THE ESSENTIALS OF DATA SOURCES IN EYE EPIDEMIOLOGY*

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ABSTRACT

The extensive literature on eye epidemiology was selectively reviewed to provide a concise and comprehensive summary on the current status of available data sources. The topics being covered were epidemiologic data evaluation, data handling, card registration, computer analysis, geographic factors, socio-economic conditions, personal attributes, genetic backgrounds, twin analysis and laboratory procedures for host defense factors including humoral and cellular immunity. Also, the scope of this article encompassed such major practical issues as glaucoma, cataract and other blinding diseases as well as traffic and occupational hazards. Epidemiologic information thus obtainable through data searching may prove to be instrumental in the identification of any potential preventive measures in ophthalmology and public health.

INTRODUCTION

Eye epidemiology has been used as an efficient scientific discipline in the investigation of ocular diseases for decades. The major focus has been widespread infectious trachoma, onchocerciasis and keratoconjunctivitis, which together rank as the principal causes of blindness. Highly developed, industrialized countries have been relatively free from these diseases, whereas in other countries, they are still rampant requiring public health campaigns to bring them under control. In tropical areas, a pandemic of enterovirus infections causing acute hemorrhagic conjunctivitis has recently been observed (Kono, 1975).

Although highly infectious epidemic keratoconjunctivitis due to adenovirus does not cause blindness, it does induce temporary visual incapacitation. Moreover, protracted recurrent keratitis due to herpes simplex virus may culminate in irreversible blindness and debilitation. Developed countries have added problems of increasing incidences of industrial, occupa-

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tional, and traffic hazards, to almost epidemic proportions. Furthermore, in all countries, the rates of major blinding diseases such as glaucoma, cataract, senile macular degeneration, diabetic retinopathy and herpetic keratitis seem to be rising.

It appears necessary to investigate eye epidemiologic data sources which may ultimately prove to be useful in designing future intervention studies.

**EPIDEMIOLOGIC DATA EVALUATION**

Basic principles of general epidemiology have been described in detail with special reference given to non-infectious, chronic diseases (Leavell & Clark, 1965; MacMahon & Pugh, 1970). The concepts discussed in these references can be applied to etiological and pathological aspects of eye diseases and used in the assessment of methods for improving prevention, diagnosis and treatment (Schwartz, 1963a, 1965).

The incidence rates are the quantitative basis of analyzing eye diseases and are made up from the number of newly arising cases per year, or the numerator, which is divided by the total population of approximately 100,000 or the denominator. Prevalence signifies the number of existing cases at a point in time, and includes chronic diseases that have been carried over from year to year. The changes seen over decades are secular changes which may show increasing or decreasing cycles. Any unusual or rapid rise of the attack rates (the incidence at a point of time), will signal an epidemic. Such figures in incidences and attack rates will be used to determine any effects that the agent and environment may have on their occurrence. Vital statistics, therefore, are the main sources of populational information from which the incidence and attack rates of diseases are calculated. These basic figures are derived mostly from birth, marriage and death certificates, the census and special reports from the National Office of Vital Statistics (U.S. Public Health Service, Publication No. 584). Complete data were obtained through household interviews in prospective programs of health examination surveys which recorded various disabilities resulting from major chronic diseases and its geographic distribution, types of injuries and comparison of using different methods of evaluation of reported data. Current listings of Vital and Health Statistics (National Center for Health Statistics, 1972), includes the comparison of vision testing devices (series 2, No. 1), types of injuries (series 10-57), binocular visual acuity in adults (series 11, No. 3) and selected demographic characteristics (No. 25).

Additional sources are World Health Organization epidemiologic and vital statistics (Statistics Annual) with a cancer registration on ocular neoplasms;