Rationale for a Program in Community Ophthalmology

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The high incidence of eye abnormalities among blacks, coupled with the relative unavailability of ophthalmic services, has resulted in excessive rates of blindness otherwise preventable or curable. As a consequence, incidence rates for blindness are higher for the black population than the white population.

Statistics show that black children requiring eyeglasses are less likely to receive eyeglasses than similar age-matched white children. In virtually every state surveyed, blacks were more frequently and severely afflicted with eye diseases and were less likely to receive treatment than whites. Yet, no programs exist in any state specifically targeted to promote eye care among blacks and reverse the ever-worsening trend. Additional data characterizing the scope of the problem shall be presented.

An initial strategy for approaching the problem, namely, *community ophthalmology,* has been developed. Community ophthalmology represents a new discipline promoting eye health and blindness prevention through programs utilizing methodologies of public health, community medicine, and ophthalmology. Basically, the use of community ophthalmology strategies is critical to positive outcome, when given a population composed of blacks and other minorities who are chronically underserved with regard to all sectors of health.

The evolution and rationale for these concepts are discussed from national, as well as international, perspectives.

Registeries for the blind are maintained in most states as a requirement of state as well as federal law. Legal blindness requires that the visual acuity or a visual field in the better eye be equal to or less than 20/200 or 20 degrees, respectively. A nationwide study of the etiologies and characteristics of blindness was undertaken in 1962 by the National Institute of Neurological Disease and Blindness, the National Society for the Prevention of Blindness, the American Foundation for the Blind, and the Division of Chronic Disease of the US Public Health Service.[1] The National Eye Institute, which was created in 1968, continued the study and reported the findings for the years 1968, 1969, and 1970.[2] A model reporting area (MRA) representing 16 states, was established and all statistics and projects were based on data obtained from the blindness registers of those 16 states (Table 1).

Epidemiologic data regarding blindness were collected and reported in 1968, 1969, and 1970. The study was discontinued in 1970 because a comparison of the data revealed insignificant change over the three-year period of the study.[3]

Based on the data collected, it was not possible to obtain true incidence rates. However, the rate of new additions to the blindness registers was computed and does represent an approximation of blindness incidence rates. Consequently, the designation "new additions" to the blindness registers will be compatible with blindness incidence for the purpose of this study.

Also, register prevalence will be interpreted to approximate national

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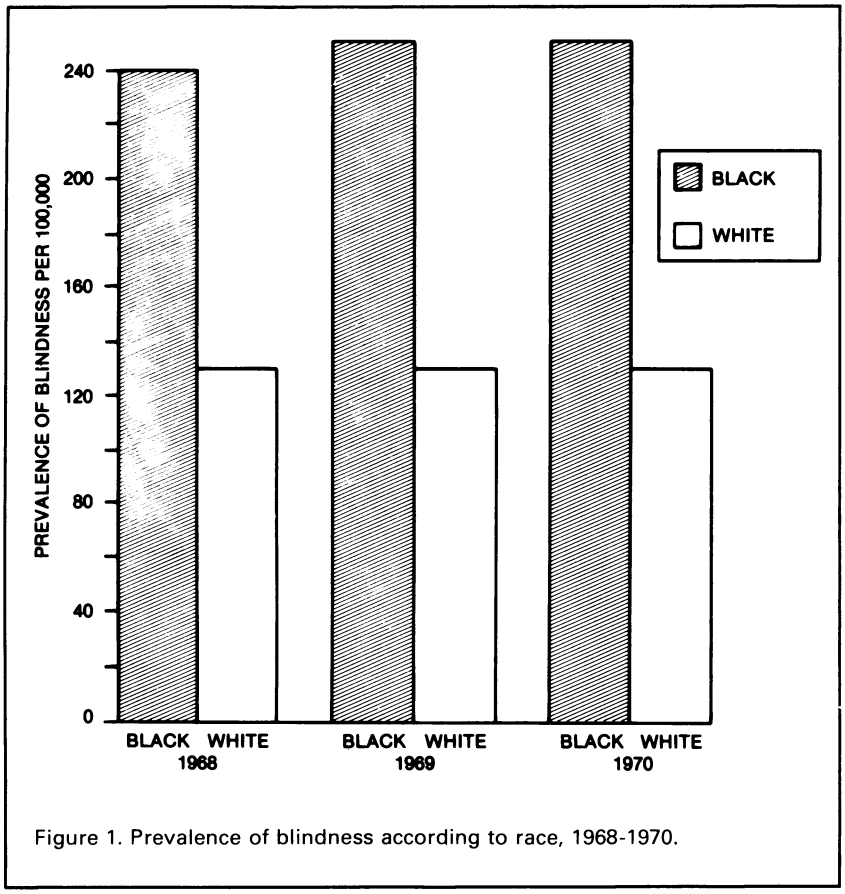

