HHS Public Access

Author manuscript

Am J Respir Crit Care Med. Author manuscript; available in PMC 2020 November 01.

Published in final edited form as:

Am J Respir Crit Care Med. 2019 November 01; 200(9): 1077–1078. doi:10.1164/rccm.201906-1177ED.

What will uncontrolled asthma cost in the United States?

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Asthma is characterized by variable levels of chronic airway inflammation and episodes of cough, wheeze, chest tightness, and difficulty breathing. The public health impact of asthma in the United States is substantial. In 2017 there were more than 25 million people in the United States with asthma, including over 6 million children (1). While many individuals are symptom-free and able to control their asthma by appropriately using prescribed medications and avoiding asthma triggers, millions have inadequate asthma control.

In 2010 on average, 38% of children and 50% of adults with asthma had uncontrolled asthma symptoms (2). Uncontrolled asthma reduces the quality of life of people with asthma and those who care for them, results in missed school or work, and increases the risk and severity of asthma exacerbation. In 2017, more than 11 million people reported having at least one asthma exacerbation in the last 12 months, 1.8 million ED visits, nearly 200,000 hospitalizations, and about 3,500 deaths (2).

In this context, the study entitled “The Projected Economic and Health Burden of Uncontrolled Asthma in the United States”, published here, provides important new information (3). The authors examined national and state-level projections of the economic burden (healthcare costs = direct costs and the cost of missed work = indirect cost or productivity loss) and health burden (Quality Adjusted Life Years) lost due to uncontrolled asthma from 2019 to 2038 in adults and adolescents age ≥ 15 years in the United States. The authors used the Asthma Control Test (ACT) to separate people with asthma into two groups of those who have controlled and uncontrolled asthma.

The methods used in the paper by Yaghoubi and colleagues set up a new approach in estimating the burden of asthma, by separating the part of the total burden that can be reduced through cost-effective asthma management strategies. Unsurprisingly, people with uncontrolled asthma usually have more ED visits, more hospitalizations, more missed school or work days, and generally lower quality of life. Moreover, the average cost of asthma for patients with uncontrolled asthma is significantly higher than for patients with controlled asthma (4).

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Previous studies on the cost of asthma primarily focused on estimating the added cost of having asthma of any level of control over having no asthma (5–8). While such information presents a more complete estimate of the economic burden of asthma, preventing or curing asthma is not currently possible. Because asthma management programs' goal is to bring asthma symptoms under control, a counterfactual should be asthma that is controlled. Another important feature of the paper is an estimation of projected added cost of uncontrolled asthma for the next 20 years based on several dedicated sources of data (3). The projection of the cost of uncontrolled asthma provides important information for policy makers and asthma management programs that should help develop and implement long-term asthma control strategies for the population with uncontrolled asthma.

Yaghoubi and colleagues estimate that the direct costs of asthma in adolescents and adults in the United States over the next 20 years is likely to be over $1.5 trillion. Over this 20-year-period, the authors also estimate that there will be 175 million person-years with uncontrolled asthma. If all those people with uncontrolled asthma in the United States can achieve and maintain asthma control, the authors estimate saving about $300 billion in direct costs, $660 billion in indirect costs, and recovering 15,462 Quality Adjusted Life Years (3).

Several limitations should be considered when interpreting the study results. Most notably, the authors acknowledge that their projections assume neither change in the prevalence of asthma nor in widespread implementation of effective asthma strategies that reduce the proportion of people with uncontrolled symptoms. In other words, the analyses ignore the possibility for potential changes in ambient and indoor environment linked to lung disease and the adoption and expansion of novel therapies and non-clinical asthma interventions that over the next two decades may significantly affect large populations with uncontrolled asthma. Also, the analyses do not include information about children with asthma who are younger than 15 years old or the consequences on those who care for them, such as poor sleep or days of lost work. It is therefore possible that the authors have overestimated or underestimated the costs of uncontrolled asthma. A potential next step could be to estimate the excess healthcare utilization, costs, and Quality Adjusted Life Years of individuals across different levels of asthma control, e.g. well-controlled asthma [ACT scores 20–25] vs. not well-controlled asthma [ACT scores 16–19], or well-controlled asthma vs. poorly-controlled asthma [ACT scores 5–15]. Such information would help to quantify savings according to changes in the proportion of people whose asthma is improved from poorly-controlled asthma to not well-controlled asthma or to well-controlled asthma. The authors' approach to estimating excess costs is based on the information from previous literature. Another potentially promising approach could be the use of econometric methods for estimating incremental cost of having uncontrolled asthma, similar to the methods used in the studies on the cost of asthma (5–8).

Notwithstanding these considerations, the answer to the question "What will uncontrolled asthma cost in the United States?" by Yaghoubi and colleagues is clear: *Too much*.

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