THE NATIONAL EYE INSTITUTE SYMPOSIUM ON THE EPIDEMIOLOGY OF EYE DISEASES AND VISUAL DISORDERS

INTRODUCTION

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This issue of the *American Journal of Epidemiology* contains a series of papers that were presented at the Symposium on the Epidemiology of Eye Diseases and Visual Disorders, in Bethesda, Maryland, June 10–11, 1982. The Symposium, organized by the Office of Biometry and Epidemiology, National Eye Institute, National Institutes of Health, and attended by more than 100 scientists from the United States and abroad, was, to my knowledge, the first national or international meeting ever held on this subject.

Eye epidemiology is a young discipline that has grown rapidly in the last few years. One indication of this growth is the increase in the number of eye epidemiology papers published by the *American Journal of Epidemiology*—from four in 1971–1976 to 15 in 1977–1982. The current issue contains 13 of the papers presented at the Symposium.

Several factors have contributed to this growth, a prominent one being the establishment in 1971 of the Office of Biometry and Epidemiology by the Director of the National Eye Institute shortly after the formation of the Institute. Staff of this office have played leadership roles in conducting courses in clinical vision research (with emphasis on epidemiology and biostatistics), and in the planning and conduct of pioneering eye epidemiology studies such as the Framingham Eye Study and the Diabetic Retinopathy Study. These investigations have provided training in design, protocol development, conduct, and data analysis of epidemiologic investigations for many vision researchers. The National Eye Institute’s strong support of well-designed, randomized clinical trials has led to the hiring of biostatisticians by several ophthalmology departments. Recently several ophthalmology departments have added persons with experience in epidemiology to their staffs, and several epidemiology departments have added staff with a major interest in eye disease epidemiology. Although eye epidemiology is still a young field, it seems that a critical mass of scientists has now been assembled for significant progress.

The goals of the Symposium, which emphasized disease etiology, were: 1) to provide a forum for the exchange of information by leading practitioners on the substance and methods of research on the epidemiology of eye disease; 2) to provide critical reviews of the literature on the epidemiology of the leading causes of visual impairment in the United States; and 3) to provide directions for the future and stimulate research in this field.

The organizers of the Symposium attempted to facilitate achievement of these goals by: 1) inviting many of the leading practitioners of vision epidemiology and providing them with the opportunity to meet and share ideas and experiences; 2) inviting critical literature reviews on the epidemiology of the major eye diseases in order to summarize and share what is known, what important information is

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lacking, and what substantive and methodological research is needed; 3) providing ample time for discussion—formally during the sessions and informally during intervals and at social functions; 4) publishing in this issue of the Journal the review and results papers that seemed most nearly ready for publication and that had not already been submitted to other journals. The discussions were not published because many of the papers, having been presented in preliminary form, were modified after the discussion.

The Symposium appears to have accomplished its main purposes. The invited literature reviews for cataract, senile macular degeneration, open-angle glaucoma, and amblyopia are published in this issue, as are nine reports on the results of recent research.

The following research concerns were among those discussed during the Symposium:

Standard definitions are needed for several eye diseases (e.g., cataract, glaucoma, senile macular disease). The absence of such definitions makes it difficult to compare the results of descriptive or analytic studies in different populations. The goal of widely accepted standard definitions will be difficult to realize in the near future, but a start in this direction can be made by the development of standard disease classifications, such as has been accomplished for diabetic retinopathy with the Airlie House classification, which is based on standard fundus photographs. Ferris, in his review paper in this issue, has proposed a photographic classification for senile macular disease. A standard classification can form the basis for several hierarchic definitions of a disease.

Descriptive epidemiologic studies are needed to provide more information about the comparative frequency of eye diseases and visual impairment in various populations. Differences in disease frequency between populations can lead to the formulation and testing of genetic and environmental hypotheses of disease etiology.

Analytic studies—case-control studies, cohort studies, and population surveys—are needed to test etiologic hypotheses that have been suggested by previous work. The case-control study of senile macular disease described in this issue by Hyman et al. can serve as a model for future case-control studies, not only of senile macular disease but also of other eye diseases.

Studies are needed to assess the reproducibility of various ophthalmic observations and measures. Work to date suggests that good within- and between-observer agreement cannot be taken for granted. A paper in this issue by Brilliant et al. provides some examples.

Technological advances are needed to develop instruments that can make and record ophthalmic observations. The goal of this development should be to replace visual observations and subjective responses with such instrumention as photography, densitometry, and automated perimetry, assisted by computer, if appropriate. The absence of this technology has been a handicap in population surveys of eye diseases in that it has been difficult to obtain commitments from ophthalmologists to examine large numbers of persons. Observations recorded by instruments can reduce time involvement by ophthalmologists and subjects. Such records as photographs can also be easily reexamined to measure intra- and inter-observer agreement.

A paper on methodological problems in eye disease epidemiology, including a number of those discussed at the Symposium, is being published elsewhere (1).

In view of the success of the Symposium and the evident growth of the field of eye disease epidemiology, participants generally agreed that another symposium should be held in two or three years.

REFERENCES