Figure 1. Prevalence of blindness according to race, 1968-1970.

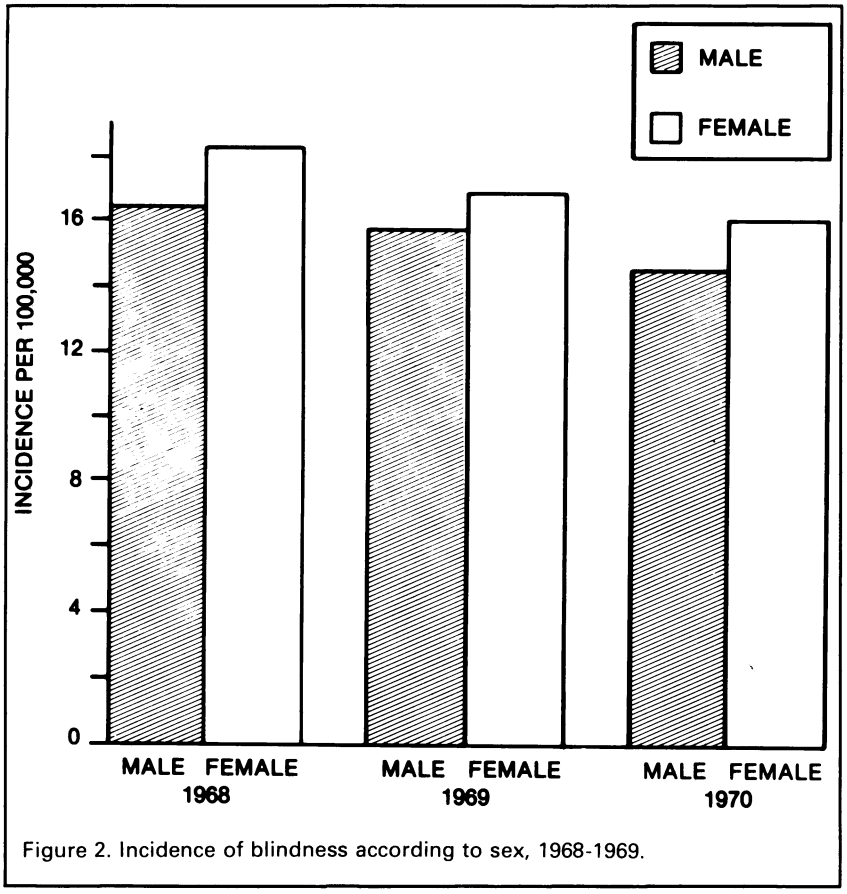

Figure 2. Incidence of blindness according to sex, 1968-1969.

"prevalence." It must be recognized that register reporting is incomplete and probably that true incidence and true prevalence are underestimated. These data, for the three-year period 1968, 1969, and 1970, are presented in Table 1.

Based on the national statistics available, the distribution of blindness in the United States is analyzed with respect to race, age, sex, and etiology.

The Prevalence of Blindness

There are approximately 500,000 legally blind individuals in the United States. Another 1 1/2 million Americans are functionally blind, that is, they cannot read newspaper print with either eye aided by glasses.[4]

The prevalence of blindness in the United States is 147 per 100,000. The prevalence of blindness among blacks is 252.7 per 100,000, whereas for whites, the prevalence is 127.1 per 100,000 (Table 2 and Figure 1).

