

Allergic Rhinitis (Hay Fever)
Summary of Methods and Data for Estimate of Costs of Illness

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|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| 1. Estimated Total Economic Cost | \$ Not Available |
| Estimated Direct Cost | \$ 1.9 billion |
| Estimated Indirect Cost | \$ Not Available |
| Reference Year | 1996 |
| IC Providing the Estimate | NIAID |
| | |
| Direct Costs Include: Other related nonhealth costs | No |
| Indirect Costs Include: | |
| Mortality costs | No |
| Morbidity costs: Lost workdays of the patient | No |
| Morbidity costs: Reduced productivity of the patient | No |
| Lost earnings of unpaid care givers | No |
| Other related nonhealth costs | No |
| Interest Rate Used to Discount Out-Year Costs | Not Available |
| 2. Category code(s) from the International Classification of Diseases, 9th Revision, Clinical Modification, (ICD-9-CM) for all diseases whose costs are included in this estimate: <u>477</u> . | |
| 3. Estimate Includes Costs: | |
| Of related conditions beyond primary, strictly coded ICD-9-CM category | No |
| Attributable to the subject disease as a secondary diagnosis | No |
| Of conditions for which the subject disease is an underlying cause | No |
| 4. Population Base for Cost Estimate (Total U.S. pop or other) | Total U.S. pop |
| 5. Annual (prevalence model) or Lifetime (incidence model) Cost: | Annual |
| 6. Perspective of Cost Estimate (Total society, Federal budget, or Other) | Total Society |
| 7. Approach to Estimation of Indirect Costs | Not Applicable |
| | |
| 8. <u>Source of Cost Estimate</u> : (Reference published or unpublished report, or address and telephone of person/office responsible for estimate) | |

Ray NF et al, J Allergy Clin. Immunol., 1999; 103; 401-07.

9. Other Indicators of Burden of Disease:

It is estimated that 39 million persons in the U.S. experienced allergic rhinitis in 1987 (Malone, 1997). However, only 12.3% (4.8 million) sought medical treatment for allergic rhinitis (Malone, 1997). The number of individuals with allergic rhinitis has increased by 25% from 1979-81 to 1990-92 (CDC, 1997). The majority of these people are a subset of the 50 million Americans who are reactive to at least one of the 8 allergens known to contribute to allergic illness. In 1987, allergic rhinitis resulted in approximately 811,000 missed workdays, 824,000 missed school days, and 4,230,000 reduced activity days (Malone, 1997). Chronic sinusitis is the most commonly reported chronic disease, with 14.7% of the population (about 38 million persons) affected.

10. Commentary:

The previous estimate by McMenamain et al has been replaced by the annual cost estimate for allergic rhinitis performed by Ray et al due to the more current nature of the estimate as well as the inclusion of more services in the calculation of direct cost. Ray et al estimated direct healthcare expenditures for allergic rhinitis from two perspectives. The first estimate specified healthcare expenditures of \$1.9 billion for allergic rhinitis as the primary coded diagnosis, while the second estimate of \$5.93 billion included the cost of allergic rhinitis as a secondary diagnosis. For the second estimate, an expert panel using the Delphi consensus-building technique estimated the degree of overlap between allergic rhinitis and other disorders. This

technique allowed for estimation of the costs devoted to evaluation and treatment of allergic rhinitis but assigned to other airway disorders. These conditions included sinusitis, chronic rhinitis, acute upper respiratory infections, pharyngitis and tonsillitis, rhinorrhea, asthma, nonatopic conjunctivitis, and chronic otitis media and eustachian tube disorders. The \$1.9 billion estimate for the cost of allergic rhinitis was chosen as the reported annual cost because this value is more direct and more easily understood.

Services included in the direct cost of allergic rhinitis were derived from inpatient and outpatient hospitals, emergency departments, ambulatory surgical centers, physician offices, and patient medications. Data from three National Center for Health Statistics (NCHS) surveys were used to determine the number of people who received care for allergic rhinitis in 1994.¹ The unit price per encounter was determined for each type of service on the basis of the 1987 National Medical Expenditure Survey (NMES) of the Agency for Health Care Policy and Research and was then inflated to 1996 dollars. The NMES comprised 14,000 households, representing 36,259 individuals. Total costs for each service were determined by multiplying the number of encounters by the unit price per encounter in order to determine the direct annual U.S. cost of allergic rhinitis for 1994. Indirect costs were not determined in this study. When allergic rhinitis was the primary diagnosis, the costs were directly ascribed to this disease. For the related disorders, the panel's final proportional estimates were multiplied by the total number of encounters for each airway disorder to estimate the cost of allergic rhinitis as a secondary diagnosis. These values were then extrapolated to 1996 values by using standard epidemiologic techniques. Data were further separated by age to assess costs for childhood (<12 years) and adult (>13 years) allergic rhinitis.

Also subsequent to the McMenamin reference, in 1997, Malone et al published an estimate of the cost of allergic rhinitis. Malone et al estimated the annual expenditure for allergic rhinitis at \$1.15 billion in direct costs, and \$1.23 billion in total costs, in 1994 dollars. This study also used data from the 1987 NMES to determine the annual U.S. cost of allergic rhinitis. Estimated expenditures were included for visits to outpatient offices, clinics, hospital offices, or emergency departments and for patient medication. Reported expenditures in this survey incorporate medical expenses, including consumer out-of-pocket and third-party payer expenditures. In cases where no costs were reported for services and products, approximations of the market value were determined by the Agency for Health Care Policy and Research. Indirect costs include lost work productivity, school absenteeism, and restricted activity days. Malone determined the prevalence of allergic rhinitis by examining self-reported data on a health status questionnaire. In contrast to Ray, Malone determined the prevalence of allergic rhinitis in 1987 by examining self-reported health status questionnaire data from NMES. Person-level weights were used to estimate the number of persons who sought medical care, missed work or school, or were otherwise limited by allergic rhinitis.

The report of \$1.9 billion in direct costs by Ray et al has been referenced here due to the detailed calculation of cost for treatment in each service category including institutional care as well as outpatient care. Ray et al collected data from several 1994 NCHS surveys for hospital discharges, office-based physician encounters, hospital outpatient encounters, ambulatory surgery centers, emergency departments, and prescriptions to calculate the direct cost for each service for 1996. These values were totaled for the estimate of the direct cost of allergic rhinitis for 1996.

Because of the nature of the NMES, neither the Ray nor the Malone study includes the cost of self treatment. However, Malone reports that retail sales of over-the-counter allergy relief products exceed \$140 million a year (Waldrop J. Spring sneezes. *Am Demographics* 1993;15:4).

¹ The following 1994 NCHS surveys were used: the National Hospital Discharge Survey, the National Hospital Ambulatory Medical Care Survey, and the National Ambulatory Medical Care Survey.

Other references:

CDC. Prevalence of Selected Chronic Conditions: United States, 1990-92. Series 10: Data from the National Health Survey, DHHS Pub. No. 97-1522, January 1997.

McMenamin P. Costs of hay fever in the United States in 1990. *Annals of Allergy*. 73:35-39, 1994.

Malone DC et al, *J Allergy Clin Immunol* 1997; 99: 22-27.