Cabana MD, Rand CS, Becher OJ, Rubin HR. Reasons for pediatrician nonadherence to asthma guidelines. *Arch Pediatr Adolesc Med* 2001;155:1057-62.
9. Colice GL, Yu AP, Ivanova JJ, Hsieh M, Birnbaum HG, Lage MJ, et al. Costs and resource use of mild persistent asthma patients initiated on controller therapy. *J Asthma* 2008;45:293-9.
10. Haselkorn T, Chen H, Miller DP, Fish JE, Peters SP, Weiss ST, et al. Asthma control and activity limitations: insights from the Real-world Evaluation of Asthma Control and Treatment (REACT) study. *Ann Allergy Asthma Immunol* 2010; 104:471-7.
11. Stanford RH, Gilsenan AW, Ziemiecki R, Zhou X, Lincourt WR, Ortega H. Predictors of uncontrolled asthma in adult and pediatric patients: analysis of the Asthma Control Characteristics and Prevalence Survey Studies (ACCESS). *J Asthma* 2010; 47:257-62.
12. Morgan WJ, Crain EF, Gruchalla RS, O'Connor GT, Kattan M, Evans R 3rd, et al. Results of a home-based environmental intervention among urban children with asthma. *N Engl J Med* 2004;351:1068-80.
13. Gershon AS, Wang C, Guan J, To T. Burden of comorbidity in individuals with asthma. *Thorax* 2010;65:612-8.
14. Zhang T, Carleton BC, Prosser RJ, Smith AM. The added burden of comorbidity in patients with asthma. *J Asthma* 2009;46:1021-6.
15. Marino LA, Shen J. Characteristics of complementary and alternative medicine use among adults with current asthma, 2006. *J Asthma* 2010;47:521-5.