An evaluation of the rates of addition to blindness registers for the states composing the MRA revealed that in every state (except South Dakota) excessive numbers of blacks were blind (Table 1).

The data in Table 1 show a consistent trend of excess blindness in blacks over the three-year period during which national blindness statistics were collected. In the states where data were available over a three-year period, excess blindness was present in blacks from a high of 2.8 to 1.1. Prevalence data for the MRA over the period 1968-1970 is shown in Table 2.

In view of the similarity of data over the three-year period, only 1970 data will be discussed (unless indicated otherwise) with reports to age-specific rates, severity, and etiology. In addition, the designation "non-whites" will be equated with black because previous data have shown that 90 percent of the US non-white population is black.[5]

Age–Specific Blindness Rates

In general, there is an increase in blindness rates with age. The rate of new blindness additions, in the under-five-years age group, is 4.0 per 100,000 compared to a rate of 203.0 per 100,000

Table 1. New Additions to Blindness Registers per 100,000 by Race and State[2] (Modified)

State	Black			White		
	1968	1969	1970	1968	1969	1970
Connecticut	15.4	24.2	22.3	11.4	15.9	8.1
Georgia	(1)	(1)	(1)	(1)	(1)	(1)
Kansas	27.6	29.0	29.6	13.8	15.2	15.3
Louisiana	20.8	18.6	22.1	11.8	10.6	11.2
Massachusetts	(1)	(1)	(1)	(1)	(1)	(1)
New Hampshire	(2)	(2)	(2)	15.0	17.1	14.2
New Jersey	(1)	(1)	(1)	(1)	(1)	(1)
New Mexico	16.5	5.0	(1)	14.8	4.8	(1)
New York	(1)	(1)	(1)	(1)	(1)	(1)
North Carolina	41.5	36.3	32.7	20.5	16.4	15.0
Oregon	16.7	(1)	(1)	19.1	(1)	(1)
Rhode Island	(2)	22.6	21.9	15.5	14.0	15.8
South Dakota	29.6	2.9	11.4	11.4	12.0	15.4
Utah	(2)	14.8	17.9	14.6	10.6	11.0
Vermont	(2)	(2)	(2)	19.6	10.6	15.1
Virginia	21.7	28.9	23.1	12.2	10.3	12.0

(1) Not computed because color was unknown for more than 10% of total additions to the state register.
(2) Not computed because the state had less than 25,000 such people for this color.

in the 85-years-and-over age group (Table 3). From a purely statistical point of view, it could be agreed that the higher rates of blindness among blacks represent an artifact because the black population represents an older population. For example, overall blindness rates are slightly higher for US females because the female population distribution is older relative to the male population (Figure 2). However, an examination of US Census Tables reveals the reverse to be true for black Americans. In fact, the average life span for a black person is 65.3 years compared to 71.7 years for a white male.[5]

Race and Age-Specific Blindness Rates

Data from the 1970 MRA report on blindness prevalence by age and race are summarized in Table 4. Rates were considerably higher for blacks than for whites in all age groups and reached a maximum at the 45-64 age group. For this age group, the rate of blindness was 3.6 times higher for blacks than for whites. For the age group 64-74, the rate was 3.5 times higher for blacks than for whites. While there is a general trend for blindness to increase with age for both age groups, the comparative peak for blacks at the 45-64 age group is unexplained. The age-standardized rate of blindness is most similar for blacks and whites at the two extremes, ie, the under-five and the 85-and-over age groups.

Level of Blindness

The spectrum of legal blindness begins with a visual acuity of 20/200 and ends with absolute blindness, ie, no light perception (NLP). Most of the blind in the United States are not totally blind, but retain varying degrees of vision. However, comparative analysis of the level of blindness reveals that more blacks were absolutely blind relative to whites. In general, visual impairment was greater among blacks in comparison to whites (Table 5).

The median level of residual vision was lower for blacks than whites. There were 19.5 percent of blacks in the two lowest levels of visual acuity, representing an excess of 5.1 percent. Consequently, blacks were more severely afflicted than whites relative to visual acuity assessment.

