

The opportunity costs of screening children for asthma

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The current health reform debate has laid bare the challenge with determining appropriate care in an environment of uncertain medical effectiveness and rising health care costs. Comparative and cost-effectiveness studies are policy tools that permit decision-makers, theoretically, to allocate limited resources toward the greatest health benefit. Without these tools, opportunity to improve health may be missed. For example, would investing in early childhood screening miss an opportunity for greater health benefits from an investment in improving adherence to treatments for asthma?

The article in this issue by Gerald et al¹ fills an important information gap and highlights much of the controversy that exists in recommendations for screening and cost-effectiveness analysis. The article finds that a school-based screening program in a high-risk population is highly unlikely to be cost-effective. In particular, they find the most cost-effective intervention would cost \$151,000 per quality-adjusted life-year versus the alternative of no screening. These results are driven by 4 main inputs: how much having uncontrolled asthma reduces a person's quality of life, how likely a parent is to follow up with a physician after receiving a positive screening result, the adequacy of asthma control in patients, and the treatment effects on symptoms. We suspect the results represent a lower bound estimate because benefits are more diffuse in lower-risk populations, and therefore the cost per quality-adjusted life-year would likely be higher in a population-based screening program. The main limitation of their study, as acknowledged by the authors, is a reliance on secondary data. Future research should consider conducting economic evaluation alongside an ongoing randomized clinical trial evaluating the effectiveness of asthma screening.

Beyond the obvious result that childhood asthma screening is highly unlikely to be cost-effective, the investigation by Gerard et al¹ provides a number of useful insights. Ideally, increased childhood screening would lead to better health outcomes because positive screening results would lead to confirmation of the initial diagnosis, access and receipt of early and appropriate treatment, adherence to treatment, and ultimately better health outcomes. However, for asthma screening, this is not the case because the follow-up to positive screening results, access to appropriate treatment, and

adherence to treatments are limited. For example, it has been shown that less than a third of children identified by a survey as having undertreated asthma actually received subsequent care.² In addition, even after identification and seeking follow-up care, it has been shown that asthma treatment at the physician level is inadequate³ and adherence to recommended treatment is also poor.⁴ This evidence along with the results of Gerald et al¹ highlight that increased investment in screening may be putting the cart before the proverbial horse in that any benefits derived from investment in screening are unlikely to materialize because subsequent care is lacking. This implies that a more cost-effective strategy for improving asthma outcomes is likely to involve investments in finding better ways to improve adherence, treatment, and follow-up to referral, in that order. Once these impediments have been ameliorated, the cost-effectiveness of screening programs should be re-examined.

Many advocate for a population-wide childhood asthma screening program because asthma is one of the most common chronic diseases and is a leading cause of hospitalizations in children.^{5,6} However, for asthma, increased investment in screening may divert resources from more cost-effective interventions and will likely provide little benefit. In addition, screening programs tend to acquire a permanence once implemented even if additional evidence emerges that raises questions about their effectiveness. For example, mammography screening serves as a cautionary tale about implementation of population-wide screening programs. Recently, the US Preventive Services Task Force revised their mammography screening recommendation by increasing the age from 40 to 50 years for commencement of routine screening for breast cancer. This modification was based on a review of recent clinical evidence that indicated the increased risks (false-positives and unnecessary anxiety, biopsies, and costs) caused by screening outweighed the benefit of avoided breast cancer mortality.⁷ The change sparked a significant backlash because advocates for screening felt that early detection was a significant contributor to the reduction in breast cancer mortality, although there is limited evidence to support this in 40 to 50 years old. Nonetheless, a number of advocacy groups opposed the changes, and the senate amended the current health care legislation "to prevent the United States Preventive Service Task Force recommendations from restricting mammograms for women."⁸

Implementation of asthma screening may carry a high opportunity cost, especially if resources could be more effectively used in other areas and if a screening program, once put into practice, is difficult to modify. The results of Gerald et al¹ offer initial evidence that population screening for childhood asthma would be costly and would provide minimal benefits given that subsequent care and treatment is inadequate. Once issues related to adherence, treatment, and follow-up to screening are addressed, it may be possible to implement a cost-effective childhood asthma screening program.

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In the December 2009 issue, Gurka et al suggest that because the protective effect of early child care exposure on the risk of developing asthma appeared independent of the number of reported respiratory tract illnesses, other factors related to the number of children in a child care setting may be involved.

Gurka MJ, Blackman JA, and Heymann PW. Risk of Childhood Asthma in Relation to the Timing of Early Child Care Exposures. *J Pediatr* 2009;155:781-7.

In the same issue, Schuh et al found that montelukast is not an adequate alternative to corticosteroids after outpatient stabilization of children with mild to acute asthma.

Schuh S, Willan AR, Stephens D, et al. Can Montelukast Shorten Prednisolone Therapy in Children with Mild to Moderate Acute Asthma? A Randomized Controlled Trial. *J Pediatr* 2009;155:795-800.

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