Blindness Distribution by Cause Etiology

Among white Americans, the major cause for new additions to the blindness register is senile or degenerative disease of the retina. Definitive treatment as well as precise pathogenesis remain unknown for this disease process. However, the major cause for new blindness among blacks is glaucoma which is neither a senile nor a degenerative disease. Blindness due to glaucoma is eight times more common in blacks compared to whites (Table 6.)

In general, blindness due to glaucoma may be prevented by early detection and therapy, whereas, no effective preventive measures exist for senile or degenerative diseases of the

Table 2. Correlation of Race and Blindness

Prevalence	1968	1969	1970
Black	241.4	246.9	252.7
White	128.3	126.4	127.1

Table 3. Correlation of Age and Blindness Incidence[2] (Modified)

Age Group	Rate/100,000
Under 5	4.0
5-19	5.1
20-44	6.1
45-64	20.4
65-74	36.8
75-84	94.5
85 and Over	203.0

Table 4. Correlation of Race and Blindness

Age Group	Prevalence Rates per 100,000 Black	White
Under 5	—	—
5-19	55.3	41.9
20-44	144.5	70.4
45-64	556.1	151.7
65-74	1,150.6	325.1
75-84	1,649.1	725.3
85 and Over	2,709.1	2,174.7
Total	252.7	127.1

Table 5. Level of Blindness

Visual Acuity Group	Rates per 100,000 Black	White
Absolute Blindness	8.1	5.3
Light Perception	11.4	9.1
Less Than 5/200	1.4	0.9
5/200 to<10/200	17.0	14.5
10/200 to<20/200	8.9	11.0
20/200	13.8	17.8
Restricted Field	24.2	29.7
Unknown	8.6	5.1

Table 6. Age-Standardized Incidence of Blindness by Cause and Race[2] (Modified)

	Rates per 100,000 Black	White
Glaucoma	6.5	0.8
Cataract	4.1	1.8
Retinal disease	5.3	4.1
Retrolental fibroplasia	0.1	0.1
Myopia	0.6	0.3
Cornea or sclera	1.2	0.2
Uveitis	1.0	0.3
Optic nerve disease	2.0	0.8
Multiple affections	2.8	1.2
Other	2.2	1.0
Unknown	2.9	1.6

retina. The cure or prevention of blindness due to senile or degenerative disease will depend upon scientific advances in the realm of basic science and laboratory research. However, in order to reduce blindness due to preventable causes, effective prevention programs are necessary. Specifically, the overall strategy of community ophthalmology is proposed.

Community Ophthalmology

Community ophthalmology represents a new discipline in clinical medicine promoting eye health and blindness prevention through the practical application of the methodologies of preventive medicine, public health, and clinical ophthalmology. In order to develop a program in community ophthalmology, the initial planning must include a thorough epidemiologic and demographic assessment to define the extent of blindness within the community. Based on the specific results of this assessment, programs which are relevant and appropriate for a given community can be developed.

In general, the two important components essential to any program in community ophthalmology are (1) consumer health education and (2) outreach screening programs.

Health education is necessary in order to effectuate primary prevention. The community must be aware of the warning signs of eye disease so that earliest possible detection is promoted. Outreach programs, particularly glaucoma screening, are necessary in high-risk communities.

Fortunately, eye screening programs are readily adaptable to a community setting and the utilization of paraprofessional personnel. The determination of visual acuity and intraocular pressure are relatively simple procedures which do not require elaborate training or equipment. Consequently, the prognosis for reducing blindness due to preventable causes is good, given a well-planned program strategy in community ophthalmology. Both the private and public sector must be encouraged to develop such programs in conjunction with active community participation.

Conclusion

The prevalence of blindness among blacks is double the prevalence for whites. An analysis of the etiologies for blindness reveals that disproportionate numbers of blacks are blinded by preventable causes. However, thus far, no national strategies exist for reducing the excessive rates of blindness among the black population. Specific data characterizing the problem are presented and analyzed. A program strategy for approaching the problem, namely, community ophthalmology has been proposed.

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